



**THE HARRIS  
CENTRE**  
Memorial University

**ACTION CANADA PAPERS**  
**on Labrador Mining, Aboriginal Governance and Muskrat Falls**

Dr. Keith Storey, Dr. Larry Felt, and David Vardy  
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## **Preface to the Action Canada Report**

This report includes three separate papers dealing with the mining industry in Labrador, Aboriginal governance in Labrador, and the possible development of the Lower Churchill hydroelectric development. The papers appear with the concurrence of the three authors, respectively, Dr. Keith Storey, Honorary Research Professor with the Department of Geography, Dr. Larry Felt, Professor of Sociology, and David Vardy, Professional Associate of the Harris Centre.

The papers were drafted at the request of Action Canada, a non-profit organization whose objective is to further develop the leadership capabilities of outstanding young Canadians. Each year, up to 20 outstanding Canadians (“Fellows”) are invited to join an 11-month leadership development and public policy program. The goals of the program are to enhance the Fellows’ leadership skills, enrich their understanding of Canada, and build a network whose members will support each other in making Canada the best country it can be. Action Canada was born in 2002 out of a vision to strengthen Canada’s future and is generously funded through private and public support. More information can be found about Action Canada at [www.actioncanada.ca](http://www.actioncanada.ca).

Engaging with Canadians on important issues is a priority for Action Canada and the annual program includes public dialogues in several locations. In September 2011, the Fellows met in Happy Valley-Goose Bay, in Newfoundland and Labrador. In preparation for the event, Action Canada asked the Harris Centre to help identify major issues facing Labrador, and then assist in finding experts in those areas to prepare background notes.

Dr. Keith Storey is a former Head of the Department of Geography at Memorial University, and a recognized expert in planning for mining projects. Dr. Larry Felt has long experience working with Aboriginal groups in Labrador. And David Vardy, in addition to being a Professional Associate of the Harris Centre, is also a former Clerk of the Executive Council of Newfoundland and Labrador, and former chair of the Public Utilities Board of Newfoundland and Labrador, the Crown agency responsible for regulating the generation and transmission of electricity (among other things).

These papers are meant to provide the reader with facts and options surrounding three complex (and interrelated) issues currently facing the residents of Labrador, as well as the province of Newfoundland and Labrador as a whole. Any opinions expressed in this report are solely those of the authors.

The Harris Centre is grateful to Action Canada for the opportunity to assist with the project and help share the results. Special thanks go to Cathy Beehan, the Founding CEO of Action Canada, and Dr. Andrea Rose of Memorial University’s Faculty of Education.

The Harris Centre  
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# **An Overview of Mining Activity in Labrador**

**Paper prepared for the Action Canada Working Conference, Labrador 21-25 September 2011**

Keith Storey PhD

Honorary Research Professor, Department of Geography, Memorial University

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## **1.0 Introduction**

In 2009 the contribution of mining to Newfoundland and Labrador (NL) GDP was estimated at \$1,566 million (6.7%) second only to offshore oil extraction and support activities (27.5%) of industries in the goods producing sector (GNLDF 2011).

Mining in NL is dominated by iron ore production in western Labrador and nickel ore production at Voisey's Bay on Labrador's northeast coast (Figure 1). The forecasted Gross Value of Mineral Shipments (GVMS) for 2011 for NL as a whole is \$4.7 billion of which approximately \$3 billion will be from iron ore and \$1 billion from nickel. Projected increases in shipments of iron ore and the opening of Labrador Iron Mines operation at the Québec/Labrador border near Schefferville in 2011, the end of the strike at Voisey's Bay and a general increase in commodity prices are the main contributory factors that should see the highest GVMS on record (GNL 2011).

## **2.0 Mines and Mineral Development in Labrador**

### **2.1 Iron Ore**

Substantial iron ore deposits were discovered in 1892, but isolation and other factors prohibited mining in Labrador until the 1940s. The end of WWII saw an increase in the demand for metals and minerals and resulted in a new boom in exploration and mine development. Labrador was a remote and then largely unknown region, but advances in aviation and mineral exploration technologies emerging from WWII offered new cost-effective means of opening up the area.

Iron ore mining is concentrated in the Labrador Trough, a 1,600 km long and 160 km wide geological structure that extends south-southeast from Ungava Bay in the north through Québec and Labrador and southwest into central Québec. Mining began in the Knob Lake (now Schefferville) area on the Québec-Labrador border following the end of WWII. This included, starting in 1950, the construction of a 588km railway from Sept-Îles, Québec to Schefferville. Mining commenced in 1954 under the control of the Iron Ore Company of Canada (IOCC), a private company owned by a number of US and Canadian steel companies and operating on LME leases. Mining activity ceased in the Schefferville area in 1982. Today mining is concentrated around Labrador City and Wabush in western Labrador, and Fermont, Québec 14 km to the west. Currently exploration and development is taking place in the vicinity of Labrador City and Wabush and once again near Schefferville, 250 km to the north (Figure 1).

Currently the main industry players are:

1. **The Iron Ore Company of Canada (IOC)** began producing iron ore from its Carol Lake project in Labrador West in 1962. IOC is owned by Rio Tinto PLC, which operates within the Rio Tinto Iron Ore Group (58.7%), Mitsubishi Corp. (26.2%) and the Labrador Ore Royalty Income Fund (15.1%) (Schiller 2011).

IOC is Canada's largest iron ore pellet producer operating several pits, a concentrator and a pellet plant at Carol Lake, port facilities in Sept-Îles, Québec, and the 420 km rail line linking the mines and the port. Annual mine production is 35-38 million tonnes (mtpa) at an average grade of approximately 40% iron. Annual production capacity is 17 mtpa of concentrate of which approximately 13 mtpa are pelletized (GNL 2011).

The rail link, the Québec North Shore and Labrador (QNS&L) railroad, is a common rail carrier. Because it crosses an inter-provincial boundary it comes under the jurisdiction of the federal government, and is obligated to permit the use of the rail line by other users (Schiller 2011).

In May 2010 IOC restarted its proposed expansion plan that would see an investment of Can\$435 million to increase annual concentrate capacity to 26 mtpa by 2013. In February 2011 a second phase investment of Can\$289 million was announced that would further increase capacity to 23.3 mtpa by year-end 2012. Shipments are forecast to increase from 15.6 mtpa in 2010 to 16.4 mtpa in 2011 with employment remaining steady at 1,625 (GNL 2011).

In August 2011 IOC announced a study to evaluate options to increase production to 50 mtpa. This may include new concentrators, mining pits, and related mine, rail, stock handling and port infrastructure (Rio Tinto 2011).

Since 1986 IOC has also mined dolomite in Labrador West for making fluxed pellets. 2011 production is forecast to be 195,000 tonnes (GNL 2011).

2. **Wabush Mines**, now owned 100% by Cliffs Natural Resources Inc. of Cleveland, Ohio, started mining iron ore from the Scully Mine in Labrador West in 1965. Wabush Mines currently operates a mine and a concentrating plant at Wabush, and a pellet plant and shipping facilities in Point Noire, Québec. Ore is shipped via the QNS&L railway to Pointe Noire. In 2010 concentrate production was 3.76 mtpa, up from 2.6 mtpa in 2009, and is expected to increase to 4.4 mtpa in 2011. Employment is also expected to increase from 428 in 2010 to 439 in 2011.

Wabush Mines plans new investment at the Scully Mine between 2010 and 2012 that could total Can\$115 million and would see replacement of equipment, implementation of a manganese reduction project, equipment reliability improvements and environmental projects (GNL 2011).

3. **Labrador Iron Mines Holdings Ltd.'s (LIM)** project at the site of the former IOC operations near Schefferville is designed to mine and process high grade direct shipping iron ore (DSO). LIM has 20 iron ore deposits containing 150 million tonnes of DSO grading 56-58% Fe of hematite ore (Schiller 2011).

The first phase of LIM's Silver Yards processing plant has been commissioned and full-scale mining operations at the James Mine are underway. On June 29 2011 the first ore train left

Silver Yards for Sept Îles, Québec via the Tshiuetin Rail Transportation Inc. (TRTI) and QNS&L railways, the first commercial ore train from the Schefferville area in almost 30 years (LIM 2011). Mine life expectancy is about five years but this could be extended to 15 years if other nearby deposits are developed. By 2015 production is expected to be about 5 mtpa and about 110 people will be employed (GNL 2011). The plant will operate seasonally for seven or eight months between April and November or December, depending on weather conditions. Overburden and waste mining and some ore mining will continue through the winter period.

4. **Tata Steel Minerals Canada Ltd.** with joint venture partner **New Millennium Capital Corporation** will mine and process high grade, DSO from the site of former IOC operations at Elross Lake, near Schefferville. NL released the project from further environmental assessment in January 2011. A phase two expansion plan into Québec remains under assessment. Project construction is expected to be complete by the end of 2012 and once operational will produce between 1.5 and 3 mtpa of iron ore during years 1 to 3 and result in about 188 direct jobs. Pre-feasibility studies of the Labrador DSO project indicate 64.1 million tonnes of proven and probable reserves and 15.3 million tonnes of measured and indicated resources (Schiller 2011; GNL 2011).
5. **New Millennium Capital Corporation**, in addition to its interest in the Elross Lake project, also holds an 80% interest in the 5-6 billion tonne LabMag taconite iron ore deposit near Schefferville, and a 100% interest in the similar size KeMag deposit across the border in Québec.

Taconite is a low-grade iron ore containing a high percentage of magnetite, which can be concentrated to produce high-quality iron. Based on proven and probable reserves the project would have a life expectancy of 74 years at a production rate of 22 mtpa. Production is currently anticipated in 2015-2016 (Baird 2011).

6. **Alderon Resource Corp.** is in the pre-development phase of its Kamistiatusset, or Kami, project located 10km south of Wabush. Production is planned at a rate of 8 mtpa over a 21-year mine life. Proximity to existing operations mean that rail spurs or conveyors could readily connect the mine to the main rail line to Sept-Îles (Schiller 2011).

The rapid growth in iron ore exploration and development activity in Labrador could see a significant increase in total iron ore production in Labrador and in Quebec over the next several years. The expansion of IOC's operations, Tata/New Millennium's Elross Lake and Alderon's Kami project would almost double current total Canadian production from 35 mtpa to more than 62 mtpa. Together with other developments in Québec, and potentially Baffin Island, Canadian production could reach 100 mtpa by 2015 or soon thereafter.

Whether this will happen depends largely on continued growth of markets, particularly those in China, which in 2009 imported c. 66% of total world iron ore exports and produced 60% of the world's pig iron – both of which are key indicators of consumption (USGS 2011). In 2009 new capacity in various countries added 75 mtpa to global production (Tabe 2011), and Brazil has indicated that it is anticipating increasing production from 372 mtpa in 2010 to 771.5 mtpa by 2015 (Spinetto 2011). Such increases will outstrip expected consumption if China's growth slows and will place some planned projects at risk.

## 2.2 Nickel

The Voisey's Bay nickel deposit on the northeast coast, southeast of Nain (Figure 1), was discovered in September 1993 and is considered to be one of the most substantial mineral discoveries in Canada in the last forty years. Drilling at the Discovery Hill site commenced in late 1994 and led to the discovery of high grade "Ovoid Zone", a huge bowl-shaped accumulation of massive iron, nickel and copper sulphides that contains about 32 million tonnes of ore grading 2.83% nickel, 1.69% copper and 0.12% cobalt. Sitting just below the surface it can be easily mined by open-pit methods. The estimated mine-life of the ovoid is 14 years (Vale 2011).

Two other sub-surface sulphide zones, the Eastern Deeps and the Reid Brook Zone have since been identified. While the average grade of each of these is significantly lower than that of the Ovoid, the deposit as a whole is estimated to contain 141 million tonnes at 1.63% nickel, 0.85% copper and 0.09% cobalt. Including the sub-surface resources, the mine has expected life of 30 years. However, before an underground mining plan can be developed exploration and evaluation and other feasibility analyses need to be completed to establish probable underground minable reserves and provide the information necessary to complete a mining plan and carry out financial evaluations. Should underground mining go ahead, it is anticipated to take place by 2018.

**Vale Newfoundland and Labrador Limited** (VNL), a unit of Vale, owns and operates the Voisey's Bay mine, which came into production in 2005. Ore is currently shipped by sea and rail for processing at Vale's Ontario and Manitoba operations.

In 2008 Vale announced that it would build a hydromet nickel processing facility at Long Harbour on the Isthmus of Avalon on the Island of Newfoundland. The project is expected to be complete in February 2013 (GNL 2011).

In 2010 42,000 tonnes of nickel, 33,000 tonnes of copper and 524 tonnes of cobalt were shipped. Production fell between August 2009 and January 2011 as a result of a strike by unionized employees. Current employment at the mine/mill operation is approximately 450 How many of those are of Aboriginal ancestry is not indicated (Vale 2011).

## 2.3 Uranium

Uranium was discovered near Makkovik more than 50 years ago. In the late 1970s development plans for two deposits were halted due to the collapse of uranium prices and concerns about the environmental impacts of mining. In 2005 uranium exploration picked up, resource estimates at previously known deposits were revised upwards and new discoveries made (GNL DNR 2009).

**Aurora Energy Ltd.** is a uranium exploration and development company active in the Central Mineral Belt of coastal Labrador and has identified significant uranium resources in six deposits. Of these the Michelin deposit is the most significant (Figure 1). Measured and indicated resource levels are estimated at 67.4 million pounds of  $U_3O_8$  and an inferred resource of 35.5 million pounds. A Preliminary Economic Assessment indicated a potential 17-year life for the mine with an average annual production of 5.7 million pounds (Aurora 2009).

The project would be on lands that fall under the jurisdiction of the Nunatsiavut government. In 2008 the Nunatsiavut government imposed a three-year moratorium on uranium mining on part of these lands, to be reviewed after March 31 2011. The moratorium was designed to give the

government time to develop environmental legislation and finalize its land use plan. There is currently no indication of when such a review will take place.

## **2.4 Mineral Exploration**

The Voisey's Bay discovery prompted a staking and exploration rush of unprecedented scale in Labrador. Between 1990 and 1995 annual exploration expenditures in Labrador ranged from \$0.75 to \$3.7 million. In 1995 expenditures were \$61.5 million, rising to a peak of \$81.4 million in 1996 before declining to \$12 million in 2000.

A second exploration rush in Labrador, associated mainly with uranium and iron ore, has occurred since 2005, with expenditures in that year of over \$30 million. Since then exploration expenditures have continued to rise reaching \$98 million in 2008. The recession led to lower expenditures in 2009 (\$35 million), but they have rebounded to an estimated \$92 million in 2011 (GNLDNR 2011a).

## **3.0 Secondary Processing**

The issue of the lack of secondary processing of mineral ores in the Province has been long-time concern. In the case of iron ore, beyond the production of concentrates and iron ore pellets there is no further processing of iron ore in Labrador. The economics of iron and steel production suggest that this is unlikely to change.

Crushing and screening operations are performed at the mine plant sites. Some ores then need to be upgraded before smelting, and concentration involves producing ore fractions richer in iron and lower in silica than the original material. Most concentration processes rely on density differences to separate light minerals from heavier ones so the ore is crushed and ground to release the ore minerals from the gangue. Magnetic techniques also are used.

The concentrate can then be agglomerated for blast furnace use by pelletizing. Moistened concentrates are first fed to a rotating drum or an inclined disc, the tumbling action of which produces soft, spherical agglomerates. These "green" balls are then dried and hardened by firing in air to a temperature in the range of 1,250° to 1,340° C and then slowly cooled. Finished pellets are round with diameters of 10 to 15 mm, making them almost the ideal shape for the blast furnace (Walker 2011). This represents the extent of iron ore processing.

Iron is produced from smelting the ore, and approximately 98 per cent of all iron produced is used to manufacture steel. While iron ore is the key raw material input, it is only one of a number of inputs required to produce steel. Integrated iron and steel plants are located wherever it is economically feasible to bring together large quantities of the raw materials required and at locations where the demand for steel is the greatest. Currently the world's leading crude steel producers are the People's Republic of China (44.5% in 2010), the European Union (12.2%) and Japan (7.7%), and the United States with 5.7%; Canada ranks 17<sup>th</sup> with 0.9% of world production (WSA 2011).

Canada's largest steel plants were built at locations along the Great Lakes-St. Lawrence Seaway system, locations to which iron ores from northern Ontario, Québec, Labrador, Minnesota, Wisconsin and Michigan, and coal from Pennsylvania, West Virginia and Kentucky could be transported most economically. Also, they are the locations where the demand for steel has been the greatest due to the concentration of manufacturing industry. Labrador is an important source



of raw material for the iron and steel industry, but does not meet the locational requirements for further processing.

The Voisey's Bay discovery prompted requirements to ensure that a greater degree of primary processing would take place in NL. The Newfoundland and Labrador *Mineral Act (RSNL M-12)* as amended in 1998, now requires that a person holding a mineral lease in the Province complete primary production, in whole or in part, in the Province, subject to certain economic considerations. As a consequence the *Voisey's Bay Development Agreement* (2002) required VBNC to build a Hydromet Plant or suitable alternate facility in the Province.

Traditionally the nickel industry has smelted concentrates produced from nickel, copper and cobalt sulphide ores to make an intermediate sulphide product called matte. Hydrometallurgy has been used for refining the matte to produce high purity nickel, copper and cobalt for the market. Thus, traditionally production of these metals has occurred in two steps: smelting and refining. The Vale hydrometallurgical process will be able to process the nickel concentrate directly to metal products without first having to smelt the concentrate. This is seen as more economical and environmentally friendly and the process will also yield more of the cobalt that is lost to a great extent in the smelting process.

Nickel-cobalt-copper concentrate delivered from Voisey's Bay will be processed to produce a nickel, cobalt and copper solution, which is then purified and the nickel, copper and cobalt separated. The copper and cobalt will be recovered as by-products. The nickel will be recovered by electrolysis as high quality electronic nickel product (99+% pure nickel) suitable for next stage production of stainless steel, nickel alloys, batteries, etc. (Vale 2011).

In agreeing to establish a processing plant in NL, Inco, then the owner, conducted a province-wide study of 15 potential sites in 1996 to locate a smelter-refinery complex. The former US Naval Base at Argentia was initially selected as the preferred site, but changes in processing options resulted in Long Harbour, on the Isthmus of Avalon, being selected as the site for the processing facility (VBNC 2007). Particular advantages over Labrador sites include that Long Harbour has an ice free port that can operate year-round and offers easy access to major North Atlantic shipping lanes. The latter will be of particular importance once the Voisey's Bay resource is depleted and the plant relies on ore from elsewhere.

### **3.0 Provincial Minerals Policies**

In the pre-confederation era the primary need was the opening up of the interior to provide economic development. Mining was seen as a frontier activity that would create jobs and provide infrastructure. Direct financial benefit through taxation and royalties was a secondary consideration. Particularly after 1934 and the period of the Commission of Government<sup>1</sup> there was a growing tendency to award mineral rights by special agreement – the concession system – in which large tracts of land were awarded to selected companies or individuals for extended periods of time. The rationale was that this was the most effective manner in which to attract exploration and development capital for large-scale prolonged exploration surveys and then development in remote areas. All of the iron ore developments in western Labrador came into production under the terms of special agreements, which also determined the level of government royalties; royalties, however, continued to be a secondary consideration after jobs and development.

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<sup>1</sup> From 1934 to confederation with Canada in 1949 Newfoundland reverted to British colonial administration.

In the mid-1970s the concession system was replaced with one based on competitive claim staking, introduction of measures to encourage concession holders to surrender land that was not being explored, and changes to the mining tax legislation to provide for increased royalties (though these only applied to operations that came on stream after 1978). This revised legislative framework continued until the *Mining Act* of 1999, which has driven the regulation of the industry in recent years.

Mining and Mineral Rights Tax is imposed under the *Revenue Administration Act*. While referred to as taxes, they are essentially crown royalties, similar to the royalties from offshore oil. Operators are taxed in the range of 12-16% on net income, while others who receive rents, royalties or other payments from mine production are taxed at 20% of that income (GNLDNR 2011b).

Taxation for the mines operated by IOC and Wabush Mines operate under the terms of private statutes dating back to the mineral concession system. These vary in their terms, but involve payment of royalties based on the level of production and, in some cases, a percentage of profits. The government of NL has estimated that when overall fiscal burdens are considered (factoring in federal and provincial corporate income and capital taxes), compared with other jurisdictions the province is 'mid-stream' in terms of revenue generated and the fiscal burden on mining (GNLDNR 2011b).

The last review of mineral policy and legislation in NL was in the 1970s. This review marked a major change in the way the industry was managed, however, since then the industry has changed and new issues have emerged including developments in Aboriginal law, sustainability issues ensuring economic and community benefits and minimization of environmental impact. In the 2010 provincial Budget funds were allocated to develop a Minerals Strategy for the province. One of the preliminary objectives of that strategy is to maximize the value received from mineral resources to ensure that Newfoundlanders and Labradorians benefit from their development, while still providing a fair return to the mining companies (GNLDNR 2011b). Publication of the Strategy document is awaited.

#### **4.0 Aboriginal Relations**

The Labrador Inuit Land Claims Agreement (LILCA) provides for the establishment of the Labrador Inuit Settlement Area (LISA) consisting of approximately 72,520 km<sup>2</sup> of land and approximately 48,690 km<sup>2</sup> of adjacent tidal waters. Within the LISA approximately 15,800 km<sup>2</sup> is Inuit-owned land referred to as Labrador Inuit Lands (LIL). Within LIL Inuit also own 3,950 km<sup>2</sup> of specified materials (quarry materials) in Specified Material Lands. Any person wishing to explore for subsurface resources in LIL is required to submit a work plan for approval by the Government of Newfoundland and Labrador and the Nunatsiavut Government.

In accordance with the LILCA, Impacts and Benefits Agreements (IBAs) must be negotiated between the Nunatsiavut Government and developers before *any* developments may proceed in LIL and before any *major* development may proceed in the LISA outside LIL. The LILCA also provides for the continued designation of several areas as exempt mineral lands. Those areas designated as exempt mineral lands within LIL can not be changed prior to the date the land use plan comes into effect for the LISA without the written consent of the Nunatsiavut Government. As noted earlier, the Nunatsiavut Government imposed a moratorium on uranium mining in LIL in 2008 for a three year period, to allow completion of the land use plan, development of environmental legislation, and to gain a better understanding of issues associated with uranium mining.

The land claim of Innu Nation is under negotiation. Certain crucial elements relating to that land claim negotiation were agreed upon by Innu Nation and the Government of Newfoundland and Labrador as part of the *New Dawn Agreement*, which sets out various areas and types of lands that are proposed for inclusion in any final legally binding land claims agreement with Innu Nation (Figure 2). In Labrador West and northwest Labrador the rights applicable to the CIII area are limited to the right to harvest migratory species of wildlife without provincial licences and the right to harvest migratory birds, subject to the concurrence of the federal government.

Elements that relate to the land claim are now under review by the federal government for potential inclusion in a land claim Agreement-in-Principle that will provide the basis for a final legally binding land claims agreement (GNLDNR 2011b). Until that time, Innu Nation is consulted by the province, by various means, on developments that are proposed to occur in the Innu Claim Area. In addition, the establishment of IBAs between companies and Innu Nation are now standard practice before any development takes place.

The NunatuKavut Community Council Inc. (NCC), formerly known as the Labrador Métis Nation, has recently filed new land claim documentation with the federal government. Should the federal government accept that claim for the purposes of land claim negotiation, the province will then make its own independent decision on that matter. In the meantime, certain mineral activities can be referred by the province to the NCC for comment (GNLDNR 2011b).

There are also assertions of Aboriginal rights from various First Nations in Quebec to areas of Labrador. Also, various Quebec Innu First Nations have filed land claim documentation with the federal government in relation to areas of Labrador. While the province has not accepted any such land claims for the purposes of negotiation or any of the aforementioned assertions, these assertions may have implications for mineral exploration and development in certain areas of Labrador (GNLDNR 2011b).

Land Claims Agreements place greater decision-making power in the hands of aboriginal groups. Where lands are designated for other uses, or decisions on land uses are delayed, this may have a negative effect on corporate decisions regarding mineral exploration and development.

## **5.0 Labour Market Challenges**

Labour market conditions in Newfoundland and Labrador have improved significantly over the past several years and are expected to continue to do so. A significant number of new jobs will be opening up between 2013 and 2015 as a result of major project developments. Overall, expansion demand is expected to increase over the next 10 years, which, together with a loss of workers from retirements could mean upwards of 15,000 replacement job openings (GNLDHRL 2010).

These opportunities also represent a significant challenge. The impacts of downward population trends are more evident in NL than elsewhere in Canada. While most jurisdictions are facing slowing population growth, the Province's population has sustained continued population decline over the past decade and now has one of the most rapidly aging populations in Canada.

Concerns over labour shortages have been escalating, especially in light of increasing competition for workers from other jurisdictions. Even during the recession of 2008-09, employers in NL continued to voice concerns over their ability to find and keep skilled workers. Temporary foreign workers are already being sought to fill positions in Labrador City. Labour supply pressures could negatively impact economic and firm growth in the absence of significant in-migration or

complementary investment in capital improvements and workforce development by employers to maintain productivity growth.

While increases in participation rates across all age groups might also be expected over the next decade, the rapidly changing and increasingly competitive global marketplace and technological advancements will continue to increase skill demands and contribute to changing job duties. Current workforce literacy levels, particularly among older workers, will pose challenges in responding to these changing demands. These challenges are further exacerbated by the fact that NL continues to experience low participation rates in adult-learning courses among its working-age population and among the lowest levels of employer investment in workforce development and training (GNLDHRLE 2010).

Many of the skills required by the mining industry, particularly in the trades, are also required by other sectors. In addition, the mining industry faces shortages of qualified personnel in specific areas including geoscientists, mining engineers and miners. Recruitment into these professions is poor. Overall, the Canadian mining sector is anticipating a shortfall of 100,000 workers in the next decade (MIHRC 2010). Labrador will not be immune from these effects.

## **6.0 Environmental and Infrastructure Issues**

### *Tailings Management*

The use of natural water bodies to confine mine tailings is permitted under certain conditions by provincial and federal legislation (the *Metal Mining Effluent Regulations*, a 2002 amendment to the *Fisheries Act*), but this practice is strongly opposed by a number of NGOs and private citizens.

The use of natural water bodies for storage of chemically reactive tailings is a relatively inexpensive solution for mining companies. Environmentally, natural water bodies may reduce the rate of release of contaminants to the environment and offer stable basins that are safer for long-term storage than artificially constructed impoundments. These views are often disputed on the grounds that safety varies with circumstances and that other jurisdictions have mandated the use of constructed impoundments. In addition, use of natural water bodies involves the loss of freshwater habitat and loss of biota. Federal regulations do require the creation of new habitat to offset losses, but reviews by the Auditor General and DFO publications point to a lack of success with habitat compensation (see, for example, Harper and Quigley 2005).

### *Protected Areas*

Pristine areas, protected in perpetuity and excluded from mining exploration and development potentially protect places for future generations and help preserve biota in their original form. The 1994 *Whitehorse Mining Initiative* (WMI 1994) recognized the importance of completing protected area networks. However, NL is said, to lag behind most Canadian and many other international jurisdictions in efforts to complete a representative network of protected areas (MiningWatch Canada 2011).

A concern of the industry is that their designation reduces the amount of land available for exploration and access for mining companies. While some land has been 'lost' to development in the recent past to alternative uses (e.g. Smallwood Reservoir, military reserves, parks), 82% of Labrador is still available to staking (GNLDNR 2011b). However, additional lands may become unavailable (e.g. Lac Joseph proposed protected area, traditional use lands under the Nunatsiavut

Land Use Plans, Innu lands under the *New Dawn Agreement*, and designation as ecological reserves). One mining company has estimated that if all current proposed alternative uses were adopted it could reduce the estimated land available to staking in Labrador to 49% of the total area (Altius 2011).

### *Exploration Regulations*

Risks associated with orphaned or abandoned sites associated with operating mines is now addressed through closure assurances posted by mine operators, but there are few regulations to address risks associated with exploration, where it is often assumed that there will be few or no environmental or social effects. Impacts on water, wildlife, quality of life and traditional practices can, however, occur and to address this the Nunatsiavut government has introduced comprehensive exploration regulations that can improve oversight and ensure remediation of exploration sites (Nunatsiavut 2009). Adoption of similar requirements has been suggested for NL as a whole.

### *Environmental Monitoring*

Environmental monitoring is essential to ensure compliance, verify effects predictions and provide warning of unanticipated effects. Much of the required monitoring is carried out by the mining companies. Given the rapid growth in the mining sector there is concern that there are insufficient inspectors or budget to provide the necessary oversight (MiningWatch 2011). To address issues of communication and transparency, independent monitoring agencies have been established elsewhere in the country for major mineral developments (e.g. diamond mining in the NWT), and in the Province to monitor low-level military flying in Labrador. This approach has been suggested for mining activity in Newfoundland and Labrador.

### *Energy Supply and Demand*

The 2010 Nalcor Energy Annual Report notes that “Churchill Falls sells 225MW to Twin Falls to service the mining industry in Labrador West” (Nalcor Energy 2010). It is not known whether all of this power is utilized by the mining industry, nor whether the demands of the growing mining sector in Labrador West and northwest Labrador in particular, can be met from this source, from the 300MW sold to Hydro for use in Labrador and as “recall energy,” or whether power from the proposed Muskrat Falls development would be used to provide power to Labrador mining projects.

### *Community Infrastructure/Community Development*

Growth in iron ore mining has led to rapid urban growth in Labrador West in recent years. Lack of land for housing development in Labrador City in particular is driving up housing demand and associated costs and there is currently an almost zero vacancy rate for rental accommodations. The announcement that IOC is contemplating doubling production (Rio Tinto 2011) will place additional pressure on local housing infrastructure and local companies abilities to provide services for a growing population. Housing shortages are already having negative effects on low-income residents and potentially constraining development.

Since the 1970s it has become common practice to use fly-in/fly-out (FIFO) work arrangements and camps to accommodate workers at remote sites and in the absence of a local townsite (e.g. Voisey's Bay). Similar arrangements are also used when, for example:

- insufficient infrastructure is available in nearby existing townsites (e.g. Fort McMurray);

- where the objective is to minimize the adverse effects of a large transient and temporary population, particularly during construction (e.g. the proposed Muskrat Falls hydroelectric generation project);
- at locations where operations employees are unwilling to relocate on a permanent basis (e.g. Millertown NL[Aur Resources 2006]); or
- where the life expectancy of the operation is short and investment in permanent infrastructure not justified.

Given proposed and potential mining developments in Labrador it seems likely that FIFO operations will become increasingly common in the future. While FIFO may be practical from the company perspective, when adopted for long-term mine operations it does little to promote community development while at the same time, in the absence of mechanisms to recover costs, it can prove costly to those communities whose infrastructure and services FIFO workers may utilize as they pass through.

## References

- Altius. 2011. "Response to Government of Newfoundland and Labrador Minerals Strategy Discussion Paper." Altius Minerals Corporation, St. John's, NL.
- Aur Resources. 2006. Registration Duck Pond Camp. Registration document submitted to the Government of Newfoundland and Labrador Department of Environment and Conservation. [http://www.env.gov.nl.ca/env/env\\_assessment/projects/Y2006/1297/1297\\_Reg.pdf](http://www.env.gov.nl.ca/env/env_assessment/projects/Y2006/1297/1297_Reg.pdf)
- Aurora Energy. 2009. "Fronteer Reports Positive Preliminary Economic Assessment for Michelin Uranium Project." News and Updates, Aurora Michelin Project. <http://www.aurora-energy.ca/news/fronteer-reports-positive-preliminary-economic-assessment-michelin-uranium-project>
- Baird, M. 2011. "Labrador's next iron ore mine OK'd." *The Telegram*, January 6, 2011.
- GNL (Government of Newfoundland and Labrador). 2011. *Mining in Newfoundland and Labrador March 2011*. St. John's, NL. <http://www.nr.gov.nl.ca/nr/mines/Mining%20in%20NL,%20March%202011.pdf>
- GNL (Government of Newfoundland and Labrador) and Innu Nation 2008. The Tshah Petapen Agreement/New Dawn Agreement. Land Claim Agreement in Principle. Government of Newfoundland and Labrador and Innu Nation. <http://www.releases.gov.nl.ca/releases/2008/exec/0926n07agreement.pdf>
- GNLDF (Government of Newfoundland and Labrador, Department of Finance). 2011. *The Economy 2011*. <http://www.economics.gov.nl.ca/TheEconomy2011.asp>
- GNLDHRLE (Government of Newfoundland and Labrador, Department of Human Resources, Labour and Employment). 2010. Canada-Newfoundland Labour Market Agreement 2010-2011 Annual Plan. St. John's, NL. [http://www.hrle.gov.nl.ca/hrle/publications/lmd/LMA\\_Annual\\_Plan\\_2010\\_2011.pdf](http://www.hrle.gov.nl.ca/hrle/publications/lmd/LMA_Annual_Plan_2010_2011.pdf)
- GNLDNR (Government of Newfoundland and Labrador, Department of Natural Resources). 2011a. Mineral Exploration Statistics. Newfoundland and Labrador Exploration Statistics 1981-2011. St. John's, NL. [http://www.geosurv.gov.nl.ca/minesen/exploration\\_stats/](http://www.geosurv.gov.nl.ca/minesen/exploration_stats/)
- GNLDNR (Government of Newfoundland and Labrador, Department of Natural Resources). 2011b. A Minerals Strategy for Newfoundland and Labrador – Discussion Paper. St. John's, NL. [http://www.nr.gov.nl.ca/nr/mineralstrategy/minerals\\_strategy.pdf](http://www.nr.gov.nl.ca/nr/mineralstrategy/minerals_strategy.pdf)

GNLDNR (Government of Newfoundland and Labrador, Department of Natural Resources). 2009. *Mineral Commodities of Newfoundland and Labrador: Uranium*. Geological Survey, Mineral Commodities Series Number 5. St. John's, NL.

Harper, D.J. and J.T. Quigley. 2005. "A comparison of the areal extent of fish habitat gains and losses associated with selected compensation projects in Canada." *Fisheries* 30:18-25.

LIM. 2011. "Production commenced at James Miner and Silver Yards Plant." LIM Holdings Limited. [http://www.labradorironmines.ca/pdf/LIM%20YR%20and%20First%20Rail%20Shipment%20\(Final\)%20June%2030%202011R.pdf](http://www.labradorironmines.ca/pdf/LIM%20YR%20and%20First%20Rail%20Shipment%20(Final)%20June%2030%202011R.pdf)

MIHRC (Mining Industry Human Resources Council). 2010. Canadian Mining Industry Employment and Hiring Forecasts 2010. [http://www.mininghrforecasts.ca/en/resources/MiHR\\_Canadian\\_Mining\\_Employment\\_Forecasts\\_July2010.pdf](http://www.mininghrforecasts.ca/en/resources/MiHR_Canadian_Mining_Employment_Forecasts_July2010.pdf)

MiningWatch Canada. 2011. Submission on Newfoundland and Labrador Mineral Strategy. Ottawa, ON. <http://www.nr.gov.nl.ca/nr/mineralstrategy/submissions/mwatch.pdf>

Nalcor Energy. 2010. 2010 Business and Financial Report. St. John's, NL. [http://www.nalcorenergy.com/assets/nalcor%202010%20business%20and%20financial%20report\\_final\\_may%2030%202011.pdf](http://www.nalcorenergy.com/assets/nalcor%202010%20business%20and%20financial%20report_final_may%2030%202011.pdf)

Nunatsiavut. 2009. Mineral Exploration Standards. Nunatsiavut Government, Nain, NL. <http://www.nunatsiavut.com/index.php/en/lands-and-natural-resources/mineral-exploration-standards>

Rio Tinto. 2011. "IOC announces study for further expansion." IOC press release August 16, 2011. <http://www.ironore.ca/main.php?sid=m&mid=9&lng=1&id=150>

Spinetto, J. 2011. J. Spinetto 2011. "Usiminas port bid seen quadrupling its iron ore: Freight markets." *San Francisco Chronicle*, Business report August 24 2011. [http://sfgate.bloomberg.com/SFChronicle/Story?docId=1376-P9ORCKNLET9QFXQYE\\_NMLEnf-20110824142704-402GR32FRLI2GC20KNVRL7080D](http://sfgate.bloomberg.com/SFChronicle/Story?docId=1376-P9ORCKNLET9QFXQYE_NMLEnf-20110824142704-402GR32FRLI2GC20KNVRL7080D)

Schiller, E. 2011. "Canada's Labrador and Newfoundland/Québec iron ore mines expand production." *ResourceWorld Magazine*, February 2011: 74-77.

Taber, B. 2011. "Analysis: China steps up iron ore drive in Africa." Reuters August 18 2011. <http://news.yahoo.com/analysis-china-steps-iron-ore-drive-africa-130550367.html>

Vale. 2011. Voisey's Bay Development. Frequently Asked Questions – Mine and Concentrator. <http://www.vbnc.com/MineFAQ.asp>; Processing. <http://www.vbnc.com/OperationsProcessing.asp>

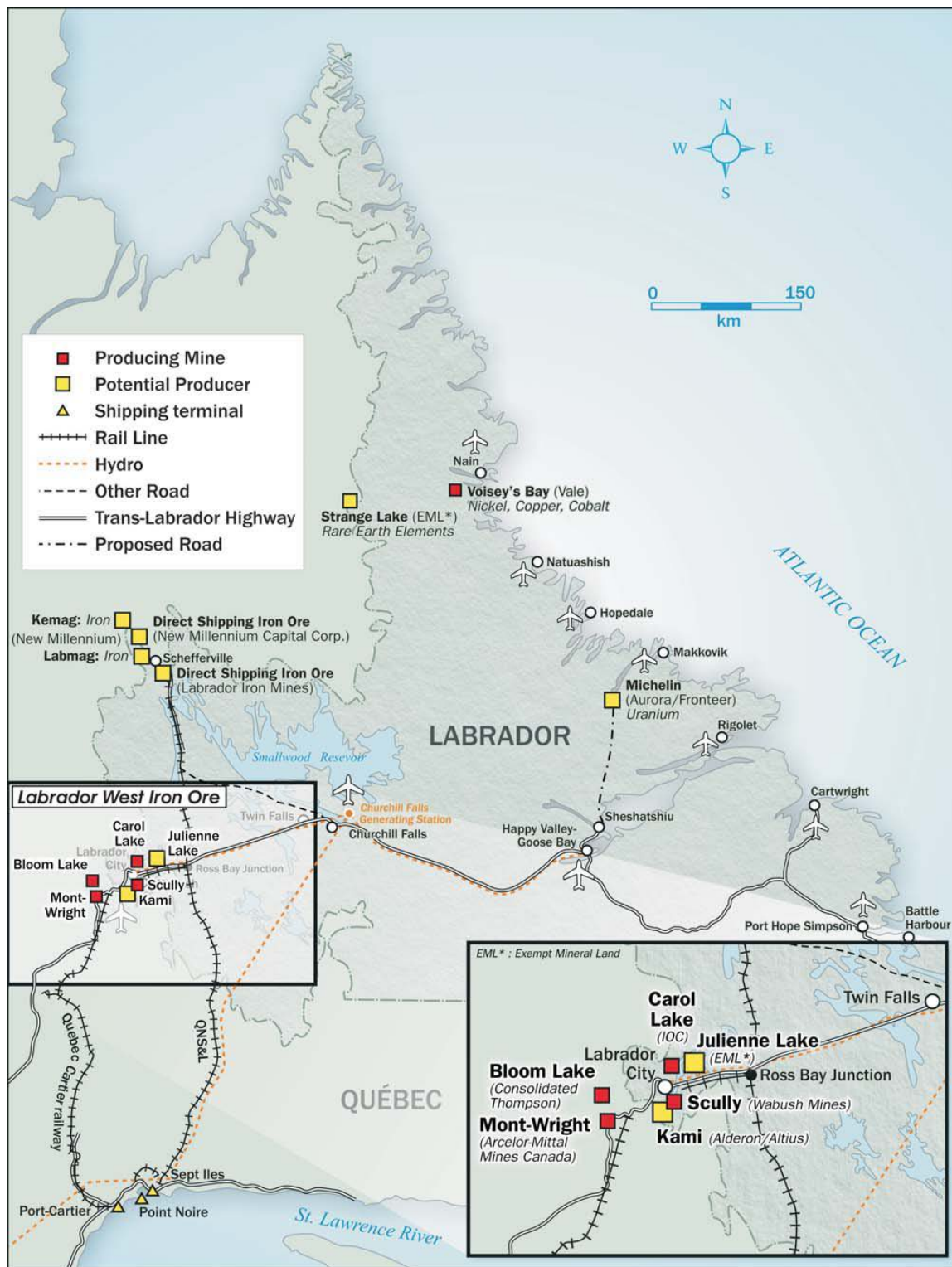
VBNC. 2007. Environmental Impact Statement Long Harbour Commercial Nickel Processing Plant, Volume 1 The Project. Voisey's Bay Nickel Company Limited. St. John's, NL. [http://www.env.gov.nl.ca/env/env\\_assessment/projects/Y2008/1243/1243\\_volume\\_1\\_the\\_project.pdf](http://www.env.gov.nl.ca/env/env_assessment/projects/Y2008/1243/1243_volume_1_the_project.pdf)

Walker, R. D. 2011. "Iron Processing." *Encyclopædia Britannica Online*. <http://www.britannica.com/EBchecked/topic/294507/iron-processing>

WMI. 1994. *Whitehorse Mining Initiative Land Access Issue Group Final Report*. <http://www.nrcan.gc.ca/mms-smm/poli-poli/pdf/lan-ter-eng.pdf>

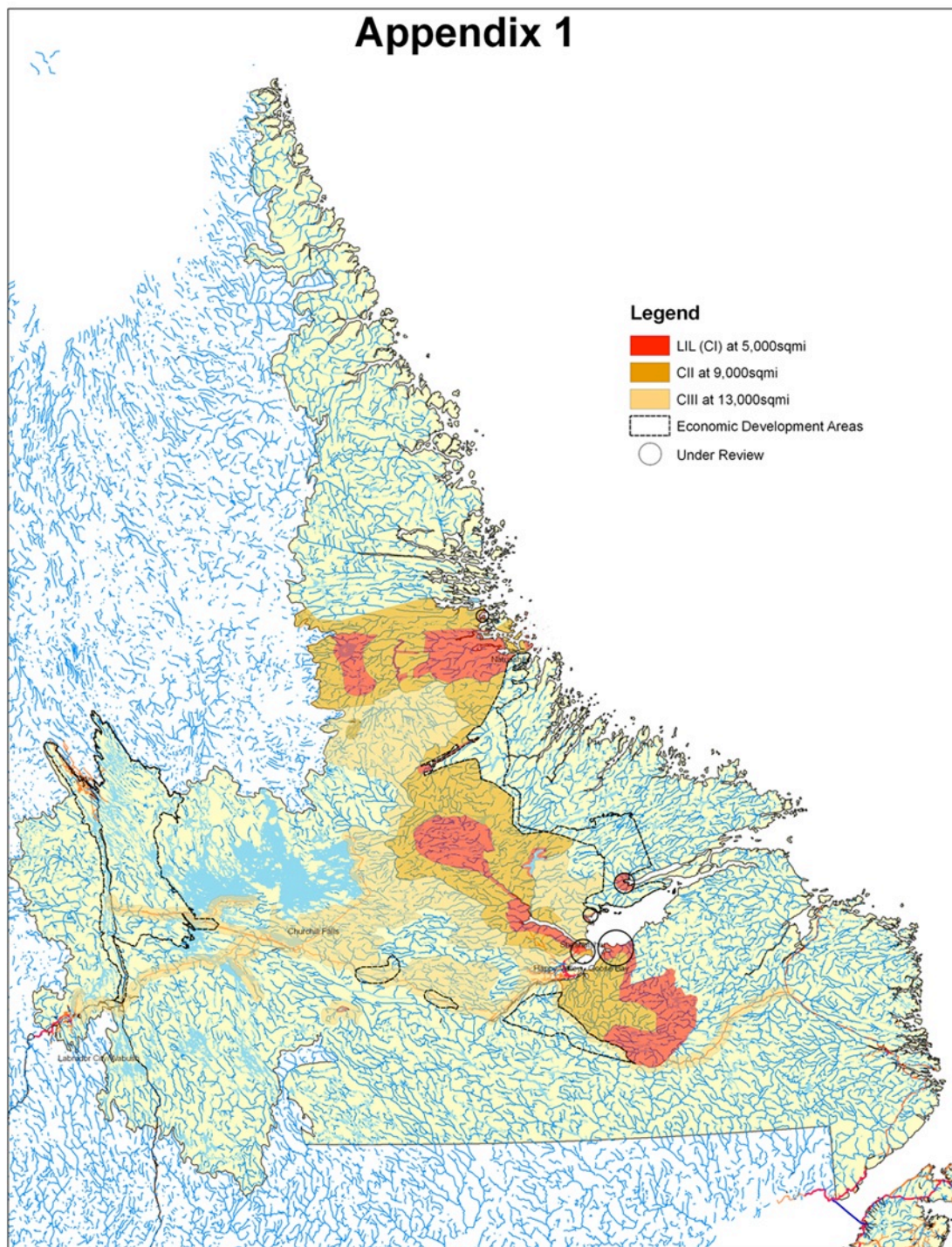
WSA. (2011). World Crude Steel Production. World Steel Association.  
<http://www.worldsteel.org/pictures/newsfiles/2010%20statistics%20tables.pdf>





Source: GNLDNR 2010

**Figure 1 – Mining in Labrador**



Source: GNL and Innu Nation 2008

**Figure 2 Innu Nation Land Claim**

## **Action Canada Working Conference Labrador 21-25**

### **Suggested questions**

1. The recent dramatic global expansion of iron ore production and proposals for expansion seem likely to lead to an oversupply of iron ore if China's demand slows. What are the implications of this for Labrador's current and potential iron ore operations and how do the mining companies prepare for such eventualities?
2. What actions will IOC and the Town of Labrador City take to accommodate workers and others? Are Labrador City and Wabush working together to address this problem? Would IOC contemplate FIFO arrangements to address housing and other infrastructure constraints?
3. What are the factors that will determine whether underground mining at Voisey's Bay will go ahead? What is the probability that it will go ahead? What are the implications for the processing facility at Long Harbour if underground mining does not proceed? What are the advantages/disadvantages of having a processing facility at Long Harbour with no 'local', i.e. Labrador, ore supply?
4. When is the moratorium on uranium mining in Nunatsiavut likely to be reviewed? What are the current attitudes of Inuit towards uranium mining? How has the Fukushima Daiichi nuclear plant disaster affected the potential economic viability of the Aurora Energy project in coastal Labrador?
5. What are the implications of outstanding land claims by Aboriginal groups for mining activity in Labrador? What are the implications of the designation of lands for other uses on mining activity in Labrador?
6. What energy demands are new mining activities likely to place on Labrador energy supplies? How will these demands be met?
7. Major projects in Newfoundland and Labrador (e.g. Long Harbour, Hebron, Muskrat Falls) and elsewhere (e.g. Fort McMurray) together with retirements and low levels of recruitment will exacerbate existing labour market challenges, how will mining companies in Labrador address this question?
8. Which aspects of current provincial minerals policy are most likely to change as a result of the development of the new provincial Minerals Strategy?

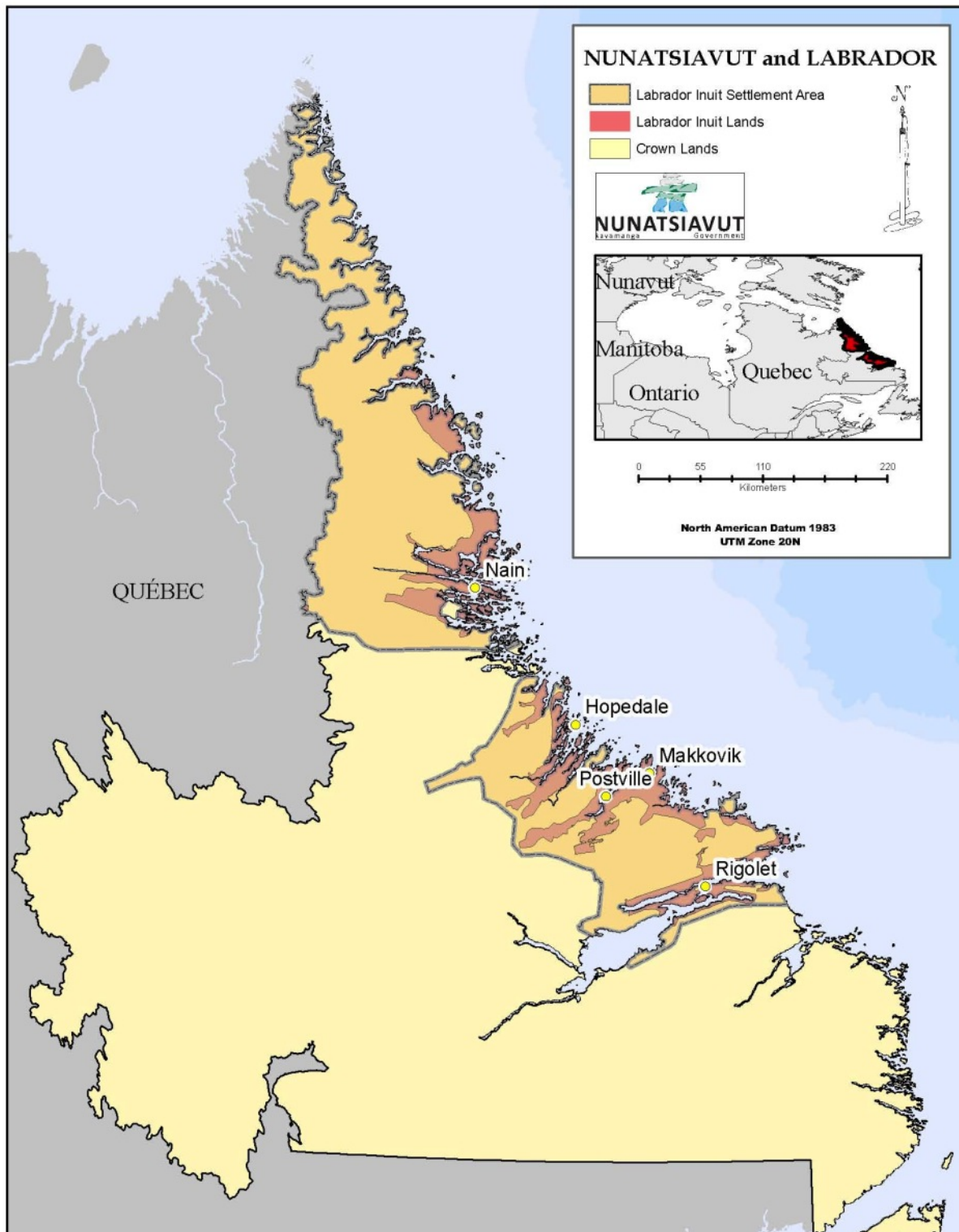
**Land Claims Agreements and Aboriginal Governance Issues in Labrador: the  
Nunatsiavut Experience**

**Lawrence Felt  
Professor of Sociology  
Memorial University**

**September 1, 2011**



**Map 1: Labrador Inuit Settlement Area, Inuit lands and Crown lands**



# **Land Claims Agreements and Aboriginal Governance Issues in Labrador: the Nunatsiavut Experience**

## **1.0 Terms of Reference:**

- 5-7 page policy paper on Aboriginal governance issues using Nunatsiavut as a case study.

## **2.0 Governance: An overview**

Much of what we call government, in fact, now occurs outside of it. Political scientists have coined the term **governance** to capture this wider process. Governance denotes a larger process and system(s) through which societies and organizations, formally governmental as well as non-governmental, make important decisions, determine whom they involve in the process, and how they ensure accountability for the decisions they make (Bowles and Gintis 2002). In this general sense, governance refers to the web of organizations and relationships, formal and informal, through which people establish priorities, mediate conflict, and build a common future and the norms and rules governing this process .

## **3.0 An overview of ABORIGINAL Groups in Labrador:**

There are three aboriginal nations calling Labrador home: the Inuit of the central and northern coast as well as the central region of Happy Valley/Goose Bay/Mud Lake/North West River, the Innu of the Western and Northern expanse of Labrador to the Quebec border and the NunatuKavut Community Council (Labrador Metis Nation) of Central and Southeastern Labrador. Each has its own distinct history and culture. Moreover, each is at a different stage in negotiations with the Canadian and provincial governments. As a result, the implications for governance relations are somewhat different for each resulting in both shared yet distinctive forms of governance with each other as well as external governments and other organizations. Since the system of governance is most advanced and extensive with the Labrador Inuit, they are taken as the most useful point from which to discuss issues of aboriginal governance.

### **3.1 Inuit People:**

Descendants of contemporary Inuit are thought to have first migrated wither from the Western arctic or from Greenland in the late 1400's though intermittent Inuit ancestry may be traced back several thousand years (See Rankin et. al in Natcher, Felt and Procter, 2011). Their history up to the 20<sup>th</sup> century has been well documented in several sources by Garth Turner, Hans Rollman and other researchers (See Brice-Bennett, 1977). In many respects, their modern history, at least leading to the Labrador

Inuit Land Claims Agreement (LILCA) can be traced back to the mid 1970's and the founding of the Labrador Inuit Association (LIA).

Between 1977 and 2003, the Labrador Inuit Association (LIA), representing Inuit peoples in Labrador, the Canadian and, more recently, the provincial government of Newfoundland and Labrador, carried out intermittent negotiations to establish a land claims agreement recognizing a physical Inuit homeland and an associated land claims regional government directed by Labrador Inuit to govern in their regional government in ways that protected and supported the language, culture and lifestyles historically important to their identity as a distinct people. On August 29, 2003 all three parties to the negotiations initialed an agreement. In the Spring of 2004 Inuit beneficiaries as defined by the agreement voted overwhelmingly to accept the agreement and in late 2005, the Inuit Land Claims government of Nunatsiavut formally came into being. LILCA provided for the establishment of the Labrador Inuit Settlement Area (LISA) consisting of approximately 72,520 km<sup>2</sup> of land and approximately 48,690 km<sup>2</sup> of adjacent tidal waters as well as the aboriginal government. Within the LISA approximately 15,800 km<sup>2</sup> is Inuit-owned land referred to as Labrador Inuit Lands (LIL) (See Map 1.)

Nunatsiavut consists of approximately 72,500 km<sup>2</sup> of land straddling the central and northern Labrador coast inland to upwards of 100 km populated by approximately 3200 Inuit in five communities (See Map). A further approximately 2500 live in the central Lake Melville communities of Happy Valley/Goose Bay, North West River and Mud Lake outside the designated territorial boundaries. A further 1700 live in other parts of Labrador, the province of Newfoundland and Labrador or beyond in other Canadian or foreign locations. The logistical and labour requirements of a western model government structure upon such a population are immense, even before occupational requirements for many of the highly skilled jobs is challenging, to say the least..

Due to an extended history of contact with European and North Americans dating back to the late 1500's and a more immediate relationship with Moravian missionaries and settlements founded beginning in the 1770's that continue to this day as important Inuit coastal communities such as Nain, Hopedale and Makkovik, the designation of people within the land claims area to be considered beneficiaries in the agreement is complex due to resulting intermarriage, continuous coastal settlement by individual Europeans since the 1860's and related events. For an excellent overview of the Moravian history on the coast and its relationship to Labrador Inuit see Hans Rollman special edition of Newfoundland and Labrador Studies entitled *Moravian Beginnings in Labrador*.

In recognition of the long standing Inuit-European contact, the Land Claims Agreement provides for several means of determining Inuit status, or beneficiary status as it is termed. To deal with such complexity, the Land Claims Agreement in Chapter 3 Beneficiary status under the agreement is provided for those who (a) possess continuous Inuit ancestry; (b) no Inuit ancestry but who settled permanently in the

Labrador Inuit Land Claims area before 1940 or (c) no Inuit ancestry but is a lineal descendant of an individual referred to in clause (b) above and was born on or before November 30, 1990 (LILCA 3.1, p. 34). The more inclusive term of *Kablunangajuit* (*Kablunangajuk in the singular*) meaning people designated as beneficiaries under LILCA. This term is increasingly used to characterize beneficiaries. As of 2011, *Kablunangajuit* number approximately 8,000 individuals. It is these people who form the electorate of Nunatsiavut.

### **3.2 Innu People:**

The Innu people of Labrador are historically, and still often by kinship, originally part of two related Innu groups utilizing the vast landscape from the area north and east of the James Bay drainage area of Quebec to the Labrador coast. Highly migratory and nomadic, their annual cycle coincided with movements of the vast caribou herds in the area. While they have had intermittent contacts with Western representatives as long as the Inuit, there has not, until relatively recently, been year round permanent settlement. In 1990, the two groups formed the Innu Nation (*Mamit Innuat*) that replaced an earlier organization formed in 1976 termed the Naskapi Montagnais Innu Association reflecting the names of the two groupings. Today, most of the approximately 2,500 Innu live in the two Innu communities of Sheshatshiu and Natuashish. The former is approximately 30 km from the central Labrador commercial and population hub of Happy Valley/Goose Bay; the latter near the North Central Labrador coast between the Inuit communities of Hopedale and Nain.

For approximately the same time, the Innu nation has been in negotiations for their recognition as an aboriginal people and a land claims settlement reflective of the vast territory in the North and Western part of Labrador through which their nomadic life was based. While recognition has been achieved for some time, they have not yet concluded a formal land claims agreement. Prospects for this happening in the near future have been considerably enhanced, however, with the looming development of the Lower Churchill hydro facility and a recently signed agreement.

The Innu nation has recently (2011) approved The *Tshash Petapen* Agreement (New Dawn in English) that resolved key issues outstanding between the people and the provincial government relating to matters surrounding the Innu Rights Agreement, Lower Churchill Impacts and Benefits Agreement (IBA), Innu redress regarding the Upper Churchill hydro development and a commitment to fast track land claims negotiations. The latter is to be achieved, in part, through establishing certain areas and types of land that might be proposed in an eventual land claims agreement. It should be mentioned as well that historically what are now Quebec Innu used large sections of Western Labrador in their migratory life styles and some land claims documentation has been filed with the Canadian government covering Labrador territory.

### **3.3 Metis people:**



The third aboriginal population in Labrador is the NunatuKavut Community Council (formerly known as the Labrador Metis Nation) of Central and Southeastern Labrador. Founded in 1985 as the Labrador Metis Nation, it was the political arm of Labrador Metis people and as such provides a wide array of services as well as lobbies for a land claims settlement and regional government of its own.

Labrador Metis are largely an ethnic mix of more Southerly Inuit with English, Scottish, Irish and French partners though there is a minority proportion in which aboriginal lineage is through the Innu nation. Many can trace their lineage back to the island portion of the province and its founding populations of Irish, Scottish and English settlers. Metis people are primarily distributed in central and southeastern portions of Labrador with particularly large proportions of the community population from Cartwright through Charlettetown, William' Harbour, Port Hope Simpson to Mary's Harbour and Lodge Bay on Labrador's southeast coast. A significant number also reside in the Happy Valley/Goose Bay central area. Prior to the 1960's, many Metis were active as trappers in the vast area to the south of the Churchill River.

The Metis people have received at least de facto recognition by the Canadian government. Fisheries and Oceans, Canada essentially treats them as an aboriginal group in terms of their food, social and ceremonial fisheries as well as their Federal Aboriginal Fisheries Initiative. Following their recognition in an *amicus curiae* brief filed three years ago on behalf of a group seeking Metis recognition in Northwestern Ontario near the Manitoba border, it is expected that they will receive complete aboriginal status by the government soon. Preliminary, unofficial land claims negotiations have apparently been hold but no formal meetings have yet occurred to my knowledge.

Provincial government recognition has been more problematic. Officially, the government of Newfoundland and Labrador has refused to recognize the existence of the Metis people in the province. There have been informal discussions and NunatuKavut has subcontracted the delivery of some health, manpower training and education services from the province.

#### **4.0 Emergent Governance Challenges Drawn from the Nunatsiavut Experience:**

Nunatsiavut has had but five years to try its new government. These years are best seen as an experiment and many of what are currently seen as challenges simultaneously provide opportunities to build the type of government and society the citizenry desires. The following are five particularly interesting challenges flowing from this experiment.

##### **Challenge of Organizational Scale:**

A common characteristic of land claims agreements in Canada is a provision to incorporate what is called 'government-to-government structures. This has typically led, at least with the larger regional aboriginal governments such as Nunavut, Nunavik, and

Nunatsiavut replicating the hierarchical Western model reflected in Canada's national and provincial levels with a significantly reduced level of human and fiscal resources poses a number of logistical, organizational and fiduciary challenges. Important consequences involve 'stretched' government structures, skilled labor shortages, high levels of labour mobility for those who are qualified and frequently insufficient financial resources. In this regard, Nunatsiavut is similar to other devolved land claims aboriginal governments in the Canadian North (Natcher and Davis 2007; Natcher et. al. 2005).

One result of this mismatched scaling is a concatenating or linking of distinct ministries. The Nunatsiavut government (NG) is organized around six ministries and several crown corporations. Ministries include: Nunatsiavut Affairs; Lands and natural Resources; Health and Social Development; Culture, Recreation and Tourism; Finance, Human Resources and Information Technology; and Education and Economic Development. While sufficient numbers of highly skilled Inuit staff the upper levels of these ministries (Rodon and Grey 2009), there are often vacancies at mid levels as qualified individuals frequently move as opportunities arise. Virtually all these positions require an extended range of work activities i.e. doubling up work tasks/responsibilities with the result that employees often live out of their suitcases, both within and outside NG. While the situation will likely change positively as more and more Labrador Inuit acquire the educational and technical skills necessary to staff modern state bureaucracies, in the short to medium period relating government-to-government is likely to be a logistical, organizational and labour challenge.

Exacerbating this structural or institutional issue is one of adequate, longer term financial stability. Nunatsiavut is financed through several sources of which the most relevant is a five year funding agreement with the federal government (D. Lowe, Personal communication). While specific details may be found on the provincial government's Department of Labrador and Aboriginal Affairs web site (<http://www.laa.gov.nl.ca/laa/>), the following table drawn from the site summarizes revenues and expenditures. Note that the OSR refers to Own Source Revenue.

<b>Revenue</b>	
<b>Source</b>	<b>Amount</b>
Investment Income from Trusts	5,000,000
Personal Income Tax sharing and GST	3,751,996
Fiscal Financial Agreement (FFA)	30,975,264
Contribution Agreements	3,004,862
Mining Royalty	1,210,000
<b>TOTAL</b>	<b>\$43,942,122</b>
<b>Expenditure</b>	
Administration	13,827,337
Programming (FFA Revenue clawed back by a % of OSR)	30,975,264
<b>TOTAL</b>	<b>\$44,802,601</b>

This funding arrangement has created some funding pressure given the high cost of government in a remote region where all core Inuit communities are only accessible

by plane, boat or snowmobile depending upon season. As a result, many jobs remain part-time or for contractually limited periods of time. In the smaller coastal Inuit communities this has led to few permanent jobs and very high levels of unemployment. Part-time, contractual employment often has conditions or 'strings' attached since program delivery funds and rules governing their operation originate in distant non-Inuit bureaucracies. This curtails long term planning and expanding government capacity in a number of areas in service provision and beyond. By failing to allocate sufficient resources and insisting on conditions established elsewhere, tension between levels of government can arise, with local authorities finding themselves in "financial strait jackets" when it comes to what is considered relevant, culturally and traditionally appropriate and respectful 'place-based' policy development and administration (Prince and Abele, 2002: 2). While this has not happened to any extent yet, these factors collectively raise a number of institutional, logistical and fiduciary issues that could pose important future challenges for Inuit governing capacity and effectiveness.

### **Challenge of Compatibility with Traditional Culture and Authority- the Role(s) of Inuit Elders:**

Unlike hierarchical Western models, traditional Inuit government was informal, horizontal and personalized with elders, either individually or informally organized among seasonally migrant small groups based largely on kinship. As pressures towards more permanent settled occurred in the 19<sup>th</sup> century, largely through Moravian contact, attempts were made to formalize elder leadership as early as 1865 through elder councils, particularly in Nain and Hopedale (Peter Evans in Natcher, Felt and Procter 2011).

While respect, honour and general acknowledgement of the cultural and spiritual place of elders within Inuit society remains widely acknowledged and strong, new government structure as of yet does not have a formal set of roles and institutional place within the land claims government. A Nunatsiavut-wide Elders Council or Foundation (*TungavittalauKit Inutikavut*) workshop was held in September 2009 in the community of Rigolet. While this author was not present at the workshop, a research assistant, a lifelong Inuit resident of the coast, was. Those at the meeting expressed a strong desire to be more involved in the larger process of governance if not a more specific role within NG itself. Nunatsiavut politicians appear very supportive of such a role(s). There is currently discussion of having a formal position of 'elder advisor' for the government and Inuit politicians are supportively exploring other possible ways in which elders may play a more formal role in government.

### **Challenge of Meaningful Involvement of Local governments:**

The Labrador Inuit Land Claims Agreement (LILCA) provides for a distribution of political power between the Land Claims government itself and the five coastal Inuit communities of Nain, Hopedale, Postville, Makkovik and Rigolet that form its principal constituencies. Chapter 17 of the LILCA specifies power allocated to the Nunatsiavut government as well as to the five coastal municipalities or Inuit Community Governments (ICG's). The agreement, and Constitution associated with it, allocates responsibility for the vast majority of activities, other than local service provision to NG even though the structure as well as level of NG representation is established in such a

way to protect and enshrine the importance of these communities. This can be seen in a brief overview of government organization.

Nunatsiavut is governed a President elected at large and a General Assembly composed of community-elected representatives from seven constituencies including the five coastal communities as well as provision for Inuit beneficiaries living in central Labrador and elsewhere in Canada. Each of the coastal communities has one elected member per 1,000 residents up to a maximum of four with 75% of all community seats reserved for beneficiaries under the LILCA. Additionally, the *AngajukKat* or ICG mayor, sits in the general assembly. Only the President is elected by the entire electorate and only he/she must be fluent in Inuttitut. The President then appoints a First Minister from the elected General Assembly, who in turn nominates other ministers to form the government.

In light of traditional political organization one might have expected a wider range of powers and responsibilities to have been allocated to ICGs. Given the small size of the Nunatsiavut population this does not appear problematic at present but could potentially be if significant population growth occurs on the coast and the government begins to assume control over a greater range of government activities. There may also be an issue with elevating community rivalries to the General Assembly level while a wider sharing of powers between government levels might potentially mitigate, though not eliminate, this possibility. In hierarchical Western Parliamentary governance models, municipalities have relatively modest legislative mandate other than providing local services so this is perhaps not unexpected within a government-to-government framework. This is an important point being discussed within Nunatsiavut as they review their first five years as a government. It is an important part of a larger process of how it can become more of an Inuit government consistent with Inuit culture, values and spirituality.

### **Challenge of the Ethnic Basis of membership:**

To better protect its culture and language, Labrador Inuit negotiators preferred a form of ethnic government in which membership, and hence most rights, was determined by ethnic definition and membership rather than geographical and residency criteria. Membership in the new government is defined in terms of a beneficiary status. At least two advantages of this approach are thought to be (a) minimizing rivalry and conflict between previously existing local aboriginal organizations and subsequent aboriginal governments and (2) consolidating funding amounts and sources for government utilization (Rodon and Grey, 2009). In so doing, it also provides the capacity and mandate to move beyond service provision towards a more comprehensive government and governance mandate (Cornell and Kalt 2007; Felt and Natcher 2008).

Interesting issues arise from this decision, however. A number seem at least potentially obvious. One is that it creates an important intra community distinction in small, relatively undifferentiated communities based on ethnicity, a distinction made more restrictive by tight eligibility rules. In the view of Rodon and Grey (2009), an

important consequence is that, in their words, “it (ethnic governments) tend to create beneficiaries rather than citizens. Beneficiaries have rights while citizens have not only rights but also a duty to their community “(331). They note that this has not yet happened since in important respects, the euphoria of the recent agreement and subsequent creation of NG still dominates local political discourse.

A related issue concerns the geographic distribution of beneficiaries. Based on 2008 data, 38% of beneficiaries lived within the Land Claim Area (LCA) or the five coastal communities, approximately 45% reside in Labrador outside the LCA, primarily in the Upper Lake Melville area. 28% reside outside of Labrador (but not necessarily outside the province). Should these constituencies continue to grow at a faster rate than the coastal communities themselves, a likely assumption, representation provisions currently in place may become less and less adequate. Depending upon the awareness and utilization of this beneficiary status, there may be important issues of governance that could arise. In the short term this appears most likely in the Lake Melville area as it will most probably benefit from new hydro construction for the Lower Churchill development.

### **Challenge of Aboriginal to Aboriginal Relations:**

Nunatsiavut has created and maintained efficient and productive relations with other Inuit governments and associations, nationally and internationally, for many years. The NG President sits on ITK (*Inuit Tapiriit Kanatami*), successor of the Inuit Tapirisat of Canada). As well, NG is a member of the Inuit Circumpolar Council (ICC) as well as several regional boards. They have also developed good relations with the Labrador Innu with whom they share an overlapping management area adjacent to Upper Lake Melville and utilize caribou hunting areas to the north and west of the Labrador Inuit Settlement Area. In fact, there is the Innu community of Natuashish, resettled from the near-by island community of Davis Inlet in 2002, between Inuit communities of Hopedale and Nain. These historical adjacencies have generally been supportive and mutually beneficial both at aboriginal government-to-government level as well as interpersonally.

In more recent years, Labrador Inuit have extended their relationships with other first nations. A good example is their membership in the Atlantic Policy Congress of First Nations Chiefs and through it the Atlantic Aboriginal Economic Development Integrated Research Program (AAEDIRPP). AAEDIRP’s mandate includes conducting research on Aboriginal economic development, create a database on Aboriginal economic development, build Aboriginal research capacity and hold workshops on Aboriginal economic development. A number of Inuit elders have been particularly involved in AAEDIRP initiatives and this may prove to be a useful venue for greater involvement in Nunatsiavut governance activities more generally. A particularly interesting project within this relationship is exploring ways to integrate Inuit traditional knowledge (ITK) and its more general formulation of *Inuit Qaujimajatuqangit* into economic development. While relations with the Atlantic Policy Congress and AAEDIRP has been largely

informal, an issue of particular interest is whether this might be a useful venue to address the earlier issue of greater involvement of Inuit elders in government and governance in Nunatsiavut.

### **Challenge of Aboriginal to Non-aboriginal Relations in Labrador and Beyond:**

Relations with non-aboriginal Labrador settlers as well as the provincial government, in particular, have not always been cordial and in recent years as land claims negotiations became more focused and conclusive, relations with other Labrador residents less relevant. Memories of resettlement from northerly communities of Hebron and Nutak are still remembered as is the provincial government decision to curtail the teaching of Inuttitut in local schools. Moreover, in the 1948 negotiations under which the province of Newfoundland, as it was then known, was admitted to Canada, the soon-to-be provincial government insisted that no recognition or reference to aboriginal peoples be included in contractual terms of admission to Canada. Moreover, a resettlement plan that resulted in the closure of more northerly communities such as Hebron and Nutak (Evans, 2011) created a certain level of distrust. Having said this, the success of land claims negotiations (and the provincial government's agreement to them) combined with significant economic change in Labrador and the rise of a proliferation of 'civil society' initiatives as more and more non-governmental organizations have arisen to address these issues of social, economic and political change have created a new, more devolved governance landscape in which Nunatsiavut seems destined, and willing, to play an important part.

With land claims negotiations behind them, the new Inuit government is now taking a reflective examination as well of their formal and informal relations with other actors in Labrador governance more generally. For example, as mineral and hydro development occurs, relations with non-Inuit municipalities through the Combined Council of Labrador Municipalities as well as other civil groups will take on increased importance and relevance.

### **Summary:**

It is important to emphasize that effective governance is neither automatic nor problem-free. Rather, it is shaped by the traditions, cultures, and the social locations of all parties. Federal and provincial governments, who have long treated communities and municipalities as little more than service providers, will need to continue on their path of devolution or participatory governance, with appropriate fiduciary support, or risk accelerated criticism for being arrogant and insensitive to local meaningful involvement (Natcher et al., 2004). This is the new governance environment to which land claims governments such as Nunatsiavut increasingly need to be able and prepared to play a leadership role. Simply stated, no one government, group, or individual can afford to be a spectator during this period of change. In the end, all Labradoreans will need to reach out and cooperate if effective governance is to develop. Nunatsiavut is particularly well situated to play a leading role in this momentous transformation in governance for the region.

## REFERENCES AND USEFUL READING

Bowles, S. and Gintis, H., 2002. Social Capital and Community Governance, *Working Paper 01-01-003*, Santa Fe Institute, [www.santafe.edu/sfi/publications/wplist/2001](http://www.santafe.edu/sfi/publications/wplist/2001)

Brice-Bennett, Carol. 1977 *Our Footprints are Everywhere: Inuit Land Use and Occupancy in Labrador*. Labrador Inuit Association. Nain, Labrador.

Cornell, Stephen and Joseph P. Kalt, 2007. Two Approaches to the Development of Native Nations: One Works, the Other Doesn't. In Jorgenson, M.(ed.). 2007. *Rebuilding Native Nations: Strategies for Governance and Development*. Tucson: University of Arizona Press: 3-33.

Evans, Peter. 2011. Abandoned and Ousted by the State: the Relocations from Nutak and Hebron, 1956-1959. in Natevher, Felt and Procter, *Settlement, Subsistence and Change Among the Nunatsiavummiut (Labrador Inuit)*. Winnipeg: University of Manitoba Press. Ch 5. pp. 111-148.

Felt, Lawrence and David Natcher. 2008. Effective Governance in the Changing Political Landscape of Labrador. *Newfoundland Quarterly*.101:1 (November 2008. 32-42.

Jorgenson, Miriam (ed.), 2007. *Rebuilding Native Nations: Strategies for Governance and Development*. Tucson: University of Arizona Press.

Labrador Inuit Land Claims Agreement (LILCA). 2005. Ottawa: Queen's Printer for Canada; Nain: Labrador Inuit Association; St. John's: Queen's Printer.

Natcher, David, Lawrence Felt and Andrea procter. 2011. *Settlement, Subsistence and Change Among the Nunatsiavummiut (Labrador Inuit)*. Winnipeg: University of Manitoba Press.

Natcher, David and Susan Davis, 2007. Rethinking Devolution: Challenges for Aboriginal Resource Management in the Yukon Territory. *Society and Natural Resources*, 20(3): 271-279.

Natcher, David C., Sharman Haley, Gary Kofinas and Walt Parker, 2005. Effective Local Institutions for Collective Action in Arctic Communities. *Northern Review*, Summer/Winter: 259-273.

Prince, M. and F. Abele. 2002. Paying for Self-Determination: Aboriginal Peoples, Self-Government, and Fiscal Relations in Canada. Paper presented at the Conference, Reconfiguring Aboriginal-State Relations, Canada: The State of the Federation 2003. Institute of Intergovernmental Relations, School of Policy Studies, Queen's University,

Ontario, Canada. November 1–2.

Rodon, Theirry and Minnie Grey. 2009. The Long and Winding Road to Self-Government: The Nunavik and Nunatsiavut Experiences. *In* Frances Abele, Thomas Courchene, Leslie Seidle, and France St-Hilaire, eds., *Northern Exposure: Peoples, Powers and Prospects in Canada's North*. Montreal: Institute for Research on Public Policy: 317-343.

Rollman, Hans. 2009 . *Moravian Beginnings in Labrador: Papers from a Symposium held in Makkovik and Hopedale*. Newfoundland and Labrador Studies, Occasional Publication #2. St. John's.



PREPARED FOR ACTION CANADA

# Making Best Use of the Lower Churchill:

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## The Muskrat Falls Development

**David A Vardy**

**8/31/2011**

This essay was prepared by David A Vardy for Action Canada. The essay examines the policy context in which the Lower Churchill can best be assessed from a national and provincial context, along with the options to be considered in achieving energy security

## 1.0 Introduction<sup>1</sup> and Terms of Reference

This essay was commissioned by Action Canada, who asked the author to deal with the Lower Churchill development, including the following issues:

- How much power is needed on the island?
- What are the potential sources of power for the island?
- Is the best alternative to transmit power from Muskrat Falls to the island?
- What are the other potential uses of Lower Churchill power (including Gull Island)?
- Is the current proposal the best use of the Lower Churchill potential?

A draft was forwarded on August 15, 2011 and this final version is submitted on August 31, 2011, incorporating revisions and expansions requested by Action Canada.

This essay will deal with the Lower Churchill hydroelectric developments in Labrador, downstream from the large Churchill Falls project which was completed in 1976 and most of the power of which is sold by Churchill Falls (Labrador) Corporation to Hydro Quebec under contractual obligations that end in 2041. There are two proposed generation facilities on the lower reaches of the Churchill River, one at Gull Island and the other at Muskrat Falls. The Government of Newfoundland and Labrador recently announced its plan to begin development of the smaller of these two facilities, located at Muskrat Falls, just 18 km upriver from Happy Valley-Goose Bay. The proposed Muskrat Falls facility is rated at 824 megawatts (MW) and 4.9 million megawatt hours (MWh) of energy per year. The combined capacity of Gull Island and Muskrat Falls is 3,074 MW<sup>2</sup> while the combined energy is 17 million MWh of electricity per year.

The Muskrat Falls project has been selected as the first of the two facilities because its smaller size is perceived to be a better fit for the Province's energy requirements. The Muskrat Falls facility, if constructed, will serve the energy requirements of the Island of Newfoundland, with surplus energy to be sold to Emera Energy of Nova Scotia and other power users in Eastern Canada or the Eastern United States. The Gull Island facility, according to the Province's energy plans, will be developed later, possibly for sale west, using transmission lines in Quebec or using an additional transmission line across the Strait of Belle Isle and the Cabot Strait, through the Maritime Provinces. The preferred sequencing of these two projects will be discussed below in the context of the recently released Joint Panel Report on the Lower Churchill Hydroelectric Project, in which Report the term "Project" embraces both the Muskrat Falls and Gull Island generation facilities.

## 2.0 Role of hydroelectric power in Canada

Canada depends heavily upon hydroelectric power, compared with other industrial nations. It is second in the world in hydroelectric power generation.<sup>3</sup> More than 60% of Canada's electricity production is from renewable hydro generation while 24.9% comes from thermal generation.<sup>4</sup> Today, 11.5% of the world's hydropower is generated in Canada. There remains an estimated 163,173 MW of

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<sup>1</sup> The author is grateful to Nalcor Energy, for providing information and agreeing to the use of their map and charts in this document, as well as to James Feehan (Professor of Economics at Memorial University), Ron Penney (former Deputy Minister of Justice with the Province of Newfoundland and Labrador), Victor L. Young (former Chair and CEO of Newfoundland and Labrador Hydro) and Fred Way (former Vice-Chair of the Canada Newfoundland and Labrador Offshore Petroleum Board, Secretary to Cabinet, Deputy Minister of Intergovernmental Affairs and Deputy Minister of Natural Resources), for helpful comments on previous drafts of this essay. Any errors or omissions are the responsibility of the author alone.

<sup>2</sup> (16), slide 21 and (9).

<sup>3</sup> (12), p 19.

<sup>4</sup> (2), p. 15.

undeveloped hydro potential in Canada today, mostly in the North.<sup>5</sup> More than 10,000 MW of this undeveloped hydro potential is in Newfoundland and Labrador.<sup>6</sup> Quebec and British Columbia together have 80,000 MW undeveloped.

Canada is a major exporter of electric power to the United States. Gross exports in 2008 were 55.7 million MWh while gross imports were 23.5 million MWh, resulting in net exports of 32.2 million MWh.<sup>7</sup> This number corresponds roughly to the energy that is sold to Hydro Quebec by the Churchill Falls (Labrador) Corporation (CF(L)Co). The high level of Canadian electric power export calls for a highly reliable continental transmission system, with open access.

Decisions regarding investment in new capacity must recognize the impact of generation upon global warming. In Canada, there has been a federal commitment to reduce national greenhouse gas emissions by 20 percent below 2005 levels by 2020, and 90 percent non-emitting electricity generation by 2020.<sup>8</sup> Such a commitment favours hydroelectric investment along with investment in other renewable sources.

Investment in the electricity sector is required in order to meet future demand and to replace aging infrastructure as well as to reduce greenhouse gas emissions. Such investment will lead to rising prices as undeveloped generation projects are normally more costly than those already developed. Planners normally select those projects where energy costs are lower, unless there are other compensating factors, such as inappropriate scale, in relationship to the load to be served.

The supply mix has to recognize the needs for both baseload power and for peaking. Some energy sources are better suited to meeting base demand while others are suited to supply peak demand. Some energy sources, such as solar and wind power, are intermittent and require energy storage, posing greater challenges than those presented by hydroelectric, nuclear and thermal power sources. However, water reservoirs can often be used to store potential energy. Variations in hydroelectric production from such reservoirs can be used to compensate for variations in energy supply from other renewable sources, such as wind and solar energy, thereby turning these reservoirs into multi-purpose energy storage.

The electric power system should be designed with an optimum mix of energy sources which will minimize cost and achieve environmental and sustainability goals. Planning for future growth must also deal with energy conservation and with the design of a pricing system that will provide information to the consumer as to the full cost of his/her decisions to consume energy. Canada enjoys relatively low cost power and Canadian utility pricing to domestic and industrial consumers reflects these lower costs. However, an efficient allocation of resources should reflect the incremental or marginal cost of energy as well as the competitive advantage which gives us relatively low cost hydroelectric power in Canada.

## **2.1 Hydroelectric resources of Labrador, including Churchill Falls**

The infamous Churchill Falls contract is a prominent feature in the social and economic landscape of Newfoundland and Labrador and is a major influence in the Province's energy policy. The loss of economic rent from this undertaking is perceived to be egregious. The Churchill Falls power contract reaches the end of its 65 year term in 2041. This contract has been the source of much controversy in light of the fact that the energy is sold by the Churchill Falls (Labrador) Corporation to Hydro Quebec, at the border. The option of dealing with customers outside Quebec was not available, and Hydro Quebec was placed in a monopsony position. The general view in Newfoundland and Labrador is that the power contract is one-sided, providing large benefits to Quebec and few benefits to Newfoundlanders and Labradorians. The price paid by Hydro Quebec is very low over its 65 year term and declines for the last 25 years, which compounds the intrinsic inequity of the contract during a time of

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<sup>5</sup> (2), p.22.

<sup>6</sup> (14), pp.35-40.

<sup>7</sup> (3), p. 18.

<sup>8</sup> (3), p. 57

escalating energy prices. The power contract will have run its course in 2041 and all of the options will then be back on the table, including the use of Churchill Falls power for meeting domestic requirements, as well as for revenue generation by export from the Province of power surplus to the its requirements. The Province's Energy Plan of 2007 fixed its sights on the post-2041 time horizon in examining the options for oil and gas and electric power development.<sup>9</sup>

The Government of Newfoundland and Labrador attempted to utilize the courts to overturn the power contract and to recall additional power through two different initiatives. The first case involved an attempt to recall additional power under the provision of the lease of water rights which stated that power could be recalled where it was economically feasible to do so. This case took 16 years to resolve. The Supreme Court of Canada ultimately upheld the decision of the Newfoundland Court of Appeal that it wasn't economically feasible in 1988, so that attempt failed.

Because of the length of time it was taking to get a final determination of this case, the Government decided to pursue another approach, which would have had the effect of taking back the lease of the water rights through The Water Rights Reversion Act. The Government referred the constitutionality of this Act to the Newfoundland Court of Appeal. It was ultimately heard by the Supreme Court of Canada, which decided in 1984 that it was unconstitutional because it attempted to interfere with the power contract, which gave the right to deliver power at a place outside the territory of the Province and the Province had no authority to legislate outside of its boundaries.

The Churchill Falls Power Corporation, CF(L)Co, which operates the power plant at Churchill Falls is owned by Nalcor and Hydro Quebec, with majority ownership held by Nalcor. The Upper Churchill is the largest generation facility in the Province, producing 5,428 MW of power and 34.0 million MWh of energy. With the exception of 1) the 300 MW which has been reserved for use in the Province, depending upon provincial requirements, 2) the block of 225 MW which was diverted from Twinco to the Churchill Falls project for use by the iron ore industry in Labrador and 3) 682 MW which is being sold to Hydro Quebec on a seasonal basis<sup>10</sup>, the full output is sold to Hydro Quebec under a long term contract for a price declining from 1976 to 2016 and which is currently \$2.50 per MWh. It will decline to \$2.00 per MWh for the remaining 25 years, from 2016 to the conclusion of the power contract in 2041.<sup>11</sup> To put this in context, the rate charged for domestic power users in St. John's is \$104.07 per MWh.<sup>12</sup>

When the Province's hydroelectric production is compared to population size, the 80,000 MWh per year per 1,000 people in Newfoundland and Labrador is higher than in many resource-abundant jurisdictions, higher than Iceland (30,000 MWh) and Norway (25,000 MWh) and higher than Manitoba (30,000 MWh) and Quebec (25,000 MWh).<sup>13</sup>

The Energy Plan calls for the transfer of funds from non-renewable energy sources to renewable sources through the development of Gull Island and Muskrat Falls as well as other hydroelectric and wind energy projects. For the Province as a whole 85% of total energy output is from hydroelectric sources. However, this number is heavily influenced by Churchill Falls and very little of the Churchill Falls energy is used within the Province. For the Island, which is not yet electrically connected with Labrador, the percentage of total energy capacity that was hydroelectric in 2007 was 65%, when the Energy Plan was published; 35% came from thermal power. Since then, two small wind powered projects have been developed but thermal power continues to play a major role, particularly the 490 MW oil fired plant at Holyrood, which is on the Avalon Peninsula, close to St. John's

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<sup>9</sup> See (9)

<sup>10</sup> See (15), p. 20.

<sup>11</sup> Ibid, p. 9.

<sup>12</sup> From the Newfoundland Power bill of David Vardy dated August 11, 2011.

<sup>13</sup> (9), p. 16.

In addition to the two sites on the Lower Churchill there are a number of other potential developments in Labrador. Millan (1974)<sup>14</sup> estimated a potential of over 9,000 MW, not including five interprovincial rivers whose headwaters are in Labrador but which run through Quebec's North Shore on their way to the St. Lawrence River. These are the St. Paul, St. Augustine, Little Mecatina, Natashquan and Romaine Rivers, which have a combined potential of approximately 3,430 MW.<sup>15</sup>

In order to develop the full potential of these projects both the Provinces of Quebec and Newfoundland and Labrador must come to an agreement on water management, dealing with headwaters and river flooding. However, this has not stopped Quebec from embarking on a major new project which will be almost twice the size of Muskrat Falls. Hydro Quebec has commenced work on a \$6.5 billion facility on the Romaine River which will produce 8 million MWh of energy. This facility, with four dams, will be built on Quebec's Lower North Shore by 2020.

Nalcor Energy (Nalcor) is a provincially owned energy company, a crown corporation, which in turn owns the Newfoundland and Labrador Hydroelectric Corporation (Hydro) as well as CF(L)Co. Hydro operates most of the generation capacity on the Island along with the high voltage transmission lines. On the Island, Hydro is the wholesaler which sells to the retailer, Newfoundland Power (NP), fully owned by Fortis Inc. NP operates the distribution lines and deals with household consumers and general service commercial and industrial users, charging rates approved by the regulator.

In Labrador, Hydro is responsible for both the generation and transmission of power and sells power without the intermediation of Newfoundland Power or any other distributor. Hydro serves customers on the interconnected Labrador system and also operates a series of generating systems in isolated communities in Labrador and on the Island, fueled primarily by diesel generators. Rates charged by Hydro to interconnected Labrador customers are lower than those charged to interconnected Island customers, recognizing the lower cost of service in Labrador, where the power is supplied from Churchill Falls, drawing from the recall block of up to 300 MW. On the other hand, the rates charged to customers in isolated communities on the Labrador Coast, and on the Island, are higher, due to reliance on diesel fuel, given that the cost of connection to the grid is prohibitively expensive.

The development of the Upper Churchill was undertaken by a private company, Brinco, not by the Province, and the shares not owned by Hydro Quebec were acquired by the Province in 1974, along with the water rights for downstream development, so as to facilitate the development of the Lower Churchill.

In 1978 the Province signed an agreement with the Federal Government to create the Lower Churchill Development Corporation (LCDC), which is 51% owned by the Province, 49% by the Federal Government, to develop the power sites on the lower Churchill River at Gull Island and Muskrat Falls. The LCDC is currently inactive. However, the Province has approached the Federal Government for a loan guarantee for the Muskrat Falls facility, which was the subject of a recently signed MOU. Negotiations have commenced to work out the details of the guarantee. It would not be surprising if the Federal Government were to seek some form of management control to protect and limit their financial exposure. It is not known whether reactivation of a structure similar to LCDC might be an option for them.

Both Hydro and NP are regulated by the Board of Commissioners of Public Utilities of Newfoundland and Labrador (the PUB), which approves energy rates through the use of an allowed rate of return on rate base. Capital budgets for both utilities are also subject to review by the Board. The Lower Churchill projects (at Gull and Muskrat Falls) have been exempted by Order-in-Council from the jurisdiction of the PUB. However, the Provincial Government has made a reference to the PUB pursuant

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<sup>14</sup> (14) pp. 35-40.

<sup>15</sup> (4).

to Section 5 of the Electrical Power Control Act (EPCA). The reference question is whether Muskrat Falls represents “the least cost option for the supply of power to Island Interconnected Customers over the period 2011-2067 as compared to the Isolated Island Option.” We will return later to this reference and the limited mandate it gives to the PUB.

#### 4.0 Proposal for Muskrat Falls Development

The proposed Muskrat Falls development calls for a dam at Muskrat Falls, with four turbines generating 4.9 million MWh of energy per year from a capacity rated at 824 MW. This project was announced jointly by Premier Danny Williams of Newfoundland and Labrador and Premier Darrell Dexter of Nova Scotia on November 18, 2010.<sup>16</sup> The project has five components, the Muskrat Falls generating plant, the transmission line to Churchill Falls and the Strait of Belle Isle, the Strait of Belle Isle crossing, the Island transmission system to Soldier’s Pond (outside of St. John’s) and the Cabot Strait crossing, estimated to cost a total of \$6.2 billion (see map in Figure 1). The generating plant will cost \$2.9 billion, the Labrador-Island link will cost \$2.1 billion, and the Maritime Transmission Link is expected to cost \$1.2 billion. Completion will take approximately six years. The subsea line across the Strait of Belle Isle will be 30 km in length while that from the Island to Nova Scotia across the Cabot Strait will be 180 km.

Emera Inc. (Emera), which is an energy and services company serving Nova Scotia, will contribute 20 per cent of construction costs and provide transmission to Nalcor Energy (Nalcor) across the Maritime Link and through Nova Scotia. Nalcor will provide Emera with approximately one million MWh per year (Nova Scotia Block) or 20% of the energy from Muskrat, for a term of 35 years.<sup>17</sup>

The rationale given for the project at the press conference was the closure of the 490 MW Holyrood thermal plant and the elimination of its GHG, along with stabilization of power costs by avoiding continued exposure to the price volatility of oil-fired thermal generation. The development of Muskrat Falls would avoid approximately 96 million tonnes of emissions by 2065.

The project will generate large scale employment benefits for the Province, the Atlantic region and the country as a whole. First consideration for jobs in Labrador will go to the Labrador Innu as outlined in the New Dawn Agreement, then to Labrador residents, and then to residents of the province generally.

Initially, displacement of Holyrood energy will absorb 40% of the energy from Muskrat Falls. In addition to the commitment of 20% to Nova Scotia the remaining 40% will be available for sale into New England or the Maritimes or else held in reserve for the industrial requirements of Labrador.

*Nalcor will be provided use of Emera’s transmission rights to transmit power through New Brunswick with Nalcor paying the associated transmission tariff when used by Nalcor. If these rights cannot be acquired or extended, Emera will purchase the power Nalcor would have sold through New Brunswick. Alternatively, at Nalcor’s option, Emera will provide Nalcor with the opportunity to acquire or use 300 MW of firm transmission if proposed Nova Scotia-New Brunswick transmission line is constructed.*<sup>18</sup>

The Government of Newfoundland and Labrador has reached an agreement with the Innu Nation with respect to land claims along with impact and benefits. The agreement covers resource royalty sharing and management of lands. An Upper Churchill redress agreement has also been reached with the Innu Nation.

The reference review being undertaken by the PUB will not consider the potential revenues from the agreement with Emera nor will it consider the costs incurred as part of the Term Sheet to supply

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<sup>16</sup> (21).

<sup>17</sup> (10)

<sup>18</sup> (10)

power to Nova Scotia. Instead the PUB will examine Muskrat Falls solely on the basis of its ability to supply Interconnected Island customers at a lower cost than the Isolated Island alternative. The Gull Island project, as an alternative to Muskrat Falls, is not covered in the reference. The deadline for the PUB reference is December 30, 2011.

#### 4.1 Environmental Assessments

A joint federal-provincial environmental assessment panel has completed hearings on the Lower Churchill generation project. Their report, released August 25, 2011, is a comprehensive review of the Lower Churchill Project, defined as comprising both the Gull Island and Muskrat Falls facilities. This packaging of the two facilities did not preclude individual assessments of each. Transmission lines were not included in the Project. The provincial and federal governments will make the final decisions regarding the Project approval. The Terms of Reference issued by the Ministers required the Panel to assess the environmental effects of the Project, including:

- consideration of the need for and purpose of the Project;
- alternatives to the Project and alternative means of carrying out the Project;
- the environmental effects of the Project, including accidents and malfunctions;
- cumulative effects, and the significance of these effects;
- measures to reduce adverse effects and enhance beneficial effects; and
- monitoring and follow-up.

The Panel decided that it would assess Muskrat Falls and Gull Island separately with respect to alternatives, energy requirements and economic considerations, even though their mandate combines the two as a single Project. This separate assessment is based on the fact that each component is subject to separate sanction decisions.

The panel approached the energy security issue with the understanding that the Province's long term energy security is assured and that energy requirements beyond 2041 will be addressed through access to Churchill Falls power, once the power contract has expired. The main benefit to future generations will accrue to the rest of North America. The Province's ability to capitalize on these benefits, through revenues from power sales, will depend on the future of electricity market demand and supply as well as on achieving access to these markets.

*Long-term energy security would be among the key benefits to future generations. The Panel observes that because of the existing Churchill Falls project, the long-term energy security for the province is already secure after 2041, so the main benefit to future generations in this regard would accrue to the rest of North America. Another potential benefit to future generations would be the predicted large-scale provincial revenues. Whether and at what scale these would be realized would depend on a number of factors, including whether the whole Project proceeds, whether economic access to markets can be realized, and the future of electricity demand and supply.<sup>19</sup>*

The panel has considered Muskrat Falls and Gull Island together as a single project, possibly with overlapping schedules or else with a hiatus in between. This provides the opportunity for sales outside the province to cross-subsidize the price of power to domestic consumers, if such sales are available. Lack of market access, or its high cost, may make such external sales infeasible or unattractive.

*If the Muskrat Falls facility were to proceed by itself because market access could not be resolved in a manner that makes Gull Island economically attractive, there is a risk that the Project would not generate sufficient revenues to cover the various mitigation and compensation commitments*

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<sup>19</sup> (13) p. 308.

*and needs associated with the Project, or the revenues for the Province necessary to ensure long-term economic benefits, and that it would result in higher power rates for the Island of Newfoundland than would be the case without it. The Panel has therefore recommended a formal financial review and an independent alternatives assessment to resolve these uncertainties and allow for a more accurate assessment of the economic risks. ...*

*If the whole Project proceeds, the Panel has reasonable confidence that the adverse economic effects and risks would be outweighed by the potential for large-scale economic benefits. Economic benefits during construction would be centered on jobs and business opportunities, while the dominant economic benefit during operation would arise from the potential revenues the Project would generate for the Province. The financial review recommended by the Panel (Recommendation 4.1) should give government decision makers a better understanding of whether these net economic benefits would materialize.*

*The results of the alternatives assessment recommended by the Panel (Recommendation 4.2) may affect whether a government decision to permit the Muskrat Falls facility to proceed should be made on the basis of a separate sanction decision by Nalcor, or whether other options, which might include commitments by Nalcor to a Gull Island (project) only or a joint sanction decision for Muskrat Falls and Gull Island, should be considered.*

*The Panel believes that only after the financial review and alternatives assessment have been completed would government decision makers be in a position to carefully consider whether the Project, under the various scenarios contemplated by Nalcor, would have a net economic benefit, and at what scale.”<sup>20</sup>*

In its Recommendation 4.2 the panel describes the terms of reference which should be covered by an independent analysis of alternatives to meeting domestic demand. They ask

*why Nalcor’s least cost alternative to meet domestic demand to 2067 does not include Churchill Falls power which would be available in large quantities from 2041 or any recall power in excess of Labrador’s needs prior to that date, especially since both would be available at near zero generation cost (recognizing that there would be transmission costs involved);<sup>21</sup>*

The Joint Panel recommends this question should be included in the terms of reference of the independent analysis, along with the following questions and issues:

- Whether Gull Island power should first be developed, given that it has a lower per unit generation cost than Muskrat Falls?
- Whether Nalcor considered developing technology, as compared simply with current technology?
- Whether Nalcor’s assumptions regarding the price of oil till 2067 are robust and realistic?
- Whether Nalcor’s estimates of domestic demand growth are realistic?
- Whether Nalcor has placed sufficient emphasis upon demand management programs in light of information about targets set and expenditures incurred in other jurisdictions?
- Whether Nalcor should consider introducing disincentives to the inefficient use of electric space heating?
- Whether Nalcor has placed sufficient priority on wind power, in light of the suggestion by the Helios Corporation that an 800 MW wind farm on the Island should be considered as an alternative to Muskrat Falls?

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<sup>20</sup> Ibid. p. 305.

<sup>21</sup> Ibid. p. 34.



- Whether conversion of the Holyrood thermal plant to natural gas as an alternative to Bunker C should be considered?
- Whether further exploration of the potential for renewable energy sources on the Island (wind, small scale hydro, tidal) would be a viable option?

The panel also believes that the planning approach of defining demand requirements and seeking the lowest cost generation solution should be replaced by what is known in the public utility fraternity as integrated resource planning (IRP). IRP looks at both demand and supply options and places more weight on demand management than least cost supply planning.

The panel returns to wind power and demand side management in their recommendation 17.4 where they say as follows:

*From a greenhouse gas emissions perspective, the Project would offer significant advantages over fossil fuel-based energy sources, and be generally comparable to wind, other hydro and nuclear power. Conservation and efficiency measures would rate better than the Project. From a general biophysical perspective, large-scale hydro again tends to rate better than fossil fuel based energy, but does not rate as well as wind or conservation and efficiency measures.<sup>22</sup>*

Both Nalcor and the Panel are of the view that the two projects are likely to be beneficial if they are sequenced, with an overlap in construction. The Panel supported this approach largely because lessons learned and capacity built from construction of Muskrat Falls can be applied to Gull Island. If Muskrat Falls proceeds on its own, in order to meet the Island's energy needs, it is less clear to the Panel that the Project will result in net benefits to the Province as a whole or to Labrador, as a region of the Province.

The Panel recommends a wide range of measures to mitigate the adverse environmental, social and economic impacts. The Panel concludes that the social effects in Labrador could likely be fully mitigated and could be expected to diminish when construction is finished, but the reduced environmental effects would still be negative for Labrador. The regional distribution of benefits is a big concern for the Panel, particularly the impact upon Labrador. The full Project (Muskrat Falls and Gull Island, with overlapping construction) would likely deliver net benefits to the Province as a whole but net benefits to Labrador will depend upon the policy decision to reinvest revenues in the Labrador component of the Province.

An environmental assessment of the transmission line has not yet started. The Labrador-Island Transmission Link project is currently undergoing public and government review of 14 topic-specific Component Studies (prior to submission of Nalcor Energy's Environmental Impact Statement (EIS)).

The environmental assessment for this project does not include the Maritime Transmission Link, for which no EIS has yet been filed.

## **5.0 Interprovincial transmission through Quebec**

Hydro (and Nalcor) has had difficulty in gaining access to wheeling rights for Churchill Falls power through the high voltage transmission lines of Hydro Quebec and remains in dispute with Quebec about the terms under which Lower Churchill power can pass through Quebec. This has led the Government of Newfoundland and Labrador to pursue the "Anglo-Saxon route", bypassing Quebec, to connect with the national transmission grid through Nova Scotia. This route imposes the cost penalty of two sub-sea underwater crossings, one of 30 km and the other of 180 km, thereby placing both Lower Churchill projects at a cost disadvantage. The cost per unit of Gull Island energy is lower by virtue of economies of scale. From this perspective it makes more sense to develop Gull Island with its power

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<sup>22</sup> Ibid. p. 307.

capacity of 2,250 MW, rather than Muskrat. This is in keeping with both the theory and practice of public utility economics.

Nalcor has attempted to use the leverage of the US Federal Energy Regulatory Commission (the FERC). The FERC's Order 2000 provides that "all transmission users should receive access under rates, terms and conditions comparable to those the transmitting utility applies to itself to serve its own customers." This open access provision is intended to open up wheeling of power through long distance transmission lines by imposing FERC rules upon Canadian companies, including Hydro Quebec, selling into American markets. As a major exporter of energy into the United States wheeling power through power lines owned by American utilities, Hydro Quebec has to comply with the wheeling rules established by the national American energy regulator, which demands that reciprocal open access rules be observed. The Province has attempted to deal with Quebec through a series of negotiations and legal maneuvers but, as noted earlier, none of these has been successful.<sup>23</sup>

## **6.0 How much power is needed on the Island?**

Nalcor has selected a 50 year time horizon for planning purposes and has performed a cumulative present value analysis for the period 2011-67, which includes the 50 years after the 2017 in service target date for the Muskrat Falls project and is reflective of its capital life. It has forecasted a growth in demand of 0.8% a year for this period.

The actual compound annual growth rate in energy consumption that occurred for the period 1970-2010 was 2.3%<sup>24</sup>(see Figure 2). This rate is in fact driven by growth in the first 20 year period, since there was virtually no growth from 1990 to 2010. The Province's population is virtually static and growth projections are modest. In recent years, the loss of two pulp and paper mills at Stephenville and Grand Falls plus the expropriation of the Abitibi hydroelectric facilities and the elimination of a paper machine at Corner Brook have created negative growth. These factors resulted in a decline in energy use from 2004 to 2010, when it declined to 1990 levels. As a forecasting tool the 40 year growth rate of 2.3%, used by Nalcor to estimate future trends, is suspect, given the lack of growth in the period 1990-2010, notwithstanding that electric heating is being used in 85% of new homes. It can credibly be argued that the historical period from 1990 to 2010, during which growth was flat, might be a more relevant reference period for future planning. From 2010 to 2067, Nalcor's forecast of compound annual growth is 0.8%. Nalcor maintains sufficient reserve capacity to ensure that the loss of load probability (LOLP) is no greater than 2.8 hours per year. By this standard, capacity deficits begin in 2015 and energy deficits in 2019.

This means that the Holyrood thermal plant would not be able to meet peak winter demand and still meet the LOLP reserve capacity by the year 2015. If the peak could somehow be spread out the system would be able to supply energy requirements up until 2019. The inexorable winter weather does not permit elimination of the peak, in a Province where electricity is widely used for home heating. However, more aggressive demand side management might be a good way to shave the peak and delay the need for new capacity.

This suggests that it is not the forecast of robust growth in demand that is driving the Muskrat Falls project. Rather it is more closely linked with the goal of removing the Holyrood Thermal Plant from the system. The power capacity of the Island system at present is about 2,000 MW, with energy capability of 9 million MWh. Slightly more than 600 MW of the 2,000MW of power capacity is thermal power, mostly generated at the Holyrood plant, of which 490 MW is fully operational during winter months and

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<sup>23</sup> For a history of the power corridor issue see: (4), (5), (6), (8) and (24).

<sup>24</sup> See (19) slide 10.

could produce 3 million MWh, if operated year round. Because of the high cost of bunker C fuel<sup>25</sup> this capacity is only drawn upon when hydroelectric generators are running close to their maximum output. As the load grows the dependence upon Holyrood thermal capacity increases. It is this growth in the use of expensive bunker C fuel that is driving the Muskrat Falls project, combined with the projected increase in fuel prices and the high cost of refurbishing an old plant.<sup>26</sup>

*Holyrood's historical consumption and historical oil prices are not a basis to forecast the thermal plant's production output and oil costs for the next 20 years. Twenty years from now, if the Holyrood plant remains in operation, Hydro estimates the plant will be burning an average of about 3.5 million barrels of heavy fuel oil a year, at a projected cost of about \$150/BBL CDN which is approximately \$500 million annually. For comparison, in 2010, 1.36 million barrels was burned at Holyrood at an average cost of \$74 /BBL CDN.*

The Long Harbour hydromet plant which has been constructed to smelt nickel from the Voisey's Bay mine will impose a major demand upon the Holyrood plant.<sup>27</sup>

*By 2015, electricity demand on the island is expected to reach the same level as 2004 when we hit an historical peak in electricity use, and it will continue to grow from residential, commercial and industrial electricity usage.*

*Almost all extra load growth on the island from today, including the addition of Vale Inco's large industrial load at Long Harbour commencing late in 2011, will cause Holyrood output to once again increase. The Long Harbour hydromet plant at full load in 2016 will require the burning of an additional 1.1 million barrels of heavy fuel oil at the Holyrood thermal plant every year under normal hydroelectric production conditions.*

The additional 1.1 million barrels of heavy fuel oil in 2016 is almost a doubling of the 2010 usage at Holyrood, all driven by one industrial plant.

## **7.0 Alternative sources of power for provincial load**

Nalcor's preferred choice, Option A, is the construction of Muskrat Falls and transmission lines to the Island (and another to Nova Scotia). As Option B, Nalcor has identified an alternative generation expansion path with no interconnection between the Island and Labrador. This expansion path draws upon a combination of small hydro sites on the Island, along with wind power, refurbishment of the Holyrood thermal plant, other small thermal sources, along with energy conservation measures to reduce dependence upon thermal power. Option B is estimated to be more costly than Muskrat Falls, Option A. The cumulative present worth (CPW in 2010\$) of the Isolated Island alternative over the period 2011-67 is \$12.3 billion, compared with \$10.1 billion for the Muskrat interconnected option. Muskrat Falls is preferred by over \$2.2 billion dollars (see Figure 3).

The load forecast is based upon forecasts provided by the Department of Finance, which is projecting minimal growth in population over the forecast period. Nalcor has assumed that the two mills at Stephenville and Grand Falls will remain closed, that the Corner Brook paper mill and the Come by Chance Refinery will continue with their present level of energy use and the nickel smelter will begin to take power in 2011, rising to its full load in 2016. The provincial load forecast must also include new industrial requirements, including those emerging in Labrador from an expanding mining industry. Real

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<sup>25</sup> Bunker C is a high viscosity residual fuel which is what remains from the processing of crude oil after the more valuable products, such as gasoline, have been removed. The residue may include undesirable impurities which add to the negative environmental impact of operating the Holyrood thermal plant.

<sup>26</sup> (20).

<sup>27</sup> (17)

disposable income is projected to rise by 0.9% a year from now to 2029. Average housing starts are projected to drop from 2575 (by 2014) to 2135 (by 2029). The preference for electric heating is assumed to continue.<sup>28</sup>

The three small hydro sites scheduled for development under Option B are Island Pond (36MW and 172,000 MWh), which will require 42 months to develop, Portland Creek (23MW and 99,000 MWh) which will take 32 months to bring onstream, and the smaller Round Pond (18 MW and 108,000 MWh) which will take 33 months to develop. These three hydro power sites will contribute 77 MW of capacity.

The Province has two existing 27 MW wind farms (at Fermeuse and St. Lawrence) which are connected to the Island transmission system. The next potential wind farm will have a capacity of 25 MW (using eight wind turbines) with firm energy capability of 70,000 MWh. It will take 30 months to bring such a system on stream. If the Island were interconnected the potential for additional wind turbines would be enhanced by enabling energy exchanges, depending on where the wind is blowing.

Nalcor's Isolated Island alternative continues to rely heavily on thermal fired plants. Combined-cycle combustion turbine (CCCT) plants can be fired by light fuel oil or by natural gas. The proposed 170 MW CCCT plant would generate 1,340,000 MWh of firm energy. The overall project schedule is estimated to be at least 36 months from the project release date to the in-service date.

Option B provides for two 50 MW (net), simple-cycle combustion turbines (CT) to be located either adjacent to similar existing units at Hydro's Hardwoods and Stephenville Terminal Stations, at the Holyrood site or at greenfield locations. They are fired on light oil and due to their modest efficiency relative to a CCCT plant they are primarily deployed for peaking and voltage support functions. If required, they can be utilized to provide an annual firm energy capability of 394,000 MWh each.

The small hydro and wind units will add 102 MW, while the CCCT and CT units will add 270 MW, for a total of 372 MW by 2030. This incremental capacity of 372 MW compares with the 824 MW capacity of Muskrat Falls. The cost of these capital assets plus the cost of fuel are estimated at more than \$12.2 billion, \$2.0 billion more than the cost of the Muskrat Falls project. Nalcor is, strangely, not forecasting an increase in generating capacity beyond 2030, in the Isolated Island alternative.

Option B will include addressing environmental concerns with sulphur dioxide (SO<sub>2</sub>) and particulate emissions at Holyrood in the 2015-20 period via the addition of scrubbers and electrostatic precipitators, at a cost of \$582 million. This will be followed after 2030 by the replacement of the thermal units (\$1,504 million). It appears, based on the evidence filed by Nalcor with the PUB, that the additional 372 MW in place by 2030 will be sufficient to meet demand up to 2067.

## **8.0 Alternatives to Development of Muskrat Falls**

Other alternatives to the development of Muskrat Falls have been proposed. Fisher et al<sup>29</sup> have undertaken a desk study for the Harris Centre of Memorial University which examined the potential for very small hydroelectric developments, along with additional wind power. They claim that such developments are sufficiently economic to avoid further dependence on thermal power in the absence of a Lower Churchill megaproject. The conclusions of the report require additional study but the authors have made a case for investing in further exploration of the options before the Province commits itself to a large and expensive project such as Muskrat Falls.

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<sup>28</sup> The data on load and generation options in this and the following paragraphs are taken from (16) and (19).

<sup>29</sup> (7).

The Joint Panel received presentations dealing with wind power, specifically the notion of a large wind farm on the Island with a capacity of 800 MW and with energy output comparable to Muskrat Falls. The levelized cost of energy cited was 7.5 cents per KWh.<sup>30</sup>

All of the possible alternatives cannot be explored in this essay. Four other options will be explored briefly in addition to Option A (Muskrat Falls) and Option B (Isolated Island Alternative). One, which we will call Option C, is pursuit of the larger Gull Island project, the cost per kilowatt hour of which is lower than the cost of Muskrat Falls<sup>31</sup>. This 2,250 MW project can produce close to 12 million MWh of energy, more than twice the output of Muskrat Falls. In the absence of wheeling rights through Quebec and access to Hydro Quebec's high voltage transmission system, the necessity to build expensive new transmission lines and underwater power cables across two Straits (the Strait of Belle Isle and Cabot Strait) makes it extremely difficult to deliver energy at competitive prices. If surplus Gull power could be sold through Quebec it is likely that Gull energy could be delivered more economically than energy from Muskrat Falls.

The provincial reference to the Public Utilities Board does not include consideration of this option, which is unfortunate. The reference limits the enquiry to consideration of Muskrat Falls, in comparison with Nalcor's Option B, the Isolated Island alternative. However, development of Gull Island is an attractive option if wheeling arrangements can be negotiated with Quebec, possibly with Federal help, and if markets can be found for firm energy commitments.

Option D is to negotiate with Quebec to access power, possibly supplied from the Churchill Falls power plant. It is unlikely that Hydro Quebec would sell the power at the same price stipulated in the power contract between CF(L)Co and Hydro Quebec. However, the price might be more advantageous than the cost incurred to develop Muskrat Falls, with 40% of the energy remaining unsold. Transmission lines would still need to be built to connect Labrador with the Island but the cost of building the new generation site at Muskrat Falls would be avoided, as would the cost of the link with the Maritimes.

Option E is to set our sights on the year 2041, when the 65 year Churchill Falls power contract will have expired, and more aggressively to moderate demand on the Island until that time, through demand side management and conservation. The Joint Panel reports that the Province is budgeting \$3.1 million for conservation and demand management or about 0.75% of utility revenues. Hydro's consultant proposed that this should be substantially increased. Demand management can be accomplished by using better pricing signals, where prices are more finely tuned to reflect marginal cost<sup>32</sup>, thereby signaling to the energy user the cost consequences of his decisions. This might be a good way to discourage electric space heating in favour of more efficient alternatives.

In addition to introducing disincentives to the use of energy, government could open up competition on the supply side by offering to purchase power from small producers, particularly small hydro, wind and solar producers and other renewable energy sources. This would open up private sector solutions to the supply of energy and perhaps, ultimately, transform Hydro into a system manager, reducing its role in the direct provision of energy. Hydro could then focus its energy on the transmission of power, including building an interconnection with Quebec.

Option F is a variant of the Isolated Island alternative. It includes a thermal plant at Holyrood but one which is converted to use natural gas, a cleaner and cheaper alternative, rather than Bunker C, with its high emissions. Abundant natural gas is available on the Grand Banks in association with producing oilfields. It has been suggested that a system of pipelines be established to collect gas and that the

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<sup>30</sup> (13) p. 32.

<sup>31</sup> The levelized unit energy cost for Gull Island and Muskrat Falls were estimate at 3.92 cents and 4.47 cents per kilowatt hour (KWH) (2000 dollars) respectively. Ibid. p. 19.

<sup>32</sup> (23).

pipelines come ashore on the Avalon Peninsula, possibly in Holyrood.<sup>33</sup> Nalcor has advised<sup>34</sup> that there are two problems. One is that the gas is currently being used to optimize oil production through reinjection of natural gas and that production of gas would detract from the economics of oilfield operations. The second is that natural gas prices have fallen largely as a result of new discoveries of gas found in association with shale, known as “shale gas”. This decline in prices has a “good news, bad news” effect. The good news is that natural gas is cheaper, thereby enhancing the viability of the proposed conversion at Holyrood. The bad news is that the low prices may not justify a large investment in underwater pipelines on the Grand Banks. Another important factor is that the requirements of a converted thermal plant would be extremely small in relationship to the large amount of natural gas which would be piped and may not justify bringing a pipeline landfall on the Island.

Two other sources of natural gas should be considered. One is liquefied natural gas (LNG) which is transported by gas tankers from suppliers around the world. This supply of natural gas should be explored as an alternative to Bunker C. Market prices are relatively low and large volumes are available. Liquefaction of natural gas on the site of floating oil producing platforms is not considered feasible by industry experts. Compressed natural gas (CNG) is another possibility and might be available by compressing gas on oil-producing sites as well as from international suppliers outside the Province. Both LNG and CNG should be explored to improve the economics of the isolated Island alternative.

### **9.0 Is Muskrat Falls the best option to supply the Island?**

The Muskrat Falls project is probably a second or third best solution. Notwithstanding the power agreement whereby the overall investment is shared between Emera and Nalcor Energy, the project will cause a large increase in the already large debt burden of the Province. This raises the question as to whether a private sector solution can be found, or a private public partnership, which will avoid the added direct debt burden. Can such a partnership be found which will engage the private sector as well as other provinces, possibly Ontario? Could such a partnership build Gull Island rather than Muskrat Falls, and, in so doing, secure lower prices for Newfoundland and Labrador consumers while at the same time serving other North American consumers, by meeting their needs with firm and long term energy contracts?

The selection of Muskrat Falls as the first Lower Churchill project defers the preferred Gull Island project, with its larger capacity and lower cost per energy unit, which ideally should be the first project in the sequence of Labrador power developments. While the Churchill Falls project conferred few benefits upon the Province it did not impose large financial obligations upon the Provincial Government or its Crown Corporations to underwrite the financing costs, as does Muskrat Falls.

Option A, with Muskrat Falls, leaves 40% of the power without committed sales and the politically unpalatable potential of being sold in the Maritimes or New England at a price below the prices charged to local consumers. The challenge is to mobilize the resources of the Province so that the needs of local users will be given first priority while at the same time extracting maximum rent for the people of the Province. If neither of these projects can be expedited without inflicting huge financial risks upon ratepayers and taxpayers then perhaps other avenues should be found to bring demand into line with the supply of energy. Looming large over these decisions is the prospect of access to Churchill Falls power in 2041, both to meet the energy needs of the Province and to generate revenue through sale of power at current and rising energy prices. Do we have the foresight to make the tough choice of short term pain for long term gain?

### **10.0 Other potential uses of Lower Churchill Power**

Much of the public debate over Muskrat Falls has focused on meeting the energy needs of the Island and shutting down the Holyrood power plant. In assessing local needs one has to look as well at the

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<sup>33</sup> (1).

<sup>34</sup> This information on LNG is based on a discussion with Ed Martin, President and CEO of Nalcor Energy, and his senior officials, on April 14, 2011.

growth of industrial demand in Labrador. While the mining industry has been expanding in Labrador as well as in Quebec the energy available to fuel this growth has remained limited to the 225 MW generated at Churchill Falls to replace Twin Falls and made available to the iron ore industry. In addition there is a block of 300 MW of recall power that is being used by local domestic and industrial consumers.

We need to assess all potential uses for power in Labrador, including the further processing in Labrador of indigenous mineral resources, and also mineral resources extracted from nearby mines in Quebec. Electric power can be used as an instrument of economic development to encourage processing and smelting of local ores. It can also be used to encourage the smelting of imported raw material such as bauxite into aluminum. Our Province has in the past used cheap energy as an inducement to develop energy-intensive industry. Such incentives must be weighed against the benefit of extracting rents by sale of energy to growing central Canadian and American markets. Such sales will require resolution of the wheeling issues which have for so long delayed power development in Labrador.

## **11.0 Conclusion**

The Lower Churchill Project (or projects) needs to be viewed from a national, provincial and regional (Labrador) perspective. It is in the national interest to develop clean, renewable energy projects which allow Canadians, wherever they live, to enjoy access to our comparative abundance of hydroelectric resources, without compromising the ability of resource owners to maximize their economic rent. National policy should facilitate free interprovincial and international trade in energy and reduce barriers to the free flow of energy in all its forms. Canada has not enjoyed the same freedom of trade in electric energy as does the United States, nor has the National Energy Board (NEB) played the same trade-liberating role as has the Federal Energy Regulatory Commission (FERC). Yet there is a Federal Government commitment to bilateral free trade between Canada and the United States.

The Federal Government has been invited to participate in the financing of the Muskrat Falls proposal by providing a loan guarantee. It is highly unlikely that they will participate in this project unless the questions identified by the Joint Panel are addressed to their satisfaction and unless they have some management authority in decisions relating to the commissioning of the project. They will want to ensure that a Lower Churchill development strategy that places Muskrat first in the sequence is in the national interest. They will also reflect upon the Panel's caveats about the wisdom of the Province undertaking Muskrat Falls on its own without further analysis of the alternatives. The Lower Churchill, embracing both components, Gull Island as well as Muskrat Falls, has the potential not only to satisfy the energy needs of Newfoundland and Labrador but also of electrical consumers across Canada. For this reason Canada should the Lower Churchill within a broad policy context and will explore how national policy instruments can be used to facilitate interprovincial wheeling of power. The LCDC may be the appropriate instrument both to support financing of the project and to allow the Parliament of Canada to declare the project to be a national undertaking for the general advantage of Canada under Section 92 (10) (c) of the Constitution Act.

The Panel has recommended that the two components overlap in order to maximize net benefits. In light of this recommendation we would expect that the Federal Government will want to assure that markets in Canada are clearly identified to achieve cost recovery for the full energy output and that if markets are not available in Canada they should be found south of the border in the United States.

At this point in time it is difficult to undertake effective marketing, when the most cost effective transportation route (through Quebec) is precluded. The Province of Newfoundland and Labrador should be free to choose between the Quebec versus the so-called Anglo-Saxon routes on the basis of cost. If the Quebec route were an available option and if the cost were substantially less than the cost of the Anglo-Saxon route, with two submarine crossings, then Newfoundland and Labrador might elect to maximize its economic rent by selling all Lower Churchill power west, meeting the energy requirements of the Island from facilities entirely located on the Island. When this choice is unavailable the Province is left with only

one possible wheeling option to market energy surplus to its needs. Clearly there is a case for the exercise of national policy to ensure that efficient choices are made, within a free trade environment.

The Province's energy policy concerns itself with meeting the energy needs of the Province, as well as optimizing economic benefits and economic rent from energy developments. The Joint Panel has questioned Nalcor's analysis which showed that Muskrat Falls is the best and least cost way to meet domestic energy requirements. It recommended that an independent analysis of economic, energy and environmental considerations be undertaken before governments make their final decision. In light of the prominence given to the 2041 expiration date for the Upper Churchill contract in the Province's 2007 Energy Plan the Joint Panel recommended that Nalcor include Churchill Falls power in its planning for 2011-2067, which includes the period 2041-2067.

The Province has to be cognizant of the impact of the Muskrat Falls project upon Labrador. The Joint Panel heard a large volume of evidence from aboriginal and other groups in Labrador. Labrador can potentially benefit from the availability of power for use within the region. They concluded that a large-scale mitigation and adaptive management effort will be required to offset adverse social and biophysical effects. Social effects can be fully mitigated with enough resources and the passage of time. They also concluded that the residual environmental effect, though much reduced, would still be negative for Labrador. Unless the Province establishes a policy framework to redistribute benefits to Labrador the region may suffer negative net benefits.

In summary, there are a number of issues that must be addressed in weighing the options for supplying the energy needs of the Province of Newfoundland and Labrador. There are inherent advantages to be achieved through interconnection with the Mainland, in terms of reliability and the ability to export (and import) energy from renewable energy sources, such as wind. With respect to Muskrat Falls (Option A) versus the Isolated Island Alternative (Option B) the former will provide greater long term stability of prices to consumers by avoiding dependence upon unpredictable oil prices. On the other hand, without a firm market for surplus energy, Muskrat Falls involves building overcapacity and requires a large investment up front, with the potential for cost escalation and for adding to the provincial debt. The Isolated Island alternative allows for capacity to be built as needed depending on changes in the trend of load growth over time.

There is merit in the recommendation of the Joint Panel for an independent assessment. Such an independent assessment might be undertaken by broadening the terms of the reference made by the Province to the Public Utilities Board, or, preferably, by rescinding the exemption of Muskrat Falls and Gull Island from the jurisdiction of the Public Utilities Board. The Muskrat Falls decision should not be rushed. Due diligence requires further consideration of all of the issues raised by the Joint Panel, particularly the following:

- The lack of firm purchase agreements for surplus power and a clearer understanding of marketing possibilities;
- The use of other thermal alternatives, such as natural gas;
- The inefficient use of electric space heating; and
- Opportunities for conservation and demand management.

For convenience, the options are shown as follows, along with their advantages and disadvantages.



Table 1: Comparison of Options for Supplying Energy to Newfoundland and Labrador		
Five Options	Pros	Cons
Option A: Muskrat Falls Project with Link to Island and Maritime Transmission Link	<ul style="list-style-type: none"> <li>• Price stability, upon completion.</li> <li>• Lower overall cost (CPW).</li> <li>• Connection of Island to continental grid.</li> <li>• Availability of additional power for industrial load growth in Labrador.</li> <li>• Sale of power surplus to needs of Province.</li> </ul>	<ul style="list-style-type: none"> <li>• Overcapacity for Island along with high initial cost.</li> <li>• Potential for cost escalation.</li> <li>• Increase in public debt.</li> <li>• Reliance upon long transmission lines with two sub-sea crossings.</li> <li>• No market for 40% of the energy.</li> <li>• Loss of Avalon Peninsula based emergency power by removal of Holyrood thermal plant.</li> </ul>
Option B: Isolated Island Alternative	<ul style="list-style-type: none"> <li>• Increased flexibility by building new capacity only as needed.</li> <li>• Can use demand side management.</li> </ul>	<ul style="list-style-type: none"> <li>• More costly than Muskrat (\$2.2B).</li> <li>• Vulnerability to escalating oil prices</li> </ul>
Option C: Gull Island Project	<ul style="list-style-type: none"> <li>• Lower per unit cost.</li> <li>• Potential to accommodate unforeseen load growth.</li> <li>• Connection of Island to continental grid.</li> <li>• Revenue from sale of surplus power on firm basis.</li> </ul>	<ul style="list-style-type: none"> <li>• Overcapacity</li> <li>• Reliance upon Quebec for transmission.</li> <li>• Requirement for firm energy markets.</li> </ul>
Option D: Negotiate with Quebec to purchase power, with Link to Island	<ul style="list-style-type: none"> <li>• Reduced capital cost.</li> <li>• Lower energy cost.</li> <li>• Connection of Island with continental grid.</li> </ul>	<ul style="list-style-type: none"> <li>• Nalcor indicates that Quebec is not receptive. However this may change as the political scene unfolds.</li> </ul>
Option E: The 2041 alternative, drawing upon Island sources as needed, along with aggressive demand side management, until Churchill Falls power is available in 2041, at the end of the power contract with Quebec.	<ul style="list-style-type: none"> <li>• Reduced capital cost.</li> <li>• Increased flexibility by building new capacity only as required.</li> </ul>	<ul style="list-style-type: none"> <li>• Higher prices before 2041.</li> <li>• Loss of economic opportunities from development of the Lower Churchill.</li> </ul>
Option F: The Conversion of the Holyrood thermal plant from Bunker C to natural gas.	<ul style="list-style-type: none"> <li>• Improved viability of Isolated Island alternative.</li> <li>• Lower fuel cost.</li> <li>• Lower emissions.</li> </ul>	<ul style="list-style-type: none"> <li>• Possible high capital cost.</li> </ul>

## 12.0 Bibliography

1. Bruneau, Stephen, *The Rationale for a Natural Gas Pipeline to the Island of Newfoundland*, October 2005, see <http://www.engr.mun.ca/~sbruneau/research/energy/noia.pdf>.
2. Canadian Electrical Association, *Building Tomorrow's Electricity System: Electricity Fundamentals for Decision-Makers*, 2009.
3. Canadian Electrical Association, *Canada's Electricity Industry: Background and Challenges*, 2010.
4. Churchill, Jason L., *Power Politics and Questions of Political Will: A History of Hydroelectric Development in Labrador's Churchill River Basin, 1949-2002*, in *Collected Research Papers of the Royal Commission on Renewing and Strengthening our Place in Canada*, Volume 3, pp. 257-312.
5. Feehan, James and Melvin Baker, *The Origins of a Coming Crisis: Renewal of the Churchill Falls Contract*, *Dalhousie Law Journal*, 75 p., Faculty of Law, Dalhousie University, Halifax, Spring, 2007.
6. Feehan, James, *Smallwood, Churchill Falls and the Power Corridor through Quebec*, Acadensis, forthcoming.
7. Fisher, K, M. T. Iqbal, and A. Fisher, *Small Scale Renewable Energy Resources Assessment for Newfoundland*, project funded by Harris Centre, 2010.
8. Froschauer, Karl, *The Churchill River Trap (Newfoundland)*, in *White Gold: Hydroelectric Power in Canada*, Vancouver: UBC Press, , 1999, pp. 108-137.
9. Government of Newfoundland and Labrador, *Focusing our Energy, Energy Plan*, 2005.
10. Government of Newfoundland and Labrador, Joint News Release and Backgrounder at <http://www.releases.gov.nl.ca/releases/2010/exec/1118n06.htm>
11. Government of Newfoundland and Labrador, *Terms of Reference and Reference Question*, PUB website at <http://www.pub.nf.ca/applications/MuskratFalls2011/files/corresp/TermsOfReference.pdf>
12. International Energy Agency, *Key World Energy Statistics 2010*, Paris: IEA/OECD, p. 19, [http://www.iea.org/textbase/nppdf/free/2010/key\\_stats\\_2010.pdf](http://www.iea.org/textbase/nppdf/free/2010/key_stats_2010.pdf).
13. Joint Review Panel, *Lower Churchill Hydroelectric Generation Project Nalcor Energy Newfoundland and Labrador, August 25, 2011* at [www.gov.nl.ca/env/env\\_assessment/projects/Y2010/1305/lower\\_churchill\\_panel\\_report.pdf](http://www.gov.nl.ca/env/env_assessment/projects/Y2010/1305/lower_churchill_panel_report.pdf)
14. Millan, S. M., *Energy in Newfoundland*, *Geoscience Canada*, 1(2), pp. 35-40. 1974.
15. Nalcor Energy, *2010 Business and Financial Report*, p. 9.

16. Nalcor Energy, *Generation Planning Issues July 2010 Update*, System Planning Department, at <http://www.pub.nl.ca/applications/MuskratFalls2011/files/exhibits/Exhibit16-GenerationPlanningIssuesJuly2010.pdf>
17. Nalcor Energy, *Response to Lower Churchill Hydroelectric Joint Review Panel Information Request of March 21, 2011* at <http://www.ceaa-acee.gc.ca/050/documents/49310/49310E.pdf>
18. Nalcor Energy, *Muskrat Falls Development: 2011 Annual General Meeting*..
19. Nalcor Energy, *Muskrat Falls Development: Presentation to the PUB, July 18, 2011* at <http://www.pub.nl.ca/applications/MuskratFalls2011/files/presentation/Nalcor-ProjectOverview-July18-11.pdf>.
20. Nalcor Energy, *Why the Holyrood plant will mean escalating rates for consumers* by Paul Humphries and Rob Henderson June 28, 2011 at <http://nalcorleadershipblog.com/?page=2>.
21. Nalcor Energy and Emera Energy, *Term Sheet*, November 18, 2010, at <http://www.nalcorenergy.com/assets/nalcorenergyandemeraincterm%20sheet.pdf>.
22. NERA Economic Consulting: *Final Report Newfoundland and Labrador Hydro, Marginal Costs of Generation and Transmission*, May 2006.
23. NERA Economic Consulting: *Implications of Marginal Cost, Results for Class Revenue, Allocation and Rate Design, Prepared for Newfoundland and Labrador Hydro*, July 2006.
24. Smith, Philip, *Brinco: the Story of Churchill Falls*, Toronto: McClelland and Stewart, 1975.

Figure 1: Map of Muskrat Falls Development

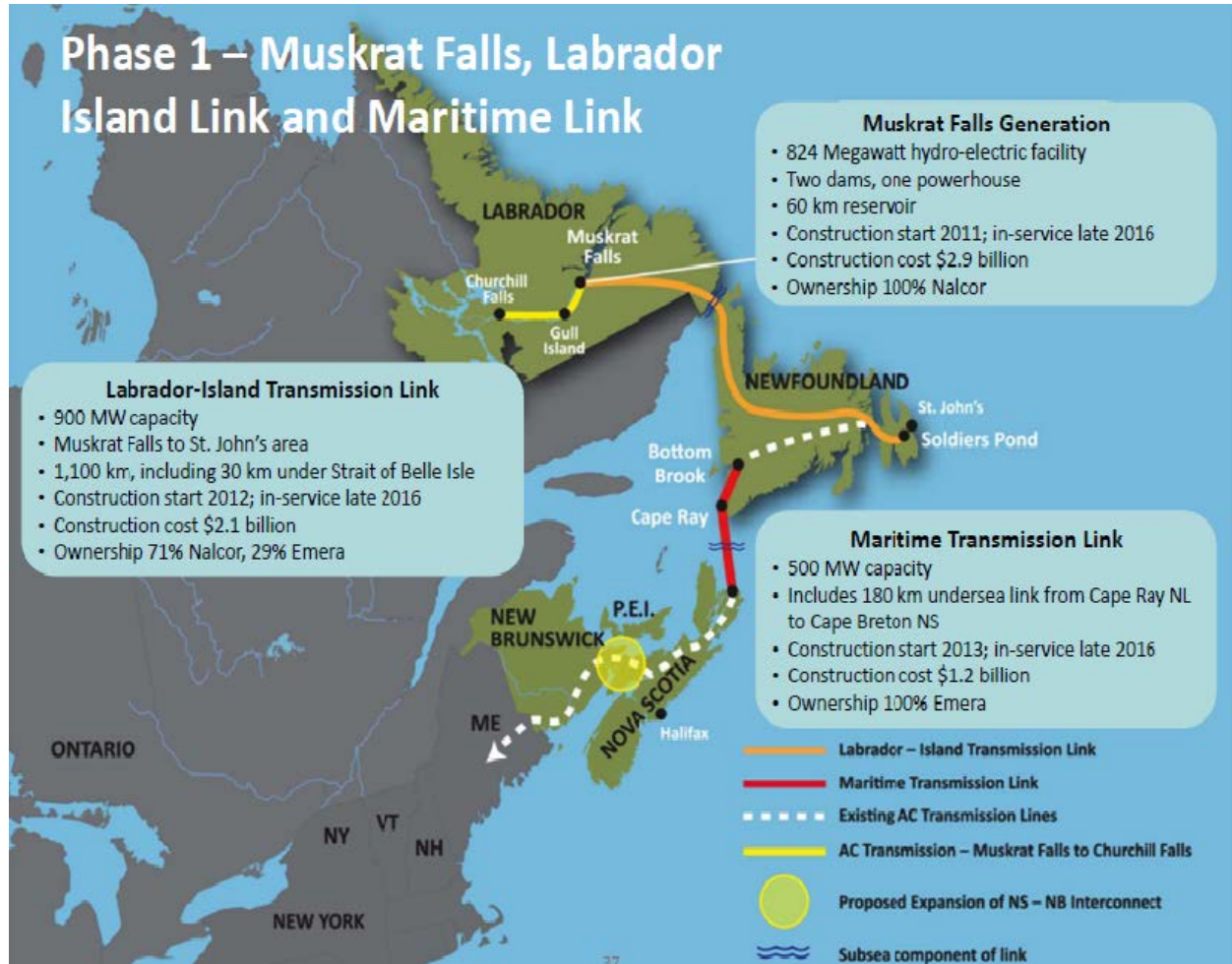


Figure 2: Historical and Forecast Energy Needs

# Historical & Forecast Electricity Needs

Load forecast is realistic and reflective of the expected provincial demand

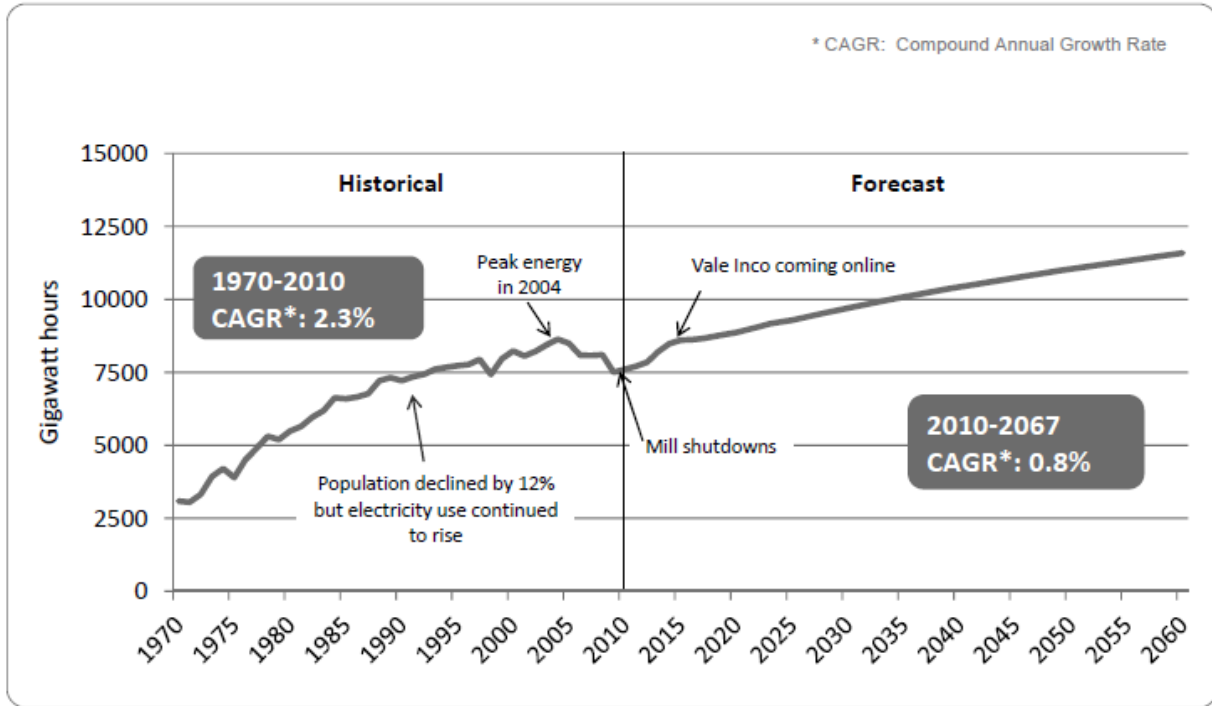
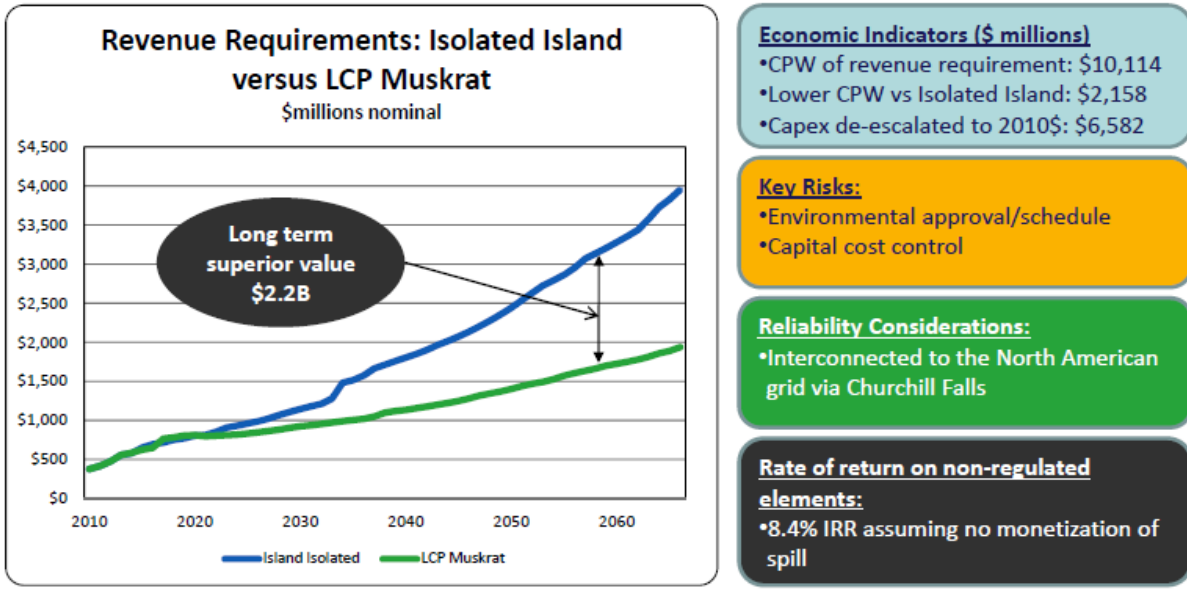


Figure 3: Comparison of CPW of Muskrat Falls with Isolated Island Option

## LCP – Muskrat Falls First Key Indicators





**THE LESLIE HARRIS CENTRE OF REGIONAL POLICY AND DEVELOPMENT**

1st Floor Spencer Hall, St. John's, NL Canada A1C 5S7

Tel: 709 864 6170 Fax: 709 864 3734 [www.mun.ca/harriscentre](http://www.mun.ca/harriscentre)

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