Submission to the Standing Committee on Energy, the Environment and Natural Resources

“Managed” Transition to a Low-Carbon Economy

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Mr. Neil Larlee
Director, Strategic Planning
New Brunswick Power Corporation
515 King Street, Fredericton, New Brunswick E3B 4X1
506/458-4048
NLarlee@nbpower.com
www.nbpower.com
“Managed” Transition to a Low-Carbon Economy

New Brunswick Power (NB Power)

NB Power is a publicly-owned utility that safely and reliably serves New Brunswick residential, commercial, industrial and municipal customers with competitive rates. Its vision is to provide Sustainable Electricity with a mission to Be Our Customers’ Partner of Choice.

Currently, the main contributors to greenhouse gas emissions in New Brunswick are:
- electricity (30%)
- large industrial emitters (29%)
- transportation (27%)

NB Power is well positioned, based on its generation mix, to provide its customers with electricity generated with consideration for the environment. External purchases, largely hydro, help supplement this mix resulting in over 70 per cent of the current in-province energy requirements being supplied by non-emitting generation. By 2020, the generation mix will achieve 75 per cent non-emitting. When considering greenhouse gas emissions, NB Power is approximately 52 per cent below 2005 levels. (Attachment A provides an overview of NB Power’s system).

Introduction

We will touch on four key areas of consideration regarding a “Managed” Transition to a Low-Carbon Economy.
1. Overview of NB Power and the impact competitive rates has on New Brunswick’s economy due to our electricity intensive Gross Domestic Product.
2. NB Power’s infrastructure renewal and commitment to reducing and shifting demand.
3. Integrating renewables
4. Finally, the role NB Power plays in the Atlantic Region.

Electricity and the New Brunswick Economy

As a result of the preponderance of electricity-intensive industries, such as pulp and paper, mining and petroleum refining, New Brunswick has one of the most electricity-intensive economy in the world.
- The economy of New Brunswick is among the most electricity-intensive in Canada, after Quebec (Attachment B illustrates).
- Compared to the rest of the world, the economy of New Brunswick is among the top five most electricity-intensive economies, comparable to that of Norway which has the most electricity-intensive economy in the world.

An adequate, secure and reliable supply is of paramount importance to sustain economic growth in New Brunswick because of the electricity-intensive nature of its economy.
New Brunswick’s Economy Is Very Export Dependent

In addition to having an electricity-intensive economy, New Brunswick’s economy is also one of the most export-dependent compared to other provinces of Canada. A competitive electricity supply cost structure in New Brunswick is therefore of utmost importance to maintain the competitive advantage of New Brunswick’s exports.

New Brunswick competes in the forestry sector with low electricity rate jurisdictions such as Quebec, Wisconsin and British Columbia. Similarly it competes in the petroleum sector with Alabama, Louisiana and the U.S. Midwest for petroleum refining. It is therefore important that NB Power maintains or improves its electricity rates competitiveness with these jurisdictions.

Given this dependency on competitive electricity rates to sustain the New Brunswick economy, NB Power believes it is critical that a “Managed” Transition to a Low-Carbon Economy occur to avoid undue hardship.

Infrastructure Renewal

A cornerstone to NB Power’s ability to provide reliable and competitively priced electricity with limited indigenous energy resources is its diverse portfolio of generation assets and via transmission interconnections. This diverse generation mix including hydro, wind, nuclear, biomass, biogas, and thermal (coal and oil) has been an effective strategy to mitigate fuel cost volatility in the past and is seen to be an important strategy for the future. From an environmental perspective, this diverse generation mix supplemented by external purchases, largely hydro, results in over 70 per cent of the current in-province energy requirements being supplied by non-emitting generation. By 2020, the generation mix will achieve 75 per cent non-emitting.

Based on New Brunswick’s electricity load growth projections, NB Power has adequate generation capacity to reliably meet the electricity needs of the province for the next 10-15 years. However, since new electricity infrastructure is capital intensive requiring significant lead times to build, NB Power must plan ahead to ensure resources are in place when needed. We are not alone.

As we contemplate how to transition to a low carbon economy and electricity supply, it is important to recognize the importance of maintaining and increasing base load generation from non-emitting sources. Sufficient base load generation is critical to achieve stable and reliable electricity supply to customers. Obviously, hydro is important as well as the need for new nuclear generation. Ensuring Canada maintains and expands its nuclear program is a cornerstone to achieving a low-carbon economy.

Further, the timely retirement of thermal assets is critical to avoid rate shock to customers. For example, New Brunswick’s only coal station (Belledune Generating Station) is scheduled to retire in 2043 per federal regulations. Should it be required to shut down early, by 2030 for example, this would result in a rate increase of approximately 39 per cent in addition to planned increases. This would have a devastating impact on the New Brunswick economy.
Energy Efficiency – Reducing and Shifting Demand (RASD) – Smart Grid

NB Power believes that infrastructure renewal includes investments in technologies to modernize the utility. We are currently integrating demand side management into our utility system in a fiscally responsible way and are focusing on energy efficiency as part of our Reduce and Shift Demand (RASD) initiative. Fundamental to RASD is a holistic strategy that includes education, energy efficiency incentives, the utility leading by example, changes to policy, standards and codes, and technology to realize peak demand reductions.

RASD can be broken down into the following two significant streams of activity.

The first area includes program decisions that will be made by our customers as it requires them to change their electricity consumption behaviour through conservation and energy efficiency efforts. It will be important that consumers are able to mitigate future rate increases by altering their consumption pattern. By offering this NB Power will be able to offset some of the revenue loss with fuel and other savings.

Successful programs provide a wide spectrum of options (home retrofit, product incentives, efficient heating systems, etc.) to all customers groups (residential, commercial, industrial, low-income). Currently NB Power is delivering a variety of programs in the area of conservation and energy efficiency.

The second significant area of RASD is non-obtrusive load shifting performed by the utility in cooperation with the customer. This is only achievable through significant investment in information and communication technology. NB Power is leading the industry with its partnership with Siemens. Siemens has established its Smart Grid Centre of Competency in New Brunswick. They also moved their Smart Grid Research and Development department from New Jersey to New Brunswick. As a result of our focus to reduce and shift demand we are moving forward with:

- advanced metering infrastructure to support two-way communication with the meter;
- customer demand response whereby the utility incents customers to reduce and/or shift load;
- exploring innovative rates such as “time-of-use” to send the proper price signals, and;
- customer load/storage management where the customer’s space heating and water heating loads are adapted to energy thermal storage. Customers will have the ability to become electricity producers themselves using environmentally sustainable energy sources (e.g. wind, solar).

To optimize and maximize the value from these types of initiatives, NB Power, in its partnership with Siemens, has implemented a load management software which operates like a virtual power plant. This enables a more dynamic relationship between variations in electric consumption and intermittent renewable energy integration.
As it relates to transportation, significant reductions in greenhouse gas emissions can be achieved through the broad adoption of electric vehicles. Incentive programs are necessary to speed up adoption of electric vehicles and installation of charging infrastructure to gain consumer confidence.

**Integrating Renewables**

As a modern utility it will also be important to optimize our ability to integrate renewables on our system. NB Power currently has approximately 300 MW of wind capacity under contract through power purchase agreements. An additional 80 MW of renewable energy from First Nations and community will be added by 2020. Recent experience shows we are reaching the limits of our ability to integrate wind due to challenges with the variability of wind generation and the need to have other forms of generation to follow and provide back-up such as hydro and thermal generation. Therefore, it is vital that the proper balance is maintained to ensure system reliability.

As noted earlier, our leadership in partnership with Siemens to implement the virtual power plant is critical to integrating more renewables effectively and reliably.

**Regional Cooperation and Opportunities**

The Maritime Utilities, Quebec and New England have a long history of over 50 years of collaboration through the purchase and sale of energy and capacity, and in the operation of the power system to the benefit of customers in the respective provinces or states. This started with the signing of Interconnection Agreements and continued with Operating and Energy Agreements. With the introduction of Open Access Transmission Tariffs and mandatory Reliability Standards, it became necessary to demonstrate to the outside world through the North American Electric Reliability Corporation (NERC) that this collaboration results in safe and reliable interconnections with all our neighbors. By working together, the Maritimes have been able to minimize the operating costs in meeting these standards.

With the Muskrat Falls development in Labrador by Nalcor, the on-going hydro development in Quebec and consideration of a second nuclear reactor, the concept of regional collaboration envisions the participation of the four Atlantic Provinces and Quebec.

As noted above, transmission interconnections are the key enabler to allow regional collaboration to occur. As robust as New Brunswick's transmission system is, it is anticipated that investment will be required at the Quebec, PEI and Nova Scotia interfaces and NB Power’s in-province transmission system to maintain and enable further collaboration to move additional non-emitting energy across those interfaces. Attachment C includes an Interconnection Map.
Summary

When reviewing Canada’s electricity sector today and looking to the future to achieve a low-carbon economy, NB Power believes it is important to give consideration to the following items for the electricity sector:

1. Each province or region in Canada is different. The result of changes in regulations affecting electricity pricing and how it impacts the provincial economies is different for each region and must be well understood.

2. Infrastructure renewal at the right time with the right resource, supported by our RASD initiative, which includes energy efficiency and demand side management programs, will achieve better results. Regulatory certainty coupled with efficient project delivery will encourage renewal. A well thought out plan to modernize utilities will result in better environmental outcomes and customer satisfaction. A “Managed” Transition to a Low-Carbon Economy is critical.

3. Regional collaboration has proven to be very beneficial in the past and is a key ingredient for a more efficient, cleaner electricity sector in the future. It is important that regional collaboration be based on sound business principles to create a win/win result.

Conclusion

NB Power has built its system with consideration of fuel diversity resulting in over 70 per cent of the current in-province energy requirements being supplied by non-emitting generation. By 2020, the generation mix will achieve 75 per cent non-emitting. When considering greenhouse gas emissions, NB Power is approximately 52 per cent below 2005 levels.

NB Power is leading the industry with its partnership with Siemens. NB Power is committed to continuing on this journey by identifying innovative environmental technologies that will benefit customers through its RASD/Smart Grid initiative, by implementing energy efficiency and demand side management programs and by integrating renewables into its system in a balanced, strategic manner. NB Power remains committed to working with its regional partners to minimize operating costs and take advantage of a variety of opportunities that promote low-emitting generation.

New Brunswick has one of the most electricity-intensive economies in the world and its economy is very export dependent, which means New Brunswick businesses require competitive electricity rates. Given this dependency on competitive electricity rates to sustain the New Brunswick economy, NB Power believes it is critical that a “Managed” Transition to a Low-Carbon Economy occur to avoid undue hardship.
Attachment A – New Brunswick Power Overview

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Attachment B – Electricity Intensity

Electricity Intensity (kWhs/$ GDP),
a Provincial Comparison

Notes and Source: 1. Gross domestic product is expenditure-based, in current million $. From Statistics Canada #13-213. See: http://www40.statcan.ca/l01/cst01/econ15.htm 2. Electricity consumption is total made available for consumption, defined as generation + imports - exports - transmission losses. From Statistics Canada Cansim Table #127-0001.
Attachment C – Interconnection Map