

ELECTRICITY: A REGIONAL VISION FOR SUSTAINABILITY AND COMPETITIVE INDUSTRIAL RATES

Prepared by: Atlantica Centre for Energy, June 2010

NB Power - Overview

NB Power is the primary electrical utility in New Brunswick¹. It is a Crown Corporation wholly owned by the Government of New Brunswick and is composed of a holding company and four sub-companies: NB Power Distribution and Customer Service, NB Power Generation, NB Power Nuclear, and NB Power Transmission. The NB System Operator, not part of NB Power, is an independent corporation whose primary responsibilities are to ensure the reliability of the electrical system and to facilitate the development and operation of a competitive electricity market in New Brunswick.

NB Power and Economic Development

Since its earliest days, NB Power has been an important catalyst for economic development in New Brunswick.

In 1920, then Premier Walter E. Foster proposed the creation of a provincially-owned electric company to support economic development in the province. The New Brunswick Electric Power Commission was created and started construction on a \$2 million hydroelectric dam at Musquash and built a 142 km long high voltage power line to connect Saint John, Sussex and Moncton.

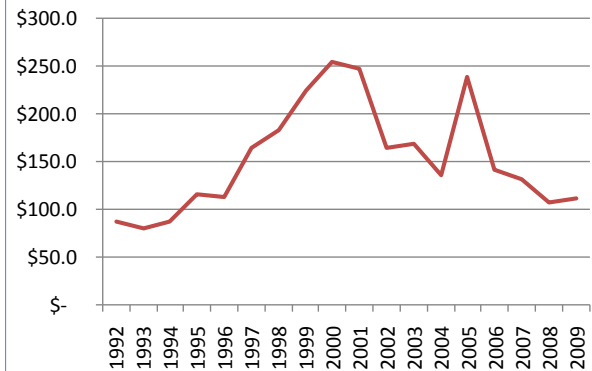
In the 1950s and 1960s, new hydroelectric generating stations provided low cost electricity for the burgeoning forestry and industrial sectors. One of the main influences behind the Point Lepreau Nuclear Generating Station, which came online in 1983, was low cost power for industrial development.

In addition to providing low cost power to New Brunswick residents and industry, NB Power also started exporting power in the early 1970s to New England distributors and continues to export electricity until today (Figure 1). Exporting electricity was a way to make use of excess generation capacity needed for winter heating that was idle during the summer months.

The Industrial Electricity Rate Challenge

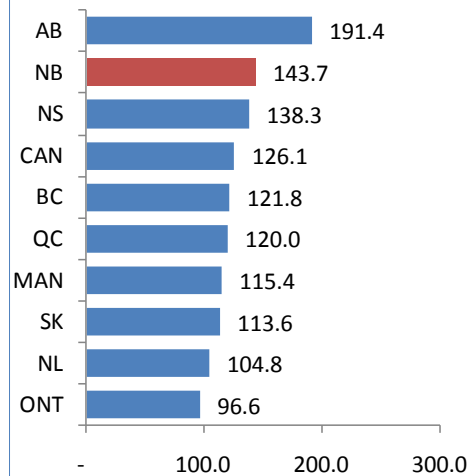
In the late 1990s, NB Power's electricity rates started to escalate faster than many other jurisdictions across North America. There were a number of reports and commissions put in place to try and address rising electricity rates culminating in the 2003 amendments to the *Electricity Act*. The Act reorganized NB Power into a holding company with four divisions. The Act also maintained NB Power's distribution, transmission, and nuclear power monopolies, but was meant to open the door to competition in the generation business.

Figure 1: Exports of Electricity from New Brunswick (\$Millions)



Source: Statistics Canada. Accessed through Industry Canada's Trade Data Online service.

Figure 2: Non-Residential Electricity Price Index (1997=100)



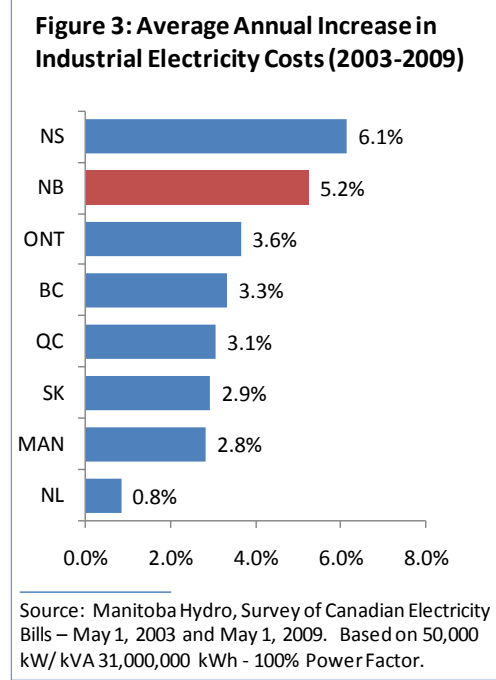
Source: Statistics Canada Electric power selling price indexes for non-residential customers — Over 5000 kw

¹ Saint John, Edmundston and Perth-Andover are served by municipal electricity utilities.

A main goal of these legislative changes was to re-establish a competitive environment for electricity rates in New Brunswick.

However, a number of internal and external factors led to an even faster escalation of industrial and residential electricity rates post the 2003 reforms. As an example, the conversion of the Colson Cove generating station to burn Venezuelan Orimulsion² under a long term contract was meant to stabilize rates but the Venezuelan government decided to break the contract. Rising fuel costs and significant debt servicing costs were other contributors to rate increases.

From 2003 to 2009, NB Power had the second fastest increase in industrial electricity costs of any province in Canada and well above the median increase among U.S. states (Figure 3). As of 2009, industrial electricity rates in New Brunswick were well above the median in Canada and the United States and 40%-90% higher than areas that directly compete with New Brunswick firms in the forestry industry (Table 1). Going back to 1997, industrial electricity costs increased faster than all other provinces except Alberta (Figure 2).

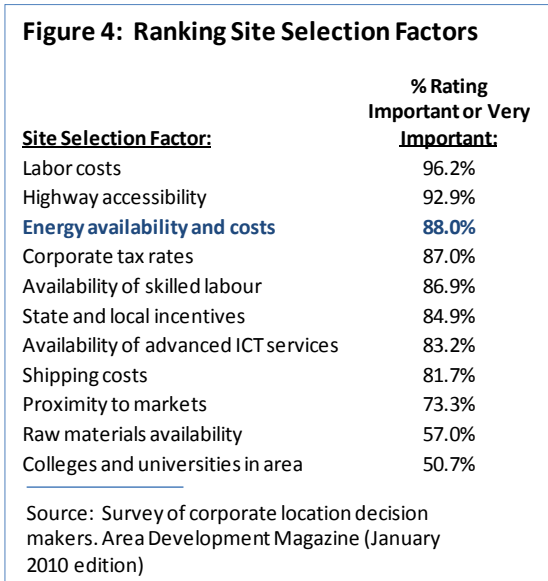


Why does it matter?

Economies are broken into two main segments: the goods producing segment and the services segment. The goods producing part of the economy includes manufacturing, natural resources and construction while the services part of the economy includes education, health care, retail, accommodation, food services, professional and personal services, government, etc.

Because of New Brunswick's natural resources and historical operating cost structure, the province is more reliant on the industrial component of its economy than all but two other Canadian provinces (based on both employment and gross domestic product). This segment of the economy also generates high value economic activity. Employees in the goods producing sector earn over 30% more in average weekly wages than those in the services sector around the province. The industrial economy is also more spread out around New Brunswick providing value to all regions of the province.

Energy costs are a critical part of the operating cost structure of most industrial activity. According to a recent survey of U.S. based firms, energy availability and costs was ranked as the third most important factor when considering where to set up a new facility across North America (Figure 4).



Competitive energy costs are important for the competitiveness of existing industrial and manufacturing firms and for New Brunswick's ability to attract new companies and investment to the province.

² Orimulsion is a bitumen-based fuel that was developed for industrial use by Petroleos de Venezuela SA (PDVSA).

The Potential Load 'Death Spiral' or Virtuous Cycle?

The other main reason why New Brunswick needs to have competitive electricity costs for large industrial users is that NB Power needs them to have a stable business model. Approximately one third of NB Power's total cost structure is tied to energy generation (operations, fuel, etc.), another one third is related to overhead, transmission and distribution activities and the final one third is related to debt servicing-related costs.

Large industrial users purchase between 30%-35% of the kilowatt hours that NB Power sells each year. If one or more large industrial users leave the NB Power system because of increasing rates (either by going out of business or finding another supplier), NB Power will have to cover a portion of that lost revenue from other customers - leading to upward rates for the remaining customers - forcing more large industrials to leave - pushing up rates even further and creating a "death spiral" leading to higher and higher rates and the loss of ever more industrial load.

This may have not been the case in previous years when NB Power had to buy significant fuel to high market prices to cover peak demand but the reduction in demand in recent years means that there will be limited fuel cost savings from losing the large industrial load.

This reinforces the need to find a way to foster a virtuous cycle by having large industrial, commercial and residential customers all accessing a shared system that maintains critical mass and provides pricing and services to meet their specific needs.

Policy Options

In this paper, we have tried to include consideration of large industrial users as well as energy sector service providers. Industrial customers do compete on a broader scale. For example, the forestry companies that have left have not left the forest products business – just New Brunswick. One of the main reasons is their perception that power costs are uncompetitive with those offered to them in other jurisdictions.

There are a number of policy options that may have potential to lower industrial electricity rates and/or establish a more stable and competitive rate base for the future. They can be grouped into three categories: 1) changes to NB Power, its regulatory regime or its cost structure that would lead to lower rates; 2) developing an incentive program (s) targeted at specific industrial sectors/users; or 3) pursuing regional opportunities that lower NB Power's cost base.

1. Changes to NB Power and the regulatory regime

Option #1: Transfer stranded debt from the ratepayer to the taxpayer

In relative terms, NB Power has the highest debt load of any public electricity utility in Canada (including the debt associated with the current refurbishment of the Point Lepreau nuclear electricity generating station). A significant part of the rate charged to residential, commercial and industrial customers goes to service that debt. A recent estimate concluded that one third of the electricity rate per kWh was used for debt service and repayment costs. Compounding the problem is that much of this debt is 'stranded'. When a utility builds a new electricity generating facility, the cost is built into rates over the useful life of the facility. In the case of NB Power, much of the debt associated with generation was not amortized into the rates and now is considered to be stranded. Future rates will not only include a component associated with the debt from new generation but also from this stranded debt.

This option would involve the Government of New Brunswick taking over a portion of NB Power's debt. New Brunswick currently has a lower government debt to GDP ratio than Ontario, Quebec, Nova Scotia, Prince Edward Island and Newfoundland & Labrador. The government could assume much of NB Power's debt and still have a similar or lower debt to GDP ratio compared to the majority of other provinces across Canada³. This would transfer the stranded debt to the taxpayer to be addressed through general taxation. The current NB Power ratepayers would not have to pay for costs that should have been incurred in the past. This would not likely impact New Brunswick's credit rating as the agencies that set these rates already include NB Power's debt in their calculations. This is important as more public debt could lead to a rating downgrade and higher rates on future government bonds.

Option #2: Restructuring the rate setting (cost allocation) methodology

Electricity rates in New Brunswick are set by the Energy and Utilities Board guided by a cost allocation methodology. Essentially, rates are set based on the approximate costs associated to provide service each class of rate payer (residential, general service, wholesale and industrial). The current model used in New Brunswick has led to the second lowest rate 'spread' between residential and industrial electricity rates among the 10 provinces in Canada and one of the lowest across North America (Table 1). In jurisdictions that are directly competing with New Brunswick such as British Columbia, Saskatchewan and South Carolina, the rate spread is much higher.

Across most industries, there is a rate discount associated with volume purchases. For example, companies that buy millions of minutes of long distance from telecommunications companies only pay a fraction of what residential customers pay for long distance services. The same applies with electricity. However, even though New Brunswick is highly dependent on its industrial economy, it has the lowest spread between industrial and residential rates.

One example change in the rate setting methodology would involve charging residential customers for the cost of peak electricity during the winter months. It costs NB Power far more to produce power because of this need to provide electrical heat during the winter. Industrial clients do not peak - they require a consistent load of power throughout the year. This cost premium is not built into residential rates. There are additional ways to modify the rate setting process that are beyond the scope of this report.

Table 1: Spread Between Residential and Industrial Electricity Rates

Jurisdiction:	Residential (cents/kWh)	Large Industrial (cents/kWh)	% Difference
Prince Edward Island (Maritime Electric)	16.11	10.74	-33%
Ontario (Hydro One Networks Inc.)	12.99	7.56	-42%
Nova Scotia	12.33	6.96	-44%
New Brunswick	10.51	6.63	-37%
Saskatchewan	10.14	5.05	-50%
Quebec	7.16	4.50	-37%
British Columbia	7.74	3.97	-49%
Newfoundland and Labrador	10.25	3.96	-61%
Manitoba	6.62	3.39	-49%
Iowa	9.45	4.74	-50%
South Carolina	9.19	4.83	-47%
Utah	8.15	4.52	-45%
Virginia	8.74	5.07	-42%

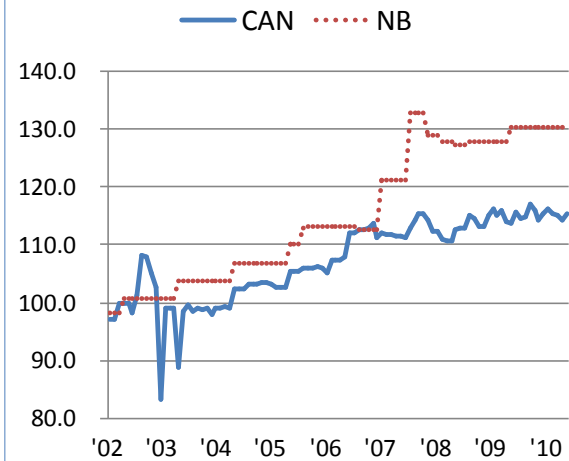
Sources: Manitoba Hydro Electricity Rate Comparison (May 2009) and the U.S. Energy Information Administration (Jan. 2010).

³ However, New Brunswick's net debt is currently growing faster than most other provinces.

There would be both positive and negative impacts for residential and small business electricity customers from changing the rate setting process (leading to lower industrial electricity rates). On the negative side, the average New Brunswick household already spends 50% more for energy as a percentage of total income than the average across Canada. The inflation rate on household electricity costs in New Brunswick has been well above the national average since 2002 (Figure 6). Adding additional costs would be a burden for many New Brunswickers.

However, combined with other government incentives, this could lead to a significant move into energy conservation and the use of alternative energy sources. According to Statistics Canada, over 62% of New Brunswick households have heating systems that are more than 10 years old - more than all but two other provinces in Canada. New Brunswick also has among the oldest housing stock in Canada with 80% of all homes being constructed before 1990. In addition, over 40% of New Brunswick homes require either minor or major repairs.

Figure 5: Consumer Price Index (CPI) Component: Electricity (2002=100)



Source: Statistics Canada Table 326-0020 - Consumer Price Index (CPI), 2005 basket, monthly (2002=100)

Rising electricity costs could be mitigated by upgrading to energy efficient systems. This would have significant benefits for NB Power as it would reduce the company's requirement to provide high cost electricity during the winter months. More about this issue is covered in another report in this series (*Smart Energy and Economic Development*).

Option 3: Other ways to structurally reduce industrial electricity rates

There may be other options to reduce NB Power's cost structure and thus its rate structure. A full review of these is beyond the scope of this report, but there are two worth mentioning. First, there remains potential for New Brunswick to leverage its electricity transmission infrastructure into new revenue. The four provinces surrounding New Brunswick either already export electricity to the United States through New Brunswick or are looking at its potential. Second, the transmission infrastructure could be used to bring lower cost sources of electricity to the province. Long term power purchase agreements (PPAs) could potentially be used to lower NB Power's cost structure.

2. Incentive Programs

In addition to making structural changes to NB Power and the electricity system that would lead to lower industrial electricity rates, the province could look at specific incentive programs or similar policy tools that would address specific industries or companies based on their economic impact to the New Brunswick economy.

Option 1: Industrial electricity incentive rates

This would involve a deliberate intervention by government leading to an incentive rate for large industrial users. NB Power offered such a program back in the 1990s for very large loads. New York State has some of the highest industrial electricity rates in North America (average of 9.34/cents per kWh in January 2010) but offers lower cost power for industrial users through two separate programs. The *Power for Jobs* program provides 450 megawatts of low cost electricity for large industrial use saving 20 percent versus typical rates. In 2009 alone, it is estimated the program saved customers between \$50 and \$100 million in energy costs. The other program, *Economic Development Power*, has a similar mandate is highly targeted to only 100 large users supporting approximately 90,000 high paying jobs.

In New Brunswick this could either involve a specific allocation of megawatts that would be provided to various companies based on economic benefit to New Brunswick or it could be targeted to specific industries such as forest products. However, this would have the impact of shifting the cost burden to other rate classes.

Option 2: Direct/targeted subsidy program

This option would involve a direct subsidy to specific industries or large industrial users. New Brunswick has used a similar approach to offset some of the high power costs in recent years (through a break on provincial property tax liabilities). The Ontario government has a similar program specifically targeting pulp and paper manufacturing facilities in Northern Ontario. To be eligible, pulp and paper mills must consume a minimum of 50,000 purchased megawatt hours (MWh) annually and be located in Northern Ontario. Starting in the fall of 2010, the three year program will average \$150 million in savings annually by providing electricity price rebates of two cents per kilowatt-hour. This will, on average, reduce industrial electricity prices by about 25 per cent (based on 2009 levels). This option addresses a specific need but does cover non-forestry companies and is meant to protect existing jobs not foster new economic activity.

Option 3: Customized company-specific intervention

Another policy option would be to address the industrial electricity rate problem on a case-by-case basis. Using an economic impact analysis, the government could develop specific incentives to reduce the cost of energy for a specific company. This approach is being used in a number of jurisdictions. In Nova Scotia, for example, the global forestry company *NewPage* recently signed an agreement with *Nova Scotia Power* to develop a new 60 MW biomass co-generation facility. Under the deal, *Nova Scotia Power* will invest the capital (\$200 million) and *NewPage* will be responsible for the construction and operation of the co-generation facility. While the details of the project are unknown, it is expected to significantly reduce *NewPage's* overall cost of energy.

The Quebec government entered into a similar arrangement to encourage the reuse of a former pulp mill in Thurso, Quebec. The government will provide a \$102 million loan to convert the facility for cellulose production and then purchase 18.8 MW of biomass-based electricity at incentive rates well above what the mill will pay Hydro-Quebec for its industrial electricity - leading to an effective electricity cost well below Quebec's already low rates.

BC Hydro is in the midst of a long-term *Mechanical Pulping Initiative* aimed at reducing the electrical energy consumption at the province's pulp and paper mills by an average of 20%.

Option 4: Incentivize self-generation or direct control over energy

Many jurisdictions are using tax incentives or other programs to encourage large industrial users to produce their own electricity. The forest products industry in the United States is increasingly focused on generating its own energy. *Verso Paper Holdings LLC* produces approximately 50% of the energy needs for its coated paper mills from sources such as waste wood and paper, hydroelectric facilities, chemicals from the pulping process, steam recovery boilers, and internal energy cogeneration facilities. Washington State-based *Clearwater Paper Corp.* has significantly increased its internal electricity production in recent years and has as one of its strategic priorities to increase this self-generation in the future. *NewPage* claims to produce 45% of its energy requirements internally and operates a wholly-owned subsidiary, Consolidated Water Power Company, to provide hydroelectricity to its mills in central Wisconsin.

The government of Australia recently released a report stating it would look at new policies designed to encourage more site-based electricity and steam generation among its pulp and paper companies.

The New Brunswick government could provide incentives or cost-share with large industrial electricity users to generate more electricity - or to take them totally out of the NB Power system completely.

There are significant challenges with this option. First, NB Power needs the large industrial users to pay for a large portion of relatively fixed overhead. About one third of NB Power's total annual cost is related to overhead that would not be reduced by losing large industrial customers. This cost would have to be recovered from the rest of the customer base leading to potential increases in rates. Second, it would not address the stranded debt issue. The remaining rate payers would ultimately assume this cost.

This option has been considered by government but a significant roadblock would be the 'exit' fee associated with a large user leaving the NB Power system.

3. Exploration of Regional Opportunities

Another strategic option involves exploring regional opportunities that will strengthen the electricity business model in New Brunswick and the region in a mutually beneficial way. This could include:

- Coordinated improvements to the ability of the system across the region to take on more renewable energy.
- Regional coordination of transmission infrastructure to better facilitate the movement of electricity to move in and around the system.
- Collaboration on the development of a smarter grid and a Maritime system operator.
- A regional view regarding generation capacity, load balancing and carbon reduction initiatives.

Full consideration of these regional opportunities may involve negotiations with both private and public sector stakeholders that could involve restructuring parts of NB Power. For example, the decision to combine regional transmission service providers into a single operator could lead to some restructuring of NB Power and its partners in other provinces.

It would be premature to make recommendations related to specific structural changes without a full assessment of the strategies that would lead to closer collaboration around the region.