POWER TRIP: Stumbling Toward a Policy for NB Power

THOMAS L. TUCKER

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Atlantic Institute for Market Studies

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About the Author

Dr. Thomas L. Tucker holds BS, MS, and Ph.D degrees from Michigan State University and an MBA from Lake Superior State University. He has extensive experience in the areas of government policy analysis and development, industrial development and benefits, strategic and operational planning, economic analysis and forecasting, business planning and assessment, program evaluation, and teaching at the university level.

Prior to joining AIMS, Dr. Tucker worked at Saint Mary's University as Manager, External Program, developing, marketing, and delivering new for-profit executive and management development training seminars at the university. He also worked for the Nova Scotia Petroleum Directorate as Director of Benefits and Training, and has held Director General and other senior management positions with the federal government across Canada. Dr. Tucker has a strong interest in resource economics, with a particular emphasis on oil and gas and forest resources. He also has a strong interest in fiscal and monetary policy and its impact on the economy.

EXECUTIVE SUMMARY

New Brunswick Power has an abysmal financial track record, which should be of concern not just to New Brunswickers, who are a captive market for the company, but to all who must purchase energy from a single public utility.

Since the mid-1990s, NB Power has lost money more often than not, and its unenviable record of having among the highest operating costs of any publicly owned electric utility in the country remains unchallenged. It also has by far the highest debt burden of any Crown utility — the company's chronic inability to service its debt out of revenue led the province to assume $450 million of its debt in 1999.

Prior to 1993, NB Power borrowed heavily to invest in major capital projects such as the expansion of its Point Lepreau nuclear plant. Such capital investments are normally expected eventually to produce a stream of income sufficient to pay down debt and reward investors. But given NB Power's operating expenses and pricing, its current assets will never generate sufficient revenues to recoup the money spent on these investments. Moreover, the need to reduce emissions to satisfy commitments under the Kyoto Protocol and to provide adequate funds for the eventual decommissioning of its nuclear facility creates additional financial strain on the company.

Key contributors to the company's very high operating costs are, first, the high-cost coal it buys from its wholly owned subsidiary, NB Coal, to fuel many of its thermal generating plants; and, second, its reliance on nuclear energy for as much as 40 percent of output, which means that the utility must maintain a very high and costly reserve capacity in case that facility shuts down.

In 2002, after years of procrastination, the New Brunswick government finally announced plans to restructure NB Power. The reorganization will see the creation of a parent holding company, with the business units divided among four new Crown corporations responsible for generation (except for nuclear), nuclear, transmission, and distribution and customer service. A fifth corporation will act as the system operator, which will manage and supervise access to the transmission system.

Unfortunately, reorganization will do nothing to tackle the fundamental problems of excessive costs and crushing debt. To address the latter, the government will assume a further $1.5 billion share of outstanding debt. Another new entity, the NB Electric Finance Corporation, will be responsible not only for servicing but also for retiring the province's portion of the debt. The money to achieve this debt repayment will come from NB Power, in the form of payments in lieu of taxes and dividends on its equity position.

None of these transformations, however, amounts to anything more than legerdemain. The new corporations will still have to generate revenues sufficient to meet expenses and service debt. In the event they are unable to do so, New Brunswick's taxpayers will foot the bill. In this sense, the proposed reforms represent no significant improvement for taxpayers.

NB Power is the least competitive major utility in the country, and were it not for the willingness of the government to guarantee and then assume part of its debt, the company would be insolvent. Yet, incredibly, the company proposes a major capital expansion program that includes an $845 million refurbishment of its aging nuclear facility at Point Lepreau, and is now searching for a private sector partner. However, to attract private participation in the financially risky nuclear area, NB Power will have to assign generation revenues or undertake a long-term purchase agreement with its partner. That would leave the company on the hook for the existing debt, with at best only part of the revenues the renovated facility would generate.

This report makes the following recommendations:

- The province should privatize NB Power. Doing so would cap taxpayers' debt liability and ensure that operational decisions reflect economic forces.
- The province should assume a sufficient portion of the stranded debt liabilities (debt that cannot be serviced from operations) to attract private investors to purchase the utility. Any proceeds from the sale should be used to retire existing debt.
- Electricity rates should be allowed to rise, over time, so that they reflect the real total costs of operating and maintaining the system.
- The province should take measured steps to open both the wholesale and retail elements of the system to competition and consumer choice, while taking care to avoid policy errors that have marred a few other jurisdictions' moves to competitive power markets.

If these measures were adopted, market forces would result in New Brunswickers' benefiting from electric power delivered at a price that would reflect production costs without being covertly subsidized by government, while encouraging fuel conservation.

INTRODUCTION

Throughout most of their history, publicly owned utilities have played the dominant role in the generation and distribution of electricity in Canada. The movement toward deregulation and increased competition in the United States has spurred interest in taking steps to open the Canadian industry to market forces. Not all these efforts have been implemented with complete success, but just how urgently major changes in current practices are required can be demonstrated by a study of New Brunswick Power (NB Power), a Crown corporation wholly owned by the province.

NB Power has lost money in eight out of the past nine years and its capital and operating costs are, according to the Dominion Bond Rating Service, among the highest of any major utility in Canada. The inefficient generation of electricity, therefore, affects all New Brunswickers through increased taxpayers' liabilities, reduced government revenues, unnecessarily high debt-service costs, higher taxes and deficits, and poor allocation of scarce capital assets. These are, moreover, costs that New Brunswickers have been paying for years.

Faced with NB Power's dismal track record, the provincial government recently introduced measures intended to substantially restructure the industry. What, then, does the future hold for NB Power? Will the proposed restructuring improve NB Power's financial prospects any time soon? If the evidence of past performance and the half-hearted nature of the government's proposed steps are any guide, the future of NB Power does not bode well for New Brunswickers.

NB Power's performance has been deteriorating for well over a decade (see Adams 1996, 1997). Yet only now has the provincial government tabled draft legislation to deal with the serious deficiencies in the structure and operations of the company and the electricity market. Moreover, these proposals are either flawed or more symbolic than substantive. Crucially, the government has ignored earlier recommendations that the industry be transferred to private competitive ownership.

This paper reviews how NB Power's current situation evolved and examines the lessons learned, and those not yet learned, by the New Brunswick government and by the management of NB Power. The paper also looks at what the future holds. It provides further support for the recommendations Adams made in 1996, and addresses several of the often-heard arguments supporting public ownership of electrical utilities. Finally, the paper proposes a concrete course of action that, in the long term, could provide electrical power to New Brunswickers and Atlantic Canadians in the most cost-effective manner.

How Serious Is NB Power's Condition?

In 1996, the Dominion Bond Rating Service found that NB Power consistently had the highest operating costs of any major Canadian electrical utility (Adams 1996).[1] Since 1998, NB Power's operating costs have been surpassed only by those of SaskPower. Moreover, NB Power has managed to lose money in no less than eight of the past nine years.[2]

In 1999, growing debt-servicing problems forced the New Brunswick government to assume $450 million of NB Power debt, yet there has been little significant improvement in the company's debt or financial performance since then. It still has one of the highest debt burdens of any major utility in the country.

Reflecting this depressing record, in 2001 the province announced its intention to restructure NB Power and reform New Brunswick's electrical industry. A new *Electricity Act* was finally introduced in January 2003 and received Royal Assent in April.[3]

In light of the company's performance and the provincial government's recent response, Adams' 1996 and 1997 studies make enlightening reading. Adams made a number of significant observations that remain pertinent today:

- NB Power's aggressive capital expansion had resulted in a 70 percent increase in the company's debt and one of the highest debt burdens of any major Canadian utility. Moreover, those assets had begun to age and would be unable to generate sufficient revenues to service the debt that had been assumed to finance their construction.
- NB Power had the highest operating costs of any major Canadian utility — in part because of its high reserve capacity and in part because of its policy of purchasing coal from its wholly owned subsidiary, NB Coal, at a cost that was 120 percent more than imported coal! Indeed, there was absolutely no economic justification for the existence of NB Coal.
- NB Power should be exposed to increased competition through the introduction of natural gas into the New Brunswick market.

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1 Operating costs are equivalent to variable costs and include operation and maintenance costs plus fuel costs.

2 NB Power's Annual Reports do not show these losses but, as Betts (1995) argues, the company's reported net income figures exaggerate and distort its actual profitability. Like a number of utilities, NB Power capitalizes some repair expenditures, including interest and depreciation costs on plants under planned and forced outages. Expensing these items would increase operating costs and reduce profits, resulting in the losses noted in this study.

3 The act had not yet been proclaimed at time of writing (October 2003).

- The Point Lepreau nuclear facility would be unable to maintain operating levels without significant upgrading, and the financial risks of making those investments would be very high.
- NB Power's high level of excess reserve capacity was a major factor in the company's high operating costs.

Little has changed since Adams' 1996 analysis. NB Power is still plagued by exceptionally high debt, excessive operating costs, very large reserve capacity, the continued use of uneconomic coal, and the long-term threat of competition from natural gas, not to mention the cost of complying with the Kyoto Accord, the impact of which Adams did not factor into either his 1996 or 1997 studies.

Indeed, NB Power has yet to come clean, so to speak, on the added costs of Kyoto. Nova Scotia Power, by comparison, in its April 20, 2003, Depreciation Report, estimates that complying with the Kyoto Accord will cost the utility $65 million: $40 million in decommissioning costs and shorter asset life (greater depreciation) and $25 million in extra income taxes. These costs are estimated, moreover, on Nova Scotia Power's generating capacity of 2200 megawatts compared with NB Power's 3484 megawatts. Leaving aside NB Power's nuclear and hydro components, the two utilities have a similar generating capacity. Therefore, if NB Power were to operate on a level playing field with the private sector, as the New Brunswick government proposes, the utility would likely face an added cost burden in the $65 million range to comply with Kyoto, a burden that has yet to show up in its financial projections. The company's continued use of high-cost dirty coal from NB Coal just adds to the problem.

In the face of these costs, the provincial government's response is both tentative and misleading. The proposed changes fall short of introducing the necessary degree of market influence that would make New Brunswick's electrical industry truly competitive, while the planned organizational restructuring will not be sufficient to avoid the painful adjustments that must take place to both operations and prices in order to achieve a viable debt-repayment capability.

LESSONS NOT LEARNED

If we take a closer look at the progress that has been made to date on solving the problems Adams detailed in his 1996 and 1997 studies, it is evident that the relevant authorities have not been paying attention.

Chronic High Debt

NB Power has been experiencing financial and operating problems for well over a decade. For several years prior to 1993, the utility engaged in a program of major capital expansion, adding new facilities such as the Point Lepreau nuclear plant to its generating capacity. To finance those projects, NB Power steadily increased its long-term debt — thus adding to its fixed costs through higher debt-service charges. The capital expansion phase came to an end around 1993, and NB Power has not embarked on any major capital project since then.

Such a pattern of uneven capital development is not unusual for electrical utilities. In the period following a major expansion, however, the new assets should begin to generate significant positive cash flow, enabling the utility to pay down the accumulated debt and to lower fixed costs. Utilities operate in an environment of high fixed and semi-variable costs and generally low variable or operating costs,[4] so taking on large debt and fixed costs up front is eventually compensated for by reduced operating costs. In the case of NB Power, however, this has not happened. Over the past decade, the utility's financial performance has not improved significantly — its assets have depreciated and its debt has been only slightly reduced. As a result, NB Power still has one of the highest debt burdens of any major utility in Canada, and virtually no prospects of recovering its investment before the assets wear out.

As Table 1 shows, at first glance NB Power's debt, as a percentage of provincial gross domestic product, appears to be comparable to that of Manitoba Hydro or Hydro-Québec. The comparison, is, however, misleading. A significant component of the generating capacity of both Manitoba Hydro

4 A major contributor to high fixed costs is the need to maintain reserve generating capacity. An example of a semi-variable cost is that of the labour needed to maintain facilities and keep turbines spinning, even when no electricity is being generated. A major component of variable costs is fuel, the cost of which fluctuates widely for different types of generating facilities. The fuel cost of hydro power is near zero; the fuel cost of nuclear plants is relatively low, while thermal plants fuelled by coal, oil, and natural gas have higher variable costs. In general, the variable costs of utilities are much lower than their fixed costs.

Table 1: ***Debt of Canadian Public Electric Utilities***

	Year	Long-Term Debt	Debt per Worker	Debt as a % of Provincial GDP
		($ billions)	*($)*	*(%)*
SaskPower	2000	1.571	3,074	4.4
BC Hydro	2001	7.633	3,796	5.7
Manitoba Hydro	2001	6.020	9,390	15.6
Ontario Hydro	2001	38.381	6,400	9.0
Hydro-Québec	2000	34.887	11,496	18.1
NB Power	2001	3.160	9,200	16.0

Source: Adams 2000.

and Hydro-Québec is hydroelectricity, the up-front capital cost of which is much higher than for the thermal generating facilities that make up the bulk of NB Power's generating capacity.

NB Power's total debt declined at an average annual rate of only about 2 percent between 1993 and 2000. As Adams (2002, 2) notes,

> At the average rate of debt decline demonstrated over the last seven years, NB Power's existing assets would have to continue performing at present rates of profitability without capital investment for over 50 years to pay off the debts incurred acquiring those assets. Many of NB Power's main generating assets will reach the end of their economic life in much less than 50 years.[5]

Now NB Power is burdened by infrastructure that needs to be refurbished and replaced if the utility intends to meet the future needs of its customers. Meeting the Kyoto Accord's nitrous oxide, sulphur dioxide, and carbon dioxide standards will shorten the life of these assets even further.

For New Brunswick taxpayers, the inability of NB Power's current assets to pay for themselves[6] means, above all, that taxpayers are obligated to pay the utility's debt one way or another. This fact of life was demonstrated in 1999 when the province assumed $450 million of NB Power's debt. That, moreover, was not an isolated incident: the provincial government's restructuring proposal explicitly entails a further transfer of $1.5 billion in company debt to the province — that is, to current and future taxpayers.

5 The status of NB Power's largest hydroelectric unit, the 672-megawatt Mactaquac dam on the Saint John River, is relevant to the utility's rate of paying off its debt on assets. The dam is subject to alkali aggregate reaction, a chemical process that causes the concrete to swell and become stressed. A recent expert assessment suggests that, as a result, the facility, whose current life expectancy extends until 2038, may become unsuitable for operations as soon as 2015. The life expectancy of the Point Lepreau nuclear plant is also in question.

6 Debt that cannot be serviced from operations is often referred to as "stranded debt" or "stranded liabilities".

High Operating Costs

As we have seen, the appropriate debt level of a utility is determined in large part by its asset structure. Where it is necessary to make large upfront investments — such as the construction of hydroelectric or nuclear facilities — a higher initial debt may be appropriate. A better indication of the financial strength of a utility is its ability to service its debt along with meeting its other operating costs. NB Power's operating costs are uncompetitive. In February 1996, the Dominion Bond Rating Service found that NB Power had the highest variable and semi-variable costs of the major Canadian utilities they studied, and that NB Power's operating costs were 17 percent higher than Hydro-Québec's industrial selling price. Since 1996, that gap has grown to 22 percent.[7]

Just as utilities with a higher proportion of hydro and nuclear capacity normally have larger initial capital expenditures, they usually also have lower operating costs than utilities that depend more on thermal generation, primarily due to the lower cost of fuel. Yet Nova Scotia Power, with half the hydroelectric market share of NB Power and no nuclear facility, has forecast a running cost of 4.45 cents/kWh in 2003,[8] which is comparable to NB Power's running cost of 4.3 cents/kWh. Yet even these figures are misleading, since Nova Scotia Power's cost included a return to shareholders and taxes, neither of which were included in NB Power's cost figure.

An examination of fixed plus variable costs per kWh of electricity produced also shows how poorly NB Power stacks up against other major utilities (see Table 2). Only in 2000 and 2001 did SaskPower have higher total costs than NB Power.

What are the consequences of high costs, particularly operating costs? In 2001, only two Canadian electric utilities, NB Power and Ontario Hydro, posted losses. Unlike Ontario Hydro, however, for NB Power this is a common occurrence — during the 1995–2002 period, only in 2000 did NB Power manage to report a positive net income (excluding transfers from internal accounts). Another consequence is that high operating costs only compound the problem of excess debt load. Therefore, as a competitive player in the field of electricity generation, NB Power places dead last relative to other major Canadian electric utilities, a fact that has not changed since Adams' 1996 study (see Figure 1).

High Reserve Capacity

Reserve capacity is idle generation capacity that is available to come on line in an emergency if elements of a utility's generating facilities fail. In this regard, NB Power is in a uniquely unfavourable

7 Hydro-Québec's low industrial selling price is, however, clearly the result of built-in subsidies, the extent of which are not known. Nonetheless the change over time and its comparison to NB Power is illustrative. In 1996, NB Power's operating costs were 3.23 cents per kilowatt hour (kWh), while Hydro-Québec's industrial selling price was 2.75 cents/kWh. By 2000, they were 4.3 cents/kWh and 3.5 cents/kWh, respectively.

8 Undertaking U-5 of Nova Scotia Power's December 2002 request to the province's Utility and Review Board for approval of an "Extra Large Industrial Interruption Rate" showed a total energy rate of 4.45 cents/kWh.

Table 2: ***Fixed plus Variable Costs of Canadian Public Electric Utilities, 1997–2002***

	1997	1998	1999	2000	2001	2002
			(cents per KWh)			
SaskPower	5.34	5.50	5.13	6.64	7.54	
BC Hydro		3.78	3.27	3.11	4.43	3.75
Manitoba Hydro	3.34	3.16	3.63	4.04	3.89	4.40
Ontario Hydro			3.64	3.65	4.25	4.38
Hydro-Québec	5.51	6.34	6.17	6.04	6.36	
NB Power	7.54	6.93	6.29	6.46	7.50	6.81
Newfoundland & Labrador Hydro	4.34	4.50	5.40	4.60	4.50	

Note: Fixed and variable cost information was not available for Emera or Nova Scotia Power.

Source: Kolodzie and Heath 2002.

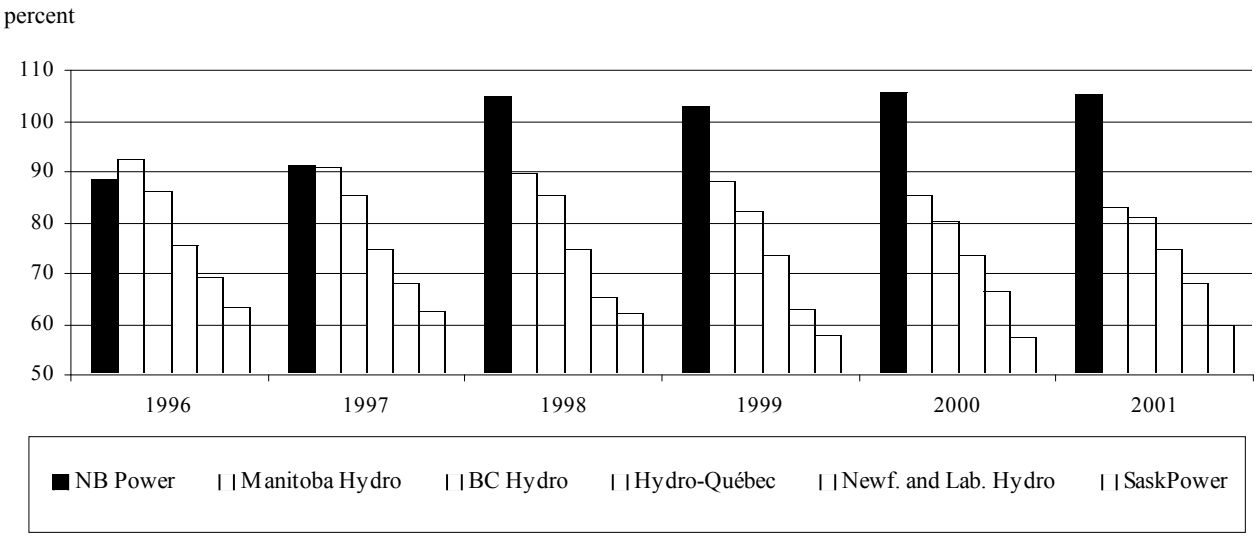
position. Because the Point Lepreau nuclear facility, when operating at historic rates, supplies 30 to 40 percent of the province's electricity, NB Power must, according to regulations, maintain a contingency reserve capacity of up to 40 percent of the load in case Point Lepreau fails.[9]

Point Lepreau was originally approved by the National Energy Board to export power. At the time, NB Power indicated that only about half the output would be sold in New Brunswick, thus avoiding the need for a large reserve capacity. An export market agreement with the United States did not materialize, however. To compensate, the province built load capacity for Point Lepreau by promoting the federal government's off-oil program, which encouraged consumers to switch from oil to electric heat. This has proven to be a costly move, forcing NB Power to maintain high reserve capacity. In fact, NB Power maintains a reserve of about 46 percent, which is very high relative to other utilities. Utilities such as SaskPower, which rely more heavily on coal-fired thermal generation, generally have a reserve capacity of only 18 to 22 percent.

Maintaining a very high reserve capacity adds greatly to NB Power's costs, in particular its fixed and semi-variable costs. The company has made some effort to manage these costs by sharing or pooling reserve capacity with other utilities. Yet the reality is still that NB Power's reserve capacity is very high relative to other utilities, which contributes to its poor performance.

9 In fact, in 2002 Point Lepreau managed to supply only 25 percent of New Brunswick's electricity, according to the Dominion Bond Rating Service.

Figure 1: ***Adjusted Debt in the Capital Structure of Selected Canadian Electric Utilities, 1996–2001***



Source: Dominion Bond Rating Service.

High-Cost Coal

NB Power uses high-cost fuel supplied by its subsidiary, NB Coal, in its thermal generating plants. This coal is among the most expensive in the world, yet NB Power refuses to switch to cheaper and cleaner coal from other sources. Adams (1996) highlighted the absence of any economic justification for the continued existence of NB Coal or for NB Power's use of its high-priced product, yet the practice persists, continuing to impair NB Power's financial health, and no plans are afoot to change the situation.

Competition from Natural Gas

By design, New Brunswick has a very high percentage of electrically heated homes. As noted above, the export market agreements for power generated by the Point Lepreau nuclear plant did not materialize, leaving NB Power scrambling to find an alternative market, and New Brunswickers were encouraged to convert from fuel oil to electricity for heating. While such a move appeared to be a reasonable strategy to justify the massive investment in Point Lepreau, it has proven to be very shortsighted. It dramatically raised NB Power's reserve capacity requirements and made the utility more vulnerable to competition from the development of a natural gas market, as Adams (1996) foresaw.

Natural gas is now available in New Brunswick, but the competitive threat to NB Power has not yet been realized. Enbridge Gas New Brunswick is building its customer base by aggressively encouraging current fuel oil and electrical heating customers to switch to natural gas. So far, how-

ever, high prices for natural gas have held back the growth of this market and have actually caused some large-volume gas users to switch back to fuel oil and electricity. Nonetheless, when gas prices return to their more traditional levels relative to fuel oil and electricity, conversion from electrical heat to gas may once again become attractive. The very existence of a competing fuel source augers poorly for the longer-term prospects of an underperforming utility such as NB Power — and it is small comfort that the threat has not yet materialized in substantial measure. It will just take longer than originally anticipated.

A High-Risk Investment Strategy

NB Power is still the least competitive of any major utility in Canada, is burdened by very high debt and fixed costs, maintains very high reserve capacity, and consistently loses money. For all intents and purposes, NB Power is insolvent, or would be if it did not have the New Brunswick government to guarantee and take over its debt. What, then, are NB Power's plans to turn things around?

Incredibly, NB Power seems to believe that the road to recovery involves incurring nearly $1.6 billion in new debt to finance a massive new capital spending program anchored by replacing the Coleson Cove generating station and refurbishing the Point Lepreau nuclear power plant.

The New Brunswick Board of Commissioners of Public Utilities, however, thinks otherwise, declaring in September 2002 that it did not support NB Power's proposal to spend $845 million to refurbish Point Lepreau. The Board noted that "there is no significant economic advantage to the proposed refurbishment project". In addition, the Board found fault with the evidence provided by the utility — specifically, that NB Power had overestimated the operating capacity of Point Lepreau by nine percentage points, underestimated the cost of capital by more than two percentage points, underestimated the capital costs by a significant amount, developed an unrealistic construction schedule, and underestimated the regulatory risks. Moreover, even if NB Power corrected these deficiencies, the Board concluded, the project would still not be viable as it would not generate a positive net present value.[10] (See New Brunswick 2002.)

The Board's findings represent a serious indictment of NB Power's misguided strategy of persisting along the same course of costly capital expansion that has resulted in the company's current unsatisfactory financial performance. NB Power's response to the Board's rejection of its Point Lepreau refurbishment was to announce that it was looking for a private sector partner to invest in the project. It expected to have such a partner by the beginning of 2003, but none has yet been found. If or when one is found, what sort of deal would be struck?

Any private sector partner that took on the financial risk of refurbishing Point Lepreau would want an assignment of the revenues from operations or a long-term purchase agreement for the power generated at the facility until the refurbishment debt is repaid. Such an arrangement would leave NB Power with the responsibility of servicing Point Lepreau's existing debt with, at best, only part of the revenue generated by the facility, thus exacerbating NB Power's already onerous debt-service responsibilities.

10 "Net present value" results from discounting all future costs and benefits to the present using the cost of capital (the interest rate) and subtracting the present value of costs from the present value of benefits.

It should be clear that, if it is not economical to proceed with the Point Lepreau refurbishing on NB Power's account (supported by taxpayers' money), it would not be any more feasible for the private sector to undertake such an investment using their shareholders' money. Nonetheless, NB Power has not given up on its plans to refurbish Point Lepreau.

The other large project in NB Power's plans is to replace the use of oil with a bitumen-water slurry called "Orimulsion" as fuel for its Coleson Cove generating station (NB Power's Dalhousie facility also uses Orimulsion). NB Power has received approval to spend $747 million on this project and has, in fact, already spent $100 million.

The problem with the use of Orimulsion is that the world's only producer and supplier of the product is Bitor, a subsidiary of the Venezuelan state oil company, PDVSA. In September 2003, PDVSA announced it was eliminating Bitor and folding the company's operations into PDVSA, which itself is struggling to establish financial and management stability.

The risk of depending on a sole source of supply for Orimulsion became abundantly clear during the winter of 2002–03 when the Venezuelan oil industry was shut down by a strike. When the supply of Orimulsion was cut off, NB Power had to spend $20 million to modify the Dalhousie facility so that it could burn heavy fuel oils instead. Partly as a result of this unexpected expenditure, NB Power posted losses totalling $77 million in fiscal year 2002/03. Given Venezuela's unstable political climate, dependence on Orimulsion is a highly risky and questionable strategy.

The New Brunswick government sought a private sector partner to undertake the Coleson Cove project, but was unable to attract private interest on terms that were "sufficiently beneficial to New Brunswickers". But even if a private sector partner had been found, the terms of agreement no doubt would have required, as with Point Lepreau, the assignment of revenues or a power purchase agreement. And again as with Point Lepreau, NB Power — that is to say, New Brunswick taxpayers — would have been left to carry the burden of existing debt while revenues flowed to the private sector investor.

In short, NB Power's investment strategy fails to address the utility's need to reduce operating costs, retire debt, and rationalize reserve capacity, all of which have contributed to its deteriorating financial problems.

New Brunswick's Strategy

If NB Power did not undertake its proposed investments, market opportunities driven by expected power shortfalls would encourage the private sector to step into the breach and invest in generating facilities, at no risk to New Brunswick taxpayers. What is the province's attitude toward private sector involvement in the electricity market?

In January 2001, the New Brunswick government released its Energy Policy, which set out a ten-year phase-in for electrical market reforms. In January 2003, it followed up with the introduction of a new *Electricity Act*, which, as noted above, has received Royal Assent but has not yet been proclaimed.

Will the province's proposed restructuring of NB Power and the electric power market stop the bleeding and facilitate a reversal in the fortunes of NB Power? The short answer is no. Adams' (1996, 1997) most important recommendations were that:

1. New Brunswick should embrace a competitive future for electricity.
2. NB Power should be structurally separated into different corporate entities; power generation and marketing should take place in an open competitive market; and transmission, distribution, and system operations should be separated structurally from competitive functions and subject to regulation.
3. Part of NB Power, particularly the generation infrastructure, should be privatized in order to cap taxpayers' liability and ensure that investment and operating decisions are made on economic, not political, grounds.
4. NB Power should recognize that the changes could have significant immediate price implications and that adjustments should be phased in.

The government's proposals reflect the second and fourth recommendations — but only hesitantly endorse the principle of competition embodied in the first. They would allow some private sector equity participation and accept some private power production. They would also permit some limited competition in wholesale markets. As well, under the proposed Open Access Transportation Tariffs, the 42 largest industrial users of electricity in the province could seek other sources of supply. However, since no other sources are available — indeed, supply shortages are projected — the proposal to allow such competition is little more than symbolic.

Yet competition is essential. As a result of electricity deregulation in the United States — as seen, for example, in the Maine, Pennsylvania, New Jersey, and Maryland electrical grids — broad

competition in both the wholesale and retail markets has made possible the flexibility to respond to new technologies and new service opportunities. Competition in New Brunswick would enable operational decisions to be made based on market forces rather than through central planning.

An important element of introducing competition would be to privatize parts of NB Power to create conditions that would support competition, reduce conflict of interest, realize fair value for the public, and eliminate taxpayers' liabilities. Traditionally, large public electrical utilities have filled every role from power generation through its transmission up to its final delivery to retail consumers. However, the industry need not necessarily be organized in that manner. In fact, the system can be thought of as having five distinct components: power generation; power transmission; power marketing; power distribution; and systems operation. Power transmission, power distribution, and systems operation are natural monopolies — that is, duplication of those facilities would not be economically optimal. Power generation and marketing, on the other hand, lend themselves naturally to competition. (For a more detailed explanation of the system, see the Appendix.)

The Government's Reform Proposals in Detail

The New Brunswick government's 2001 Energy Policy envisioned a ten-year phase-in for electricity market reforms, the objectives of which were to open the market to competition and increase opportunities for cross-border trade. The government also indicated that it would amend provincial legislation to allow for private, nonutility power generation in the province, and that, by the end of 2002, it would indicate its intentions regarding the future ownership of NB Power.

Making good on these promises, the new *Electricity Act*, once proclaimed, will convert NB Power into NB Power Holding Company and break up the existing corporation into four stand-alone subsidiaries that mirror its current business units. The Holding Company and all four subsidiaries will remain Crown corporations, with the province owning all the shares in the Holding Company. About half of NB Power's current $3 billion debt will be apportioned to the subsidiaries, with the province assuming the other half. Of course, New Brunswick taxpayers will continue to be responsible for the balance of the debt on the books of the new corporations in the event they are unable to service their $1.5 billion portion.[11] The new subsidiaries are supposed to operate as separate businesses on a level playing field[12] with other energy producers.

The four subsidiaries will have the following names and functions:

- NB Power Generation Corporation will be responsible for the operation of all generation facilities except Point Lepreau.

11 NB Power's rates are insufficient to cover operating and debt-service costs. If the province and the Utilities Board allow rates to rise to reflect the cost of service, the risk to taxpayers could be reduced significantly.

12 By "level playing field", the province means that the Crown corporations will pay fees in lieu of taxes (equivalent to the taxes paid by private corporations) and pay dividends commensurate with those paid by the private sector.

- NB Power Nuclear Corporation will be responsible for operating Point Lepreau.
- NB Power Transmission Corporation will own and operate the high-voltage main transmission lines and serve as a common carrier for all parties wanting to use the system to deliver power in the province or to export power.
- NB Power Distribution and Customer Service Corporation will be responsible for the local distribution of power to homes and businesses, including the local distribution system. Both NB Power Generation and NB Power Nuclear will supply power to NB Power Distribution and Customer Service.

The new legislation also provides for two other new entities: the System Operator, an independent body which will manage and supervise the technical rules governing transmission access, and NB Electric Finance Corporation, which will manage the retirement of the province's share of debt assumed in exchange for the equity portion in the corporation.

The Debt Problem

The province assumed $450 million of NB Power's debt in 1999, and it is expected to assume an additional $1.5 billion in NB Power debt as a result of the restructuring. NB Electric Finance will service this $1.95 billion in debt and pay down the principal from the payment in lieu of taxes and the dividends it receives from the new Crown subsidiaries. Such an arrangement effectively would result in a massive subsidy to NB Electric Finance, as no other New Brunswick corporations are allowed to use the taxes they pay to reduce their debt, and it is doubtful that the private sector would see this as a "level playing field".

The point may be moot, however — it is unlikely that the Crown corporations will be able to remit payments sufficient to allow the province to retire the nearly $2 billion debt. Assuming debt-service charges of between 6 and 8 percent on the debt, annual interest payments would amount to between $117 million and $156 million. Therefore, to minimize risk to taxpayers, each year the NB Power subsidiaries would have to generate revenues sufficient to service the $1.5 billion in debt that would remain on their books; contribute revenues sufficient to cover the debt-service charges on the $1.95 billion in past NB Power debt held by NB Electric Finance; and, it is to be hoped, contribute something toward retiring the debt. Absent such revenues, the taxpayers will have to pick up any shortfall.

In effect, the existing business units of NB Power will be turned into stand-alone subsidiaries under the umbrella of NB Power Holding Company. Nothing really will have changed — before the proposed restructuring, NB Power had four business units that, collectively, had high operating costs, high reserve capacity, and $3 billion of debt guaranteed by the province. Following the restructuring, there will be NB Power Holding, four subsidiary Crown corporations identical to the previous business units of NB Power, and collectively they will still have high operating costs, high reserve capacity, and an estimated $1.5 billion debt guaranteed by the province. The only tangible differ-

ence is the amount of debt the subsidiaries will carry. And this result will have been achieved only by the province — that is, the taxpayers — actually assuming responsibility for $1.5 billion in debt, rather than simply guaranteeing it!

In announcing these changes, Natural Resources and Energy Minister Jeannot Volpé said,

> Over time, these four NB Power subsidiaries will be appropriately capitalized, pay dividends and special payments in lieu of income and capital taxes to the Province, and will no longer be dependent on the Province to guarantee their borrowings...They will operate on a level playing field with other energy providers. These measures will help to ensure that the risk to taxpayers is minimized. (New Brunswick 2003.)

"Over time" seems to indicate that, for now, the status quo is unaltered. Lowering the debt burden will do nothing about high operating costs, the high reserve capacity, or electricity rates that fail to reflect the cost of service, all of which led to NB Power's inability to manage its debt in the first place. Reorganizing the corporate structure will not solve these problems, either — least of all for the generating subsidiaries of NB Power Holding Company. There is no reason to believe that, without fundamental management and operational changes, they will be able to pay fees in lieu of taxes, or pay dividends sufficient to service debt, or be able to stand on their own. In other words, they will not operate on the same playing field as the private sector.

The proportion of debt the province will assume for each subsidiary will vary, but in total it will amount to about half of NB Power's existing $3 billion debt. (In the case of NB Power Nuclear, the province will likely assume 100 percent of Point Lepreau's debt.[13]) By assuming this debt, the province is saying, in essence, that to be viable NB Power must get rid of half its debt; put another way, NB Power and its subsidiaries must take a 50 cents on the dollar write-down in value to be viable. In reality, however, the write-down may have to be considerably higher in order to make NB Power's assets commercially viable. Only by offering those assets on the market can that point be determined.

One critical component of the province's plan is that each subsidiary, once its individual debt liability has been decided, is expected to begin making payments to the province in lieu of taxes and to begin paying dividends. Reducing the subsidiaries' debt liability will obviously make it easier for them to service their remaining debt, but it will not alter their collective ability to do so while also making sufficient payments to the province to service the additional debt it is assuming on their behalf! In the province's plan, the total debt to be serviced by the operations of the electrical utility is unaltered. Without significant changes in the way it has been doing business, there is no reason to believe that the reorganized utility will find it any easier to meet its interest costs as well as the anticipated payments to the province than it did to meet the interest charges it faced previously.

13 Don Barrett, Assistance Deputy Minister, Department of Natural Resources and Energy, telephone conversation with author, February 3, 2003.

Introducing Competition

The new legislation will also open the wholesale market to competition. In announcing this change, Natural Resources and Energy Minister Volpé said, "The restructuring and commercialization of NB Power and the move to market competition are key components of our energy policy — one that reduces risks to taxpayers and ratepayers alike while encouraging a controlled and deliberate approach to market competition" (New Brunswick 2003). In practice, however, this change will apply only to the three Local Distribution Companies (LDCs) in Saint John, Edmundston, and Perth-Andover, plus the province's 42 largest energy customers, who will be able to choose whom to buy power from or to generate it themselves.

This plan is, at best, a tepid endorsement of the principle of competition. Even those municipalities with LDCs will not benefit right away since they have existing contractual commitments to NB Power. The remainder of the province's electricity customers, including households and businesses in Fredericton and Moncton, will have no choice whatsoever, but will have to buy their electricity from NB Power Distribution and Customer Service.

If the government is sufficiently convinced of the virtues of competition that it sanctions these limited measures in selected wholesale markets and for the 42 large industrial users, why is it protecting its subsidiaries from open competition in the remainder of the retail segment of the market? As proposed, NB Power Generation, NB Power Nuclear, and NB Power Distribution (its marketing element only) will be exempt from competition throughout most of New Brunswick. Why should the majority of New Brunswick households and small businesses be prevented from benefiting from lower cost of electricity that competition and choice could bring?[14] Why shouldn't suppliers, not just NB Power, be allowed to bid for blocks of retail customers?

It would seem the provincial government believes that only large, sophisticated customers are capable of adequately assessing alternatives and making informed choices, and that retail customers lack the ability and expertise to assess adequately and choose wisely among suppliers and marketers of electricity. In Maine, however, suppliers bid for blocks of retail business, rather than for individual customers, resulting in benefits to consumers since blocks of customers provide a negotiating balance and can command better rates; they also provide a degree of economics of scale for LDCs and marketers. Such an approach would work for New Brunswick as well. One problem with allowing this level of competition, however, is that it could strand the costs of existing generators. To avoid such a problem and to allow a transition, bidding for blocks of retail customers could occur as the market grows and as stranded costs are recovered.

14 Current utility bills in New Brunswick do not reflect the real cost of generating electricity since some costs are hidden in taxes or government deficits. In a competitive market, however, since costs are not hidden, utility bills will likely rise to reflect the real cost of service. On the other hand, the increased efficiency arising from competition will reduce the total cost of generating electricity and, in the longer term, result in lower utility bills.

The province has also committed to seek equity financial participation or third-party investment in the Point Lepreau and Coleson Cove refurbishment projects. If NB Power Nuclear is to remain a Crown corporation, the government must hold at least 51 percent ownership, but Coleson Cove, as just one of the generating facilities owned by NB Power Generation, could be sold to a private sector operator.[15] In principle, this commitment is laudable. As discussed earlier, however, the private sector will not undertake such arrangements without assurances of adequate revenue streams to justify their investment.

Looking forward, the prospect of private sector participation in the industry offers the promise of new efficiencies, but it can do nothing to remediate historical underperformance. To attract such participation, assurances will have to be given that there will be no politically motivated interventions. The experience of private sector investments in power generation in Ontario may serve as an object lesson. That province's on-again off-again approach to deregulation has dried up private sector investment, and Ontario is at risk of brownouts.

15 No private sector investor has yet been found for Point Lepreau and the government has indicated that, having failed to come to any satisfactory agreement, it is no longer seeking partners for the Coleson Cove project.

LESSONS LEARNED

Belatedly, the provincial government has learned some lessons from the bleak record of electricity production in New Brunswick. It realizes at last that the status quo is not sustainable and that taxpayers have been the biggest losers.

The government now perceives some of the benefits of reorganizing NB Power into subsidiary corporations that separate the competitive and natural monopoly elements of an electrical system. This is a tentative first step toward the introduction of some competition, at least in the wholesale market and for the 42 largest industrial users.

There is some other good news. The Board of Commissioners of Public Utilities demonstrated wisdom in its recent decision to refuse the NB Power's application for the refurbishment of the Point Lepreau nuclear power plant. The Board's assessment of the proposal clearly highlighted the deficiencies in NB Power's financial statements, projections, and planning. It is to be hoped that continued vigilance on the Board's part will bring further much-needed discipline to NB Power and foster greater accountability. That said, NB Power appears not easily convinced, and seems determined to proceed with retubing Point Lepreau despite the clear lack of economic rationale.

The New Brunswick government's apparent commitment to greater competition in electricity markets signals another lesson learned. But its conviction is uncompelling. The government still appears to be reluctant to consider the benefits of more fully privatizing elements of NB Power, particular generating assets, as a means of limiting further taxpayer liabilities and introducing operating efficiencies. To understand this reluctance, it may be helpful to consider why so many governments and citizens steadfastly hold to the belief that Crown ownership of utilities is the best, or perhaps the only, way to protect the public interest.

Public or Private?

Most utilities in Canada have been publicly owned for so long that many people regard it as self-evidently natural for government corporations to provide such services. In defending this model, proponents of public ownership frequently pose a number of questions deserving of review.

Don't publicly owned utilities produce, distribute, and deliver electrical power at lower costs than privately owned utilities? After all, the private sector must make a profit to remain in business.

This question suggests that profits are an extra burden or cost that customers would not have to pay to a publicly owned corporation. In fact, profits are a very efficient rationing tool. They insure that

scarce capital assets are employed to generate the greatest benefits for society as a whole. Contrary to conventional wisdom, the pursuit of profits causes capital to migrate away from industries where the value to society is low and toward industries where the value to society is higher. Crown corporations are insulated from such market forces; as such, they are not sensitive or responsive to economic forces that would ensure the socially efficient allocation and use of scarce capital assets. NB Power's determination to go forward with the Point Lepreau project despite the negative economics is a case in point. In short, profits help to ensure the best use of resources from a societal point of view.

But don't privately owned utilities extract profits, while the excess revenue generated by Crown-owned utilities augment provincial revenues and help lower taxes or pay for additional services?

This question suggests that profits in private hands leak out of the economy or do not go to benefit society, while surplus revenues from Crown corporations are spent to benefit society. In fact, profits are paid as dividends to investors, invested in new capital assets, or held in the company as retained earnings. Retained earnings will later be disbursed as dividends or reinvested to replace worn-out capital or to create new capital. Profits, which are paid out to investors as dividends, are the reward for the risk that investors took when they invested. Rewarding risk encourages risk taking — that is, investment. Investment creates new capital assets, which are the engine for future economic growth, job creation, and wealth generation; profits serve the public interest by promoting the replacement of worn-out capital and the creation of new capital.

But don't the surplus revenues (profits) of a Crown corporation go into provincial coffers to be used in the public interest? That would be true if, like the private sector, the profits Crown corporations generate are invested rather than consumed. The profits of Crown corporations are given back to taxpayers in the form of tax cuts (the government version of dividends), but not often. They could be invested in capital assets such as roads, schools, and hospitals, that will generate benefits to society over time. All too often, however, if surpluses are generated at all, they are spent on consumables — that is, on operating costs — that have no enduring value.

But don't utility bills usually increase when the electrical system is privatized or deregulated? Just look at Ontario. In short, don't well-managed, Crown-owned utilities provide cheaper electricity than privately run utilities?

For a Crown corporation, utility bills often do not reflect all the costs of providing electricity. A publicly owned utility is exempt from taxes, and taxpayers assume the risk of guaranteeing the utility's debt and operating liabilities. As well, a Crown-owned utility does not have to pay dividends or provide a return to the owners of the assets. As such, some of the explicit and implicit costs of a Crown-owned utility are born by taxpayers and hidden in taxes paid or in deficits (future taxes), while only a portion of the costs is reflected in utility bills.

In the private sector, by contrast, all the relevant costs of service are paid by the customer — that is, they are reflected in utility bills. If they were not, the company would eventually cease opera-

tion. So the relevant question is: Are the *total* costs of a Crown-owned utility — those on utility bills plus those hidden in taxes or deficits — lower or higher than those of a privately owned utility?

A Crown-owned utility is shielded from competition and costs, such as taxes and dividends; it is also shielded from risk. As such, its performance does not reflect the discipline imposed by the market. That lack of market accountability is generally reflected in financial performance that is poorer than one would see in the private sector. If restructuring and privatization takes place, *total costs* are often lower but are then fully reflected in utility bills. Since the utility bills of Crown corporations do not normally include all costs, privatization and deregulation appear to be more costly than they are in fact. Competition and private ownership in a properly structured market produce a better outcome (lower overall electricity rates) than the traditional publicly owned and regulated monopoly.

Experience in the United States supports this contention. With the passage of the *Energy Policy Act* in 1992, the U.S. electricity market was opened to competition and restructuring. As a result, average electricity prices, adjusted for inflation, declined nationally by 13.7 percent for residential users, 13.0 percent for commercial users, and 4.8 percent for industrial customers from rates charged by the regulated monopolies that characterized the industry prior to 1992 (PennFuture 2002).

A specific example is PJM, a complex, interconnected electrical grid, operating since 1927, that supplies wholesale electricity to more than 25 million people in Pennsylvania, New Jersey, Maryland, Delaware, Virginia, Ohio, West Virginia, and the District of Columbia. In 1997, PJM opened the first competitive wholesale market in the United States. Member states also began retail restructuring. The results are noteworthy: Pennsylvania electricity customers, for example, saw a 39 percent cut in their inflation-adjusted rates (PennFuture 2003) (recent increases in fuel costs have, however, caused some reversal in this trend).

The greatest efficiencies achieved in the United States have been in those states that have adopted restructuring in both the wholesale and retail markets. Utility rate reductions have been the most pronounced when suppliers and marketers have been allowed to bid for the business of blocks of retail customers. Experience suggests that the benefits of restructuring are greatest when the private sector has ownership of the assets, when the generation and transmission/distribution assets are separated, and when both the wholesale and retail portions of the market are opened to competition.

Is the New Brunswick or the Atlantic Canadian market sufficiently large to function competitively or are the arguments in favour of competition and privatization only appropriate for larger US and Canadian markets? A recent recommendation by Navigant Consultants to the Nova Scotia Electricity Marketplace Governance Committee suggests that 3500 to 8000 megawatts of production and consumption are needed to create a functioning competitive market (see Nova Scotia 2003, 18). New Brunswick approaches the minimum figure and Nova Scotia is well below it, but combining the two provinces would give a 5500-megawatt market, well within the suggested commercially viable range. Establishing such a combined market would, however, require the cooperation of the two provinces' governments and the relevant utilities. Such co-operation has yet to become evident.

RECOMMENDATIONS

In 1996, Adams recommended that the New Brunswick government initiate the privatization of NB Power and open to competition any parts of the system that it might retain in Crown control. Notwithstanding the passage of time, my recommendations are very similar to those of Adams.

- The province should privatize NB Power. To make NB Power's assets attractive to the private sector, the province should assume a large portion (if not all) of the corporation's debt. Privatization would ensure that:

    - the remaining debt liability rests totally with the private sector, not with taxpayers, and that future debt will never become a public liability;
    - investment decisions are based on market factors, not political expediency; and
    - scarce capital assets are used to produce the greatest economic surplus for New Brunswickers — that is, they are used to produce the desired amount of electricity at the lowest cost.

- The government should assume the stranded liabilities of NB Power, but it should take over the least amount of NB Power's debt necessary to accommodate or attract private sector investors, and any or all proceeds from the sale of NB Power's assets should be applied to pay down the assumed debt.
- The government should allow electricity rates to rise so that the total costs of service are reflected in utility bills. Because NB Power's financial difficulties are the result of both low rates and high operating costs, rates will have to rise to reflect not only those operating costs but to generate sufficient revenues to pay for fixed costs and to refurbish the system. Although electricity users would face higher bills,[16] as taxpayers they would save the hidden costs they are currently paying to subsidize NB Power. To minimize disruptions and allow for a smooth transition, higher rate increases should be phased in.
- The government should open both the wholesale and retail segments of the system's generation and marketing elements to competition and choice. Its announced intention to open a limited portion of the wholesale market and for the 42 largest industrial users to competition is a cautious first step — one that I applaud. However, the province has not indicated its willingness to consider a similar move for the remainder of the retail market. U.S. experience — in Maine, for example — clearly indicates that opening both markets to competition would bring greater benefits, in terms of lower prices, than would allowing competition only in the wholesale market.

16 Betts (1995) estimates that a rate increase of about 50 percent may be required for residential consumers to reflect the true cost of service.

- The Maritimes, especially New Brunswick and Nova Scotia, should be seen as one market, thereby providing the critical mass necessary to have sufficient numbers of producers and customers for a competitive market to operate.

Harnessing competition and market discipline, particularly in the generation and marketing of electricity, would help to ensure that the maximum number of New Brunswickers are supplied with electricity at the lowest possible price, and would shift risk from taxpayers to private investors. Competitive forces cannot, however, guarantee that the billing price of electricity would not fluctuate, only that the system would operate more efficiently. The New Brunswick government, therefore, should resist the temptation to politicize the regulatory process and setting or maintaining a low ceiling price, as has been done in Ontario. In the long run, the distortions caused by such interventions would jeopardize the viability of the entire system and drive away investors.

APPENDIX

Elements of an Electricity System: Some Elements Are Monopolies, Some Are Competitive

For simplicity, the electricity market or the electricity system can be thought of as having five separate components: power generation; power transmission; power distribution; marketing; and system operation. The first four components are generally understood and, with the exception of marketing, are aligned with the four new subsidiaries outlined in New Brunswick's new *Electricity Act*.

- *Power generation* is the production of large volumes of electricity traditionally using fossil fuels, water power, or nuclear power. More recently, power is also generated by wind and, to a much lesser degree, solar power, though neither is significant in New Brunswick.
- *Transmission* is the movement of large volumes of electricity from generating facilities, using high voltage lines, to large-volume purchasers and local distribution companies (LDCs).
- *Local distribution companies* are local utilities with an exclusive franchise to distribute power via an extensive network of power lines to a large number of relatively small volume users within a specified geographic area.
- *Marketing* is the function of bringing together, or matching, buyers and sellers of electricity and providing service to those clients.
- *System operation* is the least obvious, but the most critical, function of the system. For the system to operate technically, electricity must be added to or removed from the system according to schedule, and these activities must be monitored. Any system operates with technical parameters defined by the size and length of transmission lines and the location of generation facilities. Unrestricted access to the system would lead to system failure (blackouts). System operation ensures technical integrity by overseeing the operation of the electrical grid.

Most utilities in Canada perform all five functions to varying degrees. NB Power performs most of these functions exclusively. For power distribution, however, the municipalities of Saint John, Edmundston, and Perth-Andover have their own LDCs. Marketing is likewise spread across NB Power and these LDCs. Although most electrical utilities across Canada are publicly owned and publicly regulated monopolies, not all five of these functions need to be treated as a monopoly.

Power generation and marketing are naturally competitive, while transmission, distribution, and system operation are natural monopolies and should be separated structurally from the competitive functions and subject to regulation. The proposed restructuring of NB Power would indeed accomplish this — NB Power Generation and NB Power Nuclear will undertake the competitive functions

of generation, while the marketing function will be spread over NB Power Distribution and Customer Service and the LDCs in Saint John, Edmundston, and Perth-Andover. However, other than system operations, which provides a system-wide governance function, transmission and distribution need not be publicly owned. Indeed, for those functions, there is no advantage and many disadvantages to maintaining Crown ownership. Therefore, the privatization of NB Power would bring a greater degree of accountability and sensitivity to debt as well as fixed and operating costs. Nonetheless, whether transmission and distribution services are provided by a Crown-owned monopoly or by a privately owned monopoly, regulations and ongoing oversight by the Board of Commissioners of Public Utilities will still be required.

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