WHITE PAPER

New Brunswick Energy Policy






New Nouveau Brunswick

NATURAL RESOURCES AND ENERGY

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EXECUTIVE SUMMARY

Energy markets have evolved in recent years to allow for increasingly more competition. Such competition among energy providers has extended beyond regional borders with the creation of open access markets. The New Brunswick energy policy provides direction that will allow the province to fully participate in a competitive energy market and prepare for the future, while protecting the economic, environmental and societal concerns of its citizens.

The White Paper describes the framework for a provincial energy policy that will guide New Brunswick over the next decade. The energy policy is an exercise in striking a balance among competing goals, which include:

1. ensure a secure, reliable and cost effective energy supply for residential, commercial and industrial users,
2. promote economic efficiency in energy systems and services,
3. promote economic development opportunities,
4. protect and enhance the environment, and
5. ensure an effective and transparent regulatory regime.

Public hearings were held over the past few years before Select Committees on natural gas, electricity restructuring and gasoline pricing, and resulting recommendations were among those considered in development of the energy policy. The White Paper examines challenges and opportunities for each of the energy sectors relevant to New Brunswick. Actions undertaken to meet the policy goals are identified for electricity, natural gas, refined petroleum products, renewable energy, energy efficiency and environmental concerns, as well as any cross-cutting issues which intersect more than one sector. The White Paper establishes ground rules regarding the future framework of electricity markets in New Brunswick. Consideration of the future of the Crown utility, in the context of the policy enunciated in this White Paper, will follow in a second stage.

Meeting the policy goals outlined in the White Paper will require cooperation between the public and private sectors. Pursuing these goals will be to the benefit of all parties.

Key statements included in the White Paper are:

- the Province will proceed with a deliberate and controlled approach to electricity restructuring which will provide opportunity for New Brunswick to participate in a competitive market, gather experience, learn from other jurisdictions and set the stage for full retail competition while allowing time for the market to evolve;
- a market design committee, with broad stakeholder representation, will be created to address development of the market design, structure and rules leading to a competitive electricity market;
- wholesale competition will be introduced, whereby the three existing municipal utilities may procure all or some of their power from the competitive market;
- a wider range of non-utility electricity generation projects, which are often characterized by high energy conversion efficiency and relatively low capital costs, will be permitted;

- retail competition, or the sale of electricity from competitive generators directly to end-use customers, will be gradually introduced, beginning with large industrial customers;
- full retail competition for all customers will not be introduced at this time, while the merits of full retail competition, with reference to experience gained in other jurisdictions, will be re-examined every two years;
- customers that do not select a competitive electricity retailer will be entitled to a standard offer service similar to the current service provided by their existing utility;
- the mandate of the Board of Commissioners of Public Utilities will be expanded to include regulation of many aspects of the new electricity market structure;
- rapid development of the natural gas infrastructure will be encouraged and opportunities to advance system expansions through partnerships formed with the private sector and federal government will be sought;
- supply, demand and inventory positions for gasoline, diesel and home heating oil will be monitored in order to provide consumer information and increase awareness;
- greater energy price transparency will be encouraged through public posting of information;
- a comprehensive energy efficiency strategy for all sectors of the economy will be developed and implemented;
- the Province will lead by example in energy efficiency measures by taking energy efficiency into account when considering procurement options and working with other agencies to extend the scope of the Provincial Buildings Initiative to include buildings such as hospitals, nursing homes and buildings owned or operated by crown corporations as well as municipalities;
- electricity time-of-use rates will be introduced to inform customers about the true cost for consumption and provide them with price signals for making economically based decisions about energy efficiency and controlling their energy costs;
- green pricing options will be made available and opportunities reviewed for development of small scale, on-site electricity generation;
- the Province will produce a provincial Climate Change Action Plan as part of a National Implementation Strategy to reduce greenhouse gas emissions.

The Province has made a firm commitment to support the energy policy objectives by creating an Energy Secretariat. A fundamental component of the Energy Secretariat's mandate is to be the continuing body of expertise that will develop and implement the energy policy objectives described in the White Paper.

1.0 INTRODUCTION

Provincial energy policies have evolved over recent years to reflect the energy developments of the era. In the 1970s and 1980s, energy policy was guided by price and security of supply, which was influenced significantly by conflicts in the Middle East.

Energy efficiency and conservation, along with price and security of supply, were the foundation of the energy policy of the 1990s, with goals which were characterized by sustainable development, energy efficiency and secure energy sources that were reasonably priced.

During the mid-1980s, the natural gas industry began moving in the direction of deregulation. In the 1990s, the electricity sector emerged from a regulated industry toward one being driven, in many jurisdictions, by competitive market forces. These market forces are a global phenomenon, driven in North America primarily by the United States Federal Energy Regulatory Commission ("FERC"). There is little option but to become part of what is developing into a fully integrated, North American electricity supply and marketing grid. In order to participate and to continue to capture the benefits of a competitive market, New Brunswick must operate by rules and procedures compatible with those established by FERC.

Emerging energy markets offer challenges and opportunities for New Brunswick. This White Paper provides a framework for a provincial energy policy for 2000-2010. The energy policy provides direction in preparing for the future while maintaining sufficient flexibility to allow the Province to participate in the market at a time and to a degree which is considered most appropriate and beneficial. The policy formulated also recognizes the inextricable link between different forms of energy, the economy and the environment.

1.1 PROCESS

In 1996, the Legislative Assembly appointed a Select Committee on Gasoline Pricing to undertake research and conduct public hearings on gasoline pricing in New Brunswick. The resulting document, *Final Report of the Select Committee on Gasoline Pricing*, included recommendations with respect to gasoline pricing.

In 1998, the New Brunswick Legislative Assembly appointed a Select Committee on Energy to consider the future of the electric utility industry in New Brunswick and to examine the implications of natural gas for the province. A discussion document, *Electricity in New Brunswick – Beyond 2000*, was tabled by Government and a task force established with the undertaking to prepare a report on electric utility options. The resulting document, *Electricity in New Brunswick and Options for its Future*, included input from interested stakeholders and became the focus for public hearings which culminated in the Report of the Select Committee on Energy's *Electricity Restructuring in New Brunswick*.

Industry comments were solicited and public hearings were also held to prepare recommendations with respect to natural gas development in the province. Recommendations presented in the ensuing report, *Natural Gas for New Brunswick,*

provided guidance for creation of the *Gas Distribution Act, 1999* and for development of a request for proposals in the process of awarding a provincial natural gas distribution franchise.

In 2000, the Province recommended development of a comprehensive energy policy, to be published in a White Paper. This White Paper was produced, in part, on the basis of input from the previous processes. Advice of the Select Committee and contributions from public hearings provided significant guidance in formulating the goals and objectives contained in the energy policy.

An interdepartmental Energy Policy Working Group, led by the Department of Natural Resources and Energy, prepared the White Paper, with the assistance of an energy market consultant. Similar work undertaken in other jurisdictions was extensively reviewed as part of the process.

The White Paper was approved by Cabinet in December, 2000. Consideration of restructuring options for the Crown utility will occur in a second stage process, and will be consistent with the framework provided by objectives stated in the White Paper

1.2 POLICY GOALS

Following are the five key goals that form the basis of the provincial energy policy.

1.2.1. ENSURE A SECURE, RELIABLE AND COST EFFECTIVE ENERGY SUPPLY FOR RESIDENTIAL, COMMERCIAL AND INDUSTRIAL CUSTOMERS.

While energy security does not carry the same degree of urgency that it did during the 1970's, reliability is even more critical. Supply diversity and flexibility reduce the dependence, and thus vulnerability, on price and supply that can result from over-reliance on any single energy source. The Province's energy supply interests can be enhanced by means of continued improvements in efficiency of energy use. There is also some potential for the development of indigenous resources in the Province. Reliability has become more of a factor, particularly for electricity, with the continued development of information technology-based business.

The addition of natural gas to the region's energy mix enhances competition among energy forms. Providing New Brunswick consumers with energy at the lowest possible cost can be accomplished by ensuring that the interests of all energy consumers and the energy industry as a whole are considered.

1.2.2. PROMOTE ECONOMIC EFFICIENCY IN ENERGY SYSTEMS AND SERVICES.

New Brunswick's geographic location provides a strategic advantage to compete with utilities, refiners, and energy distribution companies in surrounding jurisdictions. However, changes to the marketplace require examination of the taxation, governance and perhaps even ownership regimes to achieve the maximum economic efficiency that will allow New Brunswick companies and utilities to compete effectively in both the domestic and export markets.

1.2.3. PROMOTE ECONOMIC DEVELOPMENT OPPORTUNITIES.

New Brunswick has a relatively large, energy-intensive, resource-based manufacturing sector with a substantial proportion of industry and business operating expenses attributable to the cost of energy. The Province wishes to sustain these operations as well as attract new ventures that will enhance growth and employment opportunities.

Access to a variety of energy sources with stable, long-term competitive rates is critical to the success of existing and new businesses as they compete in the global market place.

1.2.4. PROTECT AND ENHANCE THE ENVIRONMENT.

New national and international agreements on climate change, air quality objectives and acid rain commit Canada to emissions reductions. In addition, the Province has made a commitment to long-term environmental sustainability. These will have an increasing effect on energy costs and consumption, driving the markets toward cleaner, more efficient consumptive and supply technologies. In the near term, promotion of technical innovation in the areas of energy efficiency and alternative energy forms will have an important part to play in their acceptance and recognition as critical in reducing air emissions while increasing the reliability and security of our energy supply and the competitiveness of our industries. Other environmental concerns such as nuclear waste storage, remediation of hydrocarbon contaminated water supplies and soils, decommissioning of existing energy facilities, long term effects of hydro developments, and coal mining must also be addressed.

1.2.5. ENSURE AN EFFECTIVE AND TRANSPARENT REGULATORY REGIME.

The current regime and economy has been developed over a relatively long time period, during which many social objectives were incorporated within regulations and policies. New Brunswickers have lived and made decisions to protect themselves and their livelihoods within the context of such a system. Unlike preceding models, competitive energy markets tend to be directed by light-handed, transparent, performance-based regulation.

Recognizing that major changes will take place in the market place and that New Brunswick cannot adopt an isolationist stance, the energy policy seeks an appropriate form of regulation for the restructured market, providing as much opportunity as possible for adjustment and migration to a new regime that protects the interests of all New Brunswickers. At the same time, this migration must be done in a timely fashion such that the benefits of the new competitive systems do not pass by, strand or render any of our own energy infrastructure and industry obsolete or less competitive. Involving the appropriate regulatory agencies ensures transparency in the process.

2.0 NEW BRUNSWICK ENERGY PROFILE

2.1 ENERGY DEMAND

Approximately 756,600 people live in New Brunswick, primarily along the coasts and in the river valleys. There are seven cities and nearly 52% of the province's population lives in rural areas.

New Brunswick depends strongly on a traditional resource-based, energy-intensive economy of forest products, food processing and mining, along with commercial fishing and agriculture. More recently, the province has broadened its industrial base with strong emphasis on innovation, high technology and the knowledge-based service sector. Hence, energy costs and reliability are of fundamental importance in maintaining and improving the competitiveness of New Brunswick's energy-intensive industries and of newer industries with their high energy-quality requirements.

2.1.1. TOTAL PRIMARY ENERGY DEMAND

In 1998, the total primary energy demand in New Brunswick was approximately 332 petajoules (PJ). Of this amount, 19% was provided by indigenous energy sources, primarily biomass. Biomass consumption in the residential sector was in the order of 481,000 cords of wood (10 PJ), while the pulp and paper industry consumed 2.5 million tonnes (40 PJ) of wood residue and spent-pulping liquor. Refined petroleum products supplied 65% of New Brunswick's primary energy requirements (Figure 2.1.1). Energy consumption per household in New Brunswick amounted to 129 gigajoules (GJ). The energy intensity ratio for the industrial sector is 24.3 GJ per dollar of real domestic product (GJ/RDP).

Total Primary Energy Demand, by Fuel, 1998[1]

Fuel	Trillion BTU		Petajoules
Hydro	9.8	3%	10.3
Wood	47.9	15%	50.5
Nuclear	12.9	4%	13.0
Coal	40.0	13%	42.2
Petroleum	204.9	65%	216.1
Total	**315.5**	**100%**	**332.1**

Source: Statistics Canada Cat #57-003, 57-001

[1]most recent data available

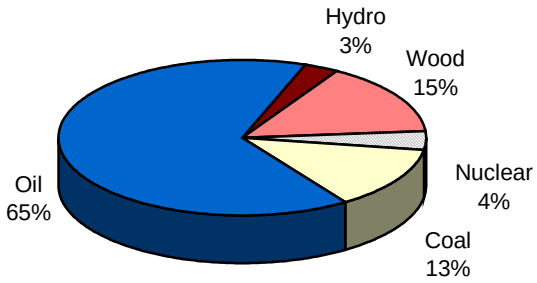


Figure 2.1.1: Percent Primary Energy Demand (1998), by Fuel

2.1.2. END USE ENERGY DEMAND

Primary energy demand includes producer's use, conversion losses and transmission losses, whereas end use energy consumption only includes energy consumption by the final consumer. For example, primary energy use for electricity generation includes conversion losses from burning coal, producer's electricity consumption at the station and line transmission losses from the plant to the household. End use energy consumption in New Brunswick in 1998 was 214 PJ, of which over half was used in the form of refined petroleum products (Figure 2.1.2(a)).

End Use Energy Demand, by Fuel, 1998[1,2]

Fuel	Trillion Btu		Petajoules
Electricity	48.7	24%	51.3
Petroleum	105.9	52%	111.6
Wood[3]	46.9	23%	49.5
Coal[4]	1.1	1%	1.2
Total	**202.6**	**100%**	**213.6**

Source: Statistics Canada Cat #57-003.

[1]most recent data available
[2]excludes producer's use
[3]wood includes residential fuel wood, industrial wood residues and spent pulping liquor
[4]coal includes coke

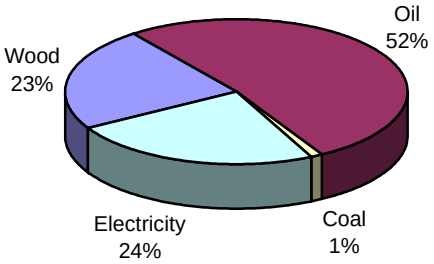


Figure 2.1.2 (a): Percent End Use Energy Demand (1998), by Fuel

The industrial sector accounted for over 40% of the end use energy consumption, followed by transportation at 32% (Figure 2.1.2(b)).

End Use Energy Demand, by Sector, 1998[1,2]

Sector	Trillion Btu		Petajoules
Residential	34.4	17%	36.3
Transportation	64.4	32%	67.9
Commercial	17.7	9%	18.6
Industrial	86.1	42%	90.8
Total	**202.6**	**100%**	**213.6**

Source: Statistics Canada Cat #57-003.

[1]most recent data available
[2]excludes producer's use

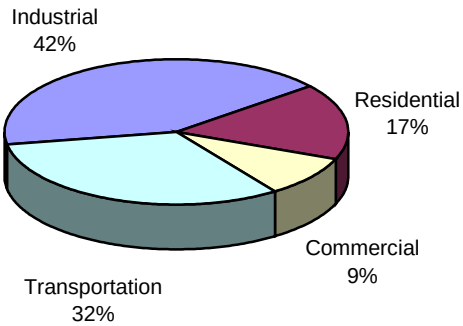


Figure 2.1.2(b): Percent End Use Energy Demand (1998), by Sector

2.2 ELECTRICITY IN NEW BRUNSWICK

New Brunswick Power Corporation (NB Power) is a Crown utility and the principle supplier of electricity in the province, supplying 94% of the total demand for electricity in 1999. Total installed electrical generation capacity in New Brunswick is currently 4,270 MW and is made up of the following:

1999 Installed Generation[1]	MW
Hydro	940
Wood/Wood Residue	195
Thermal Oil	1,559
Thermal Coal	570
Nuclear	680
Combustion Turbine	326
Total	**4,270**

Source: NB Power, Statistics Canada
[1]most recent data available

Of this total, 252 MW is non-NB Power capacity, largely made up of co-generation in the pulp and paper industry, along with some small hydro.

Peak demand for NB Power in the 1999/00 winter was 2,856 MW. Total 1999/00 in-province electrical energy use supplied by NB Power was 13,587 GWh, excluding station service, transmission and transformer losses. The total out-of-province sales for NB Power was 6,255 GWh and out-of-province purchases was 4,712 GWh.

In 1999/00,NB Power used the following fuel mix to meet total in-province energy requirements:

Fuel	%
Nuclear	26
Coal	24
Oil	12
Hydro	19
Purchases	8
Orimulsion™	11

Source: NB Power, Annual Report, 1999/00

New Brunswick's geographic location, bordering three provinces and the United States, has lead to the development of substantial interconnected facilities which allow for the import and export of electricity and the operation of larger than normal generating units. Surplus energy is sold outside the province on an opportunity basis.

In 1997, the Government announced that it was moving towards open access of its transmission system to allow for electricity transmission through the province to other markets, and access for independent electricity producers within the province to sell electricity to outside markets. This policy came into effect on January 1, 1998 with the filing of tariffs by the Crown utility with the Board of Commissioners of Public Utilities ("Board").

NB Power last implemented a rate increase on April 1, 2000, which averaged 3.0 percent for the residential sector and 1.2 percent overall. In an effort to control the costs of rate regulation, current legislation requires the Crown utility to submit rate increases to the Board for approval if the increase exceeds the greater of 3.0% or the consumer price index. This is commonly referred to as price cap regulation.

2.3 INDIGENOUS COAL

The total proven reserves of coal in New Brunswick are estimated to be 9 million tonnes. It is a highly volatile "A" bituminous coal found in the Minto and Chipman area. Other undeveloped areas of New Brunswick with coal resources are Beersville and Lake Stream. In 1998, NB Coal produced 272,000 tonnes of coal, all of which was sold to NB Power.

2.4 NATURAL GAS

Natural gas first became available to New Brunswick in December 1999 with completion of the transmission line built by Maritimes & Northeast Pipeline ("M&NP"), bringing Sable offshore natural gas to Nova Scotia, New Brunswick and the Northeast United States. A lateral to Saint John is scheduled for operation in December 2000. Enbridge Gas New Brunswick, Inc. ("EGNB") was selected as the provincial natural gas distributor and began construction of distribution mains in late summer 2000.

From the outset, natural gas was offered as an unbundled commodity in New Brunswick, whereby the transportation and marketing functions were separated. Transportation of natural gas through M&NP transmission line and laterals is federally regulated while EGNB's distribution system is provincially regulated, as are natural gas marketers.

Natural gas contract demand is in the order of 2.7 million m^3/d (107,000 MMBtu/d), for the five industrial users (one power generation unit, an oil refinery and three forest industry facilities) taking natural gas directly off of the M&NP lateral transmission system.

2.5 REFINED PETROLEUM PRODUCTS

New Brunswick's only petroleum refinery is operated by Irving Oil Ltd. and is located in Saint John. The total capacity of the Irving Oil refinery is 40,000 cubic meters (250,000 barrels) per day. Irving Oil has recently undertaken a $1 billion upgrade of the refinery. Although total output will not increase significantly, the refinery will provide improved quality products such as their "clean gasoline" and low sulphur diesel fuel to meet new environmental restrictions on refined petroleum products.

In 1998, approximately 110 million barrels of crude oil were imported into Atlantic Canada. Of this, 33% came from Norway, 25% from Saudi Arabia, 13% from Venezuela and the remaining 29% from Colombia, Iraq, Mexico, Nigeria, Russia and the U.K.

In addition, 64 million barrels of refined petroleum products were imported into the region and 26 million barrels were exported to other countries. Over 40% of the imports were gasoline while over half the exports were in the form of heavy fuel oil.

2.6 NEW BRUNSWICK ENERGY NEEDS

2.6.1. HISTORICAL ENERGY NEEDS

New Brunswick energy demand projections together with historical data dating back to 1973 are illustrated in Figure 2.6.2. There is clear evidence of the economic impacts of higher oil prices in 1973, 1979, and 1991 (Gulf War). Resulting energy efficiency and conservation programs also contributed to reduced energy demand in the subsequent years.

In 1990 tension in the Middle East culminated with the Gulf War. As a result, crude oil prices skyrocketed to $45 U.S. per barrel in December 1990. As in the previous decade, energy demand decreased as a result of the reduction in economic activity caused by high oil prices.

In 1998, crude oil prices fell to their lowest level since the 1970s as the collapse of the Asian economies resulted in an international oil supply glut. At one point, West Texas Intermediate crude oil, a bench mark crude, traded at $10/bbl U.S. In May 1999 the Organization of Petroleum Exporting Countries ("OPEC") reduced production in an effort to raise prices. Since then, the Asian economies have been restored and crude oil is trading at around $30 U.S./bbl. The Natural Resources Canada ("NRCan") forecast is based on crude oil prices in the range of $21 U.S./bbl.

Although there is concern that recent high crude prices will slow the economy, most economists point out that New Brunswick is less dependent on oil intensive industries than in previous decades. This economic shift has been attributed to significant growth in hi-tech industries and the services sector as well as energy efficiency measures implemented in the 1980s.

In the previous two decades, governments at both the federal and provincial level initiated off-oil policies in an effort to reduce the impact of high oil prices on the economy. In New Brunswick, there was a considerable move to a more intense electricity consuming society as incentives were offered to convert spacing heating systems from oil to electricity. Electricity demand almost tripled between 1974 and 1990 from about 5.5 billion kWh in 1974 to over 13 billion kWh in 1990. The average annual growth rate during this period was 5.5%. During the 1990s the average annual growth rate slowed to 1.9%, with electricity consumption increasing by 2 billion kWh, for a total of 15 billion kWh.

Total energy consumption in the 1970s and 1980s increased by 28%, at an average annual rate of 1.6%. However, total energy consumption between 1990 and 1998 increased by only 7%, less than 1% annually.

2.6.2. PROJECTED ENERGY NEEDS TO 2010

Natural Resources Canada projects total energy demand in New Brunswick to increase 14% by 2010. Total growth in electricity demand is forecast to be 15%. Demand for light heating oil and other refined petroleum products, excluding transportation fuels has been decreasing for the past 30 years and this trend is expected to continue. Natural gas is expected to meet 3% of the total energy demand by 2005 and will continue to grow, supplying 7% of total demand by 2020. Demand for wood, wood residue and other alternative fuels is expected to be maintained at present levels to 2010.

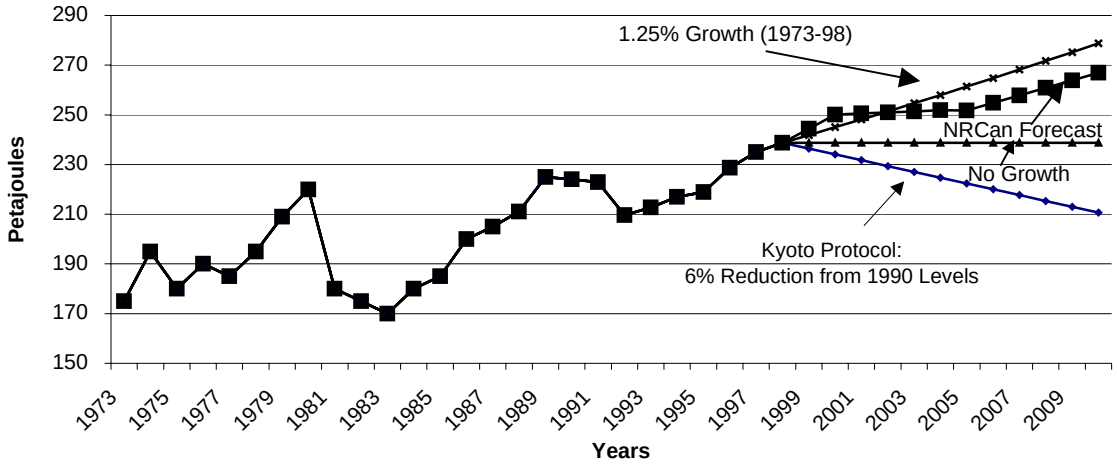
In the residential sector, demand for all forms of energy has increased by 13% during the past three decades. Natural Resources Canada forecasts total energy consumption in the residential sector to grow 4% by 2010. In the commercial-institutional sector, demand for all forms of energy has remained stable. The Natural Resources Canada forecast expects energy demand in this sector to remain relatively unchanged over the next 10 years. In the industrial sector, demand for all forms of energy increased by slightly less than 1% annually during the previous 30 years. Total industrial energy consumption is predicted to increase 11% by 2010.

The demand for transportation fuels increased dramatically during the past three decades. Most of this growth was in the consumption of diesel. Natural Resources Canada expects the demand for transportation fuels to grow 14% by 2010.

Figure 2.6.2 illustrates energy consumption in New Brunswick to 2010, for various scenarios. If the average annual rate of growth in total energy demand during the past 30 years were to be extrapolated to 2010, energy demand in New Brunswick would reach almost 280 petajoules. This is 4% higher than the Natural Resources Canada forecast.

Another scenario includes the impact of any decision to meet the Kyoto Protocol on energy demand in New Brunswick. The Kyoto Protocol requires a 6% reduction of greenhouse gas emissions from 1990 levels, by 2010. Carbon dioxide emissions resulting from energy consumption is the largest contributor to greenhouse gases. It remains to be determined how the individual provinces will achieve this target.

If New Brunswick attempted to achieve the goal of the Kyoto protocol through energy reduction initiatives, total energy demand would have to decline by 12% between 1998 and 2010. If combined with Natural Resources Canada expected growth of 14%, the required reduction in energy demand would total 26%.



Assumptions:

- Average annual growth rate in total energy demand 1973-1998: 1.25%.
- Natural Resources Canada ("NRCan") projected average annual growth rate in total energy demand 1997-2020: 0.9%.
- No growth in total energy demand assumes that energy efficiency policies and economic policies result in no increase in energy demand.
- The Kyoto Protocol signed by the federal government requires a 6% reduction in greenhouse gas emissions from 1990 levels by 2010. Since emissions from burning fossil fuels accounts for 90% of total greenhouse gas emissions this limit could result in a potential reduction of 0.8% annually in the total energy demand, if met exclusively by reduced energy consumption from present sources.

Figure 2.6.2: Historic and Projected New Brunswick Energy Demand

3.0 CHALLENGES AND OPPORTUNITIES

Jurisdictions worldwide can expect to encounter a multitude of energy-related challenges and opportunities over the next 10 years. The following sections present the path which New Brunswick will take to meet these challenges and opportunities in the areas of electricity, natural gas, refined petroleum products, energy efficiency, alternative energy and environmental concerns. The provincial government acknowledges that legislative authority may be required in order to enact the policy described in this document.

3.1 ELECTRICITY

The inter-connected nature of the electric industry in North America is such that restructuring in one region of the continent will profoundly influence the industry in surrounding regions. New Brunswick has examined, and will continue to observe, experiences in other markets to determine the most advantageous route for the province to take. This section describes New Brunswick market restructuring at the wholesale and retail levels, as well as examines the role of non-utility generation in the competitive market. A second stage process will consider the future of the Crown utility, within the framework provided by the energy policy.

3.1.1. BACKGROUND

3.1.1.1. Review of Previous Electricity Reports

In the past two and a half years there have been a series of reports that have evaluated the electricity issues that confront New Brunswick. The first was a discussion paper entitled *Electricity in New Brunswick Beyond 2000* (February 1998). The second was the report of the Hay-Savoie Task Force, issued in July 1998, entitled *Electricity in New Brunswick and Options for its Future*. Most recently, the Select Committee on Energy ("Select Committee") issued a report in May 1999 entitled *Electricity Restructuring in New Brunswick* ("Select Committee Report").

The Select Committee recommended that the Province adopt a policy of a managed transition. It was recommended that this policy consist of: (1) a gradual introduction of wholesale competition and re-evaluation of the benefits of retail competition after five years; (2) incentives for improving the efficiency in the delivery of regulated transmission and distribution functions; (3) improved regulatory oversight; and (4) assurance that all citizens have access to safe, reliable, affordable, and uniformly priced electricity supplies. The Select Committee also recommended the formation of a Stakeholder Group to develop policies and make policy recommendations. The strategy outlined in this White Paper is consistent with a policy of managed transition and establishment of a Stakeholder Group, with the addition of some refinements.

3.1.1.2. Electricity Restructuring in Other Markets

The electric utility industry is being restructured in many places throughout the world. The most significant changes are occurring in the wholesale and retail electric markets.[1] In Canada, Ontario and Alberta are restructuring their electric power markets and will implement final reforms in 2001. Quebec has pursued a different path. Hydro Quebec's low cost resource power is protected for domestic use, by legislation. Rates for Quebec retail customers are fixed at a level that is below Northeast market prices. The role of Hydro Quebec's regulator, the Régie de l'énergie, was reduced as a result of the legislation, whereas in Ontario the role of the regulator was considerably strengthened.

In the Northeast United States, wholesale markets operate with a combination of bilateral contracts and bid-based pools where participating generators are paid the market-clearing price. Most states in this area have implemented full retail competition. Throughout the United States, more than 25 states have implemented or begun to implement electric industry reforms, and the U.S. Congress is considering legislation that would establish a national program for wholesale and retail competition. Globally, a number of other countries have implemented market reforms including the European Union countries, Australia, New Zealand, much of South America, and a number of countries in Asia. The Select Committee Report reviewed the status of electricity market restructuring efforts in many of these jurisdictions to provide a framework for possible electric restructuring in New Brunswick.

The experiences in restructured and restructuring markets have varied. Most notable is the experience during summer 2000 in California, where prolonged periods of hot weather led to record electric demands and threatened the reliability of supply. Reflecting the lack of available uncommitted supply, market prices increased dramatically, with total electricity bills to many San Diego Gas & Electric ("SDG&E") customers in July 2000 being more than double the July 1999 levels. California's experience can be explained by a number of factors, two of the most significant being: (1) the market was restructuring during a period when there was growing demand and little surplus capacity; and (2) the hourly bid spot market was used to set electricity commodity prices for customers that did not select a competitive retailer. For the period during which stranded costs were being collected, increases in customer commodity prices from the spot market were offset by decreases in the stranded cost charges so that the customers' total charge for both items was unchanged. However, once SDG&E's stranded costs were paid off, the customers' commodity prices varied with the spot market leading to a more than doubling of customer electricity bills when prices on the California power exchange skyrocketed.

Alberta is another market that recently experienced a dramatic increase in wholesale electricity prices. The more than doubling in Alberta's wholesale prices in the last year can be attributed to a series of factors: (1) a shortage of generating capacity; (2) a doubling of natural gas prices in a market where natural gas was the marginal fuel for

[1] The wholesale market involves the production of electricity by competitive generators and its sale to and by marketers, traders and/or aggregators for resale to customers served by the distribution system whereas, the retail market focuses only on the sale of electricity directly to end-use customers. Within the context of New Brunswick, customers in the wholesale market include the three municipal electric utilities and, potentially, the Crown utility's distribution and marketing operations.

electric generation; and (3) the indirect effects of higher electricity prices in interconnected markets, i.e., the Pacific Northwest and ultimately California, flowing through to Alberta.

Other markets have had more favourable restructuring experiences. One of the most successful has been Argentina, where electric utilities were disaggregated and privatized in 1992. Argentina has experienced a 40% reduction in wholesale market prices since market opening. These price reductions are due, in part, to the introduction of greater efficiencies.

The England and Wales pool was one of the first wholesale markets to be reformed. When initially established, the market had two dominant generators that had a market share of more than 75%. While the market shares of these two generators have declined dramatically, the market continues to be plagued by the exercise of market power by the incumbents. Nonetheless, residential customers have experienced a 30% real decline in electricity prices in the 10 years since the market opened. This reduction in electricity prices reflects greater efficiencies in the distribution and transmission of electricity and the displacement of higher cost coal units with new, more efficient natural gas-fired combined cycle projects.

Restructuring was successfully achieved in the State of Victoria market in Australia. After climbing 15% the year after market opening in 1995, wholesale prices have since fallen below 1994 levels. For the four-year period from 1996 through 1999, prices were 30 to 50% below 1994 prices and have only recently increased to a level where they are just below 1994 levels. The reduction in Victoria power prices reflects reduced fixed operating costs from greater generating plant operating efficiencies, a surplus of capacity in the market and enhancements to the competitiveness of the market through increased integration with nearby power markets.

The experience to date with retail competition in most markets has been mixed due mainly to weakness in the market design and abuse of market power. In general, the customer switching rates and savings offered have been low and the costs to acquire customers and implement the systems necessary to support retail competition are high. One exception appears to be markets for large customers that have experienced higher switching rates and as such have been able to realize benefits from retail competition. These large customers do not require the same level of investment relative to their load size to support retail competition as do smaller customers.

3.1.2. NEW BRUNSWICK APPROACH

The Select Committee recommended that the province pursue a “deliberate and controlled” restructuring policy that would allow for the gradual transition of the electric industry from its current monopoly structure. Such a “managed transition” approach of wholesale competition and large retail access is appropriate for three reasons. First, it is the most prudent course of action given the experiences in some power markets, such as California, where restructuring has had the unintended consequences of dramatically increased prices and price volatility. Second, other markets have experienced delays in the implementation of wholesale and retail competition, which suggest that a more realistic schedule for the implementation of reforms is prudent. Third, a significant amount of time is needed to achieve the conditions required to realize a fully competitive market.

For these reasons, **the Province accepts the Select Committee recommendation and will proceed with a deliberate and controlled approach by introducing wholesale competition and allowing non-utility generation and retail competition for large industrial customers, while waiting until conditions prove more favourable before permitting full retail competition.** This will allow New Brunswick to participate in a competitive market, gather experience, learn from other jurisdictions and set the stage for full retail competition, while allowing time for the market to evolve. In addition, **the Province will establish a market design committee to address development of the electricity market including its design, structure and rules, and make recommendations to the Province by April, 2002.** Also included will be recommendations on all codes and operating protocols. In keeping with recommendations by the Select Committee, the market design committee will be composed of a broad stakeholder group.

Policy issues associated with wholesale competition, non-utility generation and retail competition are discussed in the following sections.

3.1.3. WHOLESALE COMPETITION

3.1.3.1. Moving Toward Wholesale Competition

The electric industry restructuring taking place in New Brunswick's major export markets to the Northeast United States has a significant impact on New Brunswick's market and its policy decisions.[2] Restructuring in the Northeast United States is primarily aimed at reducing electricity costs. Electricity rates in the Northeast were, on average, 50% higher than the national average when these restructuring efforts were initiated. By comparison, New Brunswick's electricity prices are among the lowest in the region. Restructuring in New Brunswick's export markets is, therefore, motivated by different drivers, and has two major implications.

First, the Northeast United States is a major export market for the Crown utility, representing 18% of its revenues from power sales. Exports to New England are the largest single source of the Crown utility's out-of-province margins. New Brunswick's transmission network and electricity generation facilities were built to capitalize on opportunities in its interconnected markets. Transmission links to other markets reduce New Brunswick's electricity rates as surplus electricity from New Brunswick generating stations is profitably sold into export markets. Without these out-of-province sales New Brunswick's electricity prices would be approximately 10% higher.

However, New Brunswick's access to the Northeast markets has been limited since the Crown utility does not provide wholesale access and its transmission tariff is not subject to regulatory review. As a result, transmission service in New Brunswick does not satisfy the U.S. Federal Energy Regulatory Commission's ("FERC") reciprocity requirements

[2] Statistics Canada figures indicate that New Brunswick's exports to this region account for 56% of its total exports. Exports are critical to the New Brunswick economy, with 66% of New Brunswick's GDP dependent on foreign and inter-provincial exports. Furthermore, electricity is a significant cost for many of New Brunswick's export-based industries. For example, for the pulp and paper industry, which is New Brunswick's fourth largest source of exports to the United States, fuel and electricity represent 13% of total costs (Annual Census of Manufacturers, Principal Statistics of New Brunswick's Manufacturing Industries).

(FERC Order No. 888).[3] Therefore, New Brunswick is restricted from making sales directly to customers in the U.S. and is currently making sales only at the U.S. border. With its access limited, the Crown utility has to rely on other parties to make sales on its behalf in the U.S. This reduces the profitability of these sales and limits the opportunities available to the Crown utility. The Crown utility may face further restrictions from new reforms being initiated by the FERC, who is trying to promote the development of broader geographic markets through Regional Transmission Organizations ("RTOs").[4]

Second, New Brunswick industries today enjoy a competitive advantage with respect to the Northeast markets. This is attributable to New Brunswick cost-based Crown utility rates being below Northeast market price, and rates in the Northeast being above the market price while stranded costs in that area are being paid down. However, the competitors to New Brunswick's industries located in its major export markets in the Northeast U.S. are likely to benefit in the long run from reductions in the cost of electricity.[5] If actions are not taken to ensure that New Brunswick's industries continue to benefit from power market reforms, competitiveness of New Brunswick industries could be adversely affected in the long run.[6] Reforms to New Brunswick's wholesale power market are needed to ensure that the province is able to maintain the benefit of export sales and resulting lower electricity prices that it now enjoys, for as long as possible.

Creating a competitive wholesale market in New Brunswick will ensure that major capital investments are subjected to a market test and will allow the market to drive decisions regarding the need for additional electric generating facilities and strategies for reducing generation costs. This suggests that investors, not customers, would be penalized for bad investment decisions. Under a regulated market model, such as the one that exists now in New Brunswick, customers share in the costs of any bad decisions. Therefore, poor investment decisions are the primary risk to maintaining New Brunswick's electricity price advantage. However, restructuring New Brunswick's wholesale market could link New Brunswick's prices with those in the greater Northeast power market and could result in increases in electricity prices in the short run as New Brunswick prices

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[3] FERC is the U.S. federal regulatory agency responsible for overseeing the wholesale power trade including transmission pricing in the U.S.

[4] RTOs are independent organisations that have operational responsibility and authority for regional transmission facilities. While RTOs are voluntary organizations and considerable discretion is left to applicants in structuring the RTO, FERC has established four minimum criteria and eight minimum functions to ensure that RTOs are able to carry out their desired role. New Brunswick is participating in discussions to promote the creation of an Eastern Canadian RTO. One of the primary objectives of these discussions is to expand the scope of these markets and by so doing, enhance their competitiveness.

[5] New highly efficient electric generating facilities equivalent to approximately 20% of the region's existing generation (and representing a total investment of over $2.5 billion) have recently begun commercial operation or are under construction. These new generating facilities are expected to result in lower electricity prices as evidenced by the lower forward prices being quoted by traders.

[6] A reduction in New Brunswick's competitiveness from failing to institute reforms does not imply that electricity rates in New Brunswick would become higher than those in New England, just that the magnitude of the differences in electricity prices between the regions would be reduced. Therefore, there would be a reduced competitive benefit from lower electricity prices that could be used to offset any other competitive disadvantages, e.g., higher transportation costs.

migrate to the average of its interconnected markets. The framework being proposed, which allows participation in the wholesale market, will help to ensure that New Brunswick's low electricity prices are maintained for the benefit of existing customers. In order to enable New Brunswick to fully participate in export markets by ensuring full compliance with wholesale market requirements, **the Province will target implementation of wholesale competition by April, 2003**. In order to eliminate the potential for shifting of costs from the wholesale competitor to customers remaining with the Crown utility, **the Province will require wholesale participants that reduce their firm load on the Crown utility's system to levels that are below their calendar year 1999 load, to be assessed an exit fee or other equivalent charge, approved by the Board**.

3.1.3.2. Establishing a Workably Competitive Market

A significant challenge to achieving a workably competitive wholesale power market is the limited size of the New Brunswick market. Various studies have suggested that the minimum efficient scale of the electric generation sector ranges from 3,400 to 8,000MW. While these economies of scale are required within a generation company and do not demand that generation assets be located entirely in one location, the size of the New Brunswick market, with a peak load of approximately 3,000 MW, presents a challenge to achieve a minimum efficient scale. Economic theory and recent experience suggest that, at a minimum, approximately five equally sized firms are required to achieve a workably competitive market.[7] Moreover, the maximum market share of any one supplier generally should not be more than 35%.[8] Strictly speaking, to achieve a workably competitive market within New Brunswick either the Crown utility's generation portfolio must be broken up or the province's transmission interconnections with adjacent markets must be significantly increased to allow for greater access to New Brunswick.[9] Breaking up the Crown utility's generation portfolio risks sacrificing its

[7] When assessing the potential competitiveness of the New Brunswick wholesale power market relative to this five-firm standard, one must recognize that the market to be evaluated is framed in terms of the customers with choice. Furthermore, competitors in the market include those that can supply customers through the tie lines with other jurisdictions.

[8] This is the standard that is often used by the Competition Bureau to evaluate whether a proposed merger should be challenged as potentially being uncompetitive.

[9] Navigant Consulting, Inc. prepared a report that evaluated the conditions for achieving a competitive wholesale power market in New Brunswick. The report indicated that all of the five following conditions would need to be met if a competitive market is to be achieved within New Brunswick: (1) An RTO is established that encompasses New Brunswick, New York, New England, and Quebec and this RTO reduces the pancaking of transmission tariffs and minimizes wheeling through tariffs. (Transmission rate pancaking is the layering of additional transmission tariffs for each transmission system that is crossed from generation to end-use customer); (2) Electricity generation and transmission are separated, either corporately or through an RTO structure, and operated independently; (3) A second 345 kV transmission tie line with New England is developed to increase New Brunswick's integration into the greater Northeast power market; (4) The Crown utility's non-utility generation contracts and entitlements to the Courtenay Bay project are conveyed to a distribution company or the contracts are restructured so that these resources participate as competitive suppliers in the greater Northeast power market; (5) If all New Brunswick fossil and hydro generation units are owned by one party, then the hydro resources must not be price setting and there must be restrictions that prevent the owner of these hydro units from using them to physically withhold energy. In addition, the market would be more workably competitive, with less volatility, if the competition were limited to bilateral contracts and the Crown utility required to serve its distribution customer load through an entitlement contract.

economies of scale, which could result in higher costs for New Brunswick consumers, or reduced value of the Crown utility. Consequently, developing a workably competitive wholesale market within New Brunswick will be a challenge and there will likely be a need for the Government to remain vigilant regarding the competitiveness of the New Brunswick wholesale market.

The Province will direct the market design committee to make recommendations regarding requirements for market surveillance and issues related to establishing a workably competitive electricity market.

3.1.3.2.1. Interconnections

One of the most significant conditions of achieving a competitive market is the enhancement of New Brunswick's interconnections with adjacent markets. New Brunswick participation in the Northeast market is significantly limited by physical constraints on the existing transmission system. A critical aspect in establishing a competitive market is the construction of additional transmission to interconnect with New England. Evidence suggests that without more tie lines New Brunswick's ability to open its wholesale and retail markets is limited[10] and competitive access could be offered only to the three municipal utilities of Saint John, Perth-Andover, and Edmundston.[11] These three municipal utilities represent a load of approximately 250 MW which could be served through existing interconnections by a number of different parties, assuming various reforms are implemented that would ensure the wholesale market for these customers is workably competitive. Making competition available to more customers is likely to be problematic until additional intertie capacity is built. To increase the opportunities for enhanced market scope and develop a more vibrantly competitive market, **the Province will direct the Crown utility to seek options for resolving physical limitations to participation in neighbouring markets through increased transmission capacity**.

An important aspect of enhancing these interconnections is New Brunswick's possible involvement in an RTO. If such an RTO were not established, the New Brunswick power market would need to be integrated more closely with the Northeast power market. Therefore, **the Province will direct the Crown utility to continue to pursue discussions with neighbouring jurisdictions regarding the formation of a regional transmission organization or other mechanisms that enhance the overall level of access among these systems**.

3.1.3.3. Functional Unbundling of the Crown Utility

An element of the managed transition advocated by the Select Committee was that the Crown utility "undergo a structural separation into three distinct Crown Corporations: NB Generation, NB Transmission, and NB Distribution." This was to ensure that accounting

[10] Additional interconnection capacity is important for competitiveness reasons because it increases the amount of competing generation that can access the New Brunswick market and enhances the value of the Crown utility's generation by increasing its ability to make export sales in the New England market.

[11] The wholesale customers will have access to other suppliers whenever the Crown utility fully opens up its transmission system.

safeguards are in place so that competitive businesses such as generation and energy services are financially separated from regulated businesses to prevent cross-subsidization. Government will consider the details of such a separation in the subsequent stage of the process, as the future of the Crown utility is resolved and the energy policy implemented.

Until such time, FERC requires, at a minimum, functional separation of transmission and generation functions and a code of conduct for an open access transmission tariff as specified in FERC Order No. 889. It is believed that the Crown utility satisfies FERC Order No. 889 requirements for functional unbundling, which is currently the minimum requirement in the U.S. for workable bilateral competition. Given the importance of electricity export sales to New Brunswick, it appears that any structural solutions for the Crown utility should allow it to be included as a full participant in the U.S. market. Functional unbundling accomplishes this objective without restricting future options for restructuring of the Crown utility. The economic advantage of retaining any economies of scale afforded to the relatively small Crown utility make functional unbundling a preferred option over structural separation. As such it is not necessary to form three distinct Crown Corporations.

In its Order No. 2000 on RTOs, FERC has required passive ownership whereby the RTO board is fully independent of any market participants that have a vested interest in a particular market outcome. Given the potential for FERC Order No. 2000 requirements to evolve and the uncertainties regarding how they will be applied to Canadian entities, **the Province will continue to carefully monitor emerging market compliancy issues, particularly as they relate to Federal Energy Regulatory Commission ("FERC") requirements**.

3.1.3.4. Levelling the Playing Field

An issue that could represent a barrier to entry in the wholesale power market is whether the Crown utility is perceived to have an inherent competitive advantage relative to new entrants. The Crown utility has a significant competitive advantage relative to "for-profit" entities because it is exempt from federal and provincial corporate income and capital taxes, excused from some property and all water use taxes, and has its debt guaranteed by the Province.[12] However, the Crown utility does make a guarantee fee payment to the Province which is intended to cover the cost of the debt guarantee. Therefore, if the Crown utility is free to develop new generation projects in New Brunswick, it may be able to do so at a lower cost than its competitors. This is likely to make competitors reluctant to invest in New Brunswick unless changes are made to put the Crown utility on a level playing field with other market participants. One issue is the risk of tax leakage to the federal government if the Crown utility goes to a full commercial orientation and as a result is subject to full commercial taxation. **The Province will examine the issue of establishing a level playing field between the Crown utility and other market participants over the next two years and will ensure that this does not impede the development of a competitive wholesale market**.

[12] This competitive advantage has been estimated to represent a 10% to 20% cost advantage.

3.1.3.5. Reliability of Supply

Traditionally, the reliability standards employed in the planning and operation of electric power systems have been specified through the North American Electric Reliability Council ("NERC") and its regional councils. Today, operators of power systems are obliged to meet NERC standards but there is debate concerning the need for rules to govern generation supply adequacy. The more conservative approach is to develop a capacity requirement that ensures suppliers provide sufficient capacity to guarantee that a reliability target is satisfied. Alternatively, market participants can be allowed to make individual decisions regarding the appropriate levels of contract coverage and hence volatility, and have suppliers respond by building capacity to support these contractual commitments. In theory, market participants should be better able to make these decisions for themselves rather than have the market rules stipulate a capacity requirement. However, there is considerable evidence indicating that capacity shortfalls can be extremely costly in terms of higher power prices due to prolonged periods of shortage pricing. Therefore, it is more appropriate to establish a capacity requirement if there are concerns that other elements of the market structure might not provide suppliers with sufficient incentives to build new capacity. **The Province will direct the market design committee to consider reliability of supply for New Brunswick in its market design recommendations**.

3.1.3.6. Distribution Electric Utilities

Currently, power is provided to customers through the distribution business unit of the Crown utility and through the three existing municipal utilities (Saint John, Edmundston and Perth-Andover). In keeping with New Brunswick's approach to restructuring, **the Province will introduce wholesale competition by permitting the distribution electric utilities to procure power in the competitive market by a target date of April, 2003**. This will serve to satisfy FERC requirements for wholesale competition while following a prudent approach toward gaining experience in a competitive market.

As a result of allowing the wholesale power price paid by the municipal electric utilities to be determined by the competitive market, there will be no means to assess whether the rates charged to customers are reasonable. In addition, with power purchased in the competitive market, these distribution utilities will be subject to market risks. To address these issues, **the Province will require distribution electric utilities to file their rates and all long-term contracts with the Board.** The Board may initiate an investigation of these rates or long-term contracts based on a complaint from a customer or of its own accord. It should be recognized that reviewing long-term contracts alone will not protect the distribution electric utilities from all market risks. This would require a formal supply plan review, which is likely to be overly intrusive.

The three municipal electric utilities in New Brunswick serve a relatively dense, urban market with a higher proportion of General Service (commercial and small industrial) customers which have rates that are higher than their cost-of-service. Conversely, the Crown utility serves a diverse market comprised of both urban areas and low-density rural areas. The creation of additional urban distribution electric utilities is likely to result in higher costs for the remaining Crown utility customers since the cost of serving urban customers is generally less than the cost of serving rural customers. There are several reasons for this. First, customer concentration usually results in lower distribution costs

to serve urban customers than those for rural customers, and the differentiation in the Crown utility's urban and rural rates does not fully reflect the higher costs of serving rural customers. Second, urban areas have a higher proportion of commercial and small industrial customers. The Select Committee Report noted that some committee members believed that there was an inequity in the existing franchise rights of the three municipal electric utilities "arising from the fact that these three municipalities may not provide direct support towards ensuring the affordability of electricity to rural New Brunswick."

Given the different cost structures, other municipalities in New Brunswick could consider establishing their own distribution utilities in an effort to participate in a competitive wholesale market. However, establishing additional distribution electric utilities is likely to create added costs, as the economies of scale offered by the Crown utility are lost. The creation of additional distribution electric utilities would promote higher overall costs to the province and a shifting of costs from the customers of new distribution electric utilities to the Crown utility's remaining customers. Therefore, as is consistent with Select Committee recommendations, **the Province will allow no new distribution electric utilities in New Brunswick at this time and will limit existing distribution utilities to their current service territory**.

3.1.4. NON-UTILITY GENERATION DEVELOPMENT

Private, non-utility generation projects, particularly combined cycle and cogeneration projects, are likely to represent the lowest cost generating capacity additions in New Brunswick given their high energy conversion efficiency, relatively low capital costs, and the availability of natural gas. However, the *Electric Power Act* requires Order in Council approval of generation facilities over 500 hp (0.4 MW). In the long run, constraints on the development of these projects will impede the development of a competitive wholesale power market in New Brunswick. To promote the development of a more competitive wholesale market in New Brunswick, **the Province will table amendments to the *Electric Power Act* which will include removal of current restrictions on the construction of generation facilities**.

3.1.4.1. Merchant Generation Facilities

Historically, non-utility generation projects have either contracted their output to the incumbent utility or supplied it as self-generation "inside the fence" to industry. More recently, where competitive markets exist, generation projects are being constructed to supply energy directly into the market place. Such projects are required to meet interconnection standards to assure reliable operation of the power system and deliver energy through the transmission system under an open access tariff. The development of a more competitive wholesale market in New Brunswick could be enhanced through construction of merchant generation projects.

The Province will empower the Board to approve merchant plant transmission system interconnection requirements and transmission system use under a regulated, open access tariff.

3.1.4.2. Self-Generation

Self-generation projects can offer efficiency and environmental benefits. In the near-term, development of self-generation projects could create stranded costs in New Brunswick due to displaced sales from the Crown utility combined with transmission limitations to New England. These lost sales cannot be made up by increased sales in New Brunswick's export markets given transmission constraints that limit access to New England markets during some periods. Therefore, until New Brunswick needs additional generating capacity or the tie line capacity with New England is expanded, an exit fee or comparable fee must be charged when customer load is lost by the Crown utility so that remaining customers are kept cost neutral. For this purpose, **the Province will require self-generators that reduce their firm load on the Crown utility's system to levels that are below their calendar year 1999 load to be assessed an exit fee or other equivalent charge, approved by the Board.** This is in keeping with Select Committee recommendations on self-generation and is intended to eliminate the potential for the shifting of costs from the self-generator to remaining customers. In addition, **the Province will empower the Board to approve charges for ancillary services, transmission charges and, until there is workable competition, standard offer backup service**. The key factor in establishing these charges is the Government's desire to avoid cost shifting from self-generators to remaining Crown utility customers.

With respect to ancillary services, transmission charges and backup service, the intent of Government is to treat all self-generators equally, without causing rate shock for existing facilities. For this reason, it may be necessary to gradually increase rates for existing self-generators until their rates for ancillary services, transmission charges and, if applicable, standard offer backup service, match those of new self-generation projects. All self-generators will be treated equally and, in consideration for existing facilities, **the Province will direct the market design committee to examine means by which rate shock to existing self-generators can be avoided.**

3.1.5. FULL RETAIL COMPETITION

Another element of introducing competition in the electric utility industry is in the retail sales of electricity directly to end-use customers. Retail choice allows customers to select from a range of bundled services and products, allowing them to choose the offering that best satisfies their requirements, thereby encouraging product and service innovation. Retail choice would also allow customers to purchase electricity generated from renewable resources, thereby promoting environmentally-friendly generation, and has the potential to provide customer savings, market innovation, synergies with the wholesale market and cost-reflective pricing for customers.

By definition, a competitive market requires a diversity of suppliers and buyers. In most electricity markets, the local distributor represents the sole purchaser of power. Retail market competition increases the number of wholesale buyers and helps support development of a more competitive market. Retailers also represent an important opportunity for longer-term bilateral contracts that assist developers of generation facilities in financing their projects, hence reducing a potential barrier to entry.

With the exception of customers on interruptible/curtailable, time-of-use or "real-time" rates, most electricity customers are not exposed to the true volatility of wholesale

electricity prices. Thus, in a market without retail competition few, if any, customers are provided with fully cost-reflective price signals and as a result, few customers modify their consumption patterns to minimize overall market costs. As a precursor to full retail competition, **the Province will direct the distribution utilities to make customers more aware of actual prices and conditions in the market place**.

3.1.5.1. Strategic Approach to Full Retail Competition

Experience to date with retail competition in most markets has been mixed. In general, the customer switching rates and savings offered to these customers have been low. In addition, the costs to acquire customers and implement the systems necessary to support retail competition are high. Furthermore, given the prospective size of New Brunswick's retail market, it is likely that for most customer classes, the benefits offered would be less than the costs. Therefore, the Government is advocating a strategic approach to full retail competition, which is based on implementing retail competition to most customer segments only after consumer benefits have been demonstrated in other comparable markets and are believed to be viable in New Brunswick.

The key policy issues flowing from the prospect of implementing retail competition within New Brunswick are:

- Should retail competition be introduced in stages and, if so, what are the appropriate stages and what is the appropriate timing?
- What service should be offered to customers that chose not to assume a competitive retailer?
- What level of reciprocity should the government require for retail market participants from outside New Brunswick?
- What should be done regarding cross-subsidies in the current rate structures?

The policy responses to these questions are outlined in the following sections.

3.1.5.2. Timing and Staging

3.1.5.2.1. Large Industrial Retail Customers

Some jurisdictions have introduced retail competition to all customer classes simultaneously, whereas others have introduced retail competition for the largest customers first, followed at various intervals by successive tranches of smaller customers.

Where retail competition has been available, the migration rate or proportion of customers switching from the incumbent supplier to a competitive retailer has been highest among large industrial customers and lowest among small customers. There are a number of reasons why switching decreases with customer size. Generally, large customers have the knowledge and capability to independently procure other energy-related products and services since these customers do not usually need or want products and services bundled with the commodity. In addition, the settlement systems and market rules for these large industrial customers are similar to those for wholesale market participants, which minimizes the incremental costs of introducing retail competition for large industrial customers. Also, there is less competitive activity for

smaller customers and the savings realized by smaller customers are lower in both absolute and percentage terms. Given the time and effort required to solicit for and then decide among several competing offers from retailers (and to understand the relevant market rules to make a fully informed decision), many smaller customers likely find that it is not worth their time and effort to switch.

In New Brunswick, the largest group of industrial customers account for less than 1% of the customer base, but represent more than 40% of the market's electricity consumption. This situation would result in substantially lower retail market costs (on a $/MWh basis) for large industrial customers than for smaller commercial and residential customers. In many instances, a large portion of the savings realized by any customers that switch can be attributed to the introduction of more cost-reflective tariffs and increased wholesale competition, not the introduction of retail competition.

This suggests that staging the introduction of retail competition, starting with large industrial customers and then with smaller customers in one or more tranches, would be most appropriate for the New Brunswick market. Staging the introduction of retail competition also provides more opportunity for New Brunswick policy-makers to learn from experiences in other markets and allows time for the expected advances in metering technology and settlement systems to reduce the costs associated with retail competition for these smaller customers. Therefore, **the Province will allow large industrial customers, i.e., all industrial customers with a minimum contract demand of 750 kW that are connected to the transmission system, to select a competitive retail supplier, with the target date for implementation of large industrial competition being April, 2003.** To eliminate the potential for cost shifting from the large industrial customer to remaining customers, **the Province will require large industrial customers that reduce their firm load on the Crown utility system to levels that are below their calendar year 1999 load, to be assessed an exit fee or other equivalent charge, approved by the Board**.

In addition, **the Province will direct the market design committee to make recommendations for mitigation of market power in the context of the wholesale and large industrial retail electricity market such that the target implementation date can be achieved.**

3.1.5.2.2. Smaller Retail Customers

The benefits to be realized for small business and residential customers from the introduction of retail competition are uncertain in the near term, given New Brunswick's limited market size and cross-subsidies in the current rate structures. Retail competition for small business and residential customers in the near term is unlikely to result in a vibrant retail market since few retailers would be expected to participate in the market.

Smaller customers are less able to adjust to market price volatility than are larger customers. Other causes of dissatisfaction experienced by small business and residential customers in competitive retail markets include: (1) insufficient savings compared to the time and effort necessary to solicit and choose a competitive supplier; (2) difficulty comparing retailers' offers on an "*apples to apples*" basis; and (3) billing and metering problems after switching.

Finally, in New Brunswick, introduction of retail competition for small business and residential customers in the near term would require the elimination of the current cross-subsidy in a relatively compressed timeframe, which could create rate shock for some customers. For these reasons, **the Province will not move directly to full retail competition but will revisit the merits of introducing retail competition for smaller customers every two years or following pre-specified trigger points or events**. To the degree appropriate based on net societal benefits, New Brunswick will consider further phasing of retail competition to progressively smaller customers.

3.1.5.3. Standard Offer Service

Electricity prices in New Brunswick are lower than those in most other nearby power markets.[13] This suggests that as New Brunswick wholesale and retail markets open, the comparatively low electricity prices that New Brunswick consumers now enjoy may be lost as power prices in New Brunswick increase to the regional average.

Furthermore, a significant implication of retail competition has been the increased exposure to greater wholesale market price volatility. While wholesale market price volatility can be managed, it may also be necessary to manage the risk for customers who have not selected a competitive retailer.[14]

Standard Offer Service ("SOS") is the service that is provided to all customers that are not served by a competitive retailer.[15] SOS would entitle customers to the service that they are currently receiving, if they chose not to participate in the market.

To ensure that the benefits of lower power market prices are maintained for New Brunswick consumers and that they are offered some protection from price volatility, **the Province will entitle all customers that do not select a competitive supplier to standard offer service under regulated prices and terms that are consistent with the service they now obtain**. Initially, this service would be provided to wholesale and large industrial customers through entitlement contracts from the Crown utility.

Given the desire to preserve the benefits of low costs for New Brunswick customers, it is likely that the standard offer price available to New Brunswick customers would result in

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[13] Electricity prices in other markets depend in large part on fuel prices. This is particularly true with respect to New England where a significant amount of new, natural gas-fired combined cycle projects are being built. Therefore, an increase in natural gas prices is likely to result in increases in New England power market prices. However, because New Brunswick has a diverse fuel mix and there is relatively limited amount of natural gas-fired generation under development, increases in fuel oil, coal and natural gas prices do not have as dramatic an impact on prices as they do in New England.

[14] Some market designers assert that it is inappropriate for the standard offer service provider, which is often only a distribution company that does not necessarily have any trading or risk management capability, to be providing a fixed price product. Furthermore, some assert that the spot market volatility is necessary to induce customers to move to the competitive retail market.

[15] Standard offer service (SOS) is generally defined as the service that is provided to customers that are eligible to elect a competitive retailer, but remain with their incumbent supplier. However, in New Brunswick, given the phasing of retail access, SOS is defined more broadly to include all customers that are not served by a competitive retailer. Therefore, residential and commercial customers who are not eligible for retail access would be considered SOS customers.

low switching rates and therefore, higher costs per customer that switches. This reinforces the need to proceed cautiously before embarking on the wide scale application of retail competition in the near term.

3.1.5.4. Preparing for Full Retail Competition

3.1.5.4.1. Full Retail Settlement Costs

Competitive retail markets for residential and commercial customers require sophisticated settlement systems and processes to allocate costs and charges between the various market participants (generators, transmitters, distributors, retailers and customers). The complexity of these systems will influence the overall costs of retail competition and the number of retailers willing to enter the market. In general, simpler systems are less costly but can result in inequitable distribution of cost and/or risk between customer classes or between market participants. Although the New Brunswick approach is to defer introducing full retail competition at this time, there are a number of issues surrounding full retail competition that can best be resolved in advance.

A competitive retail market requires the use of interval meters, such as those currently employed by most large industrial customers. Interval meters measure consumption every 15 minutes or half-hour and so allow billing that accurately reflects the volatile wholesale market costs and that customer's usage in each interval. Other customers have meters that simply measure consumption on a continuous basis. These meters are read monthly or bi-monthly and do not provide any information that would result in consumption pattern adjustments. The cost of interval metering is relatively high for smaller customers although these costs are declining as demand increases and more advanced technology becomes available.

Given its small size, New Brunswick is unlikely to attract a large number of retailers unless the costs of operating in the market are relatively low. This points to the need to: (1) replicate the settlement rules from other jurisdictions; and/or (2) work with neighbouring jurisdictions to establish a larger market with uniform rules so that retailers will face minimal incremental costs to serve the New Brunswick market. **The Province will evaluate alternatives for reducing the costs of introducing full retail competition in New Brunswick**.

3.1.5.4.2. Cross-Subsidization in the Current Rate Structure

For a variety of historical reasons, the Crown utility's current rate structure results in cross-subsidization between commercial/institutional and residential customers. Residential customers pay approximately 90% of the actual costs that the Crown utility incurs to serve them, whereas General Service (institutions, schools, hospitals, offices, stores and other businesses) and Small Industrial customers pay an average of 115% of the actual costs incurred to serve them. In effect, institutional and small business customers are subsidizing residential customers. Large industrial customers pay roughly 100% of the costs incurred to serve them, so they are neither subsidized by nor do they subsidize other customer groups.

Since rate unbundling usually occurs in advance of, or simultaneously with, the introduction of retail competition, it will be difficult to continue the current level of cross-subsidization in a competitive retail market. While the introduction of retail competition

and elimination of any cross-subsidization between customer classes are two independent policy decisions, they are inter-related because by making one decision (introducing retail competition) the Government would be effectively making another decision (eliminating cross-subsidies). This suggests that, to the degree that the Government wishes to minimize the amount of cross-subsidization between customer classes, it may be prudent to gradually eliminate the cross-subsidies before introducing retail competition. This will ensure that the customer impact of the two decisions is distinct and separable.[16]

Perhaps more importantly, cross-subsidized rates do not properly reflect the cost of providing service and hence, impedes the use of market signals to influence consumer decisions. Consequently, consumer fuel choices are swayed by revenue to cost ratios that favour a particular class of customer over another, rather than by cost reflective market pricing.

The Province will direct the Crown utility to eliminate, over time, cross-subsidization between customer classes to gradually provide rates that are within a range of 95 to 105% of the actual cost of providing the service. This policy was first advanced by the Board in its April 15, 1992 decision on the Crown utility's cost allocation and rate design process hearing, and was subsequently supported by the Select Committee.

3.1.6. CROSS CUTTING ISSUES

There are a number of cross cutting electricity issues that apply whether wholesale competition, self-generation or full retail competition is being considered. These include: (1) refinements to the regulatory regime; (2) stranded costs and entitlements; and (3) reciprocity. Each of these issues is reviewed below.

3.1.6.1. Refinements to the Regulatory Regime

As a result of restructuring of the electricity sector, the responsibilities of the Board will be expanded to include new functions. Adequate technical expertise and resources will be required for duties such as controlling the competitiveness of the generation and retail services markets and regulating the transmission and distribution businesses (the "wires" businesses). Most importantly, with respect to the generation business, **the Province will give the Board the authority to monitor the competitiveness of the wholesale market and ensure that the Crown utility is unable to exercise market power**. This role is likely to be in coordination with the Competition Bureau and the system operator who will have the real-time data necessary to oversee the behaviour of market participants.

The "wires" businesses will continue to be natural monopolies. However, with the increased competition in the wholesale market and the prospect of competition in the retail market, it is essential that the "wires" businesses be operated in a manner that is

[16] High penetration of electric space heating and water heating among New Brunswick residential customers will exacerbate the impact of eliminating the cross-subsidy in that the bill impact of moving to full cost recovery will be more significant for electric heating customers, who have higher electric heating costs, than for other customers.

fair to all market participants and prevents incumbents from securing any undue competitive advantage or from cross-subsidizing competitive operations. Therefore, as part of the increased separation of generation and transmission functions, there will be a need for independent regulation of the transmission system**. The Province will direct the Board to regulate the open access transmission tariff.** Rate caps, which are based on the consumer price index minus a productivity offset, have proven to be effective in other jurisdictions in driving efficiency improvements and providing significant reductions in transmission and distribution rates over time. Service quality standards will be incorporated into the performance based regulatory framework. The regulatory focus will be one of increasing the administrative efficiencies of regulation such as making greater use of paper hearings and other administrative processes that reduce the costs of regulation to all parties. **The Province will direct the Board to adopt a light-handed, performance-based method of regulation**.

The Province will mandate the Board with administrative oversight regarding reported abuses of the Crown utility's code of conduct and administration of its real time information system and violations of its open access tariff. Furthermore, **the Province will empower the Board with the responsibility of approving ancillary services charges and making determinations regarding stranded costs.** Finally, with the opening of the wholesale market, the municipal electric utilities will be able to procure power from a wide range of potential suppliers. This will provide them with the opportunity to secure power at a cost that may be lower than the cost they can obtain from the Crown utility. To ensure that such savings flow through to their customers, the distribution electric utilities will be required to file their rates and any long-term power purchase agreements with the Board. In addition, **the Province will empower the Board with the authority to initiate a distribution utility rate review upon the complaint of a customer or under its own initiative**. Moreover, **the Province will require that distribution rates automatically be subject to Board review when rate increases in any customer class exceed an amount set by regulation.**

Under some conditions, the introduction of wholesale and retail competition could create stranded costs for the Crown utility. Reductions in the Crown utility's sales can create stranded costs because the lost sales contributed to the recovery of fixed costs.[17] The reduced fixed cost recovery attributable to these reduced sales represents the stranded costs. Given its comparatively low power supply costs the Crown utility would be able to mitigate these stranded costs by selling the available power in its export markets at a profit. However, this requires sufficient transmission capacity to provide access to these markets. If these stranded costs are not paid by the party that creates them, costs are shifted to remaining customers, or revenues to the Crown utility are reduced.

The issue of stranded cost recovery addresses the question of who pays for these stranded costs. At one extreme, a full "user-pays" policy would require the customer or customers that caused the stranded costs to pay these stranded costs through some form of "exit fee" so that other customers who do not benefit will not have to pay. At the other extreme, all customers would pay for the stranded costs, regardless of whether

[17] Even though its generation costs are below market prices in its primary interconnected markets, the loss of sales by the Crown utility is likely to create stranded costs because there is insufficient transmission capacity to deliver this power to the interconnected markets during all periods.

they benefit directly. An appropriate policy for deciding who should pay under these conditions is one that states when one specific customer or class of customer benefits from a decision then they should be responsible for the recovery of the stranded costs that stem from such a decision.

Therefore, **the Province will impose a policy of user-pay with respect to recovery of stranded costs associated with the introduction of wholesale competition, non-utility generation and retail competition wherever feasible and in a way that does not unnecessarily impede the development of a vibrant wholesale and retail market**. The market design committee will assess the method of cost recovery as part of their recommendations on market structure. Fees will be determined for customers who impose stranded costs on other customers, as approved by the Board. Once the market is formally restructured, competition transition charges may be assessed on all customers on an equitable basis, if the Board determines that restructuring the New Brunswick market will create stranded costs.

3.1.6.2. Reciprocity

The competitive workability of adjacent market areas is enhanced when each market offers the other reciprocal and non-discriminatory market access. Reciprocal access effectively makes the markets more efficient by increasing the market size. Should some jurisdictions not offer reciprocity, requiring it may adversely affect the competitiveness of the New Brunswick wholesale and retail markets by limiting the number of potential competitors to those offering reciprocity.

The issue of reciprocity is also closely related to stranded cost recovery. Reciprocity would provide the Crown utility with an opportunity to recover some stranded costs caused by the import of electricity from other markets by providing equivalent access to these other markets. For example, under full reciprocity, in order for an external supplier to sell electricity into the New Brunswick wholesale market, all New Brunswick suppliers would have to have equivalent access to similar markets in that jurisdiction. Whether or not the supplier would be able to take advantage of this reciprocal access would depend on its own generation cost structure relative to the cost of wholesale power in its jurisdiction.

For these reasons, **the Province will direct the market design committee to examine and make recommendations regarding the need for reciprocity requirements in its design of the New Brunswick market**.

3.1.7. POLICY IMPLEMENTATION

The Province will take the following steps in order to move forward with policy objectives relating to wholesale and retail competition:

- Establish a high-level market design committee that is charged with developing the market structure and rules required to implement these proposed policies.

- Implement legislative and regulatory changes to coincide with the introduction of wholesale competition, non-utility generation and large industrial retail competition in the New Brunswick electricity market.

- Develop a plan to minimize the amount of rate cross-subsidization, over time.

- Establish market structure and instruments such that the New Brunswick market will be prepared for and receptive to full retail competition at a future date.

- Monitor retail markets, rules and settlement system in other jurisdictions (particularly neighbouring jurisdictions) to determine the degree to which they provide customer benefits and the degree to which their application in New Brunswick would provide customer benefits.

- Identify pre-specified events that would trigger reassessing the merits of introducing retail competition for smaller customers and review the timing of standard offer services and entitlement.

3.2 NATURAL GAS

3.2.1. BACKGROUND

Prior to the recent development of Sable Island gas fields off the Nova Scotia coast, there were no widespread natural gas distribution facilities in New Brunswick. The Maritimes & Northeast Pipeline ("M&NP") transmission mainline transports Sable gas across Nova Scotia and New Brunswick to markets in the Northeast U.S. With completion of the Saint John lateral and connections to the mainline, New Brunswick markets received gas in December 2000. It is anticipated that the introduction of natural gas will provide opportunities for increased inter-fuel competition and significant environmental benefits.

The M&NP mainline and laterals are inter-provincial and, consequently, federally regulated by the National Energy Board. A lateral policy approved by the National Energy Board offers an opportunity to expand pipeline coverage by providing a single natural gas transportation tariff (postage stamp toll) throughout the province. The postage stamp transportation toll applies to the mainline and M&NP laterals that meet a threshold toll test[18], signifying they are economically justified. The level of the threshold will not change until the mainline undergoes expansion.

While the M&NP mainline and laterals are federally regulated, natural gas distribution and marketing are both under provincial jurisdiction. The process for formulating provincial natural gas development guidelines was initiated in July 1998 with circulation of an Expression of Interest document to potential gas distributors asking for their input in development of government policies. In August and September 1998, the 53rd Legislative Assembly created an all parties Select Committee on Energy, whose mandate included examination of the future of natural gas in New Brunswick. The Select Committee held a series of public hearings, with the purpose of providing potential natural gas distribution companies and other interested parties the opportunity to present their position on natural gas distribution issues. The Select Committee report, *Natural Gas for New Brunswick,* was released in November 1998. Government decisions were based on recommendations by the Select Committee, and formed the foundation for a framework on natural gas development in the province.

Legislation was created to reflect the path New Brunswick had initiated with respect to development of a natural gas infrastructure. The *Gas Distribution Act, 1999*, which received royal assent in March 1999, served to update, expand and consolidate the province's laws on gas distribution and regulation previously found in the *Gas Distribution Act* (1981*), Pipe Line Act, Public Utilities Act, Underground Storage Act* and *Municipalities Act*.

[18] A lateral is considered to be economic when the annual cost of the lateral pipeline construction divided by the volume of gas throughput is less than the threshold toll test of $0.60/MMBtu.

Selection of a natural gas distributor was through a Request for Proposals process. The 20-year general franchise was awarded to Enbridge Gas New Brunswick, Inc. ("EGNB") on August 31, 1999. In keeping with recommendations by the Select Committee, the franchise was granted on a province-wide basis to increase the likelihood that the objective of uniform distribution rates and penetration of natural gas throughout the province would be met.

While there is a strong preference for fostering development of a market that reflects customer choice, it is unlikely that everyone will have equal access to natural gas. Although the Province favours encouraging natural gas availability to all regions, the market will develop more easily in those areas where large industry is located, the population is more concentrated and which are closer to the M&NP pipeline.

The Province will encourage rapid economic development of the natural gas infrastructure, making gas as widely available as is economically justified and in a manner that maximizes benefits to the citizens of New Brunswick. The framework established to achieve this objective includes a competitive natural gas market from the outset, thereby allowing natural gas marketers to compete for customers while the distributor, which is a gas transportation monopoly, remains under the authority of the provincial regulator ("Board").

To promote the realization of the objectives of this policy, initiatives on natural gas will focus on the following:

- Development of an indigenous natural gas industry;
- Development of a viable, natural gas delivery system, including continued support for the federal lateral policy; and
- Promotion of market-based fuel selection and consumption decisions.

3.2.2. DEVELOPMENT OF A VIABLE NATURAL GAS DELIVERY SYSTEM

3.2.2.1. Extension of Natural Gas Laterals and Distribution System

The Province has been an effective participant in National Energy Board Hearings involving development of Sable gas and the M&NP pipeline project. The National Energy Board approved a lateral policy to M&NP whereby the cost of constructing laterals off of the main pipeline will be "rolled-in" to the overall cost of service provided that the average rates do not increase above revenue realized from the addition of the lateral. Accordingly, if potential loads provide enough revenue to support an investment in a new lateral, then the lateral will be built. The $0.60 per MMBtu toll test will remain in place until there is a mainline expansion, at which time the appropriateness of the toll test may be reconsidered. The current plan provides for a postage stamp rate throughout the province, where the cost for delivering gas to the end of any lateral will be no different than along the mainline.

This offers a unique opportunity to make gas available to many areas in New Brunswick without creating intra-provincial transportation cost discrepancies. Energy is regulated by a both federal and provincial legislation. To protect New Brunswick interests, **the Province will continue to actively participate at future regulatory board energy hearings.**

The Province recognizes the importance of promoting natural gas availability to all regions of New Brunswick. This may prove to be a challenge for regions farthest from the mainline, which may have insufficient natural gas demand (anchor loads) relative to the length of lateral required to transport gas from the mainline. It is the Province's objective to ensure that pipeline lateral development is economically justified. The intent is to avoid building costly laterals that are not economically sustainable. Such laterals would require significant subsidies that could, if charged on the backs of all consumers, price natural gas out of the reach of potential users. For this reason, broad-based provincial government subsidies for the construction of laterals will not be supported. However, under special circumstances, an aid-to-construct may be considered as a last resort.

The Government will continue to explore and evaluate every reasonable opportunity for the expansion of the natural gas infrastructure, where economically justified. To this end, **the Province will encourage discussions among potential natural gas customers, industry participants and other agencies which could result in sufficient load to anchor a lateral**. Moreover, **the Province will look for opportunities to form partnerships with the private sector and the federal government to secure funding that will provide leverage for natural gas infrastructure development and system expansions.**

To this end, the Government has signed a Memorandum of Understanding ("MOU") with the Province of Quebec to work toward building a natural gas pipeline that would connect Quebec and New Brunswick gas transmission networks. This MOU outlines the commitment of the two governments to create a favourable environment for the development of a lateral from M&NP through the province's Northwest and then linking with the TransQuebec and Maritime pipeline. The MOU also outlines a commitment to work together to develop a second interconnection near Belledune to serve Northeastern New Brunswick that would constitute a second alternative for serving Eastern Quebec.

The province's policies with respect to the awarding of natural gas distribution franchises are also intended to promote the development of gas distribution infrastructure in New Brunswick. Three types of distribution franchise were created: single end use, local producer and general, all of which are under provincial jurisdiction.

A single end use franchise was made available for facility-specific industrial end users. The objective is to encourage large industrial customers to act as anchor loads in securing laterals and serves to satisfy the Province's desire to use the Maritimes and Northeast Pipeline lateral policy for as long as it is in effect. The single end use franchise fee was set at $50,000 annually, indexed to the consumer price index. This amount was determined as sufficiently large to ensure that small and medium-sized consumers would find value in being served by the distribution company while not being so high as to negatively impact the likelihood that large customers would become anchor loads to the laterals. In support of developing a safe and effective natural gas industry in New Brunswick, **the Province will direct all franchise fees to help defray expenses of the Board, particularly for costs associated with pipeline safety**.

To accommodate local production of natural gas, a provision was made whereby indigenous gas producers could apply for a local producer franchise over a specific

area. The objective was to encourage continued exploration for natural gas in New Brunswick, which could prove significant to the province's economy and job creation.

In New Brunswick, a challenge exists for development of natural gas infrastructure in that potential loads required to economically justify pipeline construction are concentrated in only a few locations. The population in the province is relatively low (756,600), with 52% living in rural areas. Approximately 1/3 of the population live in close proximity to the mainline and Saint John lateral. To discourage "cherry picking" by distributors interested in serving only high volume areas, the general distribution franchise was defined on a province-wide basis. It was determined that a single, province-wide general franchise was more likely to meet the objective of uniform distribution rates and penetration of natural gas throughout the province than would awarding one or more general franchises for a smaller area.

In its proposal, EGNB committed to serve 70,000 customers in 23 communities within 20 years. The Board will monitor Enbridge's progress in satisfying its commitments and will issue a formal report within seven years while **the Province will provide ongoing assessment of Enbridge Gas New Brunswick's progress and compliance with their proposal**.

An important part of encouraging the use of natural gas was the development of clear and user-friendly terms and conditions for the monopoly distribution service. Terms and conditions of service will, at a minimum, be fair and equitable to suppliers and customers, ensure the safe and reliable operation of the distribution system, not create unnecessary entry or transaction barriers, and protect each customer's privacy. The distribution system is required to link individual customers with suppliers operating in a North American gas market. The terms and conditions of the distribution tariff will not limit how buyers and sellers structure their transactions. In other words, the operating requirements will not, unless necessary for safe and reliable system operation, define or limit the transactions between buyers and sellers.

3.2.2.2. Development of a Competitive Retail Market

Natural gas customers are interested in the opportunity to easily tailor the process and services to their unique demands. Customization can occur at a number of levels, ranging from the terms surrounding the delivery of the services, to the billing and payment process, to the bundling of services sold and delivered. Terms of service can vary from customer to customer. Some customers will seek fixed price contracts while others may prefer prices that vary monthly. Methods to customize the billing and payment process include the customer determining the method of payment or providing the capability to normalize payments throughout the year to provide stability and certainty. Customers who value convenience may seek the opportunity to bundle their energy purchases (gas, electricity, and oil) together with other services, such as telecommunications. While providing customization on a large scale may seem to be a daunting task, advances in information technology and the lack of historical systems should enable energy service providers to deliver services in a cost efficient manner.

Experience has also shown that customers seek to minimize their interaction around the "product" in three areas: product cost, transactional cost, and their involvement arising from discrepancies in information and billing. If the cost of gas is too high compared to its substitutes, consumers will not switch to natural gas, hampering the development of

the gas industry. The transaction costs to be minimized are defined as costs associated with the selection of the desired services (that may extend beyond the provision of natural gas), negotiating the services agreement, and the contracting and payment process. Customers desire an arrangement that is transparent and easy to implement. Once the service contract is in place, customers expect to minimize their involvement. The involuntarily involvement in the distribution company or gas marketers' business process has often been a source of complaints for customers in other jurisdictions.

Building on the customer attributes described above, policies to foster competition at the retail level should address quality of service issues. While the regulator is not interested in dictating how an energy service provider operates at a micro-level, it is necessary that natural gas marketers entering the New Brunswick market meet certain standards. In order to address these concerns, the Board invited potential natural gas marketers to participate in a consensus committee and on-going working group to consider natural gas marketing and operational issues. This committee proposed a code of conduct, which has subsequently been adopted as part of the gas marketer licensing requirements.

Given the important role that natural gas marketers play in increasing the penetration rate for natural gas, it is critical that the Government create an environment that encourages their participation in the New Brunswick market. Towards this end**, the Province will reassess the *Gas Distribution Act*, *1999* to identify any areas where it might be amended to improve the effectiveness of the competitive natural gas retail market**.

3.2.2.3. Reliability of Supply

As natural gas consumption in the province grows, the most cost-effective way of meeting the increased gas requirements ensuring reliability of supply might include, among other things, the development of underground storage, gas liquefaction and vaporization (LNG plant), or the ability to switch between fuels. The Province believes that it is for the market to decide which, if any, of these alternatives are preferred. However**,** given the economic benefits that would accrue from the development of high deliverability storage facilities in the province, **the Province will continue to explore opportunities for the development of natural gas storage facilities by the gas industry**.

3.2.2.4. Training and Development

The extension of natural gas systems, conversion of electrically heated buildings to oil or gas, oil heated buildings to gas, installation of equipment and appliances in the residential, commercial, institutional and industrial sectors, and the ongoing maintenance of gas and oil-fired systems requires a labour pool sufficiently skilled to perform these tasks. An increasing problem across North America is the availability of skilled technicians and trades people. Any labour shortage would hinder expansion of the gas distribution system as well as the deployment of more innovative end-use technologies. **The Province will continue to offer and actively support training programs in community colleges to ensure that the infrastructure to assist the installation and maintenance of systems that burn gaseous and liquid fuels is in place. The Province will work cooperatively with its colleges and universities to**

look for opportunities to promote research and development that will foster the penetration of natural gas in New Brunswick.

3.2.3. DEVELOPMENT OF AN INDIGENOUS NATURAL GAS INDUSTRY

New Brunswick is a natural gas-producing province. Historic peak production saw pipeline delivery of natural gas to 3,000 customers, although local production was suspended in 1991. The construction of the M&NP pipeline has renewed interest in exploration for hydrocarbons in the province and there are currently 600,000 hectares held under license to search.

The M&NP and EGNB natural gas transportation infrastructure provides New Brunswick with the opportunity to develop natural gas resources which would likely otherwise be uneconomical. In an effort to promote the development of an indigenous natural gas industry, **the Province will further develop the New Brunswick hydrocarbon geoscience database**. As part of this effort **the Province will make information available regarding the attractiveness of New Brunswick as a location for natural gas exploration**. In addition, **the Province will provide a regulatory regime that minimizes barriers to exploration and development, and fosters the development of these indigenous resources**. This will include working with the natural gas industry to update oil and gas legislation, as required. Finally, **the Province will have a competitive royalty regime in the event that there are economic discoveries of indigenous hydrocarbons**.

3.2.4. MARKET-BASED FUEL SELECTION

For a competitive market to be efficient, all buyers and sellers must be free to make rational economic decisions. This, in turn, depends on equal access to accurate, comparable and timely information that is relevant to the purchasing decision.

To determine the feasibility of converting to natural gas, potential customers will consider costs associated with the initial conversion of a heating system, water heaters or appliances, and the ongoing operating costs. The conversion costs will be comprised of capital costs and related financing costs. Operational costs will include fuel costs, periodic maintenance costs, warranty and extended warranty costs. Total estimated costs should be compared to ongoing costs that would be incurred if the potential customers were to continue with its current fuel sources. On-going costs would include fuel costs, maintenance costs and potentially, costs to comply with environmental requirements.

To facilitate market-based decision making, this information needs to be timely and readily accessible. Market participants must also have confidence in the accuracy of available information. If the scarcity of information and/or the uncertainty of the information hamper potential consumers' efforts, the decision-making process will be discounted and lower the likelihood those customers will make appropriate decisions. This will inhibit conversions from one fuel to another and the penetration of new technology into the market place.

Due to the unfamiliarity with natural gas and the potential for conflicting information, there is a need for independent unbiased source for information regarding fuel

conversion costs. Therefore, **the Province will serve as a reliable source of unbiased information that will enable New Brunswickers to make appropriate fuel choice and energy conversion decisions**. The information provided would be tailored to the market segment (particularly residential and commercial/institutional) to address differences in their respective decision making processes, initial knowledge and awareness of natural gas, and likely consumption behaviour. Developing segment specific education plans will also minimize confusion and distortion, and facilitate rational economic decisions.

3.3 REFINED PETROLEUM PRODUCTS

As in most other jurisdictions, security of supply and pricing of refined petroleum products ("RPP") has long been a concern in New Brunswick. This was demonstrated in public hearings held by the Select Committee on Gasoline Pricing. Their final report, issued in 1997, addressed the perceived deficiencies in the New Brunswick gasoline market. In response, the Province undertook to improve monitoring and reporting of the industry, and worked toward preventing discriminatory pricing practices, as recommended by the Select Committee.

The energy policy proceeds to the next step by developing measures which broaden the scope of recommendations to include motor fuels and heating oil, and by increasing the extent to which information is monitored and reported.

3.3.1. BACKGROUND

Refined petroleum product distribution in New Brunswick is highly fragmented due, in part, to a sparse population that is dispersed across rural areas and urban centres. In addition, the numbers of people in various areas are relatively small. Not surprisingly, the scale of the oil and gasoline business at the distribution level reflects the population density. While individual businesses are small and dispersed, most are affiliated with only a handful of corporations.

At the wholesale level, the market area is regional in nature. For New Brunswick, refined products can be obtained either directly or through exchanges from refineries and terminals in Quebec, Nova Scotia, and New Brunswick. Two refineries, one in Saint John and one in Dartmouth, Nova Scotia supply the majority of product to New Brunswick. The Imperial Oil refinery in Dartmouth has a capacity of 82,200 barrels of crude per day while the capacity of the Irving Oil refinery in Saint John is 250,000 barrels per day, of which 50% is exported. The Northwest region of the Province receives supply from the Diamond Shamrock (Ultramar) refinery in St. Romuald, Quebec. Product is also transported by rail from the Shell refinery in Montreal, Quebec to the Miramichi terminal.

Despite the large scale of these refining operations relative to the local markets, it is important to understand that these suppliers are participants in global oil markets. The prices of their crude oil inputs and refined petroleum product outputs are determined, for the most part, by commodity exchanges such as the New York Mercantile Exchange ("NYMEX"). Regional refiners such as Irving Oil Limited and Ultramar are particularly exposed because they are not fully integrated, i.e., they do not produce crude oil. To some degree the volatility in the oil markets is exacerbated by traders who collectively move the market in response to production, demand and inventory statistics, and inferred behaviour of major Organization of Petroleum Exporting Countries ("OPEC") cartel. At a bulk wholesale level, these refiners are essentially price-takers for crude oil, gasoline, and distillate oil (home heating oil and diesel fuel). Like other refiners, they likely use all the financial tools necessary to manage their price exposure and minimize their risk. Nonetheless, with no upstream production to buffer this price volatility, the

prices established in this worldwide market flow through to the retail market. Even fully integrated producers can be expected to flow through these NYMEX-based prices because they represent the opportunity cost against which retail sales margins must be compared. With wholesalers and retailers attempting to drive down costs by reducing inventories, these prices are likely to flow through the value chain more quickly.

At a regional market level, wholesale prices for refined petroleum products are determined partially by commodity markets and partially by local supply and demand conditions. These local conditions include the amount and availability of bulk storage, terminal capacity, inventory levels, number of retail outlets, volume of sales per outlet, demand for refined petroleum products, and expected prices.

As discussed, distributors receive product from terminals or refiners in Nova Scotia, New Brunswick or Quebec. Product is either transported by truck, rail or barge, or exchanged between parties with offsetting inventory positions. The transportation cost from Dartmouth, Nova Scotia to most outlets in New Brunswick, including the cost of marine transport to the distribution terminals, is between 1¢ and 2¢ per litre. Transportation costs for outlets serviced by the Saint John refinery are generally less. Truck transport costs are estimated to be between 0.4¢ and 0.5¢ per litre per 100 kilometres. No outlet in New Brunswick is very far from a wholesale terminal. There are distribution terminals ("racks") in Saint John, Miramichi and Belledune. To some degree, this is symptomatic of the challenges posed by refined petroleum products market in New Brunswick. The small size of the market challenges wholesalers to aggressively control fixed costs such as storage. Product is picked up at these locations, then re-delivered to local storage, dealer outlets, or directly to customers.

At the retail level, competitive pressures in local markets and taxes determine prices for gasoline and distillate oils. These competitive pressures include prices charged by competing sellers, and costs experienced by the final distribution operations (dealer outlets and heating oil distributors). The margins are determined by the difference between the locally determined retail price, net of taxes, and the wholesale price. Other components of distribution, such as the price and availability of trucking and bulk storage capacity, add to the complexity and lack of transparency of prices. Also, dealer outlets with relatively small sales volumes often have higher average costs than a large volume outlet. Accordingly, the cost structure of different competitors may either justify a higher price, or make an outlet uncompetitive. These differing dealer cost structures also can contribute to the differences in prices between outlets.

The potential for market power along the distribution chain is an issue, given the small size of the New Brunswick market and the limited number of wholesalers. With most wholesalers also having retail operations, they are able to squeeze margins to independents by electing to take their margin at the wholesale level and increasing wholesale prices. Furthermore, there is the potential for horizontal market power given the limited number of competitors. One persistent challenge for the Province is to monitor industry pricing so that anti-competitive behaviour can be evaluated.

The volatility in local markets can be explained by the impact of independent marketers and independently owned “branded” outlets who may relinquish retail margin in an attempt to lower prices and increase market share. The result is often a price war as all competitors fight to protect their market share.

During periods of high input costs, refiners attempt to limit the amount of crude oil in storage to the minimum amount of crude oil necessary to feed their refineries. This avoids the risk of incurring inventory losses when crude costs decrease and retail prices drop. In 2000, inventories in the U.S. were at a 24-year low, resulting in volatile retail prices. After the Gulf War, prices collapsed at the retail and wholesale level and refiners were forced to absorb the costs of crude oil purchased during the war. As a result, the industry moved to "last in, first out" pricing to avoid getting caught in a future pricing squeeze. Currently, retail prices reflect international pricing events of the previous two weeks and the oil industry would like to see this delay reduced even further. This is the only industry that allows almost direct consumer participation at all levels in the market place, in that decisions made by the consumer to purchase (or not purchase) the product has an almost immediate impact on prices. However, consumers appear to want stable prices that are competitive with other jurisdictions.

In New Brunswick, refined petroleum product policy issues include prices that reflect the functioning of efficient and competitive markets, access to accurate and timely information, security of supply and economic stability.

3.3.2. EFFICIENT AND COMPETITIVE MARKETS

3.3.2.1. Motor Fuels

New Brunswick has approximately 680 retail gasoline outlets, which has fallen from approximately 1400 outlets in the 1970s. The province's retail market is highly concentrated, with two companies sharing 62% of the retail outlets, and four companies sharing the next 21%. Further, 36% of the retail outlets are owned by the dominant wholesaler. Other dominant companies are either completely integrated or integrated to the refinery level. They can compete for business at either the retail or wholesale level.

Less than 10% of outlets are classified as independents. Independent outlets are those which are not owned by an integrated oil company and do not operate under the brand name of an integrated oil company. New Brunswick has the second lowest percentage of such independent outlets in Canada. The Select Committee on Gasoline Pricing concluded that this has played a role in the degree of competition in the market and the price differences between New Brunswick and other jurisdictions, with the presence of independents having a downward impact on prices. An analysis conducted by the Select Committee on Gasoline Prices indicated that "in general, the counties with the most independents have the lowest prices and the counties that have the highest degree of domination by a single firm have the highest prices."

The average volume of sales of gasoline per outlet in New Brunswick is about 1.36 million litres annually, compared to a Canadian average of approximately 2 million litres. Given the relatively low throughputs for outlets in the province, there has been an ongoing rationalization of outlets. The forced replacement or upgrading of underground storage tank systems through compliance with the *Underground Storage Act* caused a number of outlets to close because they could not justify the cost. The *Wellfield Protection Regulation*, under the *Clean Water Act,* will result in the closure of all outlets

that are in established wellfields.[19] Upgrading and re-routing of the TransCanada Highway will limit direct access, forcing further rationalization. These pressures, and others, will result in further reductions in the number of retail outlets.

The degree to which consolidation occurs among independents could have an adverse effect on competition. However, there are few policy levers available that do not require outright market intervention, other than monitoring industry pricing to ensure that any consolidation is attributable to market economics rather than uncompetitive behaviour.

Although consumers appear to desire stable prices and view disparities in prices across the province as evidence of uncompetitive behaviour, such price outcomes are unlikely to be achieved and in fact are more likely to indicate an uncompetitive market than a competitive market. Disparities between gasoline prices in different parts of the province are explained by differences in transportation costs, inventory levels (and hence different costs of gasoline in inventory) and local market conditions, e.g., a price war in one market versus a stable pricing relationship in another.

Diesel fuel for use in the transportation of goods is important to the New Brunswick economy given its reliance on the trucking industry for imports and exports. This market is significantly influenced by events in the home heating oil market because of the similarities between the two fuels. However, because of the large single volume diesel purchases, margins are lower than for the motor gasoline market, and there are fewer competitors. As well, the harmonized sales tax component of the price is returned to the purchaser in the form of a tax credit.

Regulation of sulphur content also has an effect on supply competitiveness and gasoline pricing. In 1999, Environment Canada mandated that the average sulphur content in gasoline be reduced to 150 parts per million ("ppm") by July 2002 and further reduced to 30 ppm by January 1, 2005. Refiners across Canada would like these measures harmonized with actions in the U.S. New Brunswick's only refinery is already capable of producing gasoline with less than 150 ppm of sulphur, and expects to achieve 30 ppm by 2002. The U.S. Environmental Protection Agency (E.P.A.) has mandated U.S. refiners to phase in 30 ppm sulphur content between 2004 and 2007. Low sulphur gasoline is required by car manufacturers by 2004 for new vehicles which have new and improved pollution control equipment that is sensitive to high levels of sulphur. There is concern that these regulations will result in short term supply disruptions and price spikes similar to the price spikes experienced during the 2000 motoring season in the U.S. Mandated changes in fuel qualities can result in temporary shortages as the existing storage facilities prove to be inadequate for additional fuel types. Natural Resources Canada and Industry Canada have undertaken a study into potential supply disruptions as a result of the new regulations. Similar concerns were raised when low sulphur diesel was introduced in the mid-1990s and they proved groundless.

Beyond low sulphur gasoline initiatives, Environment Canada is planning to implement ultra-low sulphur diesel fuel regulations that would result in a level of 15 ppm by 2007. During the transition, these and other regulations regarding fuel quality will add further pressure on available supplies of gasoline and diesel oil and may result in price spikes.

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[19] There are 37 gasoline or home heating oil distribution storage tanks that will be required to close and remove their storage tank within 10 years of the Designation Order being issued.

As discussed, a host of factors influence supply and, hence, pricing of gasoline and diesel oil. In Canada, the regulation of retail prices is left to the discretion of the provinces. Prince Edward Island is the only province to implement full retail gasoline price regulation. Experience has shown that regulated prices may remain low in the short-term but they tend to be higher than unregulated prices in the longer term. Studies conducted by the American Petroleum Institute have determined that in the U.S., states with price controls tend to pay higher retail prices.

A comparison of prices in markets with price regulation and those without and the distortions that result from such regulation indicates that workably competitive RPP markets produce better price outcomes than those that result from the distortions caused by price regulation. Consequently, **the Province will only intervene with price regulation in the refined petroleum product markets if there is evidence of market failure.** However, **the Province, if confronted with evidence of the abuse of market power, will bring such evidence to the attention of the Competition Bureau and encourage them to take action.**[20]

3.3.2.2. Heating Oil

The heating oil market is relatively concentrated with only a small number of suppliers. Of the 77 retail oil dealers in the province, 18 are affiliated with one company. Another five carry some brand identification. Most of the major oil companies as well as several independent marketers compete in the heating oil market. The major oil companies act as wholesalers supplying independently owned and operated outlets. With the exception of one company, most major oil companies do not own and operate retail dealerships. Because of the large quantities of product purchased at any given time, retail prices for heating oil do not fluctuate as much as gasoline prices.

In New Brunswick, 25% of households rely on heating oil as the primary source of heat. Given that demand is primarily determined by weather conditions, a cold snap early in the heating season, while inventories are still building from the changeover from high gasoline runs, can result in a dramatic run-up in prices. The shutdown of a major refinery in North America during the heating season can have a similar effect on prices. Therefore, price volatility such as that experienced during the winter of 1999-2000 continues to be a significant concern. During this period, a bout of severe winter weather in the U.S. Northeast, following two relatively mild winters caught both suppliers and consumers in the region by surprise. The sudden increase in demand for heating fuels coupled with insufficient supplies and supply route disruptions pushed prices up rapidly. As a result of supply problems and the ensuing price increases experienced in the U.S. Northeast, retail prices across Eastern Canada increased accordingly. New Brunswick retail prices increased by 43% during the 1999/2000 heating season.

Given that home heating oil and diesel fuel are similar products, diesel fuel prices are usually adversely affected by these conditions. This can have an adverse impact on the

[20] The federal *Competition Act* provides the framework for all business activity in Canada. The *Competition Act* includes provisions for price discrimination, collusion, and predatory pricing, which are all considered criminal activities.

New Brunswick economy given its reliance on the trucking industry to deliver its products to market and to import products.

The primary challenge of home heating oil pertains to price volatility and its impact on customers given the "lumpiness" of purchase decisions. One option to make home heating oil purchases more affordable to consumers is to reduce minimum purchase requirements imposed by distributors. These minimum purchase requirements stem from the economics of the home heating oil distribution business. There are significant fixed costs to delivering home heating oil, i.e., the travel time and distance from the terminal to the customer or other customers on the route, such that distributors find it more economical to deliver larger volumes, less frequently. Price volatility can be further mitigated by budget billing which can be an attractive alternative for helping customers better manage cash flow issues stemming from home heating oil purchases. **The Province will encourage heating oil dealers to reduce minimum purchase requirements and to offer budget-billing arrangements**.

Purchase arrangements such as reducing minimum deliveries and budget billing may not be sufficient to offset the inherent price volatility of home heating fuel, which is more directly affected by the volatility of world oil prices than other heating fuels, and consequently can have a greater negative affect on lower income households. New Brunswick currently has heating assistance programs in place to offset fuel costs. **The Province will examine the effectiveness of existing heating assistance programs to make improvements where warranted.**

In addition, **the Province will monitor supply, demand and inventory positions for gasoline, diesel and heating oil to enable it to advise consumers of market conditions and to monitor the ongoing competitiveness of these markets.** This is important to ensuring that the Government can provide consumers with information that might assist them in better managing market price volatility. Clearly, the use of this information can have a significant impact on the market and as such it must be released cautiously.

3.3.3. ACCESS TO ACCURATE AND TIMELY PRICE INFORMATION

For a competitive market to be effective and fair, all buyers and sellers must have the information that they need to make rational economic decisions. This, in turn, depends on equal access to accurate and timely information that is relevant to a purchasing decision. New Brunswick can encourage competition by promoting price transparency and by gathering and making available refined petroleum product pricing information. Providing RPP pricing information will result in a more informed public, allowing customers to make better decisions and requiring suppliers to behave more competitively. Specifically, **the Province will encourage competition by promoting price transparency through the public posting of wholesale and retail price information.**

In addition to price information, **the Province will provide price advisories to the public when appropriate**. The objective is to better allow the New Brunswick public to anticipate, or respond more quickly to, events that are likely to result in considerable swings in prices. For example, prior to the heating season, the Government will inform the public regarding the state of heating oil inventories and current retail prices. Care

will be taken to not exacerbate price swings by timing the release of information in a manner that mitigates price volatility.

3.3.4. SECURITY OF SUPPLY AND ECONOMIC STABILITY

Experience demonstrates that product prices spike when supply is tight and demand exceeds supply. This occurs at any number of places along the distribution chain. The result is a price increase that is absorbed by all downstream participants, primarily the consumer. Storage inventories buffer the impact of mismatches between demand and supply and hence storage is valuable in hedging against RPP price volatility. Canada does not have a strategic petroleum reserve like that of the United States, because it is a net exporter of crude oil. Instead, as a member of the International Energy Agency ("IEA"), Canada, through the Energy Supplies Allocation Board, will implement its Demand Restraint Program, if a global supply disruption occurs. The minimum trigger is a 7% shortfall in crude oil supply for any member country of the IEA. The last time a global supply disruption warranted action by the IEA was during the Persian Gulf War in 1990-91. At the provincial level any disruption in refined petroleum product supplies, such as the ice storm of 1998, is handled by the New Brunswick Emergency Measures Organization.

Market outcomes are indifferent to hardship or economic stability. As such, **the Province will exercise its authority to monitor markets by collecting, maintaining and analyzing pertinent refined petroleum product market information**. At the same time, we recognize that the information itself can trigger undesirable outcomes. Accordingly, individual company information on product supply, inventories, storage capacities, trucking, and deliveries will be kept strictly confidential to ensure market competitiveness is maintained.

3.4 ENERGY EFFICIENCY

3.4.1. BACKGROUND

Given its significant economic and environmental benefits, energy efficiency plays a key role in attaining New Brunswick's energy policy goals.

By definition, a gain in energy efficiency is the use of less energy to provide the same level of service. It does not mean less service using less energy, or doing without. The most significant characteristic of improved energy efficiency is that it is often a very good investment, with paybacks frequently realized in less than a few years.

Energy efficiency also includes the concept of "load management" by which electricity and gas demand shifts from peak to off-peak periods is curtailed, or is met through fuel substitution. Load management, however achieved, avoids energy use in time periods when electricity capacity and gas supply are stretched to the limit or energy costs are relatively high.

Increasing energy efficiency:

- **Improves economic performance and competitiveness:** The New Brunswick economy is energy intensive due to the dominant role that natural resource-based industries such as pulp and paper and mining play in the provincial economy.[21] This underscores the competitive importance of obtaining and using energy in a cost-effective, efficient manner in the province.

- **Ensures a more secure, reliable and cost-effective energy supply:** The ability of New Brunswick to meet economic growth forecasts is dependent, in significant part, on the province having a secure and reliable energy supply available at competitive cost. Improving energy efficiency in a cost-effective manner can help to achieve these growth forecasts. "Cost-effective" means that the cost of measures taken to increase energy efficiency is less than the incremental cost of energy that would otherwise have been consumed.

- **Increases consumer disposable income from savings:** If less is spent on energy purchases while maintaining the same level of service, then more disposable income is available for expenditures on other goods and services. This is one way in which energy efficiency impacts upon economic efficiency.

[21] Various factors can account for differences in the energy intensity of regional and national economies such as: the specific mix of goods and services produced, climate, housing stock, vehicles in use, equipment in service, transportation infrastructure, energy prices, population and population density, and behavioral factors. These factors make "apples-to-apples" comparisons of energy efficiency between economies rather complicated. One should not necessarily conclude that the energy intensity of an economy is an accurate measure of its degree of energy efficiency.

- **Mitigates effects of volatile energy prices:** Energy prices are known to be volatile. Energy efficiency can mitigate the negative effect of price volatility by reducing energy consumption costs, as a percentage of total consumer expenses.

- **Creates employment:** Employment is created directly through capital investments in energy efficiency improvements and indirectly through supply and service industries. In addition, experience has shown that consumers tend to re-spend energy savings, thereby creating employment in alternative goods and services.

- **Reduces air emissions:** Over 90% of total New Brunswick greenhouse gas ("GHG") emissions are associated with the production and consumption of energy. Energy efficiency improvements avoid the emissions that would otherwise result from additional energy use.

3.4.2. THE ENERGY EFFICIENCY POTENTIAL

In the early 1990s a study was completed for the New Brunswick Department of Natural Resources and Energy to determine the extent of the energy efficiency potential in the province and the associated economic and environmental benefits. The study investigated energy efficiency opportunities in the residential, commercial, industrial and transportation sectors and found the following potential benefits from economically attractive energy savings:

- energy savings could reach 37% in the residential sector, 22% in the commercial sector, 26% in the industrial sector and 13% in the transportation sector;

- 2,424 new jobs (direct and indirect) could be created annually, due to the increase in disposable income and multiplier effects;

- economically attractive energy efficiency measures could reduce CO_2 emissions by 7.7 million tonnes, NO_x emissions by 35,187 tonnes, and SO_2 by 98,038 tonnes.

In addition, the potential for fuel switching from electricity to oil was considered to be significant, with an even greater potential expected with access to natural gas.

These were gross estimates and with existing market barriers, the achievable energy efficiency levels were about a third of the totals above. This achievable level of investment still required government-induced market transformations. In the time since the study, some factors have changed including an increase in the potential for fuel switching to natural gas. For the most part, the estimates are believed to still be valid, particularly with respect to the existing building and equipment stock in the residential and commercial sectors. The estimates were based on early 1990s technology, which implies that the estimates are somewhat conservative considering advances in efficiency measures since then.

New Brunswick implemented a number of energy efficiency measures following the study, including development of a Provincial Buildings Initiative, which resulted in an average of 20% energy savings in participating buildings. Studies carried out by the federal government and other provinces have revealed results that are similar to those documented in the New Brunswick report.

3.4.3. FACTORS INHIBITING ENERGY EFFICIENCY INVESTMENT

In a perfectly competitive market, all cost-effective energy efficiency opportunities would be exploited without the need for market intervention by any level of government. In the economy as it exists today, there are numerous market barriers that hinder investment in cost-effective energy efficiency. Among these are:

- **Social and environmental externalities:** Energy prices generally do not include the full costs of health impacts and environmental damage relating to energy use. As a result, the avoided environmental and health costs are not valued by consumers when they consider making energy efficiency investments.

- **Lack of knowledge or perceived financial significance:** Many consumers are unaware of the options available to them to improve energy efficiency, and tend to make decisions based on habit. In addition, many consumers do not understand the importance of their actions in controlling energy costs. There appears to be a lack of product knowledge and of economic information.

- **Product availability and search costs:** While energy efficient equipment is becoming increasingly available, distribution and retail channels often do not stock a significant amount of energy efficiency equipment. Given limited distribution, consumers may find it frustrating and time-consuming to seek out goods and services that are most cost-effective and best suited to their actual needs.

- **Access to funds:** Even where consumers know of energy efficient options and can find vendors who offer them, the higher first cost associated with many energy efficient goods and services may deter consumers who lack up-front funds or access to capital.

- **Who pays versus who benefits:** The classic example of this barrier is the case of the tenant who pays the energy bill, and the landlord who selects the energy consuming appliances and fixtures. The landlord, who does not reap the savings provided by more efficient equipment and may have doubts about the equipment enhancing the value of the property, has little incentive to invest money for cost-effective energy efficient items.

- **Payback:** Many consumers appear to undervalue the future stream of energy savings for energy efficient goods and services. More value is often placed on the higher first costs than the longer-term savings in operating costs.

- **Mis-pricing:** Prices of regulated energy sources such as electricity and natural gas may be distorted due to inter- and intra-class subsidies and absent time-of-use price signals. These pricing distortions may skew decisions regarding the purchase of energy efficient goods and services.

3.4.4. ENERGY EFFICIENCY STRATEGY

In order to address the barriers to improvements in energy efficiency, New Brunswick has a role to help ensure that the benefits of energy efficiency are realized. These

barriers or market failings can be addressed through a wide range of policy and economic tools including strategic regulation, performance standards, fiscal and trade policies, education and awareness, and leadership initiatives. The intention of all interventions is to transform the market so that energy efficiency improvement measures will, over time, take root in the private sector without the need for continuing government or utility influence.

A good example of a market transformation measure is the R-2000 program. In the early years of the program, the provincial government, local homebuilder association and Crown utility assisted in the development of the R-2000 standard, its marketing and in some cases provided direct incentives to home buyers. As the market for R-2000 developed, the building practices associated with it continued, even when assistance for the program was discontinued.

Low income households require special consideration, as market transformation initiatives may not address their needs. With an ageing society and many living on fixed and low incomes, the cost of energy will become an increasingly important matter, as a large portion of energy use is non-discretionary. People need to heat their homes. For this reason, there may be a need to investigate opportunities for energy options specific to low income households.

Measures and policies must also consider energy efficiency gains in both end use energy and primary energy. For example, the use of a more efficient light bulb will result in an improvement in end use energy as less electricity is used and also an improvement in primary energy use as less fuel such as oil is used to produce the electricity. Also, a measure such as a fuel switching may not improve end use energy efficiency in the home or business but will improve primary energy use and overall economic efficiency.

In order to ensure that energy efficiency improvements in New Brunswick are as far-reaching as possible, **the Province will develop and implement a comprehensive energy efficiency strategy**. The strategy will be anchored by engaging the public and private sectors in partnership arrangements to develop and implement energy efficiency measures. It will begin by expanding existing programs, such as promoting the highly successful Provincial Buildings Initiative as a model for other organizations. Further initiatives will be established from a broad range of options and will be designed to ensure that they effectively address the market barriers to energy efficiency and serve the overall energy policy goals. The degree to which new options are applied will be subject to the degree to which partnerships are successfully developed and the level of funding available. Key components of the strategy will be:

- provide effective public education and awareness;
- lead by example in government operations;
- partner with the federal government and other public and private agencies to lever resources and increase the effectiveness of measures implemented;
- implement strategic regulatory initiatives such as performance codes and standards;
- determine opportunities for energy efficiency funding and financing mechanisms;

- promote fuel switching where efficiency and economic competitiveness benefits result, and
- promote appropriate pricing signals to consumers including reducing cross-subsidization among electricity rate classes and introducing time of use rates.

The sections that follow describe in more detail the current measures that will be expanded and options that are being contemplated for a comprehensive energy efficiency strategy. The energy efficiency strategy is also expected to form an integral part of a broader provincial Climate Change Action Plan.

3.4.4.1. Expand Existing Efforts

In the short term it is practical to build and expand on existing programs.

3.4.4.1.1. Consumer Information and Education

Sustained markets for energy efficiency are created when consumers drive the demand for energy efficiency. In order to create that drive, consumers need to be informed and educated on the benefits of energy efficiency. A strong consumer information program is the foundation that will support other measures. Options include expanding upon the energy efficiency information service currently provided through web pages, workshops and conferences, training programs and modules for school curriculum. While the effectiveness of all energy efficiency initiatives is enhanced with the cooperation of other organizations, this is even more pertinent for information and education efforts. For example, integrating efforts with initiatives developed for climate change information, such as the National Implementation Strategy on Climate Change, would effectively increase the resources that can be engaged. **The Province will develop an energy efficiency information and education program in cooperation with other partner organizations**.

3.4.4.1.2. Lead by Example

Provincial government departments can play an important role in increasing awareness and ensuring energy efficiency becomes integrated in day-to-day operations. **The Province will direct provincial government departments to include energy efficiency in all relevant decisions and policies.**

One of the more effective market intervention tools available to the Province is its own procurement efforts. As a significant purchaser, the Province can help to establish the market for energy efficiency products and services. Government procurement can also hasten the development of competitive retail suppliers or aggregators who bundle energy efficiency services with energy supplies. **The Province will take energy efficiency into account when considering procurement options.**

The existing Government Energy Management Program includes two successful initiatives, the Energy Accounting System and the Provincial Buildings Initiative ("PBI"). The Energy Accounting System currently focuses on electricity and provides energy use performance indicators to building managers. **The Province will expand the provincial Energy Accounting System to include oil and natural gas.**

The Provincial Buildings Initiative offers the technical, planning and contractual support needed to implement third-party financed energy saving projects on a turnkey basis. New Brunswick is recognized across Canada as a leader in the implementation of this program. The successful program currently focuses on directly funded government buildings. **The Province will continue to work with other agencies to extend the scope of the Provincial Buildings Initiative to include indirectly funded buildings such as hospitals, nursing homes and buildings owned or operated by crown corporations as well as municipalities**. In fact some municipalities are already using the tools that were developed under PBI to embark on similar projects**.**

Finally, in order to further strengthen the government's commitment to lead by example, **the Province will monitor government operations and produce an annual report of energy efficiency performance.**

3.4.4.1.3. Participate in Federal Programs

New Brunswick has successfully cooperated with the federal government in the delivery of several effective programs. For example, New Brunswick has actively promoted the federal Auto $mart Program, which advocates energy efficiency through a Student Driver Kit that is available to driver trainers. Partnership with the federal government can include task sharing, cost sharing, and sponsorship arrangements. **The Province will actively seek partnership arrangements with the federal government for energy efficiency programs.**

3.4.4.1.4. Expand Energy Efficiency Regulations and Promote High Performance Equipment

The existing New Brunswick energy efficiency regulation under the Energy Efficiency Act includes 23 products. The regulation of these products has been successful in eliminating the least efficient equipment from the market without affecting customer choice. Additional energy efficiency standards have been developed and adopted in other jurisdictions and are available for inclusion in our own regulation. With the introduction of natural gas in New Brunswick, there is an opportunity to regulate high efficiency gas furnaces, water heaters and other gas equipment so that lost opportunities are avoided. As such**, the Province will expand the list of equipment regulated for energy efficiency levels in harmonization with other jurisdictions, support the development of energy efficiency standards on any additional equipment and encourage the installation of high performance appliances**.

3.4.4.2. Propose New Measures

Engaging public interest groups and the private sector is an integral aspect in selecting additional measures to incorporate in the energy efficiency strategy. Specific measures will be established in consultation with provincial partners.

3.4.4.2.1. Energy Efficiency Funding Mechanism

The extent of options included in the energy efficiency strategy will be dependent on the level of funding available. Therefore, **the Province will seek a variety of broad-based energy efficiency funding mechanisms.** These funds could, potentially, provide

customers access to financing of approved, cost-effective measures. In many states in the U.S., where restructuring has been enacted, energy efficiency programs are funded by a per kWh surcharge on distribution rates. The efficiency fund could use loan repayments for additional efficiency measures in a revolving fund approach.

In order to influence federal and private sector funding, **the Province will contribute energy efficiency seed funding to leverage resources from other sources**. One such other source could be the National Implementation Strategy on Climate Change.

3.4.4.2.2. Residential Options

The existing housing stock offers the greatest opportunity for energy efficiency improvement in the residential sector. Experience indicates that it is most effective to take a "whole house" approach to energy retrofits, thereby encouraging a range of improvements. As a result, **the Province will explore options to be included in a comprehensive residential retrofit program**.

Programs in other jurisdictions have included financial incentives to retrofit/renovate, access to financing, home energy audits and labelling (EnerGuide for Houses), renovator training and certification, sales force training, and the involvement of community-based delivery agents.

Some relief from the energy cost burden on social housing occupants and low income households can be achieved through energy efficiency. Up-front costs of retrofits are a significant challenge for this segment of the residential sector. Options may include loans from provincial or municipal revolving funds, leveraged involvement of private sector financial institutions, and/or other alternative financing approaches. **The Province will investigate opportunities for residential energy efficiency programs that are specific to social housing and low income households.**

3.4.4.2.3. Commercial and Institutional Options

As in the case of the residential sector, most of the opportunities for energy efficiency lie in existing buildings, which tend to be less energy efficient than new ones. As such, **the Province will consider options to be included in a comprehensive commercial retrofit program**. Consideration will be given to the use of performance codes, operating and cost tracking software, retrofit options modelling software, case studies, training and awareness for owners and facility managers, and a rewards/recognition component.

The Province participated in the development of the Model National Energy Codes for Houses and Model National Energy Code for Buildings. Building codes are a municipal and provincial responsibility. **The Province will examine the benefits of adopting the national energy codes for buildings.**

3.4.4.2.4. Industry Options

Stimulating energy efficiency in the industrial sector can be a challenge because of the inherently wide variation in consumption patterns and load profiles. Investment in energy efficiency can be motivated by sending the appropriate price signals, since energy costs

can significantly impact industrial competitiveness. Pricing choices and custom packaging of energy services afford industry greater opportunity to manage energy in a manner that is most effective for their specific processes. **The Province will investigate industrial sector energy efficiency measures that focus on energy pricing and services, industry specific performance standards, research and development and demonstration of new competitive technologies.**

3.4.4.2.5. Transportation

The transportation sector accounts for a significant portion of New Brunswick energy use and, consequently, there are considerable opportunities for efficiency improvement. Vehicle kilometers travelled is increasing by 1.4% annually and new vehicles entering the fleet are getting lower average mileage than vehicles being disposed of, thereby presenting difficult challenges in reducing transportation-related fuel use and emissions. The popularity of large, fuel-inefficient trucks and sport utility vehicles at the expense of smaller, more fuel-efficient passenger cars is a major reason that vehicle fuel efficiency gains of the 1970s and 1980s have been halted. Despite these national trends, there are still many ways that New Brunswick can encourage energy efficiency in the transportation sector.

Measures to achieve the efficiency potential exist in all the components of the transportation system including, roads, rail and marine infrastructure, vehicles, fuels and users. Examples include public awareness initiatives to change travel behaviour; intelligent transportation systems that reduce traffic congestion; telecommuting initiatives that reduce the number of trips; enforcement of speed limits; training of fleet operators and truck drivers; fees that correct market shortcomings in reflecting true costs and vehicle testing programs; more energy efficient modes of transportation such as container systems and rail. **The Province will examine options to promote energy efficiency in the transportation sector as part of a new Transportation Policy currently under development**.

3.4.4.3. Incorporate Energy Efficiency in Electricity Markets

3.4.4.3.1. Price Signals

Accurate pricing that informs customers about the true embedded cost-of-service and time-of-use cost for consumption is critical for consumers in making economically rationale decisions about energy efficiency. Unfortunately, the current rate structure in New Brunswick has several shortcomings, including significant inter- and intra-class subsidies and a general lack of time-of-use ("TOU") price signals for all but the largest industrial customers. In general, commercial and industrial customers are cross-subsidizing residential customers.

Continuing efforts to correct these deficiencies are warranted and essential for creating the economic foundation needed for competitive demand side management to flourish. Specifically, further progress towards aligning rates of return for all rate classes, and lowering the usage thresholds for customers wishing to participate in interruptible rates are appropriate steps that can be taken. Seasonal rate differentials, while not as accurate as hourly TOU rates, may be an appropriate rate structure for smaller customers whose loads do not justify the expense of TOU metering and, in many cases,

will not willingly accept the added administrative complexities. **The Province will direct the Crown utility to produce and file time-of-use rates with the Board by autumn 2002.**

A declining block rate is available to "all electric", general service customers in New Brunswick. This provides electricity at a lower rate for purchases above a minimum monthly amount and sends inappropriate price signals that reward higher energy consumption. Other competing jurisdictions have moved away from declining block rate pricing, which is consistent with ensuring the customer is more clearly aware of the appropriate market price signals. **The Province will direct the Crown utility to examine removal of the declining block rate and investigate how this would impact upon existing customers.**

3.4.4.3.2. Cogeneration

Cogeneration systems can yield significant thermal-electric efficiencies of 75% or more compared with conventional central generating facilities' efficiencies of 30 to 38%. As such, cogeneration and non-utility generation in general could prove to be an important component of the energy efficiency strategy. Provincial policy regarding such installations is discussed in Sections 3.1.4 and 3.5.4 of this document. **The Province will promote cogeneration as the most energy efficient electricity generation option.**

3.4.4.3.3. Fuel Switching

Many end use applications of energy, such as heating and hot water, can be provided through competing energy forms including electricity, oil or natural gas. The efficiency of energy end use can vary significantly, depending on the energy source and conversion technology employed. For example, electric heat produced from a conventional thermal power plant is delivered at an end use efficiency of approximately 30%, and from a combined cycle natural gas plant at approximately 45%. In comparison, the end use efficiency of heating oil and natural gas utilized in a high efficiency furnace, on site, is at least 75%. These improvements in energy efficiency can result in significant emission reductions, particularly for applications using natural gas, which is the cleanest burning fossil fuel available. Fuel switching is also a means of smoothing the load curve and can play a significant part in avoiding higher cost electricity generation. **The Province will work with distribution utilities to develop a fuel switching strategy as part of the energy efficiency strategy**.

3.4.4.3.4. Demand Side Management

A fundamental shift associated with competition is the belief that markets, not government regulators and utility monopolies, should be responsible for making future energy production and consumption decisions. With the advent of competition there has been a visible transition from the era of utility-managed/government regulated supply planning procedures, typified by Integrated Resources Planning, to market-based, supply decision-making led by merchant generators at risk for their investments. On the demand side of the equation, some have also suggested that the market, not government regulators, should make the decisions about energy efficiency investments and services. Others have asserted that many of the benefits achieved in utility demand

side management ("DSM") programs would be lost (thereby becoming stranded benefits) without a continuing commitment and significant market intervention.

One area of agreement seems to be that market-driven energy efficiency, or "competitive DSM", should play a more significant role than was previously the case. Some key features of the competitive DSM model include:

- Real-time retail pricing that enables customers to view and react to changes in actual wholesale market prices;

- Real-time price signals regarding the cost of transmission and distribution service, particularly during periods when demand is close to exceeding the available transmission and distribution capacity;

- Real-time metering and/or load control devices which enable end-use customers or their suppliers/aggregators to curtail load;

- Demand-side bidding by wholesale market participants that would allow consumers, demand aggregators or other load serving entities to modify customer demand during peak periods and thereby avoid energy purchases when the cost exceeds the value to the end-use customer. In such instances the customer may have preferable alternatives to accepting high cost power such as fuel switching, on-site generation, or shifting energy use to other time periods;

- An increasing role for energy service companies and retail suppliers in providing customers with efficiency and load management services by bundling them with energy supplies sold to customers.

The initial development of competitive wholesale markets, particularly in the U.S., has strengthened the view that demand-side bidding is not only a good way to preserve an important public good, but is also essential in maintaining a well-functioning wholesale market. When supplies are stretched to the limit in meeting demand and price competition appears to be anemic, active demand-side resource participation can help to restore market balance, moderate wholesale prices, and help ensure the reliability of the grid.

To date, there are encouraging signs that retail energy suppliers and demand aggregators will bundle a variety of energy efficiency services with the energy commodity to attract and retain customers. However, few of these bundled efficiency service offerings have gone beyond large commercial/institutional customers to small commercial/institutional and residential customers.

In the post-restructuring world, utilities have reoriented their programs towards market transformation and finding the most efficient means of service delivery to the customer, involving collaboration with other utilities, non-profit organizations, trade associations and government. Collaborative programs can achieve far greater economies of scale and scope than individual demand side management programs offered by a single utility. Consequently, **the Province will examine the role of a collaborative demand-side management program in moving toward full retail competition.**

3.5 ALTERNATIVE ENERGY

3.5.1. BACKGROUND

Unlike fossil fuel combustion and nuclear fission, renewable energy sources are virtually inexhaustible and replenished through natural processes. Alternative energy, particularly in the form of renewable biomass, already plays a significant role in New Brunswick's energy mix. Biomass accounts for 15% of the total primary energy demand in the province. This includes 481,000 cords (589,000 tonnes) of round wood used for heating in the residential sector, 18,000 tonnes of wood residue consumed by hospitals and 2.5 million tonnes of wood residue and spent pulping liquor used for process heat in the pulp and paper industry.

Typical alternative energy sources and technologies in use worldwide today include:

- **Biomass energy:** includes wood, and wood waste/residue and agricultural waste, alcohol based-fuels, municipal solid waste; methane gas from solid waste landfills and sewage treatment, and cultivated energy crops;

- **Geothermal energy:** uses the heat in the earth's crust (steam or hot water) or thermal gradients below the ground surface (ground source heat pumps);

- **Hydroelectric and tidal power:** uses flowing water to spin turbine generators that produce electricity or mechanical power;

- **Solar energy:** provides direct space heat and hot water, or it can be converted to electricity with photovoltaic ("PV") cells or a solar-thermal steam turbine;

- **Wind energy:** provides electricity by turning large blades connected to a generator;

- **Fuel cells:** a self-contained unit that chemically process fuel to produce electric power; and

- **Micro-turbines:** consists of small-sized combustion turbine generators.

Over the past 20 years, great technological advances have been made in reducing the costs of non-hydro renewables such as wind and solar which in some instances have declined to one-fifth their earlier costs per kilowatt-hour ("kWh"). Today, wind projects sited in the best locations can produce electricity at costs comparable to many conventional plants, at 6-7 cents per kWh. Similar advances are being realized with the development of alternative energy fuel cells, which are a clean and efficient means of producing off-grid electricity and motive power. Although fuels used in fuel cells are not necessarily renewable, they do offer many of the benefits of renewable technologies, such as reduced environmental impact, and a significant opportunity for application on a distributed basis which would reduce loses and can lead to higher overall efficiencies.

Despite the tremendous progress for renewable and alternative technologies, they typically have higher capital costs per kW and higher average costs per kWh than the most competitive conventional technologies, such as combined cycle gas-fired electric plants with average cost of production at 4 to 5 cents per kWh. In addition, because renewable and alternative technology projects tend to be capital intensive (albeit with lower operating costs), financiers of merchant plants, who typically seek target returns in an 8 to 10 year time horizon, often do not give full value to the long-term operating benefits of renewable and alternative technology projects.

3.5.2. BENEFITS OF ALTERNATIVE / RENEWABLE ENERGY

Renewables are generally very clean sources of energy, although they can result in a number of environmental impacts.[22] Increasing the use of renewables can diminish a host of environmental problems such as air pollution, solid and hazardous waste, and water pollution. In particular, renewable energy can lessen the effects of acid rain, ground-level ozone, regional haze, particulate matter, and the threat of climate change. Several renewable technologies, such as wind power, hydroelectric power and solar power, produce no air emissions. Biomass-powered facilities, with properly managed cultivation and harvest practices, contribute no net greenhouse gas emissions.

Renewable resources are far less burdensome on water resources as well. Solar and wind power consume no water at all. Hydroelectricity harnesses (but does not consume) the power of flowing water, without introducing pollutants or waste heat to water resources. In addition, hydroelectric facilities often provide other benefits such as flood control, drinking water supplies, and recreational opportunities. Biomass often uses water in the power production steam cycle but unlike fossil fuel power, does not threaten water supplies from inadvertent petroleum spills. With regard to solid and hazardous waste, renewable energy is significantly better for the environment. Solar, wind and hydroelectric power production results in no waste materials at all.

Renewable energy technologies provide a number of important economic benefits as well. By expanding the diversity of the province's fuel mix, renewables reduce dependence on traditional fossil fuels and the associated exposure to fuel price fluctuations. In addition, since economies of scale are achieved at relatively small plant sizes for several renewable technologies, such units can be tailored to load growth and may be more easily distributed geographically, helping to reduce transmission and distribution system bottlenecks and losses. Biomass technologies have also been shown to result in significant local employment.

3.5.3. MARKET DEMAND FOR GREEN POWER

While a key motive behind restructuring of the electricity industry is to reduce electricity prices, it has also seen the rise of product differentiation in the marketplace and creative marketing strategies. A number of retail suppliers are currently offering customers clean

[22] Despite numerous environmental benefits, some renewable projects have faced strong opposition by host communities on environmental grounds such as impaired viewscapes and harm to birds by wind farms, and harm to spawning fish by hydroelectric facilities.

and renewable sources of power, often called "green" power. [23] Consumer research in the U.S. shows that, on average, 70% of residential consumers indicate a willingness to pay at least $5 per month more for electricity from renewable sources; 38% are willing to pay at least $10 per month more; and 21% report willingness to pay at least $15 per month more.[24]

Market experience to date bears out a preference among a significant segment of consumers for green energy. While only 2% of customers in California have chosen to switch to competitive suppliers from their incumbent utility, virtually all of the residential customers that have switched are purchasing some form of green power. However, to some extent this has been driven by a generous state subsidy for the purchase of renewable energy equal to 1.5 cents per kWh. In Pennsylvania, where 20% of eligible customers have chosen a competitive supplier 15% of this group has chosen a "green power" supplier. Similar results have been reported in other states now open to full retail competition.

3.5.4. ADOPTION OF ALTERNATIVE ENERGY TECHNOLOGY

3.5.4.1. Research and Development Opportunities

New Brunswick has important research and development capabilities in the area of alternative and renewable energy. The Energy Conversion Engineering Group (University of New Brunswick) and the Research Center for Energy Conversion (l'Université de Moncton) have made considerable progress in the development of ground source heat pumps. The Research Group on Thin Films and Solar Energy (Université de Moncton) is active in photovoltaic research and development. In addition, the Centre de génie éolien (Wind Power Engineering Centre) at l'Université de Moncton is active in the field of wind energy. **The Province will continue to promote research and development in renewable/alternative energy, and related economic development opportunities**.

3.5.4.2. Demonstration Projects

The Province will look for opportunities to undertake demonstration projects that showcase the benefits of renewable and alternative technologies and that help jumpstart the market to manufacture, sell and maintain renewable and alternative technologies. Examples include solar wall systems for preheating ventilation air, fuel cells and micro-turbines. In addition, emphasis will be placed on expanding the use of renewables and alternative technologies for off-grid applications such as communications, lighting and public safety equipment, where renewables and alternative technologies, particularly photovoltaics and fuel cells, are likely to be a cost-effective option.

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[23] Green power can be defined in a number of different ways, leading industry participants to call for labeling of green power. According to Environment Canada's Environmental Choice program, "green power" refers to wind, solar, landfill gas, sewage digester gas, small run-of-the-river hydroelectricity, and biomass power sources that have superior environmental performance.

[24] Barbara C. Farhar, Ph.D., *Willingness to Pay for Electricity from Renewable Resources: A Review of Utility Market Research*, National Renewable Energy Laboratory, July 1999.

3.5.4.3. Promotion and Development of Bio-fuels

Alcohol is a low emissions fuel that can displace a portion of gasoline volumes without special modifications to engines if used as a blend. The potential production and use for ethanol and other alcohols as a fuel and/or fuel additive has been evaluated a number of times in New Brunswick.

Ethanol production using agricultural feedstock has not proven to be a feasible option in New Brunswick due to an agricultural base which is not sufficiently large to support an ethanol plant of the scale necessary for economic viability. The emerging technology of converting lignin and cellulose (wood products) to ethanol has been monitored and is showing promise for New Brunswick.

On the demand side, the most immediate market for alcohol would be as a gasoline additive to replace more environmentally controversial petroleum-based octane enhancers. Alcohol blended with gasoline of 10% or higher is common throughout North America.

The Province will work with the federal government to closely monitor progress in alcohol production technology and examine the potential for production and use of alcohol as a transportation fuel and/or fuel additive in New Brunswick. If the technology offers sufficient potential, the Province will work with industry to seek strategies for demonstrating the feasibility and potential benefits of the use of ethanol as a gasoline additive.

3.5.4.4. Small-Scale On-Site Electricity Generation

Environmentally sound, small-scale electricity generation technologies such as solar, wind, biomass, and fuel cells can help increase the efficiency of energy production and use in New Brunswick. However, there are many barriers, including metering and interconnection issues that prevent such technologies from gaining more widespread use and acceptance. These technologies have a role to play in the competitive market. **The Province will direct the market design committee to review and make recommendations on the role and treatment of small-scale, on-site electricity generation**.

3.5.4.5. Green Pricing

Green pricing is the opportunity for electric utility customers, who do not have retail choice, to support a greater level of investment in new renewable or “green” power resources relative to the traditional mix of resources offered by the utility. To date more than 50 utilities, including several in Canada, have offered green pricing programs. There have been two basic types of programs offered: capacity-based and energy-based. With a capacity program, the utility offers the customer the option to select the number of renewable capacity “blocks” (typically 100 watts per block) they would like to fund. Monthly premiums range from $2.50 to $6.50 per 100-watt block. The customer’s green price premium is based solely on the number of blocks selected by the customer, not on usage. Energy-based programs allow the customer to choose the percentage of kilowatt-hours consumed that support green energy. Usage-based green price premiums range from 0.5 to 5 cents/kWh. In effect, either the capacity- or energy-based program allows the customer to select the desired shade of “green.”

Given the importance of introducing new renewable technologies to the province and the potential interest of customers in supporting renewables, **the Province will require the Crown utility and other distribution utilities in the province to develop a green pricing option and market it to interested customers**. Subsequently, **the Province will direct the Crown utility and other distribution utilities to use any funds derived from a green pricing option to promote the development of renewable technologies in New Brunswick.**

3.5.4.6. Renewable Portfolio Standard

In the U.S., twelve states have adopted some form of Renewable Portfolio Standard ("RPS"). A RPS is a requirement that a minimum percentage of a retail supplier's energy portfolio be from qualifying renewable energy sources. The definition of an "eligible renewable resource" varies from state to state; some include hydro and others do not, some focus on new and existing resources while others focus only on new resources. Another difference is how compliance is verified; some states are using a certificate-based approach where generation attributes are traded in a secondary market, separate from the electricity commodity. Other states are using contract-path tracking in which the electricity and its attributes are bundled together and can't be traded separately. There is a proposal for a 7.5% national RPS as part of its restructuring legislation, which has not yet been passed by the U.S. government.

New Brunswick currently uses a relatively high proportion of renewable energy, with 15% of primary energy demand from renewable energy sources (Table 3.5.4).

Table 3.5.4: 1998 Primary Energy Demand by Energy Source

Fuel Type	**Primary Energy Demand**	
	Canada	**New Brunswick**
Oil	33%	65%
Natural Gas	30%	0%
Coal	10%	13%
Hydro	9%	3%
Nuclear	9%	4%
Renewables	**6%**	**15%**
Natural Gas Liquids	3%	negligible
TOTAL	100%	100%

Source: Statistics Canada 57-003, QIV

Accordingly**, the Province will monitor the development of Renewable Portfolio Standard programs in other jurisdictions and assess the benefits for New Brunswick**.

3.6 ENVIRONMENTAL CONCERNS

3.6.1. BACKGROUND

Energy consumption and the resultant atmospheric emissions are significant contributors to current environmental issues before the province. New Brunswick's geographic location downwind of densely populated and industrialized areas of the United States and Canada has lead to the province playing an active role in handling many air pollution issues. By responsibly managing emissions from its own sources, New Brunswick has been able to leverage significant upwind emission reductions through a series of national and international agreements.

While SO_2 emissions have been reduced significantly in New Brunswick and across Eastern North America, continuing health and environmental studies clearly indicate that further reductions are needed. At the same time, these studies also indicate that many other emissions associated with energy consumption need to be further controlled. All this is occurring at a time when climate change, driven mainly by world-wide reliance on carbon based energy supply, is becoming more clearly recognized as a challenge for today's energy planners.

While air quality is perhaps the dominant environmental issue associated with energy use, there are others including surface and groundwater quality, land use, and habitat destruction. In an effort to control soil and groundwater contamination, New Brunswick has developed one of the most comprehensive underground storage tank replacement programs available. The Province has also been involved in mitigating the effects of acid mine drainage related to the mining of indigenous coal, and working with other agencies to address safe storage of spent nuclear fuel. To deal with the more general issues surrounding energy development projects, the Province administers an Environmental Assessment Regulation and maintains cooperative agreements with the federal government.

Environmental issues associated with energy use are discussed below, followed by a discussion of energy-related actions that will be taken to mitigate their effects on the environment.

3.6.2. KEY ENVIRONMENTAL ISSUES

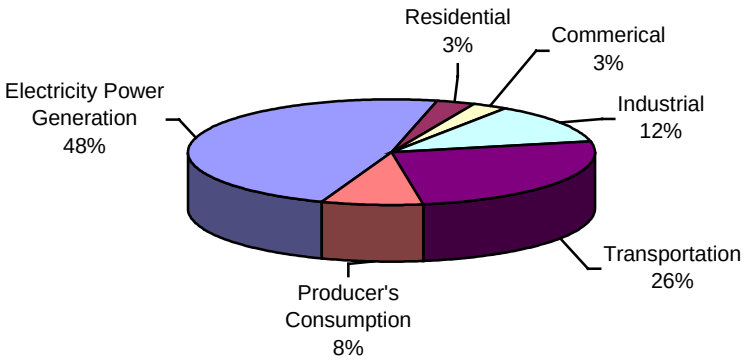
The inextricable link between energy use and its effect on the environment has long been acknowledged. As such, **the Province will ensure policy integration between New Brunswick's energy and environmental objectives.**

New Brunswick has recognized for many years that preservation and enhancement of environmental quality requires not only stewardship within the province, but also by upwind provinces and states. For example, New Brunswick cannot solve its problems related to acid rain, ground-level ozone (smog) and mercury deposition alone, but must work together with other provinces and states. Climate change has the broadest context of any environmental issue facing New Brunswick in that climate change

impacts felt in New Brunswick are identical, regardless of whether greenhouse gas ("GHG") emissions occur in New Brunswick or elsewhere in the world. **The Province will continue to actively work with the federal government, the Conference of New England Governors and Eastern Canadian Premiers, and other organizations to address trans-boundary and global air emission issues**.

3.6.2.1. Climate Change

Carbon dioxide emissions represent the greatest contributor to climate change. Fossil fuel consumption is by far the largest contributor of CO_2 concentrations in the atmosphere. In New Brunswick, electricity generation produces the most significant proportion of CO_2 emissions, followed by transportation (Figure 3.6.2(a)).



Source: Statistics Canada No. 57-003

Figure 3.6.2 (a): New Brunswick CO_2 emissions, 1998
Total = 18.1 million tonnes

Addressing the causes of climate change is a global environmental issue. In 1992, Canada ratified the Framework Convention on Climate Change to stabilize emissions of GHGs at 1990 levels by the year 2000. In 1997, Canada signed, but has not yet ratified, the Kyoto Protocol which commits Canada to reduce GHG emissions to 6% below 1990 levels by 2008 – 2012. Attainment of Kyoto commitments will be very challenging for Canada, given current forecasts that show national GHG emissions growing by 1.6% annually through 2010.

New Brunswick and the other provinces have joined the federal government in developing a National Implementation Strategy to be used as a framework for action before ratification of Kyoto protocol occurs. The Strategy incorporates a three-year rolling business plan, with the initial focus on building awareness and understanding, promoting technology, leading by government example, and encouraging private action. In doing its part toward developing a National Implementation Strategy, **the Province will produce a provincial Climate Change Action Plan.**

There is a wide range of programs that can be pursued in New Brunswick, in line with a provincial Climate Change Action Plan. The comprehensive Plan will include measures to mitigate and adapt as well as to reduce GHG emissions. An important component of the Plan will be a public education outreach program. Activities in this regard will commence immediately. For example, the Province is hosting the New England

Governors and Eastern Canadian Premiers ("NEG/ECP") Climate Change Workshop in March 2001. The workshop will focus on issues common to the Northeast region and will set the stage for a NEG/ECP Action Plan on Climate Change.

Further examples of actions being considered or undertaken in New Brunswick include expansion of the natural gas infrastructure, establishment of appropriate energy price signals and promotion of energy efficiency. Finally, the Province will need to make efforts in adapting to the changing climate in areas such as emergency response, agriculture, forestry, and coastal regions.

New Brunswick's energy efficiency strategy, as described in Section 3.4.4 of this document, will be the core contribution to the provincial Climate Change Action Plan to combat greenhouse gas emissions.

New Brunswick believes that adequate federal resources must be provided to assist the Province in the analysis of the impact of climate change on the environment and the economy, as well as the impact of implementing measures to reduce GHG emissions. **The Province will pursue a federal-provincial framework agreement to help focus policy and resources on the issue of climate change**.

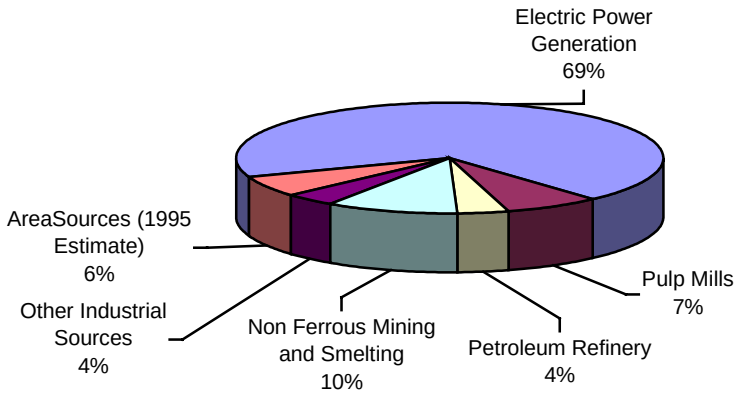
3.6.2.2. Acid Rain

Acidification of surface water bodies, forests and agricultural soils, and damage to flora and fauna led to a series of programs to reduce acid deposition. The 1985 Eastern Canada Acid Rain Program achieved sulphur dioxide ("SO_2") emissions reduction of greater than 50%, relative to 1980 levels.

Research shows that substantial additional reduction of SO_2 and nitrogen oxides ("NO_x") emissions in Canada and the U.S. are needed to bring acid deposition to safe thresholds. The development of "The Canada-Wide Acid Rain Strategy for Post-2000" was co-chaired by New Brunswick and Canada. The negative impact that these pollutants have on respiratory health and the importance of NO_x as a contributing hazard have been key drivers for further restrictions in acid deposition.

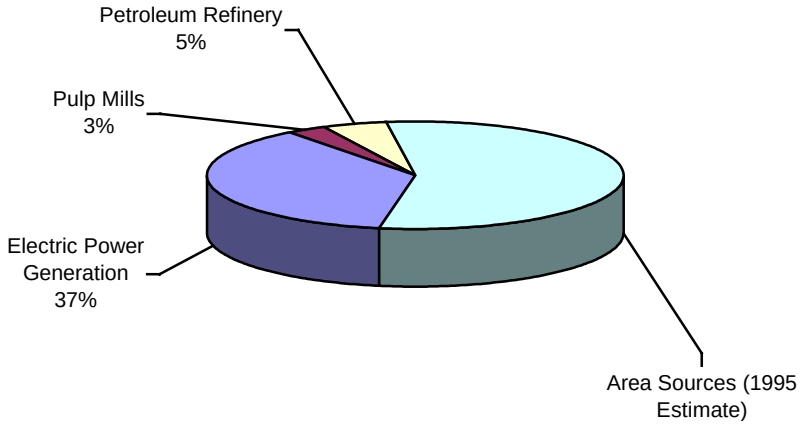
In New Brunswick, the major source of SO_2 emissions is electric power generation (Figure 3.6.2 (b)), while area sources (motor vehicles) and electric power generation together account for 92% of all the NO_x produced (Figure 3.6.2 (c)).

The Conference of New England Governors and Eastern Canadian Premiers adopted an Acid Rain Action Plan in 1999 to reduce acid deposition in the region by 50% beyond existing mandates. Under the Canada-wide Acid Rain Strategy of Post-2000, Quebec is reducing its SO_2 emissions by an additional 40% by 2002 and Ontario is targeting a 50% cut by 2015. New Brunswick will further reduce both SO_2 and NO_x emissions.



Source: Government of New Brunswick, unpublished data

Figure 3.6.2 (b): New Brunswick SO_2 emissions, 1998
Total = 133,485 tonnes



Source: Government of New Brunswick, unpublished data

Figure 3.6.2 (c): New Brunswick NOx emissions, 1998
Total = 71,600 tonnes

3.6.2.3. Canada Wide Standards ("CWS")

In 1998, New Brunswick signed an accord on Environmental Harmonization with the Canadian Council of Ministers of the Environment (CCME) as a mechanism to set priorities and develop a host of new environmental standards in a consistent manner across the country. Initial priority has been placed on ground-level ozone (smog), mercury, fine particulate matter, dioxins and furans. New Brunswick is unique in that it is the only province which must, by legislation, consult with the public before adopting such standards.

The Saint John area is one of three regions in Canada that has occasional ground level ozone readings in excess of the current national objective. Air monitoring data indicates that a substantial portion of the ozone problem stems from trans-boundary pollution flows. In 1991, Canada and the U.S. signed an agreement affirming the need for cooperation to reduce trans-boundary air pollution. On October 13, 2000, the countries agreed on a specific Annex on Ground Level Ozone to reduce substances that contribute to this pollution in New Brunswick from upwind areas in the United States, Ontario and Quebec. The CWS for ozone recognizes the continuing role of trans-boundary pollution.

Fine particulates have been the subject of recent regulatory concern under the CWS and new ambient air quality standards in the U.S. Research points to a significant number of premature deaths being caused by inhalation of fine particulates. Mercury is a neurotoxin associated with coal combustion and incineration.

The Province will continue to monitor the effect of SO_2 (acid rain) and NO_x (ozone) emission reduction plans under the Canada – United States Agreement and the impacts that other Canada Wide Standards will have on the energy industry.

3.6.2.4. Electric Power Generation Facilities

Within the time frame of this policy, fundamental operating decisions will have to be made on two generation facilities in New Brunswick, the Point Lepreau nuclear generating facility and Grand Lake station. Decisions made on these and other generating facilities will have significant environmental implications for the province.

Approximately 300,000 tonnes of coal were mined in New Brunswick in 2000. Half of this amount was transported to the Belledune power plant where it was mixed with low sulphur coal and the emissions captured by flue-gas desulphurizaton equipment (scrubber). The remainder was burned at the Grand Lake power plant, which is equipped only with particulate control. In 1998, SO_2 emissions at the 60 MW Grand Lake Station were 22.5 kilotonnes or about 23% of total Crown utility emissions. The very high relative emissions from this facility reflect the use of Grand Lake coal (8% sulphur with high ash and mercury content) and the absence of flue gas desulphurization. The Crown utility has announced that shipments of coal from Grand Lake to the Belledune coal-fired generating station will be stopped in 2001 and the Grand Lake generating station is nearing the end of its economic life.

The Point Lepreau nuclear generating station is an extremely important component in the Crown utility's emission control program, as its operation produces negligible air emissions, emitting no CO_2, NO_x, SO_2 or particulates. Although Point Lepreau comprises 18% of the Crown utility's capacity, it produced 30% of the utility's output in 1999, with a load factor of approximately 75%. A report by Hagler-Bailly in 1998 concluded that a substantial capital improvement project would be required by 2008 to maintain the unit in operation into the future.

While economics will no doubt drive decisions, **the Province will evaluate environmental and economic considerations when reviewing the future direction of any electric power generation facility in New Brunswick**.

The need for safe, permanent storage of spent nuclear fuel and radioactive waste is a continuing environmental concern. Fuel at Point Lepreau is stored in temporary, on-site facilities while the federal initiative to find a permanent storage site for spent fuel continues. **The Province will continue to work with the Crown utility and federal and other provincial governments to identify appropriate options for storage of high and low level nuclear wastes.**

3.6.3. MITIGATIVE MEASURES

Presented below are some example of action items that are designed to mitigate a number of the emerging issues identified above and respond to other environmental issues that stem from energy use or production.

3.6.3.1. Emissions Trading

Under the 1985 Eastern Canada Acid Rain Program, New Brunswick proposed and implemented a 175-kilotonne SO_2 cap that took effect in 1994. Under this cap, the Crown utility has its own cap of 123 kilotonnes, with other large industrial sources making up the balance. The existing acid rain program offers some limited flexibility for entities like the Crown utility to shift emissions between plants, provided fuel sulphur limits are observed and provincial ambient standards for SO_2 are met. However, the program is not a "cap and trade" program which grants allowances to sources and allows trading among sources to facilitate economical compliance costs.[25]

Under the Canada-Wide Acid Rain Strategy for Post 2000, New Brunswick has adopted a new SO_2 reduction target. This is an opportune time for New Brunswick to consider both the amount of reduction as well as the merits of a cap and trade program to make the reduction economically efficient as well as protective of public health and the environment. The Acid Rain Program in the United States relies on a cap and trade program that has proven highly effective and efficient. One recent study found that the

[25] Cap and trade programs are receiving increased application across North America. Under a cap and trade program emissions from sources are limited to a specific level, generally at a level which requires meaningful reductions in emissions. The level of the cap is determined by the amount of emissions that are allocated to existing sources of emissions. These sources are then free to trade their emission allowances such that sources which can implement emission control techniques at relatively low cost can over control and sell their allowances to other sources that have higher control costs.

ability to trade among sources reduced compliance costs by 13% in 1995 with expected savings growing to 37% by 2005.

At the same time, the ozone agreement and the response to climate change will lead to additional emission reduction requirements. Greenhouse gas emissions trades may be even more appropriate for such a program. **The Province will explore opportunities for and implications of the development of a cap and trade program for all air emissions**.

3.6.3.2. Natural Gas

The introduction of natural gas to New Brunswick offers many opportunities for environmental benefits that may be realized with the displacement of higher carbon fuels currently used. However, capital costs to extend lines or for customers to purchase gas-burning equipment may be an obstacle for the Province to realize the full benefit of this fuel.

3.6.3.2.1. Emission Reduction Credits for Natural Gas Conversions

One means of facilitating new investment in natural gas distribution facilities and equipment would be to allow entities subject to the SO_2 cap to receive SO_2 emission credits for making investments that reduce the use of SO_2-emitting fuels such as fuel oil and coal. For example, if an industrial company paid 100% of the cost to convert a large furnace from oil to gas, the company could be entitled to receive SO_2 emission reduction credits. **The Province will consider expanding any cap and trade programs established in New Brunswick to include credits for all emission reductions resulting from natural gas conversions**.

3.6.3.2.2. Natural Gas Vehicles

Emissions from natural gas vehicles ("NGV"s) are much lower than those from gasoline-powered vehicles. Natural gas vehicles also emit 20% less greenhouse gases and a fraction of the air toxins relative to gasoline vehicles. These emissions reductions are due to two factors: the cleaner burning nature of natural gas as a vehicular fuel and the fact that dedicated NGVs produce little or no evaporative emissions during fuelling and use.

Natural gas vehicles may help the market reach sufficient critical mass to facilitate more widespread or accelerated introduction of natural gas service in the province. Each NGV is the equivalent of a residential heating customer, except that the load is relatively constant throughout the year.

There are, however, several significant barriers to natural gas vehicle market success. Natural gas vehicles typically cost more than conventional vehicles and have a lower range and route limitations based on the location of refuelling stations. There is also a "chicken and egg" phenomenon whereby consumers will not purchase NGVs if there is no refuelling infrastructure in place, and infrastructure providers are reluctant to build refuelling facilities without an ample NGV market. Nonetheless, experience in other parts of North America has indicated that some large fleet owners, including governments, have made significant investments in these vehicles and fuelling structures.

The Province will evaluate a range of options to promote the use of low emission vehicles, such as those using natural gas. Options may include Government procurement of vehicles and fuel facilities, especially for fleet applications, and incentives for NGV purchase, fuelling station development and/or NGV fleet development.

3.6.3.3. Bio-Fuels

Wood is a renewable resource as it can be naturally replenished to keep pace with usage. Wood burning emits no net carbon, because the CO_2 emissions from combustion are taken up by new growth, if the resource is sustainably managed.

Wood has long been used as a fuel in New Brunswick and there is a significant amount of economic activity associated with wood production and distribution. However, New Brunswick wood resources are limited and appear to be fully utilized in some areas of the province. For these reasons, New Brunswick supports the use of wood in high value applications.

Wood burning can produce adverse indoor and outdoor air quality such as smoke, soot and carbon monoxide that can be unpleasant or even life threatening. By selecting the appropriate, low-emission wood burning equipment, and maintaining it properly, these problems can be diminished. Certified clean burning equipment, approved under provincial regulations (CSA B415 performance standard), or by the U.S. Environmental Protection Agency (EPA) reduce smoke emissions by as much as 90% compared to conventional wood-burning equipment. **The Province will require all new wood burning appliances installed in New Brunswick to meet the CSA standard.**

In the past decade, significant advances have been made in low-emission and high efficiency stoves, furnaces and fireplaces. However, the cost of retrofitting existing applications may be a barrier for some homeowners and other users. **The Province will evaluate several options designed to overcome barriers and promote the adoption of appropriate bio-fuel technologies**. Options may include:

- Establishment of minimum performance levels for wood stoves;
- Provision of public information about the benefits of clean burning equipment, and how to select the right equipment for the particular end-use; and
- Replication of a wood stove exchange program to encourage use of higher efficiency wood stoves.

3.6.3.4. Preparation for Competition in Electricity Export Markets

With the introduction of electricity competition, environmental standards that have been or are being adopted for fossil fuelled generation plants in Canada and the United States will present both risks and benefits to New Brunswick. To the extent that such standards reduce emissions affecting New Brunswick's environment, they are clearly beneficial. Conversely, they could have adverse economic impacts if reciprocity agreements require New Brunswick generators to meet environmental standards in order to avoid negatively impacting their ability to export electricity. Such standards could be onerous for some facilities. However, the installation of modern emission control equipment on its fossil fuel plants has place New Brunswick in a reasonably

good position. An agreement has been reached to reduce SO_2 and NO_x emissions from Coleson Cover over the next five years. A decision on the future of the Grand Lake plant will need to be made in the near future.

New Brunswick will participate in development of environmental standards and will ensure that any such decisions are consistent with real environmental requirements. **The Province will monitor and work closely with provincial and U.S. state officials to influence outcomes and ensure that any standards or programs adopted are consistent with New Brunswick's environmental requirements and the commitment to maintaining competitive access to export markets**.

4.0 MEETING THE ENERGY POLICY GOALS

The White Paper describes the framework for a provincial energy policy that will guide New Brunswick through 2000-2010. The five energy policy goals upon which objectives were developed are to:

1. ensure a secure, reliable and cost effective energy supply for residential, commercial and industrial users,
2. promote economic efficiency in energy systems and services,
3. promote economic development opportunities,
4. protect and enhance the environment, and
5. ensure an effective and transparent regulatory regime.

This section contains a compilation of the actions that will be undertaken to achieve the energy policy goals, as identified in bold typeface throughout the document. The section in which the objective is discussed in the White Paper appears in brackets.

4.1 ELECTRICITY

The Province accepts the Select Committee recommendation and will proceed with a deliberate and controlled approach by introducing wholesale competition and allowing non-utility generation and retail competition for large industrial customers, while waiting until conditions prove more favourable before permitting full retail competition (3.1.2).

The Province will establish a market design committee to address development of the electricity market including its design, structure and rules, and make recommendations to the Province by April, 2002 (3.1.2).

The Province will target implementation of wholesale competition by April, 2003 (3.1.3.1).

The Province will require wholesale participants that reduce their firm load on the Crown utility's system to levels that are below their calendar year 1999 load, to be assessed an exit fee or other equivalent charge, approved by the Board (3.1.3.1).

The Province will direct the market design committee to make recommendations regarding requirements for market surveillance and issues related to establishing a workably competitive electricity market (3.1.3.2).

The Province will direct the Crown utility to seek options for resolving physical limitations to participation in neighbouring markets through increased transmission capacity (3.1.3.2.1).

The Province will direct the Crown utility to continue to pursue discussions with neighbouring jurisdictions regarding the formation of a regional transmission organization or other mechanisms that enhance the overall level of access among these systems (3.1.3.2.1).

The Province will continue to carefully monitor emerging market compliancy issues, particularly as they relate to Federal Energy Regulatory Commission ("FERC") requirements (3.1.3.3).

The Province will examine the issue of establishing a level playing field between the Crown utility and other market participants over the next two years and will ensure that this does not impede the development of a competitive wholesale market (3.1.3.4).

The Province will direct the market design committee to consider reliability of supply for New Brunswick in its market design recommendations (3.1.3.5).

The Province will introduce wholesale competition by permitting the distribution electric utilities to procure power in the competitive market by a target date of April, 2003 (3.1.3.6).

The Province will require distribution electric utilities to file their rates and all long-term contracts with the Board (3.1.3.6).

The Province will allow no new distribution electric utilities in New Brunswick at this time and will limit existing distribution utilities to their current service territory (3. 1.3.6).

The Province will table amendments to the *Electric Power Act* which will include removal of current restrictions on the construction of generation facilities (3.1.4).

The Province will empower the Board to approve merchant plant transmission system interconnection requirements and transmission system use under a regulated, open access tariff (3.1.4.1).

The Province will require self-generators that reduce their firm load on the Crown utility's system to levels that are below their calendar year 1999 load to be assessed an exit fee or other equivalent charge, approved by the Board (3.1.4.2).

The Province will empower the Board to approve charges for ancillary services, transmission charges and, until there is workable competition, standard offer backup service (3.1.4.2).

The Province will direct the market design committee to examine means by which rate shock to existing self-generators can be avoided (3.1.4.2).

The Province will direct the distribution utilities to make customers more aware of actual prices and conditions in the market place (3.1.5).

The Province will allow large industrial customers, i.e., all industrial customers with a minimum contract demand of 750 kW that are connected to the transmission system, to

select a competitive retail supplier, with the target date for implementation of large industrial competition being April, 2003 (3.1.5.2.1).

The Province will require large industrial customers that reduce their firm load on the Crown utility system to levels that are below their calendar year 1999 load, to be assessed an exit fee or other equivalent charge, approved by the Board (3.1.5.2.1).

The Province will direct the market design committee to make recommendations for mitigation of market power in the context of the wholesale and large industrial retail electricity market such that the target implementation date can be achieved (3.1.5.2.1).

The Province will not move directly to full retail competition but will revisit the merits of introducing retail competition for smaller customers every two years or following pre-specified trigger points or events (3.1.5.2.2).

The Province will entitle all customers that do not select a competitive supplier to standard offer service under regulated prices and terms that are consistent with the service they now obtain (3.1.5.3).

The Province will evaluate alternatives for reducing the costs of introducing full retail competition in New Brunswick (3.1.5.4.1).

The Province will direct the Crown utility to eliminate, over time, cross-subsidization between customer classes to gradually provide rates that are within a range of 95 to 105% of the actual cost of providing the service (3.1.5.4.2).

The Province will give the Board the authority to monitor the competitiveness of the wholesale market and ensure that the Crown utility is unable to exercise market power (3.1.6.1).

The Province will direct the Board to regulate the open access transmission tariff (3.1.6.1).

The Province will direct the Board to adopt a light-handed, performance-based method of regulation (3.1.6.1).

The Province will mandate the Board with administrative oversight regarding reported abuses of the Crown utility's code of conduct and administration of its real time information system and violations of its open access tariff (3.1.6.1).

The Province will empower the Board with the responsibility of approving ancillary services charges and making determinations regarding stranded costs (3.1.6.1).

The Province will empower the Board with the authority to initiate a distribution utility rate review upon the complaint of a customer or under its own initiative (3.1.6.1).

The Province will require that distribution rates automatically be subject to Board review when rate increases in any customer class exceed an amount set by regulation (3.1.6.1).

The Province will impose a policy of user-pay with respect to recovery of stranded costs associated with the introduction of wholesale competition, non-utility generation and retail competition wherever feasible and in a way that does not unnecessarily impede the development of a vibrant wholesale and retail market (3.1.6.1).

The Province will direct the market design committee to examine and make recommendations regarding the need for reciprocity requirements in its design of the New Brunswick market (3.1.6.2).

4.2 NATURAL GAS

The Province will encourage rapid economic development of the natural gas infrastructure, making gas as widely available as is economically justified and in a manner that maximizes benefits to the citizens of New Brunswick (3.2.1).

The Province will continue to actively participate at future regulatory board energy hearings (3.2.2.1).

The Province will encourage discussions among potential natural gas customers, industry participants and other agencies which could result in sufficient load to anchor a lateral (3.2.2.1).

The Province will look for opportunities to form partnerships with the private sector and the federal government to secure funding that will provide leverage for natural gas infrastructure development and system expansions (3.2.2.1).

The Province will direct all franchise fees to help defray the expenses of the Board, particularly for costs associated with pipeline safety (3.2.2.1).

The Province will provide ongoing assessment of Enbridge Gas New Brunswick's progress and compliance with their proposal (3.2.2.1).

The Province will reassess the *Gas Distribution Act, 1999* to identify any areas where it might be amended to improve the effectiveness of the competitive natural gas retail market (3.2.2.2).

The Province will continue to explore opportunities for the development of natural gas storage facilities by the gas industry (3.2.2.3).

The Province will continue to offer and actively support training programs in community colleges to ensure that the infrastructure to assist the installation and maintenance of systems that burn gaseous and liquid fuels is in place (3.2.2.4).

The Province will work cooperatively with its colleges and universities to look for opportunities to promote research and development that will foster the penetration of natural gas in New Brunswick (3.2.2.4).

The Province will further develop the New Brunswick hydrocarbon geoscience database (3.2.3).

The Province will make information available regarding the attractiveness of New Brunswick as a location for natural gas exploration (3.2.3).

The Province will provide a regulatory regime that minimizes barriers to exploration and development, and fosters the development of these indigenous resources (3.2.3).

The Province will have a competitive royalty regime in the event that there are economic discoveries of indigenous hydrocarbons (3.2.3).

The Province will serve as a reliable source of unbiased information that will enable New Brunswickers to make appropriate fuel choice and energy conversion decisions (3.2.4).

4.3 REFINED PETROLEUM PRODUCTS

The Province will only intervene with price regulation in the refined petroleum product markets if there is evidence of market failure (3.3.2.1).

The Province, if confronted with evidence of the abuse of market power, will bring such evidence to the attention of the Competition Bureau and encourage them to take action (3.3.2.1).

The Province will encourage heating oil dealers to reduce minimum purchase requirements and to offer budget-billing arrangements (3.3.2.2).

The Province will examine the effectiveness of heating assistance programs to make improvements where warranted (3.3.2.2).

The Province will monitor supply, demand and inventory positions for gasoline, diesel and heating oil to enable it to advise consumers of market conditions and to monitor the ongoing competitiveness of these markets (3.3.2.2).

The Province will encourage competition by promoting price transparency through the public posting of wholesale and retail price information (3.3.3).

The Province will provide price advisories to the public when appropriate (3.3.3).

The Province will exercise its authority to monitor markets by collecting, maintaining and analyzing pertinent refined petroleum product market information (3.3.4).

4.4 ENERGY EFFICIENCY

The Province will develop and implement a comprehensive energy efficiency strategy (3.4.4).

The Province will develop an energy efficiency information and education program in cooperation with other partner organizations (3.4.4.1.1).

The Province will direct provincial government departments to include energy efficiency in all relevant decisions and policies (3.4.4.1.2).

The Province will take energy efficiency into account when considering procurement options (3.4.4.1.2).

The Province will expand the provincial Energy Accounting System to include oil and natural gas (3.4.4.1.2).

The Province will continue to work with other agencies to extend the scope of the Provincial Buildings Initiative to include indirectly funded buildings such as hospitals, nursing homes and buildings owned or operated by crown corporations as well as municipalities (3.4.4.1.2).

The Province will monitor government operations and produce an annual report of energy efficiency performance (3.4.4.1.2).

The Province will actively seek partnership arrangements with the federal government for energy efficiency programs (3.4.4.1.3).

The Province will expand the list of equipment regulated for energy efficiency levels in harmonization with other jurisdictions, support the development of energy efficiency standards on any additional equipment and encourage the installation of high performance appliances (3.4.4.1.4).

The Province will seek a variety of broad-based energy efficiency funding mechanisms (3.4.4.2.1).

The Province will contribute energy efficiency seed funding to leverage resources from other sources (3.4.4.2.1).

The Province will explore options to be included in a comprehensive residential retrofit program (3.4.4.2.2).

The Province will investigate opportunities for residential energy efficiency programs that are specific to social housing and low income households (3.4.4.2.2).

The Province will consider options to be included in a comprehensive commercial retrofit program (3.4.4.2.3).

The Province will examine the benefits of adopting the national energy codes for buildings (3.4.4.2.3).

The Province will investigate industrial sector energy efficiency measures that focus on energy pricing and services, industry specific performance standards, research and development and demonstration of new competitive technologies (3.4.4.2.4).

The Province will examine options to promote energy efficiency in the transportation sector as part of a new Transportation Policy currently under development (3.4.4.2.5).

The Province will direct the Crown utility to produce and file time-of-use rates with the Board by autumn 2002 (3.4.4.3.1).

The Province will direct the Crown utility to examine removal of the declining block rate and investigate how this would impact upon existing customers (3.4.4.3.1).

The Province will promote cogeneration as the most energy efficient electricity generation option (3.4.4.3.2).

The Province will work with distribution utilities to develop a fuel switching strategy as part of the energy efficiency strategy (3.4.4.3.3).

The Province will examine the role of a collaborative demand-side management program in moving toward full retail competition (3.4.4.3.4).

4.5 ALTERNATIVE ENERGY

The Province will continue to promote research and development in renewable/alternative energy, and related economic development opportunities (3.5.4.1).

The Province will look for opportunities to undertake demonstration projects that showcase the benefits of renewable and alternative technologies that help jumpstart the market to manufacture, sell and maintain renewable and alternative technologies (3.5.4.2).

The Province will work with the federal government to closely monitor progress in alcohol production technology and examine the potential for production and use of alcohol as a transportation fuel and/or fuel additive in New Brunswick (3.5.4.3).

The Province will direct the market design committee to review and make recommendations on the role and treatment of small-scale, on-site electricity generation (3.5.4.4).

The Province will require the Crown utility and other distribution utilities in the province to develop a green pricing option and market it to interested customers (3.5.4.5).

The Province will direct the Crown utility and other distribution utilities to use any funds derived from a green pricing option to promote the development of arenewable technologies in New Brunswick (3.5.4.5).

The Province will monitor the development of Renewable Portfolio Standard programs in other jurisdictions and assess the benefits for New Brunswick (3.5.4.6).

4.6 ENVIRONMENTAL CONCERNS

The Province will ensure policy integration between New Brunswick’s energy and environmental objectives (3.6.2).

The Province will continue to actively work with the federal government, the Conference of New England Governors and Eastern Canadian Premiers, and other organizations to address trans-boundary and global air emission issues (3.6.2).

The Province will produce a provincial Climate Change Action Plan (3.6.2.1).

The Province will pursue a federal-provincial framework agreement to help focus policy and resources on the issue of climate change (3.6.2.1).

The Province will continue to monitor the effect of SO_2 (acid rain) and NO_x (ozone) emission reduction plans under the Canada – United States Agreement and the impacts that other Canada Wide Standards will have on the energy industry (3.6.2.3).

The Province will evaluate environmental and economic considerations when reviewing the future direction of any electric power generation facility in New Brunswick (3.6.2.4).

The Province will continue to work with the Crown utility and federal and other provincial governments to identify appropriate options for storage of high and low level nuclear wastes (3.6.2.4).

The Province will explore opportunities for and implications of the development of a cap and trade program for all air emissions (3.6.3.1).

The Province will consider expanding any cap and trade programs established in New Brunswick to include credits for all emission reductions resulting from natural gas conversions (3.6.3.2.1).

The Province will evaluate a range of options to promote the use of low emission vehicles, such as those using natural gas (3.6.3.2.2).

The Province will require all new wood burning appliances installed in New Brunswick to meet the CSA standard (3.6.3.3).

The Province will evaluate several options designed to overcome barriers and promote the adoption of appropriate bio-fuel technologies (3.6.3.3).

The Province will monitor and work closely with provincial and U.S. state officials to influence outcomes and ensure that any standards or programs adopted are consistent with New Brunswick's environmental requirements and the commitment to maintaining competitive access to export markets (3.6.3.4).

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GLOSSARY

Acid Rain

Also called acid precipitation or acid deposition, acid rain is precipitation containing harmful amounts of nitric and sulphuric acids formed primarily by nitrogen oxides and sulphur oxides released into the atmosphere when fossil fuels are burned. It can be wet precipitation (rain, snow, or fog) or dry precipitation (absorbed gaseous and particulate matter, aerosol particles or dust).

Anchor Load

A large potential natural gas customer that is willing to sign a long-term contract with a pipeline company for gas transportation service. The pipeline company needs anchor customers in order to provide the economic justification for constructing the project. Anchor customers tend to be large industrial facilities or electric generating facilities.

Ancillary Services

Ancillary services are those services necessary to support the transmission of energy from resources to loads while maintaining reliable operation of the transmission system. Ancillary services typically include operating reserves, regulation and frequency imbalance, and voltage support and control.

Biomass

Energy resources derived from organic matter. These include wood, agricultural waste and other living-cell material that can be burned to produce heat energy. They also include algae, sewage and other organic substances that may be used to make energy through chemical processes.

Board

The Board of Commissioners of Public Utilities, constituted under the *Public Utilities Act*.

Capability

The maximum load that a generating unit, generating station, or other electrical apparatus can carry under specified conditions for a given period of time without exceeding approved limits of temperature and stress.

Capacity

The maximum power that a generating unit, generation station, or other electrical apparatus can supply, usually expressed in megawatts.

City Gate

Location at which responsibility for natural gas transportation is transferred from the pipeline transmission company to the distributor, generally associated with a reduction in pipe size and pressure.

Co-generator

A generating facility that produces electricity and another form of useful thermal energy (such as heat or steam) used for industrial, commercial, heating, or cooling purposes.

Combined Cycle Plant

An electric generating station that uses waste heat from its gas turbines to produce steam for conventional steam turbines.

Congestion

The condition under which the transactions that market participants wish to implement exceed the transfer capability of the transmission grid. Congestion usually requires the system operator to adjust the output of generators, decreasing output in one area to relieve the constraint and increasing it in another to continue to meet customer demand.

Contestable Market

With respect to market power analysis, any market that is open to outside competitors that would be able to limit the market power of a dominant player, whether or not such outside competitors currently exist or compete in that market.

Demand-Side Management (DSM)

The planning, implementation, and monitoring of utility activities designed to encourage consumers to modify patterns of electricity usage, including the timing and level of electricity demand. It refers only to energy and load-shape modifying activities that are undertaken in response to utility-administered programs. It does not refer to energy and load-shape changes arising from the normal operation of the marketplace or from government-mandated energy efficiency standards.

Direct Load Control

Refers to program activities that can interrupt consumer load at the time of annual peak load by direct control of the utility system operator by interrupting power supply to individual appliances or equipment on consumer premises. This type of control usually involves residential consumers. Direct Load Control excludes Interruptible Load and other Load Management effects.

Distribution Tariff

The charge the customer pays for the local transportation (natural gas) or distribution service (electric) provided by the local distribution company (LDC).

Distributor

A company engaged in distributing natural gas to end-users. Distributors control the gas between the city gate and the end-user's meter. Distributors are frequently referred to as local distribution companies (LDC).

End-use Consumer or Customer

A residential, commercial, or industrial customer in the energy marketplace who buys energy for its own consumption and not for resale.

Flue Gas Desulphurization

The emission control technique that utilizes a dry or wet limestone injection process to remove sulphur dioxide from flue gasses.

GHG

Green house gas / gasses.

Generator

An entity that owns and operates an electricity generation facility.

Greenfield Investments

Investments in new generation or transmission facilities that are located on new sites, rather than at sites with existing facilities.

Greenhouse Effect

The increasing mean global surface temperature of the earth caused by gases in the atmosphere (including carbon dioxide, methane, nitrous oxide, ozone, and chlorofluorocarbon). The greenhouse effect allows solar radiation to penetrate but absorbs the infrared radiation returning to space.

Green Power Marketing

Commercial process of marketing and selling the output of certain generation sources identified as "green" because they meet certain standards for being deemed environmentally preferable.

Ground-Level Ozone

Ground-level ozone is the main ingredient in urban smog. In the presence of sunlight and heat, gaseous air pollutants react to produce ground-level ozone smog. Ground level ozone is not emitted directly. It is the result of a chemical reaction that happens in

the atmosphere. The two main components of ozone are volatile organic compounds (VOCs) and nitrogen oxides (NOx). When these two chemicals are heated up in the air they form ozone.

Incumbent Utility

The existing utility that serves customers, and in some instances may benefit from its existing customer relationships.

Independent System Operator (ISO)

A system and market operator, who is independent of other market interests, i.e., has no ownership interest in the transmission facilities and no vested interest in specific market outcomes.

Interconnected System

Two or more individual transmission systems that have one or more interconnecting tie lines.

Interval Meter

An electricity meter that is able to record and track a customer's electricity consumption over time so that the consumption in each unit of time can be matched with the cost of power during that period of time.

Kilowatt-hour (kWh)

A standard unit for measuring electricity. Residential customers' rates are usually expressed in cents per kilowatt-hour.

kWh Metering

Metering capable of measuring the total usage or flow of kilowatt-hours on a continuing basis, but not capable of recording and tracking such usage over shorter intervals, such as every hour or half-hour.

LDC

Local Distribution Company. An entity that owns a distribution system for the local delivery of energy to consumers.

Light-handed Regulation

A streamlined regulatory method designed to speed up the process and reduce the cost while balancing the interests of the various parties and allowing the regulator to carry out its statutory duties.

Load

The amount of electric power or natural gas volume delivered or required at any specific point or points on a system. The requirement originates at the energy consuming equipment of the consumer.

Load Profile

An approximation of the amount of energy typically taken during each hour by a consumer or class of consumers over a defined time, such as monthly, given the total amount of energy metered for that defined period. Load profiles are needed for consumers who do not have interval meters, and are used to allocate total kWh usage over the month to each hour, in order to perform settlements that are based on hourly prices.

Market-Clearing Price

The price at which a market clears, such that there are no further gains to be made from further trading.

Market Power

The ability of a market entity to profitably exercise significant influence or control over prices or the terms and conditions of sale, through means other than superior competitive performance.

Megawatt (MW)

Unit of electrical power, used to measure the generating capability capacity of a generating station or the maximum demand of an electricity consumer.

Megawatt-hour (MWh)

A measure of the energy produced by a generating station over time: one megawatt of power produced for 24 hours provides 24 megawatt-hours of energy (as does 24 megawatts produced for one hour).

Merchant Generator / Plant

An electric generating facility that is built without any sales commitments.

Meters or Metering

Equipment that measures and registers the amount and direction of energy quantities over a period of time.

Non-Discriminatory Access

The rules that assure that all market participants have access to the market, the transmission system, distribution systems and ancillary services under the same terms

and conditions, with no preferential treatment for those entities who may own, or are affiliated with the owners of, transmission system or distribution system assets.

Particulate Matter (PM)

Unburned fuel particles that form smoke or soot and stick to lung tissue when inhaled. A chief component of exhaust emissions from heavy-duty diesel engines.

Peaking

Generating capability normally designed for use only during the maximum load period of a designated time interval.

Peaking Capacity

Generating capacity typically used only to meet the peak demand, the highest demand for electricity during the day. Peaking capacity is typically provided by hydroelectric generators or gas-fired combustion turbine generators.

Performance-Based Regulation (PBR)

Any rate-setting mechanism that attempts to link rewards (usually profits) and penalties to desired results or targets.

Postage Stamp Rate

A rate that applies to a particular area that does not vary by the distance between the receipt point and the delivery point. The Maritimes and Northeast Pipeline will have a postage stamp rate in New Brunswick because the transmission rates will be the same for gas delivered by the pipeline to any location in New Brunswick served by the mainline or any of the laterals.

Power Marketers

Business entities engaged in buying and selling electricity, but which do not own generating or transmission facilities.

Projected Marginal Energy Cost

The projected sum that has to be paid for the next increment of product or service. The marginal cost of electricity is the price to be paid for kilowatt-hours above and beyond those supplied by available generating capacity.

Rate of Return Regulation

Process of regulation whereby the regulator sets rates at a level that will cover operating costs and provide an opportunity to earn a reasonable rate of return on the invested property devoted to the business. Also known as Cost of Service Regulation**.**

Regional Haze

Fine particles in air not only can impact human health but, because they scatter and absorb light effectively, also can affect the quality of life by impairing visibility. Impaired visibility in all directions over a large area is called "regional haze."

Regulation

The oversight of a market by an administrative agency or regulator, including any intervention in the markets to set rates and other terms and conditions under which the regulated service must be provided. Traditional regulation attempts to put a monopoly under restraints to achieve prices (rates), output and investment levels comparable to those that would occur under a competitive market.

Regulator

An entity that, through power of law or some other legitimate means, has the authority to impose regulation.

Reliability

The degree of performance of the elements of the bulk electric system that results in electricity being delivered to customers within accepted standards and in the amount desired. Reliability may be measured by the frequency, duration, and magnitude of adverse effects on the electric supply.

Retail Market or Retail Access

A market in which electricity and other energy services are sold directly to consumers by competing suppliers. Also known as Direct Access.

Retailer

An entity that purchases electricity for the purpose of selling electricity to a consumer or acting as agent or broker for a consumer or another retailer with respect to the sale of electricity.

Spot Market

A market in which goods are traded for immediate or near-immediate delivery. In many market designs, the market operator would operate and administer settlements for a

spot market in electricity, in which suppliers could submit bids to sell and purchasers could submit offers to buy energy through a coordinated auction, with settlements based on market-clearing prices. Market participants are free to use the spot market to sell/purchase energy at market-clearing prices, as needed.

Spot Market Prices

The market-clearing prices determined in a spot market and used as the basis for settlements for all purchases and sales in that spot market.

Stranded Costs/Investment

Costs that cannot be recovered from market prices. With respect to electricity competition, stranded investments are those assets owned by a utility that would become uneconomic in a competitive market.

Substation

Facility equipment that switches, changes, or regulates electric voltage.

System Operator

The entity with the responsibility to monitor and control an electric system in real time. (The term can also refer to the individual at an electric system control centre who is monitoring and controlling the electric system in real-time).

System Losses

Percentage of kWh's consumed by the utility that was not ultimately billed to the customer. Losses can be due to line or transformation losses, errors in billing or billing estimates or theft of power.

Tariff

The terms and conditions under which a service or product will be provided, including the rates or charges that users of service or product must pay. Tariffs are usually proposed by the service or commodity provider, and are subject to regulatory approval. Typically, the rates and terms for obtaining transmission service are set forth in a tariff.

Transmission

The movement or transfer of electric energy over an interconnected group of lines and associated equipment between points of supply and points at which it is transformed for delivery to consumers, or is delivered to other electric systems. Transmission is considered to end when the energy is transformed for distribution to the consumer.

Unbundling

The breaking down of a bundled service into its component parts so that a customer can choose to purchase different components of the service that they require from different parties. When LDCs offered only bundled services, their customers could purchase gas or electricity only from the LDC. In an unbundled environment, the customer can choose to purchase its gas or electricity supply from any supplier it wants and the LDC provides delivery to the customer's meter. Additional unbundling may allow other parties to provide other components of service, such as billing, meter reading, and credit and collection services.

Wheeling

The use of an interconnected transmission system to implement electricity transactions that transmit power into (wheeling in), within, out of (wheeling out) or through (wheeling through) that system.

Wholesale Market

This refers to the market in which electricity and other energy services are sold to wholesalers/retailers/distributors (who in turn sell to retail or end-use customers). A wholesaler/retailer/distributor of power would have the option to buy its power from a variety of generators or suppliers, and the generators or suppliers would be able to compete to sell their power to a variety of wholesalers/ retailers/distributors.