

PEI ENERGY COMMISSION

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Final Report

Charting Our Electricity Future

September 2012

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Commissioners Message

This Commission was tasked to examine and provide advice on the current status and future direction of Prince Edward Island's electricity system. We have made our best effort to examine the history of past initiatives, consult with the public, evaluate the current situation, seek guidance from others, and put forth a series of recommendations for change.

The PEI Energy Accord contained three primary elements:

1. A five year power purchase agreement between Maritime Electric and NB Power providing electricity supply cost stability from March 2011 until February 2016.
2. A fixed consumer price reduction (and hence reduced regulatory activity) for a two year period ending February 2013.
3. The establishment of the PEI Energy Commission in June 2011.

The Accord enabled a unique period of stability within which the Commission could research, learn, and gather extensive expert and public input on the complex nature of our electricity system. We hope that subsequent thoughtful consideration of an affordable and price-stable electricity supply in the years ahead is shown within our report.

In announcing the Accord, Government had made some decisions and set some elements of a future path; this effectively established the baseline upon which the Commission needed to build or change. In meeting the schedule set for delivery of our report, we particularly wanted to be respectful of the time required for Government to consider our recommendations before the expiry of the first two years of the Accord.

Electricity is a fundamental part of almost everything we do in one form or another, impacting each of us on a daily basis whether at home, work or play. Following the release of our discussion paper in February, 2012 we heard that Islanders expect reliable and affordable electricity, and increasingly are demanding a greater proportion of their electricity to come from renewable sources.

Prince Edward Island's electricity system is both common and unique. It is common in that it is comprised of a complex set of physical elements, contractual agreements, regulatory requirements and legislation. It is unique in that we are the smallest Canadian province, we are an island and we have few unpopulated areas. While other provinces benefit from inexpensive electricity derived from hydroelectric or natural gas generation, we are fortunate to have other unique advantages, perhaps the most important being the presence of our world class wind regime.

As we studied the issues it became obvious that they could not be considered in isolation nor was there one simple solution to solve our electricity challenges going forward. We have attempted to strike a balance in this report between the complexity of the various issues and the relevance to the variety of stakeholders that will be interested. This report is guided by three central themes:



Commissioners Message – continued

1. The Utilities and Their Future Role
2. Regulatory Control
3. Role of Government

In setting these themes the Commission has revisited several areas which were previously the subject of the 1982 McQuaid Commission. A number of that commission's recommendations were not implemented and in some cases we have repeated them here.

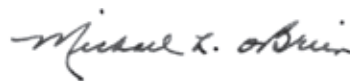
We are currently in an environment of favourable electricity prices reflective of a downturn in the North American economy while at the same time we are in an era of low interest rates. We cannot, however, assume this will always be the case. That is why there is a certain sense of urgency to make select planning decisions that are necessary for the long term stability of our electricity supply. Beginning serious dialogue on a new power purchase agreement for beyond 2015 and moving forward with plans for a new cable interconnection to the mainland are two such examples which will benefit from the current market conditions.

We are grateful to all who met with us, took part in our stakeholder presentation sessions and public forums, and to those who made written submissions to us. Their ideas and advice provided a wealth of insight and guidance to the Commission. The Commission also received the full cooperation of officials from our own and the New Brunswick governments, Crown agencies and our two utilities. Sincere thanks go out to all individuals that took the time to meet with us and to those who responded promptly to the many questions that were asked. In particular we wish to thank Bill Marshall, our senior advisor and the secretariat staff of the PEI Energy Corporation and Executive Council Office. Special thanks go to Mark Victor whose unwavering dedication to the project was instrumental in the completion of this report.

Serving as members of this Commission has been a highly rewarding experience and we sincerely hope that our work will help those involved in the governance of charting our electricity future.



David Arsenault
Co-Chair



Michael O'Brien,
Co-Chair



Richard Hassard
Commissioner



Roger King
Commissioner



Gerald Morneau
Commissioner

Foreword

Generation and supply of electricity in Prince Edward Island dates back to 1886 when the Montreal-based Royal Electric Engineering and Construction Company established the Prince Edward Island Electric Company to operate a 150 kilowatt plant in the City of Charlottetown. Within ten years, a group of businessmen in Summerside followed suit to establish the Summerside Electric Company Limited to power the Island's second largest community.



Figure F.1: Exterior View of Maritime Electric Company Plant in Charlottetown, 1926.

Courtesy of Maritime Electric Company, Limited.

In 1918, Maritime Electric Company, Limited assumed operation of the Charlottetown plant and in 1920 the Town of Summerside took ownership of the Summerside plant. During this same time period, electricity generation began to proliferate throughout rural Prince Edward Island as isolated installations on a community by community basis. Initially, rural power generation was primarily hydro-based but over time as demand grew and the community systems became interconnected, reliance on hydro generation decreased.

In the years that followed, both Maritime Electric and Summerside Electric expanded their operations beyond their original service areas of Charlottetown and Summerside, respectively. In the 1930s, Maritime Electric's service area included Charlottetown, Montague and Georgetown while Summerside Electric extended its coverage to adjacent communities



within a ten mile radius. Further expansion did not begin to occur until after World War II when Maritime Electric began consolidating a number of small community utilities in Queens County and Kings County, and Summerside Electric extended its coverage further west in Prince County.

In January 1956 an ice storm devastated Summerside Electric's transmission system and precipitated the utility's contraction back to providing service generally just within its municipal boundary. This change provided Maritime Electric the opportunity to fill the resulting service void in western Prince Edward Island and also become the main supply source for Summerside Electric, making it the province's dominant electric utility.

Prince Edward Island's current population of approximately 146,000 people has grown from 128,000 over the past 25 years, an increase of 14%. The corresponding increase in consumption of electricity over this same time period has been more significant at 100%. The difference is related to improvements in standards of living and energy intensive technological advancements in farming, processing, manufacturing and facilities for all purposes. With the exception of wind, which is discussed in detail throughout this report, the province's options to respond to these increases are limited because it lacks natural resources such as oil, gas and coal to produce electricity. Accordingly, the majority of the Island's electricity needs are acquired from sources off-Island and imported via two submarine cables. These cables were installed in 1977 and have over the course of 35 years since served Islanders extremely well in terms of providing access to more affordable electricity and supply reliability. This was a sound and pivotal decision at the time, one whose vision and measured risk elements serve as Prince Edward Island's own best practice model for current planning.

Historically both before and after the installation of the submarine cables, the cost of electricity in Prince Edward Island has been higher than in the other nine Canadian provinces. This relates back to the Island's lack of conventional energy resources and the extra costs associated with importing electricity, including transmission infrastructure, transmission fees and transmission line losses. In more recent years open access transmission, changing market conditions and a move to market-based pricing in neighboring provinces has helped to level the playing field in terms of the consumer price for electricity in Atlantic Canada. However, the stability and future cost of electricity on the Island remains as an economic, environmental and social factor deserving of analysis and forward strategic thinking.

Executive Summary

The PEI Energy Commission (Commission) has been mandated by the Government of Prince Edward Island (Government) to examine and provide advice on ways in which the Island's high cost of electricity can be reduced and/or stabilized over the long term. The Commission was established in June, 2011 and progressed through three phases over a period of 16 months. The phases included: 1) information gathering; 2) public consultation; and 3) report compilation.

Through all phases of the Commission's term, the mandate issues that it was tasked to address were the focus of its deliberations and decisions. With this report, the Commission is confident that it has delivered on its mandate and that the recommendations provided are consistent with the goals of the PEI Energy Accord.

In structuring its report, the Commission identified the following key issues:

The Utilities and Their Future Role

Whether Maritime Electric should be privately or publicly owned has been debated in Prince Edward Island for many years. There are pros and cons inherent in both options and it does not have to be a choice of one or the other. A hybrid option is possible and the Commission is recommending such an approach with public ownership of generation assets through the PEI Energy Corporation (Corporation) and the continued private ownership of the transmission and distribution system through Maritime Electric (as it currently exists). This will serve to reduce the equity base upon which Maritime Electric's annual earnings are calculated. No changes to the ownership structure of Summerside Electric are proposed.

Regulatory Control

Regulatory oversight of Island utilities is the responsibility of the Island Regulatory and Appeals Commission (IRAC). The Commission has concluded that the existing legislation and cost of service regulatory model is providing a good control framework. However, there is room for improvement in the regulatory system and this can be accomplished through changes within IRAC. A new panel with its members dedicated just to electricity regulation and selected on the basis of professional qualifications and business experience should be established. The new panel would be structured to operate independent of IRAC's standard quasi-judicial process and adopt an approach that is more directly involved in all aspects of the Island's electricity supply system.

Role of Government

Government involvement in electricity is primarily through the PEI Energy Corporation and the Energy and Minerals Division (Division) of the Department of Finance, Energy and Municipal Affairs. While these two arms of Government are separate and distinct in structure and governance, operationally there is considerable overlap and some potential for conflicting interests in terms of the business objectives of the Corporation and the policy objectives of Government. To address this, the Commission would like to see a more distinct separation of Government's electrical energy interests along the following lines:



Executive Summary – continued

PEI Energy Corporation Role – Direct involvement with Maritime Electric in electricity supply and generation, sustainable energy innovation and development, and financing some electricity consumer debt obligations. Concerning the latter, the Corporation should finance all debt associated with the refurbishment of the Point Lepreau nuclear plant including what is currently held by Maritime Electric.

Energy and Minerals Division Role – Establishing policy positions on electricity matters, regulatory intervention on issues related to Government policy, and program delivery through the Office of Energy Efficiency.

A New Cable Interconnection

Perhaps the most important single component of the province's electricity supply system is the dual submarine cable interconnection with the mainland. Without the two 100 MW cables that are currently in place, the Island would be highly reliant on oil for on-Island electricity generation and the consumer price for power would be considerably more expensive. Given just how important the cable interconnection to Prince Edward Island has become, the Commission is recommending that a new cable be installed at the earliest possible date. The facts that the existing cables are now 35 years old and that one recently had to be temporarily taken out of service for repair, have resulted in a heightened sense of urgency. Mitigating factors to address the cost burden of a new cable include the possibility of federal government financial support, favourable lending market conditions and the possibility of installing the cable in or along the Confederation Bridge structure (as an alternative to another submarine installation); all three must be pursued aggressively.

Stewardship and the Environment

In a period of just 12 years, Prince Edward Island has become a world leader in the integration of wind energy into its electricity supply system. By the end of 2013, the province will have 30% of its electricity generated by wind but there is still room for more wind power integration and development. That being said, any desire for expansion of commercial wind farms for both domestic use and export will be subject to the regional electricity market situation. There is also a strong desire among some Islanders to see more opportunity to develop wind and other renewable energy projects through a community-based approach. While the Commission supports the concept of community-based renewable energy, it does so with the caveat that the resulting projects must be economically sound and will not require subsidization from ratepayers or taxpayers across the Island.

A Policy Continuum - Keeping Matters Current

In addition to the key issues, it is also recognized by the Commission that several of the mandate issues are more directly related to Government policy and planning – past, present and future. As such, these issues have been addressed in the report as policy continuum issues that are largely structured by Government but may be delivered by other sector participants. The policy continuum issues were addressed by the Commission as follows:

Executive Summary – continued

Energy Efficiency and Demand Side Management – Responsibility for demand side management (DSM) should be returned to the utilities and regulatory oversight of DSM re-established with IRAC through the *Electric Power Act*.

Regional Cooperation and Awareness – Government should continue to pursue regional cooperation on electricity sector initiatives with particular emphasis on PowerShift Atlantic and the strategic direction resultant of the Atlantic Energy Gateway initiative.

Facilitating Public Involvement – A ratepayer-funded consumer advocate position should be established by Government to represent residential and general service customers and help facilitate the participation of other interested parties at regulatory hearings.

Observations and Best Practices – The Island’s electricity sector should take advantage of its small scale by collaboratively developing best practices for integrated system planning and managing electricity price factors.

Electricity from Natural Gas – Island utilities should not pursue self-generation of electricity from natural gas until such time that the regional gas supply situation changes and new feasibility assessments warrant a policy review.

Summary of Recommendations and Direction

A complete summary of recommendations and direction contained within the report is provided as Appendix A.



1.0 Commission Mandate

The complete Terms of Reference for the PEI Energy Commission (Commission) is provided as Appendix B and the process it followed in pursuing its mandate is provided as Appendix C.

The issues that the Commission was specifically mandated to address by Prince Edward Island's Executive Council are as follows:

1. Under the PEI Energy Accord, the province has assumed short term debt associated with Point Lepreau refurbishment. The Commission will provide recommendations on how Point Lepreau deferral costs can best be financed over the long term.
2. The Commission will examine and provide recommendations on the long term ownership and management of electricity in Prince Edward Island including the advantages and disadvantages of public ownership or Government owning generation with private control of transmission and distribution. This examination will draw on a review of best practices in other jurisdictions.
3. In addition to the work being undertaken by the province to secure federal funding for a new cable, the Commission will provide mitigation advice as it may relate to a new cable.
4. The Commission will provide advice and direction with regard to further regional energy collaboration, including demand side management approaches.
5. The Commission will provide advice and direction on how Prince Edward Island can further advance its environmental stewardship responsibilities as it relates to electricity.
6. The Commission will examine and comment on all cost elements associated with Prince Edward Island's current system.
7. The Commission will provide advice and recommendations as to the future role of the Prince Edward Island Energy Corporation, the Island Regulatory and Appeals Commission (as it relates to electricity) and the Office of Energy Efficiency.
8. The Commission will provide advice on the optimal scope and size that locally generated electricity from renewable energy sources can play in addressing the Island's future energy goals.
9. The Commission will address other matters in keeping with the overall goals of the PEI Energy Accord, as agreed to by the Commission and Government.

Some of the mandate issues involve more than one aspect of the Island's electricity system as they have been sectionalized in this report. To assist the reader, Figure 1.1 is provided to cross reference each mandate issue to the report section(s) in which it is addressed.

MANDATE ISSUES

MANDATE ISSUES	REPORT SECTIONS									
	2.1 Utilities Future Role	2.2 Regulatory Control	2.3 Role of Government	2.4 New Cable Interconnection	2.5 Stewardship and Environment	3.1 Energy Efficiency and DSM	3.2 Regional Cooperation	3.3 Facilitating Public Involvement	3.4 Observations and Best Practices	3.5 Electricity from Natural Gas
1. Point Lepreau Deferral Costs			●							
2. Electric Utility Ownership	●		●					●		
3. New Cable Interconnection				●						
4. Regional Collaboration & DSM			●			●				
5. Environmental Stewardship				●	●	●				
6. All Cost elements	●	●	●	●	●			●		
7. Government and IRAC		●	●		●					
8. On-Island Renewable Energy				●						
9. Other Relevant Matters							●	●		●

Figure 1.1: Cross Reference of Where Each Mandate Issue is Addressed in the Report



2.0 Mandate Issues - Key Recommendations

2.1 The Utilities and Their Future Role

Key Recommendation: Allow Maritime Electric to continue as the Island's primary electric utility with the proviso that Government begins negotiations to acquire Maritime Electric's ownership stake in the generation component of the supply system.

Although much of the supply system's functional background also applies to Summerside Electric, the majority of discussion that follows is focused on Maritime Electric. To begin, the Commission is not recommending changes to the ownership structure of Summerside Electric. For context and comparative purposes, information concerning Summerside Electric is provided at the end of the section.

2.1.1 Ownership Options

The question of public versus private ownership of the electric utilities in Prince Edward Island has been a discussion point for many years. The McQuaid Commission report of August, 1982 provided arguments in support of public ownership and arguments in support of private ownership. Both models are operating efficiently in the North American marketplace and there appears to be no overriding argument in favour of one over the other.

Within the private utility ownership model (such as Maritime Electric locally and Nova Scotia Power regionally), private interests are responsible for all aspects of electricity supply including energy purchases, generation, transmission and distribution. With a public model (such as Summerside Electric locally and New Brunswick Power regionally), the respective government entities control all aspects of supply.

Some Canadian jurisdictions have hybrid public/private electricity supply models in place. Within Atlantic Canada, Newfoundland and Labrador is a good example of how electricity supply is shared between Newfoundland and Labrador Hydro and Newfoundland Power. Newfoundland and Labrador Hydro operates as a Nalcor Energy Company (Nalcor Energy being a provincial Crown corporation) and Newfoundland Power is owned by Fortis Inc. (the same company that owns Maritime Electric). On the Island of Newfoundland, the majority of electricity is generated and transmitted by Newfoundland and Labrador Hydro and distributed by Newfoundland Power.

To determine the appropriate utility ownership model for Prince Edward Island, the commissioners worked first to become informed regarding how the Island's electricity supply is structured. They learned that the system consists of many interdependent components that must be in place and functional on a continuous basis in order to ensure immediate response to demand. In addition, the reality is that we are a small participant in a much larger regional electricity system and a sound utility is achieved through good planning, management and due diligence, not through ownership. As such, the Commission has concluded that for most electricity consumers, it is likely less about who owns or operates the system components and more important that the price is reasonable, the service is good, and the supply is safe, reliable and environmentally responsible.

“a sound utility is achieved through good planning, management and due diligence, not through ownership.”

2.1.2 Electricity Supply Structure

Maritime Electric sources most of its electricity through third-party supply contracts but continues to own some generation equipment. It does so because the submarine cable interconnection does not completely eliminate the need to maintain on-Island generation capability for reasons of supply security.

Off-Island Supply Structure

The open access of the North American grid enables Island utilities to source electricity from any supplier on the system. However, the economics of purchasing electricity from suppliers that are long distances away and cross several transmission jurisdictions are generally not favorable due to excessive line losses and multiple transmission tariffs, respectively. For these reasons, the Island's utilities look closer to home for electricity supply contracts with suppliers in New Brunswick, Nova Scotia, Quebec and New England. (See Figure 2.1 for transmission/generation interconnection transfer capabilities within the Island's supply region.)

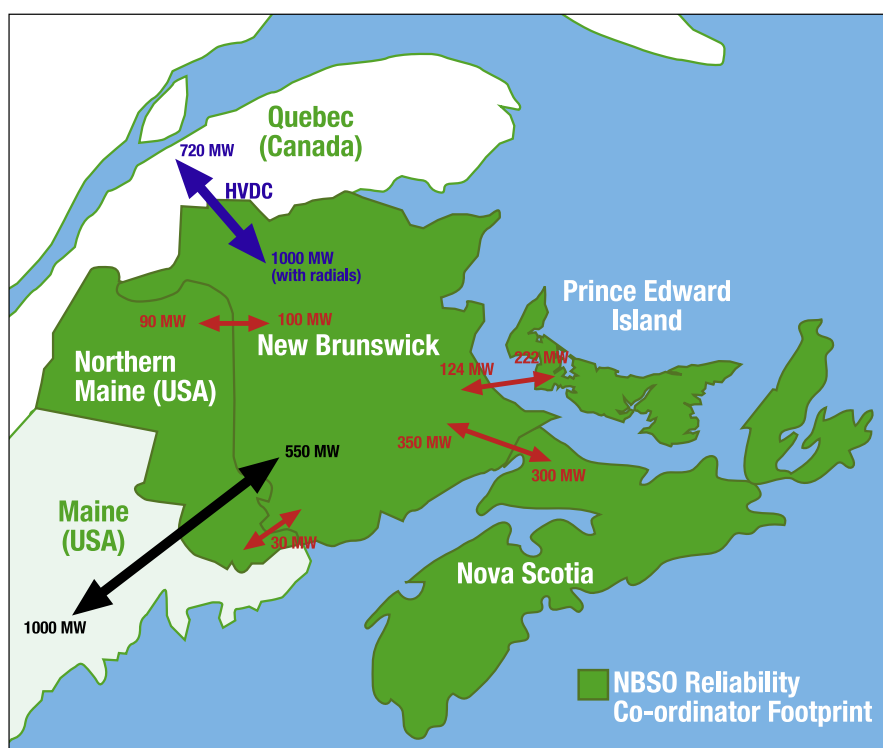


Figure 2.1: Regional Transmission/Generation Interconnection Transfer Capabilities

Source: NPCC report "2010 Maritimes Area Comprehensive Review of Resource Adequacy."

The ability of Island electric utilities to source electricity from off-Island suppliers is first and foremost reliant on the transmission infrastructure that exists between the generation source and the local distribution system that connects individual electricity consumers. Because Prince Edward Island's cable interconnection runs between Bedeque, Prince Edward Island and Murray Corner, New Brunswick, transmission through the NB Power system cannot be avoided. This gives NB Power a slight advantage over other regional suppliers (e.g. NS Power, Hydro Quebec, etc.) which expose Island utilities to additional transmission costs. While transmission tariffs and line losses add to the cost of electricity, transmission bottlenecks or congestion during episodes of high electricity demand can further escalate supply cost if alternative, more expensive sources of generation need to be utilized for even short periods of time.



Power Purchase Agreements – Maritime Electric acquires the majority share of the Island’s electricity supply through power purchase agreements (PPA) with other utilities and merchant generators. PPAs can be short or long term contracts, but are typically fixed in terms of duration, product and price. Multiple PPAs are often in place at any given time, however Maritime Electric usually secures a core PPA with an off-Island utility to provide more than half of its electricity supply. This core PPA typically includes firm and non-firm energy set against Maritime Electric’s generation capacity, which allows for variability in demand. It is also bundled with any ancillary services that may be required by the purchaser. In the past, some core PPAs have been secured through sole sourcing and others through request for proposal processes.

Maritime Electric’s current core PPA is held with NB Power, a relatively large utility which operates 14 generating stations producing a mix of hydro, coal, nuclear, oil and diesel generated electricity.* The energy (and any related capacity, ancillary services, etc.) that is supplied to Maritime Electric through this PPA is not distinguishable in terms of its origin and is simply considered as New Brunswick system energy.

**Due to the rising cost of operating its own oil and diesel generators, NB Power has recently been purchasing an increasing amount of its electricity from other suppliers in the region.*

The current core PPA, which is a key element of the PEI Energy Accord (Accord), is a five-year agreement that runs from March, 2011 to February, 2016. While the details of this agreement are commercially confidential, it can be generally stated that market conditions and a competitive bidding process resulted in better pricing over a longer term as compared to recent historic core PPAs.

“market conditions and a competitive bidding process resulted in better pricing over a longer term as compared to recent historic core PPA’s.”

Electricity supplied through unit participation agreements (see below), other PPAs held with on-Island wind farm operators and Island utilities’ generation equipment, is typically used to supplement the core PPAs and also to address emergency situations as required. The on-Island supply sources are discussed later in this section of the report.

Unit Participation Agreements - Maritime Electric also secures a portion of its electricity supply through unit participation agreements which go beyond the fixed term of a typical PPA, encompass a degree of financial responsibility for the operation and maintenance of the subject generation facility and are not unlike an ownership agreement. The basis for entering into such participation agreements, as opposed to acquiring all off-Island electricity supply through PPAs, is that the former can provide a degree of long-term security of supply and price stability. However the potential benefits must be carefully weighed against the risks associated with taking on the proportional share of obligations associated with a facility’s capital investment, operating cost and other expenses, regardless of whether or not electricity is produced and delivered.

Currently, Maritime Electric is involved in a unit participation agreement with NB Power which provides entitlement to approximately 30 MW** of baseload energy (along with the corresponding firm transmission capacity) from the Point Lepreau Nuclear Generating Station (Point Lepreau). Until recently, a similar agreement was also in place to secure approximately 20 MW*** of baseload energy from Dalhousie Generating Station (Dalhousie).

***30 MW represents approximately 4.7% of Point Lepreau generation capacity.*

****20 MW represented approximately 6.7% of Dalhousie’s generation capacity.*

Other Contracts - In addition to agreements tied to energy supply, Maritime Electric can also contract for ancillary services with off-Island utilities, provided that the services are tangible and the reliability requirements of the regional system operator (New Brunswick System Operator or NBSO) are met. Ancillary services that Island utilities sometimes contract outside of core PPAs include: capacity, load following, balancing energy, operating reserves, etc.

On-Island Supply Structure

Generation - Maritime Electric generation assets in Charlottetown consist of the Charlottetown Thermal Generating Station (Charlottetown Thermal Plant) and a General Electric LM6000 simple cycle combustion turbine-generator (CT3).

The Charlottetown Thermal Plant was the Island's primary source of electricity supply before the cable interconnection was established in 1977. It is fueled by Bunker C oil and consists of five pre-1969 vintage steam generators with a combined maximum output of 60 MW. Maritime Electric maintains the Charlottetown Thermal Plant for the following purposes:

- Plant capacity provides accredited capacity that is required to comply with NBSO planning reserve requirements.
- It provides energy to the system indirectly when lower cost interruptible surplus energy from the mainland is purchased against its capacity.
- It provides standby capacity that can be called upon when non-secure energy purchases are curtailed, or in the event of a transmission system contingency need (such as a loss of one of the submarine cables).
- It provides peaking energy as needed to prevent the submarine cables from being overloaded.

Because of its age, the Charlottetown Thermal Plant is near the end of its service life unless significant investment is made to refurbish the facility in the very near future. Whether or not to make this investment is a consideration in the timing of the Commission's work and recommendations, and the related discussion surrounding a new cable interconnection. (A third cable would eliminate the need for the 60 MW of on-Island generating capacity currently able to be provided by the plant).

“Because of its age, the Charlottetown Thermal Plant is near the end of its service life unless significant investment is made to refurbish the facility in the very near future.”

The 50 MW CT3 (see Figure 2.2) was installed within the Charlottetown Thermal Plant grounds in 2005. It is currently set up to operate on diesel but it can also be fueled by natural gas. The CT3 serves the same purposes as the Charlottetown Thermal Plant but has the additional benefit of a 10 minute startup capability that can be used for black start and non-spinning operating reserve purposes. The purchase of a second LM6000 to replace (and avoid having to refurbish) the Charlottetown Thermal Plant is an option that will have to be investigated if the installation of a new cable is delayed beyond 2015.





Figure 2.2: Combustion Turbine (CT3) at Maritime Electric's Charlottetown Plant

Courtesy of Maritime Electric Company, Limited.

Maritime Electric's Borden combustion turbine plant (Borden plant) consists of two diesel-fueled combustion turbines (CT1 and CT2) that are collectively capable of delivering 38.7 MW on 10 minutes notice. The Borden plant also provides accredited capacity, peaking capacity and operating reserve.

Transmission and Distribution – As previously stated, the submarine cable interconnection provides the transition from off-Island to on-Island infrastructure. The two 100 MW cables that serve as the interconnection are now 35 years old and are nearing the end of their service life. As a key component of the Island's electricity supply structure and considering that the cables are owned by Government, the future of the cable interconnection warrants a thorough discussion and therefore has been addressed separately in this report.

“The two 100 MW cables that serve as the interconnection are now 35 years old and are nearing the end of their service life.”

The on-Island termination point for the cable interconnection is situated at Richmond Cove and from there transmission is provided via 138 kV pole mounted wires to the Bedeque substation. The cables and the transmission infrastructure from Richmond Cove to Bedeque are owned by the Government. The Bedeque substation is the starting point of the transmission and distribution system that is owned by Maritime Electric.

Maritime Electric's transmission network is over 575 kilometers in total lines length. Of this, approximately 37% (214 kilometers) of the lines have a nominal operating voltage of 138 kV and the remaining 63% (361 kilometers) operate at 69 kV. The transmission network also includes 16 substations across the Island that tie into local distribution networks. (See Appendix D for a map of Maritime Electric's energy supply system.) While there have been some additions to the transmission system over the past decade, this expansion has been in response to wind power development, the associated costs of which were considered part of the wind farm projects.* Further, Maritime Electric has not had to build new load-serving transmission lines since the late 1980s. That being said, the transmission line that runs between Charlottetown, Scotchfort and Lorne Valley is more than 40 years old and has had no major updates or rebuilds since installation. This line will be upgraded and rebuilt over the next seven years at an estimated cost of \$20 million.

*The PEI Energy Corporation owns 36 kilometers of transmission associated with wind farm developments in western Prince Edward Island.

Maritime Electric's distribution system consists of approximately 4,500 kilometers of single and three-phase distribution lines. The distribution network is mostly radial (meaning that its lines are fed from one direction only) but there are some looping capabilities within the City of Charlottetown.

The distribution system is constantly being upgraded and reinforced as the Island's electricity load grows. In addition to expansion of the distribution system due to load growth, the current rebuild rate of the system is 35 kilometers per year. Maritime Electric has indicated that this rebuild rate should be more expansive in order to ensure adequate system reliability into the future.

Somewhat less recognized is that Maritime Electric's transmission and distribution operations also encompass peripheral activities such as customer connections, voice and data communications, tree trimming, system automation, incident response, public safety, workplace health and safety, environmental protection, property maintenance, customer service, etc. Some of these issues also apply to its generation assets but to a lesser extent on a daily basis.

Structuring Electricity Supply for the Future

As shown in Figure 2.3, in 2011 electricity supply accounted for approximately 54% of Maritime Electric expenditures. Given the higher percentage of expenditure on electricity supply versus other items, it is logical to first look for opportunities to stabilize and reduce costs in this category.

“in 2011 electricity supply accounted for approximately 54% of Maritime Electric expenditures.”

Supply Sources – Despite the fact that Maritime Electric maintains approximately 150 MW of combined oil fired generating capacity on Prince Edward Island, it generates only about 1% of the electricity that it delivers to customers annually. This is because it is generally cheaper to purchase electricity through PPAs from other suppliers that are not reliant on oil as their primary energy source.

Maritime Electric's current PPA with NB Power is a five year contract that resulted from a competitive bid process. The PPA that this new supply agreement replaced had only an 18 month term so the increase to a five year term helps to provide a more substantial degree of price stability for Maritime Electric customers. The fact that the bid process was competitive was beneficial in terms of price and product secured by the PPA.



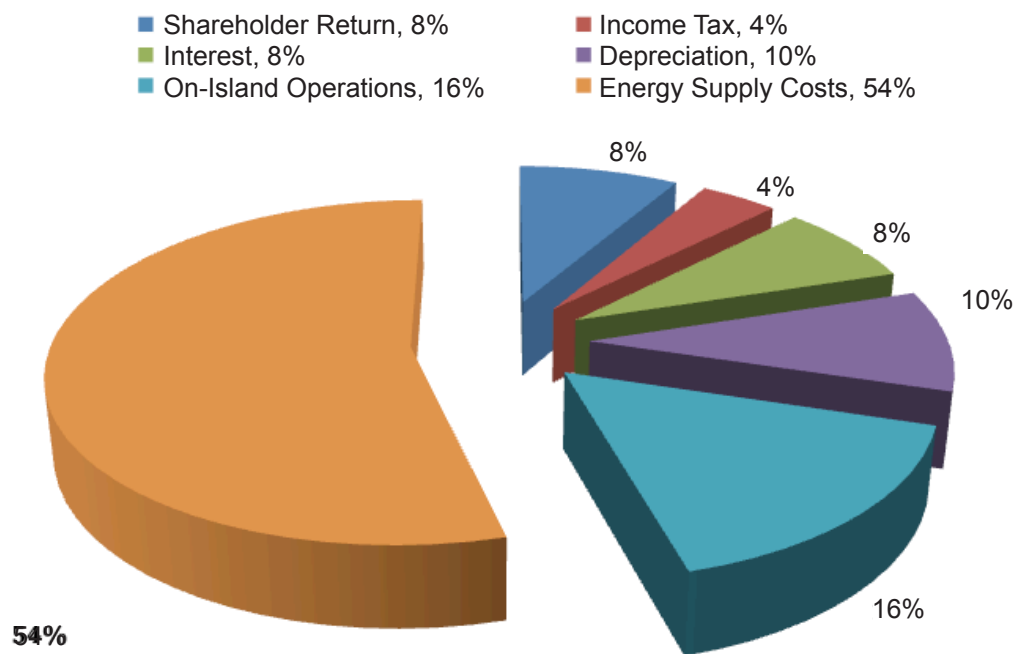


Figure 2.3: How Maritime Electric Spends Each Dollar of Revenue (2011).

Courtesy of Maritime Electric Company, Limited.

A contributing factor to the success of the Maritime Electric negotiation team in securing the current PPA was the involvement of Government. This was the first time that the utility and Government worked together on a PPA deal. It is believed that Government involvement is especially beneficial where potential suppliers are provincially owned utilities (e.g. NB Power, Hydro Quebec, Nalcor Energy) that may share similar regional energy cooperation objectives set by their respective governments.

The Commission has been asked to investigate and provide direction on reducing the cost of electricity and keeping rates reasonably stable for the long-term. The Commission has found that the keys to low cost electricity are market conditions and competitive processes, and the keys to rate stability are longer term PPAs, managing operating costs and integration of wind. Demand side management (DSM), demand response (DR) and energy storage also have potential to improve rate characteristics.

The time is now for Maritime Electric to start thinking about and preparing for the next round of PPA negotiations. The negotiating team should again include Government and the starting point should factor in initiating discussions with all potential suppliers and the possibility of extending the current PPA with NB Power. Should an extension not happen, every effort should be made to entice regional suppliers to participate in the bidding process for the next PPA. This should be done with adequate lead time to allow Maritime Electric to receive bids and make system and supply adjustments if there are issues complicating what could otherwise be an attractive supply option.

“The time is now for Maritime Electric to start thinking about and preparing for the next round of PPA negotiations”

Participation Agreements – The Commission recognizes that in the past, to provide some degree of long-term supply price stability for baseload power, participation agreements were viewed as a good way to achieve the economies of scale associated with a larger generation facility (that the Island would otherwise not be able to develop on its own). However, it has become apparent from experience with the Dalhousie and Point Lepreau supply agreements* that real and significant risks are presented which may not be present in a long term PPA for baseload power. In both of the Dalhousie and Point Lepreau unit participation agreements, NB Power held the majority stake. Thus, in the case of Dalhousie, Maritime Electric had no influence in the decision to modify plant operations while in the case of Point Lepreau it had no ability to influence the lengthy and costly process to refurbish the plant. As such, any future proposed Maritime Electric participation agreements to acquire baseload supply must be subject to rigorous and thorough regulatory review prior to execution by the company. Further, this review should not just look at electricity supply cost issues, but also consider the risk of potential costs that could result from a future decision to terminate any such agreement.

“participation agreements to acquire baseload supply must be subject to rigorous and thorough regulatory review...”

*Further, information on deferred costs and exit costs associated with the Point Lepreau and Dalhousie unit participation agreements, respectively, is provided in Section 2.3.3.

Ownership of Assets - The added supply security of a new cable would provide an opportunity to retire some of the on-Island generation that currently requires annual investment in equipment, repair, maintenance, etc. Currently, these generation resources are necessary for security of supply and must be capable of being operated on short notice in the event of a cable supply interruption (which could include for instance, the severing of a cable or any unforeseen NB Power transmission interruption).

A new cable would enable Maritime Electric to eventually decommission its Charlottetown Thermal Plant generating facility without compromising security of supply. While savings would be immediately realized by eliminating operating costs and the need for further capital investment in the plant, these savings may be offset by the actual decommissioning costs and the need to compensate Maritime Electric for the non-depreciated value of the assets. There exists a contingency fund of over \$30 million that has been accumulated from ratepayers which could help address some of this liability; however, any costs in excess of the fund would undoubtedly have to be recovered through future rates. The contingency fund would also require replenishment, albeit likely to a lesser amount to reflect the reduction in total on-Island generation capacity.

The Commission recommends that within a reasonable passage of time (e.g., within five years) all Maritime Electric assets determined to be for generation purposes should be transferred to the PEI Energy Corporation (Corporation), thereby eliminating them from the rate and equity base.** The timing of the recommended transfers has been left somewhat flexible for Maritime Electric to coordinate its reduction in equity with the retirement of debt (and thereby help to maintain the utility’s regulated debt to equity ratio). Once transferred to the Corporation, the remaining functioning generation assets would be managed, operated and maintained by Maritime Electric on a go-forward basis through a contractual agreement with the Corporation in much the same way the existing cable interconnection lease agreement is structured.

“all Maritime Electric assets determined to be for generation purposes should be transferred to the PEI Energy Corporation...”

**Once the generation assets are transferred, their value will no longer be included in the equity amount upon which Maritime Electric’s earnings are based.



It is anticipated that the PEI Energy Corporation will have 70 MW of wind generating assets in place by the end of 2013. As such, it is logical to expand the role of the Corporation to also encompass the ownership of other generation as mentioned above with resultant reduction in Maritime Electric return on equity earnings going to benefit its customers. Also, while the functioning generation assets technically satisfy the regulatory measure that a utility asset has to be “used and useful” in order to be incorporated into electricity rates (e.g., they provide capacity that would otherwise have to be purchased from off-Island), the reliability and added transmission capacity of a new cable interconnection would further minimize the likelihood of having to operate the equipment. As such, the Commission’s recommendation is based on the conclusion that every effort should be made to minimize the carrying cost of these generation assets and public ownership is a reasonable approach.

The management, operation and maintenance of the Island’s transmission and distribution network accounts for the majority of the utility’s day to day activities. Following logic similar to that used regarding generation, the transmission and distribution assets are in the truest sense fully “used and useful”. On this basis, it makes sense that these assets continue to be owned by Maritime Electric. In addition, private ownership provides a separation from Government that is desirable in terms of basing infrastructure and service decisions on best practices and standard policies, as opposed to public pressure and special interests.

2.1.3 Just and Reasonable Compensation

Serving the public interest requires a commitment to outstanding customer service, public health and safety, environmental protection and good business management. Maritime Electric risks its monopoly concession if it does not maintain its duty to serve the public interest.

Maritime Electric is required to operate under regulation and to be accountable. The rates that it charges are subject to approval and all capital and operating spending along with the issuance of debt and the return on its invested equity is subject to approval by the Island Regulatory and Appeals Commission (IRAC). During the public consultation phase of the Commission’s mandate, a concern commonly expressed by the public had to do with the approved rate of return on the company’s equity, which currently stands at 9.75%. Maritime Electric’s annual earnings are determined on the basis of this rate. At face-value, the 9.75% appears high given the current interest rate environment. However, the 2010 IRAC decision that supported 9.75% was based on the utility’s requirement to attract capital on favorable terms as well as a comparison with returns earned by other electric utilities throughout North America.

“Maritime Electric risks its monopoly concession if it does not maintain its duty to serve the public interest.”

Maritime Electric’s investor-supplied capital finances all of its utility assets which include not only property, plant and equipment, but also other utility related assets such as inventory, prepaid expenses and deferred power costs. Maritime Electric is required under the *Electric Power Act* to at all times maintain not less than 40% of the capital it has invested in the power system in the form of common equity. In recent years Maritime Electric has consistently been 2% to 3% above the minimum percentage resulting in a higher cost of electricity due to the 9.75% return. To remedy this situation without compromising Maritime Electric’s ability to secure new debt at market rates, the Commission recommends that the *Electric Power Act* should be amended to require that Maritime Electric maintain its equity stake at no less than 35% and no more than 40%.

“the Electric Power Act should be amended to require that Maritime Electric maintain its equity stake at no less than 35% and no more than 40%.”

The allowed rate of return prescribed by IRAC would be calculated on the average equity maintained by Maritime Electric throughout the year (subject to a cap of 40%).

The *Electric Power Act* caps Maritime Electric's annual earnings to a maximum of 8% return on average rate base. The use of rate base is important to distinguish the assets used in utility operations from redundant assets. However, it is confusing and contradictory to have "return on average rate base" cap Maritime Electric earnings under the *Act* and to have "return on average common equity" cap Maritime Electric earnings (at a maximum of 9.75%) in the current IRAC Order concerning rates. While the Commission appreciates the reasoning and purpose of both rate of return mechanisms, it should be made clear which one ultimately sets the cap on earnings. Accordingly, consideration should be given to amending the *Electric Power Act* for the purpose of providing the necessary clarification.

The Commission has approached the question of utility ownership by examining the attributes of both Maritime Electric and Government that are most advantageous to achieving the best possible balance between system safety, reliability and cost. As a private company, it is believed that Maritime Electric can be more efficient and decisive in the day to day operations of a utility than Government. Government, on the other hand, is a secure and reliable debtor which can attract financing rates more favourable than those typically available to a company on the scale of Maritime Electric. For these reasons, there is some potential to reduce the cost of electricity to Island ratepayers by restructuring and moving the ownership of generation assets to Government while allowing transmission and distribution assets to remain with Maritime Electric. This approach is generally consistent with the hybrid model that Fortis operates under in Newfoundland and Labrador and should therefore be an outcome that Maritime Electric can adjust to with minimal disruption to how it operates.

2.1.4 Summerside Electric Utility

Summerside Electric generation assets include the 11 MW Harvard Street Station (an oil-fired plant) and the 12 MW City of Summerside Wind Farm. Summerside Electric also has a PPA with IPR-GDF Suez North America for a further 9 MW of wind from the West Cape Wind Farm.

Summerside Electric has a core PPA with NB Power that provides approximately half of its electricity supply. This PPA is a five year agreement which runs from August, 2012 to July, 2017 and is structured to provide value equivalent to that of Maritime Electric's core PPA, albeit through slightly different pricing mechanisms.

The utility's current minimum load is approximately 11 MW and its peak load is around 23 MW. The fact that Summerside Electric's wind generation assets provide close to 50% of its total electricity supply, occurrences of high wind generation and low load result in the utility needing to sell its excess electricity off-Island.

Summerside Electric is in the process of expanding its Harvard Street Station with new generation for capacity and supply reliability purposes. This will provide the additional benefits of positioning the utility with increased generation security, reduced need for capacity purchase from off-Island suppliers and the ability to pursue energy-only contracts.

Tied to its aggressive pursuit of wind energy, Summerside Electric is pursuing the development of a Smart Utility Grid project which provides its customers with the opportunity to purchase or lease equipment (i.e., specialized furnaces, space heaters and water heaters) which convert electricity to heat for storage and release heat (or hot water) on demand. Participating customers obtain a preferred rate on a portion of their electricity consumption



while the utility reduces the amount of surplus wind energy that it has to sell off-Island. The Commission applauds and supports the effort that Summerside Electric is making to develop and promote innovation in renewable energy storage and encourages this activity within a sound business and economic framework.

The Commission recognizes the fact that Summerside Electric is already a publicly owned utility and as such, believes that there is no need to change the ownership structure or involve Government in utility operations. However, should Summerside Electric seek increased Government involvement, be it for PPA negotiations or for other matters, that option should be available.

“The Commission applauds and supports the effort that Summerside Electric is making to develop and promote innovation in renewable energy storage ...”

2.2 Regulatory Control

Key Recommendation: Secure and foster long term electric utility expertise within IRAC to ensure heightened scrutiny of Maritime Electric’s cost of service, overall performance and future planning activities.

Regulatory control of the electricity sector begins with selecting a regulatory model, structuring legislation around that model and then establishing the mechanisms (e.g., details of boards/commissions and their governance, etc.) through which effective regulatory oversight can be achieved. These core components of electric utility regulation and oversight are discussed in detail in this section of the report.

2.2.1 Regulatory Model

Independent regulators such as IRAC are charged with protecting the public interest and generally follow one of four models, namely: price cap, revenue cap, performance-based or cost of service/rate of return (hereafter simply referred to as “cost of service”) to provide electric utility control and oversight.

“electricity legislation must be designed to protect both the utility and its customers in terms of economics and service delivery.”

The electricity sector in Prince Edward Island is structured using a monopoly allocation approach where operating utilities are responsible for the supply, transmission and distribution of electricity to captive customer bases within exclusive service territories. To provide control to this approach, electricity legislation must be designed to protect both the utility and its customers in terms of economics and service delivery. One of the most popular regulatory approaches to achieving a balance between the interests of the electric utility and the electricity consumer is cost of service regulation. The cost of service model is designed to ensure a reliable and steady supply of electricity as the first order priority, with cost vigilance and commercial operating efficiency being second-order priorities.

The cost of service regulatory approach is funded through the application of a regulated electricity tariff to all end users. The tariff provides for both an allowed rate of return on the asset or rate base and cost recovery across an entire portfolio of operating assets, including power generation, transmission and distribution infrastructure, and variable costs including the purchase of energy, ancillary services and/or fuel. Maritime Electric is regulated by IRAC using the traditional cost of service model (although a modified version of the price cap model was in place for the period 1994 to 2004).

Assessment of Regulatory Models

The price cap model is generally set for extended periods of time without regard to costs. A modified version of this model worked in Prince Edward Island for ten years, but had to be abandoned in 2004 because it was deemed to be causing undue financial hardship to Maritime Electric.

Revenue cap regulation is a system for setting prices charged by regulated monopolies by limiting allowable total revenue within a given period. Cost savings realized by the operating utility are passed on to shareholders until such time as the cap is changed. This system works best if several monopolies with self-generation operate in the same competitive environment; this is not the case in Prince Edward Island.

Performance-based regulation requires comparison against common benchmarks in order to be applied in a just and reasonable manner. Performance data of a comparable utility in a similar operating environment would have to be identified and obtained. Because there is no readily available comparison to Maritime Electric, this regulatory approach would be somewhat complicated and cumbersome to implement.

Criticisms of the price cap, revenue cap and performance-based models are that they are predicated on long term extended periods, the fact that marketplace conditions can change causing complications and that their response to change is slow. Another shortcoming is that while such models may be designed to improve productivity, they can create investment disincentives leading to negative consequences in delivery of customer service and service reliability.

The cost of service model is sometimes criticized because it is seen to encourage the utility to add to its equity or rate base. In other words, there is no incentive to constrain the base upon which the approved rate of return to the shareholders is applied. In spite of such criticism, the cost of service model has the advantage of enabling long-term commitments and allows for the long-term purchase of energy resources, the formation of debt and capital and, if properly regulated, can have the benefit of efficient operational behavior.

“the cost of service model should continue to be followed for regulation of electricity in Prince Edward Island.”

On balancing the advantages and disadvantages of each model and recognizing that none are perfect and free of issues, it is recommended that the cost of service model should continue to be followed for regulation of electricity in Prince Edward Island.

2.2.2 Regulatory Structure

Importance of Electricity Legislation

The basic purpose for regulation of the electricity sector is to formalize how the desired regulatory model will be delivered and enforced. To this end, electricity legislation is used to assign certain duties and responsibilities to regulatory boards or commissions, as well as to provide various powers that will allow the regulator to perform the functions and tasks necessary to meet the responsibilities under the legislation. The regulatory functions address price, service quality, competition regulation, and customer protection while the tasks address gathering information, monitoring compliance with existing rules, determining new rules, and enforcing rules.

“the Electric Power Act is the primary legislation used to regulate the supply and delivery of electricity in the province ...”



In Prince Edward Island the *Electric Power Act* is the primary legislation used to regulate the supply and delivery of electricity in the province and the *Act* identifies IRAC as the agency that receives and rules on submissions made by Maritime Electric and other public utilities concerning electricity.

Electric Power Act

Prior to the enactment of the *Electric Power Act* in January 2004, the *Maritime Electric Company Limited Regulation Act* (1994 to 2004) required Maritime Electric to maintain its rates within 10% of NB Power rates (commonly referred to as the “NB Power-plus-10” period). This price cap model did not require a high level of regulatory oversight and during this time IRAC was virtually silent on how Maritime Electric conducted its affairs.

Under NB Power-plus-10, Maritime Electric paid market-based prices for electricity but was limited (or capped) on what it could charge customers for that electricity. In theory, this approach should have enabled Maritime Electric to continue operating in a financially sustainable manner as most of the electricity acquired by the utility was being bought from the NB Power system. In practice however, Maritime Electric found it increasingly difficult to sustain its operations without losing money. After trying a series of stop-gap measures to correct the situation in the early 2000s, the government of the day repealed the *Maritime Electric Company Limited Regulation Act* and replaced it with the *Electric Power Act*.

The *Electric Power Act* is based on a cost of service regulatory model and as such, deals with most aspects of Maritime Electric’s operations, including safety and reliability. It does not reference customer rates but provides IRAC with the authority to administer on the basis of “a just and reasonable return” and “reasonably and prudently incurred expenses”. The Commission suggests that since IRAC is charged with protecting the public interest, amending the *Electric Power Act* to also include reference to “fair and reasonable customer rates” might balance the intent and regulating scope.

“amending the Electric Power Act to also include reference to ‘fair and reasonable customer rates’ might balance the intent and regulating scope.”

Other Key Legislation

The *Island Regulatory and Appeals Commission Act* and the *Renewable Energy Act* are two other key pieces of legislation that apply to the Island’s electric utility sector.

Island Regulatory and Appeals Commission Act – The *Island Regulatory and Appeals Commission Act* provides IRAC with its structure and authority. Further, it specifically references the regulation of utilities under *Electric Power Act* as a function of IRAC.

Renewable Energy Act – The *Renewable Energy Act* requires Island utilities to obtain at least 15% of the energy that they sell in a calendar year from renewable energy sources. Further, the *Act* requires that the utilities submit an annual report to the Minister responsible for energy with the actual amounts of renewable energy and all energy sold. The *Act* also provides Government with control over the development of renewable energy in Prince Edward Island, both directly and through the following regulations:

- Development Permit Regulations
- Minimum Purchase Price Regulations
- Net-Metering System Regulations
- Renewable Energy Designated Areas Regulations

It should be noted that until the *Renewable Energy Act* was amended to reflect the terms of the PEI Energy Accord, it included utility requirements concerning Demand Side Management (DSM) planning and performance. The removal of DSM from the *Renewable Energy Act* is discussed in Section 3.1.

Review of Electricity Legislation

Legislation for the regulation of the electricity sector typically has several elements that are either considered necessary or useful in enabling a regulator to meet its responsibility to ensure a just and reasonable return. Nine such elements are described in Appendix E along with a comparison of Prince Edward Island's *Electric Power Act* and *Island Regulatory and Appeals Commission Act* to similar legislation that is in effect in New Brunswick, Nova Scotia, and Newfoundland and Labrador.

Generally, it can be concluded that the enabling legislation in Prince Edward Island provides IRAC with the degree of authority and powers necessary to carry out its duties and responsibilities with respect to regulation of the province's electricity sector. Additionally, IRAC has the authority to create regulations under legislation and has the authority to use alternative processes by virtue of an alternative dispute resolution mechanism available to the agency through the *Island Regulatory and Appeals Commission Act*. These are unique powers that are not available to all of the regulatory bodies in neighbouring jurisdictions.

There are two areas of deficiency however, in which Prince Edward Island might benefit from the consideration of legislative developments in its neighbouring jurisdictions.

First, of the eight appointed positions that comprise IRAC, only the five part-time commissioner positions have a specific fields of knowledge requirement. However, even in this case, the list is long and knowledge in only one of the fields meets the requirement.

Given the complex nature of electric utility operations across the various aspects of electricity procurement, generation, transmission and distribution, it is questionable whether the expertise requirements of the appointed positions are sufficient to ensure effective oversight. This is not a comment on the capabilities of the existing IRAC appointees but rather an observation that electric utility operations are highly complex with its regulation requiring individuals (or a group of individuals) with a strong mix of professional, technical and business experience.

Second, the legislation in Prince Edward Island makes no reference to the possible appointment of a consumer advocate or public intervener in electricity rate case applications before IRAC. The other three Atlantic Provinces all have provisions in their respective legislation that not only allow for such an appointment, but also make provision for the funding of an effective intervention by the consumer advocate or public intervener.

Both areas of deficiency can be addressed through amendments to existing legislation. Mechanisms to strengthen regulatory oversight within the structure of IRAC are provided in Section 2.2.3 and facilitating public involvement in the regulatory process through the establishment of a consumer advocate is detailed in Section 3.3.

“the enabling legislation in Prince Edward Island provides IRAC with the degree of authority and powers necessary to carry out its duties and responsibilities with respect to regulation of the province’s electricity sector.”

“electric utility operations are highly complex with its regulation requiring individuals (or a group of individuals) with a strong mix of professional, technical and business experience.”



2.2.3 Regulatory Oversight

IRAC carries out its responsibility for electricity regulation in Prince Edward Island through a three-person electricity panel that currently consists of the IRAC chair and two commissioners. This electricity panel operates through regular activities and periodic hearings related to Maritime Electric including its capital budget and rate applications, review of monthly financials and investigation of customer complaints.

Regulatory Functions

The basic functions that IRAC has in terms of its regulation of Maritime Electric are twofold.

1. To ensure that Maritime Electric's return is just and reasonable, and that the other expenses comprising the utility's revenue requirement were prudently incurred.
2. To rule on any additions to or deletions from the rate base. (This responsibility is most commonly found in IRAC's review and approval of the annual capital budgets as well as during proceedings to approve depreciation studies and the attendant electricity rates.)

To support the electricity panel in its regulation functions, IRAC has one staff analyst who is intimately familiar with the *Electric Power Act*. This staff position is not dedicated exclusively to electricity matters, also having responsibility for other issues including sewer and water utilities. IRAC also has the authority and financial means to engage expert consultants to assist in the review of Maritime Electric submissions and public concerns whenever warranted.

Regulatory Effectiveness

Ideally, electric utility regulation should be always carried out with three characteristics in balance:

1. Competence – Possessing the knowledge and skills that provide the capacity to act.
2. Independence – Not influenced or controlled by others.
3. Legitimacy – Acting in accordance with the prescribed laws and authority and providing quality decisions.

“Ideally, electric utility regulation should be always carried out with three characteristics in balance:

- *Competence ...*
- *Independence ...*
- *Legitimacy ...”*

Such qualities may be difficult to combine within a single agency because there are clear trade-offs when trying to strike such a balance. No regulator can expect to function appropriately, and be perceived as functioning appropriately, if any one of the competence, independence, and legitimacy functions are absent, or are poorly balanced. As well, it is important to note that perception becomes reality on the question of how well a regulator performs its legislative mandate: a regulator must not only balance the needs of the utility against the needs of ratepayers, it must be seen as meeting this balance in every decision that it renders.

Regulatory Approach

The current regulatory approach of IRAC towards the oversight of Maritime Electric operations can be generalized as competent, independent and legitimate, but limited. Further, IRAC currently tends to put more emphasis on its role as an adjudicator and decision-making authority, leaving the burden for challenging Maritime Electric submissions on third parties such as government/non-government organizations and individual electricity ratepayers.

The current IRAC approach is in stark contrast to the regulatory approach taken prior to the NB Power-plus-10 era, during which almost every aspect of Maritime Electric's operations was scrutinized and challenged. This pre NB Power-plus-10 scenario of third-party scrutiny resulted in costly and cumbersome oversight as strings of experts in finance, engineering and so forth provided intricate testimony before the Public Utilities Commission (PUC).^{*} Government frustration with this layered and complex process led to the NB Power-plus-10 price cap model and effectively eliminated the need for PUC oversight of the electric utilities in the province.

^{*}The PUC was the regulatory equivalent of IRAC during the period prior to NB Power-plus-10.

Improving the Regulatory Approach

Throughout its proceedings, the Commission heard concerns over IRAC's approach to regulatory function. The general perception was that while Maritime Electric provides excellent service and reliability of supply, its return on equity (currently approved at 9.75%) is excessive in the current interest rate environment and that there is no incentive for the company to aggressively seek out the lowest cost supply options or constrain spending that increases its equity base. This perception that there may be an imbalance between reliability and cost of service justifies the desire to reconsider IRAC's process and the resources it has in place to effectively regulate the electricity sector, and address questions such as:

“Throughout its proceedings, the Commission heard concerns over IRAC's approach to regulatory function.”

- Should IRAC simply continue as the process facilitator and adjudicator, or should it also be responsible for challenging Maritime Electric, regardless of whether or not third party interveners participate?
- Does IRAC have adequate human and financial resources dedicated to the electricity file and does the electricity panel have the expertise to adequately oversee and adjudicate on the operations of Maritime Electric?
- Is the quasi-judicial environment of IRAC suitable for balancing consumers concerns and utility interests, or should a different environment and process be created?

The PEI Energy Commission has considered these questions and reached the conclusion that electricity sector regulation should remain within the structure of IRAC but the process should change. This change would require responsibility for the *Electric Power Act* to be assigned to a new panel of commissioners that deals only with electric utility regulation and oversight. To this end, it is proposed that a three-person panel be established from a list of applicants possessing professional designations and business experience.

“electricity sector regulation should remain within IRAC but the process should change.”



Selection from the list of applicants could be made independently through Participate PEI to ensure that all applicants meet the required criteria and that the selection process is non-partisan. Advantages and features of the new panel would include:

- The process would go beyond solely that of adjudication to encompass on-going scrutiny and regulatory oversight of the electricity sector to include issues of utility planning, energy supply costs, participation agreements, service reliability, capital asset growth, on-Island generation, energy conservation, inter-provincial cooperation, etc.
- The work of the panel would be subject to a regular process review by the auditor general and thereby required to address any deficiencies that might be identified.
- With respect to hearings, the panel would be less about formality and expert opinion and more about accountability on the part of both the utility and the panel. Concerning the latter, written decisions of the panel would require explanation and justification.
- The panel would be funded from the current allocation provided to IRAC. These funds would be used to conduct the business of the panel and to pay honorariums to panel members.
- The panel would be truly independent from Government and be expected to weigh in on policy and regulatory decisions by Government that impact on matters related to the electricity sector. It would not be acceptable for such a panel to stand by silently and/or relinquish its oversight of Island utilities on matters affecting the best interest to electricity consumers.
- The panel would establish a separate (from IRAC) website for electricity matters. Further, the website should distinguish between the information and service needs of the regulated utilities and other sector participants, and the needs of the electricity consumer in the form of information on bills, prices, services, etc.
- The public would be provided an opportunity to periodically provide feedback to the panel on electricity issues in an informal public-forum-like setting that is welcoming and generally non-technical.

Legislative Amendments

It is also important to note that if Government pursues the direction provided by the Commission, legislative amendments will most likely follow. When this occurs, Government needs to be mindful that the amendments should not detract from the authority already provided to IRAC. It is the view of the Commission that whenever IRAC's regulatory oversight role is diminished (intentionally or not) there is increased risk of future unforeseen increases to electricity prices in the province.

Status Quo for Summerside Electric

Summerside Electric does not need to be regulated by IRAC beyond what is currently required through the *Electric Power Act* and the City of Summerside Electric Utility Exemption Regulations. The current system of being accountable to the citizens of Summerside appears to be working and the Commission does not see any reason for change in this regard.

2.3 Role of Government

Key Recommendation: Expand the scope of the PEI Energy Corporation to encompass the financing and recovery of all Maritime Electric customer debt associated with the Point Lepreau refurbishment project, all transferred generation assets of Maritime Electric, the cost of a new cable interconnection and any future investments in generation infrastructure.

The Government of Prince Edward Island manages energy policy and issues through the PEI Energy Corporation and the Energy and Minerals Division (Division) of the Department of Finance, Energy and Municipal Affairs.

2.3.1 PEI Energy Corporation

The PEI Energy Corporation was established in 1978 with the following objectives:

- To develop and promote energy systems and the generation, production, transmission and distribution of energy in all its forms on an economic and efficient basis leading to greater self-sufficiency and price stability.
- To provide financial assistance in the development, installation and use of energy systems to achieve diversity of supply and environmental sustainability.
- To coordinate all Government energy-related programs.
- To support the growth of local industries involved in the research and development of new technologies.

Projects and Initiatives

Since its establishment the Corporation has been involved in a variety of innovative energy projects and initiatives in Prince Edward Island including:

- Atlantic Wind Test Site in North Cape, (1980 to 2006)
- Charlottetown Energy from Waste Plant, (1983 to 1995)
- Biomass heating installations (1985 to present)
- Charlottetown Central District Heating System, (1989 to 1995)
- North Cape Wind Farm (2001) and subsequent expansion, (2003 to present)
- Energy Framework and Renewable Energy Strategy, (2004 to 2008)
- Wind Energy Institute of Canada (WEICan), (2006 to 2012)
- Updated Energy Strategy and Island Wind Energy: 10 Point Plan, (2008 to present)
- Wind-Hydrogen research and development (2007 to 2011)
- East Point Wind Plant (2006 to present)
- WEICan Wind Park financing (2011 to present)
- Hermanville and Clear Springs Wind Farm (2013)



Current Activities

To a great extent, Government deals with electricity issues through the PEI Energy Corporation. Specific to electricity, the Corporation has focused its activities on the development of wind energy in Prince Edward Island, dealing with Maritime Electric on electricity supply issues, and recently, direct involvement in the negotiation of the PPA that is currently in place between Maritime Electric and NB Power.

*“To a great extent,
Government deals with
electricity issues through the
PEI Energy Corporation.”*

Between the North Cape Wind Farm, the East Point Wind Plant and new wind development mandated by the PEI Energy Accord (recently identified as the Hermanville and Clear Springs Wind Farm), the Corporation will own and operate just over 70 MW of wind turbine capacity by the end of 2013 (it currently owns and operates just over 40 MW). These three projects currently represent an investment of approximately \$130 million when completed, and all of the power produced is (and will be) sold to Maritime Electric for use within the province. The Corporation has been successful in operating its existing wind farms at a profit and it forecasts the same for the new wind farm development project.

2.3.2 Energy and Minerals Division

Government’s Energy and Minerals Division is responsible for the development, implementation and administration of energy policies and programs, as well as the administration of mineral resources development and gas exploration initiatives undertaken in the province. The Division’s scope of responsibility also includes the operations of the Office of Energy Efficiency (OEE).

In the absence of other interveners with the available technical and financial resources necessary to challenge rate, capital budget and other IRAC filings by Maritime Electric, the Division and/or the PEI Energy Corporation has fulfilled this role for Government in the interest of Island ratepayers. While this has been effective to the extent that it has required Maritime Electric to clarify and justify its position on many aspects of its regulatory filings, neither the Division nor the Corporation is mandated or staffed to serve as an intervener.

As the PEI Energy Corporation has taken the lead on the Government’s electricity file in recent years, the Energy and Minerals Division gravitates toward activities associated with the exploration and economic development of mineral and energy resources, to the limited extent that they exist in the province.

Office of Energy Efficiency

In 2007, Government hired a consultant to identify energy efficiency initiatives with the potential to substantially reduce energy use and lower greenhouse gas emissions in the province by 2017. The resulting report, entitled “Energy Efficiency Initiative Designs and Achievable Potential for Prince Edward Island,” outlined program options for the residential and commercial/industrial sectors which, over a ten year period, projected a reduction in annual electricity consumption by 11% and fuel consumption for heating and transportation by 6%. The report also indicated that the proposed energy efficiency measures could offset all forecasted electricity growth over this same timeframe.

To facilitate an active response to the recommendations of its consultant, the province established the Office of Energy Efficiency in January, 2008. The concept of the OEE is that it is an agency dedicated to serve as a “one-stop-shop” for energy efficiency programs and information.

The OEE is structured within the Energy and Minerals Division with a mandate to:

“Provide Islanders with advice and programs that will promote sustainable energy use and reinforce the importance of sound energy management for the economic, social and environmental well being of Island residents and businesses.”

Since its inception, the OEE has been involved in more than 7,000 energy audits and inspections of Island homes. These audits and inspections have led to financial assistance in the form of loans and grants for residential energy efficiency improvements with program participants realizing an average annual energy saving of approximately \$1,200. While its mandate is inclusive of all forms of energy and energy consumption, the focus of the OEE’s programs for residential clients has been primarily on energy savings related to space heating.* The OEE also has funding programs for commercial clients that are less specific to space heating and can include activities to reduce electricity consumption.

** For clarity, the electricity sector has not been a focus because it is the province’s electric utilities that (until recently) were required by legislation to provide electricity focused efficiency programs.*

2.3.3 Clarification of Roles

While the PEI Energy Corporation and the Energy and Minerals Division are separate and distinct in structure and governance, many of their activities and operations share the same management, staff and facilities. To date, this has not created any significant problems but the potential for conflicting interests and competition for resources does

exist with respect to the business objectives of the Corporation and the policy objectives of Government. To provide clarity and eliminate any direct conflicts that may arise as the Corporation becomes more involved in issues impacting electricity rates, the Commission sees the need for a more distinct separation of the Government’s energy interests.

“the Commission sees the need for a more distinct separation of Government’s energy interests.”

As a provincial Crown corporation, the PEI Energy Corporation should be operated at arm’s length from the Government, with direct Government control only being exerted over its mandate, budget and the appointment of its Board of Directors. (For clarity, the board should primarily consist of individuals independent of Government.) To some degree this has not been the case and there is currently very little real distinction between the Corporation and the Energy and Minerals Division (as an entity within Government’s departmental structure). Both overlap into aspects of policy and planning issues, regulatory intervention, funding and financing, energy efficiency and conservation, and interaction with the utilities. While this gives maximum flexibility to Government in terms of how it wants to deal with a particular issue, it negates the balance that could otherwise be achieved through a more distinct separation of roles.

Corporation Role

Sustainable Energy Innovation - Since its establishment over 30 years ago, the Corporation has been successful in recognizing and realizing opportunities for greater energy self-sufficiency and the development of sustainable energy projects. The successful development of the Charlottetown Energy from Waste Plant and Central District Heating System, and the eventual sale of these systems to the private

“The Commission fully supports Government’s continuing leadership on innovative energy systems development initiatives.”



sector are in keeping with the Corporation's overall purpose and mandate. The Commission fully supports Government's continuing leadership on innovative energy systems development initiatives and subsequent privatization when such an opportunity exists. This transitional approach has the potential to provide ongoing funds for new innovation projects as well as the continuing advancement of Prince Edward Island as a leader in sustainable energy research and development.

The development of commercial wind farms in North Cape and Eastern Kings is further testament to the Corporation's mandate effectiveness toward innovation and sustainability. It must be noted that while some Commission members were originally predisposed to eventual privatization of the Corporation's wind farm assets, the majority of public input received during the Commission's consultation phase leaned emphatically otherwise. Accordingly, the Commission as a whole defers to public sentiment and recommends that ownership of the North Cape Wind Farm and East Point Wind Plant remain as assets of the PEI Energy Corporation.

Financing Ratepayer Debt Obligations - In 2009 Maritime Electric began deferring the cost of purchasing replacement energy during the refurbishment of the Point Lepreau nuclear plant. In 2011 as a component of the PEI Energy Accord, responsibility for accumulating replacement energy deferral costs was transferred to the Energy Corporation* and the scope of deferral was increased to cover the operation and maintenance obligations that required ongoing payment during refurbishment. By the time that Point Lepreau returns to service in the fall of 2012, the deferral accounts held by Maritime Electric (approximately \$47 million) and the PEI Energy Corporation (approximately \$43 million) will total approximately \$90 million and this amount will have to be collected in the future from Maritime Electric customers.

**The Accord also transferred the Dalhousie plant unit participation agreement exit costs of approximately \$12.5 million from Maritime Electric to the PEI Energy Corporation, to be financed and recovered (principal and interest) by the Corporation from Maritime Electric customers over a 10 year period.*

The Maritime Electric deferral amount should be consolidated into the deferral account of the PEI Energy Corporation to take advantage of the fact that the Corporation can secure financing at more favourable rates than are available to Maritime Electric. Once it has been consolidated, the total deferral should be amortized over a period of 25 years to approximately match the new service life of the refurbished generation facility.** If the debt is continued to be carried by Maritime Electric, approximately 40% of the debt obligation would be subject to Maritime Electric's allowed 9.75% return on equity and the remaining 60% would be financed at the best rate accessible to Maritime Electric through long-term financing. If carried by the Corporation, the entire obligation could be financed at Government's favourable financing rates. Based on recent interest rates incurred on long term borrowings by both the province and Maritime Electric, this could result in a savings differential of several million dollars over a 25 year period.

***NB Power has projected a life of 27 years in its filing of September 10, 2012 with the New Brunswick Energy and Utilities Board. The final accepted life will require regulatory approval.*

In addition to the above, given the lengthy delays experienced through the refurbishment project, Maritime Electric and Government should work together to recover any damages that they may be legally entitled to as part of an NB Power claim and/or on their own as an aggrieved party.

Electricity Supply and Generation – When implemented, the recommendations and direction provided in this report will result in the PEI Energy Corporation and Maritime Electric working more collaboratively on all aspects of electricity supply and generation.

With respect to electricity supply, the Commission sees the Corporation being directly involved with Maritime Electric in all aspects of negotiations, including power purchase agreements, participation agreements, and other related contracts pursued by Maritime Electric. This approach is consistent with the successful process used to secure the PPA that forms the basis of the PEI Energy Accord.

With respect to generation, the Commission sees the Corporation expanding its current role as an owner of wind generation assets to include the ownership of all generation assets currently held by Maritime Electric, as well as any new generation assets required to support future system requirements. Refer to the latter part of Section 2.1.2 for further discussion on this recommendation.

“With respect to electricity supply, the Commission sees the Corporation being directly involved with Maritime Electric in all aspects of negotiations ...”

Regulatory Intervention – With the Corporation more directly involved in matters that impact on rates and Maritime Electric submissions to IRAC, and the Corporation continuing as a significant supplier of wind energy to Maritime Electric, an alternative to the Corporation serving as a default intervener is warranted. The need for an alternative is addressed in Section 3.3.

Energy and Minerals Division Role

Policy and Planning – Ultimately, it is Government’s legislative power which sets the agenda for both the utility and the regulator. Energy policy and planning is the foundation upon which Government provides direction on the Island’s electricity supply structure and operations. The Energy and Minerals Division is the logical place within Government for the assignment of policy and planning functions.

“Energy policy and planning is the foundation upon which Government provides direction on the Island’s electricity supply structure and operations.”

Policy and planning within the Division as it relates to electricity should include the following:

- Setting policy objectives on issues including but not limited to: renewable energy, energy efficiency and conservation, increasing self-sufficiency, regional collaboration, economic development, research and innovation, etc.
- Ensuring that legislation is relevant and effective.
- Developing strategies for achieving policy objectives.
- Conception and design of programs for achieving policy objectives.

Regulatory Intervention – To the extent that the policy objectives of Government are relevant to any given regulatory issue under review or Order by IRAC, it would be appropriate for the Division to intervene and establish its position on the issue. The Commission however is not suggesting that the Division assume the role of default intervener, but instead use the IRAC process where Government policy objectives dictate and then subsequently consolidate the (new) policy decisions within legislation as required.

Office of Energy Efficiency – The Office of Energy Efficiency should remain a part of the Energy and Minerals Division as a means to deliver programs that meet Government’s policy objectives. Refer to Section 3.1 for further discussion regarding the future role of the OEE specific to Demand Side Management (DSM).



2.4 A New Cable Interconnection

Key Recommendation: A reliable cable interconnection is essential to achieving security of electricity supply and price stability at the lowest cost to Islanders; therefore any issues delaying a new cable must be resolved quickly followed by installation at the earliest possible date.

Until 1977, when Prince Edward Island's peak load was approximately 95 MW, all of the province's electricity was generated on-Island. In 1977 a new supply model was introduced with the installation of two 100 MW submarine cables in the Northumberland Strait. The cable interconnection was established for a cost of \$36 million which was co-funded by \$18 million in federal grants, \$9 million in federal loans and \$9 million in provincial contributions.*

**In 1985, the federal government granted the province an additional \$18 million thereby effectively financing the entire cost of the cable interconnection.*

2.4.1 The Importance of Interconnection

The existing submarine cable interconnection serves as an essential link between the Island electricity grid and the regional system that serves Eastern Canada and the New England states. Within four years of the cable connection being established, Maritime Electric changed from generating all of Prince Edward Island's electricity on-Island to purchasing virtually all of its electricity requirements from the mainland. It was not until commercial wind power generation began in 2001 that the Island's near total reliance on imported electricity began to decrease. Still today, with one of the highest degrees of utility-scale wind integration in the world, when the wind is not blowing (and under normal operating conditions), almost all of electricity used on the Island is imported via the submarine cable interconnection.

“when the wind is not blowing, almost all of electricity used on the Island is imported via the submarine cable interconnection.”

2.4.2 New Cable Timing

At the time of their installation, the design life for the two existing cables that serve the Island was estimated at approximately 30 years** (when peak load was approximately 95 MW). The cables are now 35 years in service and the province's peak load exceeds 220 MW. Current projected load growth for Prince Edward Island is 1.5% to 2% per year which may push the peak load into the 250 MW range by 2018.

***A 30 year design life was based on the cables being loaded continuously at 200 MW. Because the cable interconnection has been generally operated at a loading less than 200 MW, its service life has been extended beyond its original design life.*

In spite of their age, the existing cables are reported to be in very good condition. This is due in part to the fact that they have not been subjected to their rated capacity loads very often. That being said, one of the cables recently had to be taken out of service for repair, raising concerns over their remaining life span. The loss of one cable for an extended period of time would have financial consequences for Island ratepayers in the millions of dollars. If such a problem were to occur in the early part of winter for example,

“The loss of one cable for an extended period of time would have financial consequences for Island ratepayers in the millions of dollars.”

the cable could be out of service for several months forcing the replacement electricity to be generated on-Island using expensive oil-fired equipment. It should be noted here that if the new cable were to be installed in or along the structure of the Confederation Bridge, the risk of a long supply disruption is decreased significantly as the cable would be much easier to repair year-round. The Commission emphasizes that the feasibility of installing the cable in or along the Confederation Bridge should continue to be pursued notwithstanding the report by Buckland and Taylor Ltd. which indicated that the installation of the cable in the bridge's utility corridor could weaken the structure. It makes sense to revisit the bridge installation possibility because of the potential positive impact on maintenance and repair costs.

There are several tangible reasons for securing the Island's future electricity import requirements with a new cable interconnection, including:

- The peak load has substantially increased in the 35 years since the two existing cables were placed into service.
- Off-Island supply remains the least-cost option.
- Increasing the capacity of the mainland interconnection would enable the retirement of some of the older on-Island generation equipment and avoid having to refurbish or replace it with new equipment.

2.4.3 New Cable Cost, Ownership and Financing

The Commission is not mandated to address the need for a new cable interconnection, but is tasked only with providing advice to minimize the cost impact of a new cable on future electricity rates. However, it is apparent to the Commission and several participants during the consultation phase that a new cable is needed sooner than later.

“it is apparent to the Commission and several participants during the consultation phase that a new cable is needed sooner than later.”

The two existing interconnection cables that service Prince Edward Island are owned by Government and are leased under a long-term operation and maintenance agreement by Maritime Electric. Because of this arrangement, Maritime Electric does not generate a monetary return on the cables since these assets are not on the company's balance sheet. This ultimately reduces the cost to electricity consumers. A similar approach should be taken with any new cable project; however, the capital depreciation and financing expense will both be additional ratepayer costs as soon as this new cable becomes operational.

When a new cable is installed, it is expected to utilize much of the existing land-based interconnection and transmission infrastructure. As a submarine installation, the proposed capacity of the new cable is 150 MW at an estimated project cost of \$77 million. The preferred approach, which is to install the cable in or along the Confederation Bridge structure would result in significant savings in construction, maintenance and repair costs versus the submarine option; however, additional engineering studies are required. The technical approach to a bridge installation and the cost/benefit of installing a larger capacity cable (or having a two-phased project with two 150 MW or smaller capacity cables) needs to be determined. The province is seeking financial support from the federal government for the new cable interconnection as was the case for the original cables.

Assuming that federal financial support becomes available in the near term, another incentive for moving ahead now with the new cable project is credit market conditions. Current conditions make long-term borrowing very attractive and the Commission recommends



that the new cable be financed over a term that matches its design life. With an expectation that the new cable design life will be in the 35-year range, delaying the new cable risks an increase in interest rates that could negatively alter the economics of the project.

2.5 Stewardship and the Environment

Key Recommendation: Optimize Maritime Electric’s core PPA structure so that on-Island wind energy penetration increases in the future and study the operational and economic feasibility of existing community-based renewable energy projects.

As stated throughout the report and as is the case throughout modern society, renewable energy is an increasingly important part of Island life and the Island economy. The world is changing and the ideals associated with achieving prosperity must be balanced with concerns about the future of the environment.

Historically, the high cost of electricity in Prince Edward Island has been directly related to a reliance on generation sources that utilize fuels tied to the price of oil. The recent decoupling of natural gas prices from oil prices in North America, along with an unexpected surplus of electricity generation capacity in the region (tied to the economic downturn of 2008), has helped to alleviate some of the electricity price shock that was experienced in the past. However, even if the price of natural gas stays low into the foreseeable future, there are benefits in terms of energy security, price stability and environmental stewardship that support an even stronger commitment to renewable energy in Prince Edward Island.

“renewable energy is an increasingly important part of Island life and the Island economy.”

Renewable energy provides clean, environmentally responsible power that once developed, can be cost efficient and reduces consumer and business exposure to price volatility. Utility-scale options for electricity generation in Prince Edward Island are basically limited to wind power and wood combustion, with the latter bringing cost challenges and sustainability concerns into the equation.

2.5.1 The Challenges of Wind – Balancing and Load Following

It is not uncommon to hear comments that wind power (and other renewable energy sources) should be supplying 100% of the Island’s electricity.* Similarly there is some public resistance to producing wind power for the export market when this perceived “free” electricity could be used locally. The reality is that the wind does not always blow and when it does, it is not always at the speed necessary to produce full wind turbine output. There are also occasions when the wind speed exceeds turbine operating conditions and generation cannot occur. There is a need therefore to “balance” the output of the wind turbines through a combination of other supply sources and/or adapting the load use through smart-grid technology.** The objective is to ensure that electricity is always available when users require it.

**In reality, this is sometimes the case in Prince Edward Island when the wind is blowing during reduced load conditions.*

***Smart-grid technology can assist with wind balancing by enabling the utility and its customers to synchronize electricity demand with wind generated electricity, resulting in a “time-of-wind” load response. Energy storage systems and smart appliances that can be controlled by the customer and the utility are examples of early approaches to smart-grid technology that are currently being piloted by both Island utilities.*

The electric utilities that operate within the region buy and sell power on an hourly basis. Incorporated within those figures is the estimate of energy that will be produced from wind. Fluctuations in wind speed will cause deviations in supply forecasts. Small deviations are expected and can be readily accommodated (or balanced) by the system operator by increasing or decreasing the supply of electricity from “load following” generators. On the other hand, large discrepancies between the forecasted and actual energy production can prove to be costly.

The PEI Energy Corporation and all other wind farm operators on the Island are responsible for providing their own hourly forecasts. Balancing charges are tied to the need to sell excess wind energy if the forecasts prove to be high and to purchase supplemental energy if the forecasts prove to be low. Balancing charges accrue as differences occur between the contract price and the market price.

In addition to the balancing charges that are based on forecasting accuracy, utilities that rely on wind power must also pay a “load following” charge. This is a flat monthly fee based on the cost of providing generation that will adjust to instantaneous fluctuations in wind power production. Load following is an ancillary service that is currently purchased as a component of Maritime Electric’s core PPA with NB Power.

The ability to generate precise wind power production forecasts is key to successful wind farm operation and ultimately, maximizing the integration potential of wind as a resource. To this end, the PEI Energy Corporation and Maritime Electric have collaborated on projects aimed at improving forecasting ability and they have jointly achieved a level of precision that is considerably better than the industry standard. Work in this area should continue as it creates a positive impact on the cost of electricity in the province.

“The ability to generate precise wind power production forecasts is key to successful wind farm operations ...”

2.5.2 Commercial Wind Farms

Prince Edward Island has a world class wind resource and Government has been very active as a developer of commercial wind power projects for more than the past ten years. In 2001, the PEI Energy Corporation developed Atlantic Canada’s first commercial wind farm in North Cape and in 2003, the Corporation expanded the North Cape Wind Farm from 5.3 MW to 10.6 MW. In 2006 the Corporation developed the 30 MW East Point Wind Plant. Electricity from both of these wind farm developments is sold to Maritime Electric at a price that is competitive with electricity purchased from off-Island suppliers.

Summerside Electric is also strongly committed to commercial wind power with 12 MW of generation capacity from its own City of Summerside Wind Farm and purchasing 9 MW of generation from IPR-GDF Suez North America.





Figure 2.4: Aerial View of North Cape and Norway, Prince Edward Island, 2012.

Courtesy of the Wind Energy Institute of Canada.

IPR-GDF Suez North America (Suez) operates two commercial wind farms in western Prince Edward Island. One is located in Norway (established 2007) with an installed capacity of 9 MW and the other is in West Cape (established 2007 to 2009) with an installed capacity of 99 MW. The electricity produced by the Suez wind farm in Norway is all sold to Maritime Electric through the PEI Energy Corporation. Production from the Suez wind farm in West Cape is sold to Summerside Electric as noted above and the remainder is sold off-Island into the regional market.

Aeolus Wind PEI also operates a commercial wind plant in Norway although it only consists of one 3 MW turbine. This unit was originally installed as a prototype test turbine by Vestas Wind Systems in 2004 and the electricity from it is sold directly to Maritime Electric.

The PEI Energy Accord has mandated the PEI Energy Corporation to develop an additional 30 MW of wind power. This project (the Hermanville and Clear Springs Wind Farm), along with an additional 10 MW of new wind power production capacity currently being developed by the Wind Energy Institute of Canada in North Cape (see Figure 2.4 for an aerial view of all turbines now located in North Cape and Norway), will result in Maritime Electric contractually sourcing up to approximately 92 MW of its electricity requirements from wind by the end of 2013. The two Island electric utilities will by then, on an annual basis, be collectively supplying approximately 30% of Prince Edward Island's electricity needs by way of wind-generated energy.

Once 30% contractual wind penetration has been achieved, Maritime Electric advises that at 92 MW of wind, it will have reached the point where any further increases to the amount of the wind energy in its supply portfolio may have to be resold off-Island at a potential loss to the utility.

2.5.3 Increasing Wind Integration

The distinction between contractual energy supply and the physical energy supply is important in order to understand how the Island's consumption of renewable (wind) energy is actually higher than 30%. Regardless of how the electricity generated by on-Island wind turbines is contracted to be sold, the actual electricity produced will always flow to on-Island loads to satisfy existing demand. It is only when the on-Island supply of wind power exceeds the on-Island demand for electricity that the Island's wind generated electricity leaves the province.

The potential to advance beyond 30% contractual wind integration and utilize even more of the wind energy generated by all of the wind farms in Prince Edward Island can be realized through time-of-wind electricity consumption initiatives. However, attempts at load control through such initiatives are marginalized if the contracted electricity import conditions do not recognize on-Island efforts to synchronize electricity demand with wind energy production. Summerside Electric has already managed to better match the terms of its core PPA to its wind energy resource; Maritime Electric should follow their lead and at the very least consider a similar approach for its next energy import supply contract.

2.5.4 Other Renewable Electricity Options

Wood Biomass

The potential for wood biomass to be utilized for on-Island baseload electricity generation has been raised regularly over the years. To date however, the conditions have not proven right for such a generation facility to be developed. In reviewing the potential of baseload wood biomass projects, the Commission has determined the two issues that combine to detract from project feasibility are energy production costs and fuel supply sustainability.

In order for a base load wood biomass generation project to prove attractive to Maritime Electric, the cost of power to the utility would have to be at or below what a similar combination of energy and capacity can be purchased from off-Island suppliers. In the current market environment, with excess capacity in the region and the availability of low priced, natural gas generated electricity, wood biomass generation simply cannot compete.

Fuel supply issues are interrelated with the production cost concerns already noted, however, additional challenges related to long-term on-Island supply availability and cost premiums related to sustainable harvesting practices would need to be addressed.

In order for a baseload wood biomass generation facility to be successful in Prince Edward Island, it would almost certainly need to have a cogeneration component. This adds a significant degree of complication to realizing a project as the heat customer would have to be physically adjacent (for efficiency of supply) and financially stable (for long-term viability).

In addition, it would be more attractive and complementary to the Island's wind power developments to pursue on-Island generation that can operate in an efficient load following manner (wood biomass generation/cogeneration is not conducive to load following). At

“In the current market environment, with excess capacity in the region and the availability of low priced, natural gas generated electricity, wood biomass generation simply cannot compete.”



some point in the future, on-Island natural gas generation could serve such a purpose. The potential for on-Island natural gas generation is addressed in Section 3.5.

Solar Photovoltaic

During the public consultation phase, the Commission received presentations advocating the use of solar generated electrical energy (i.e., energy derived from the sun through solar radiation).^{*} Solar generated electricity relies on the use of photovoltaic (PV) panels and collectors. Because sunlight is not available during nighttime hours and is variable by time of year, solar energy is also an intermittent renewable which requires balancing and load following for supply reliability. Although the same energy storage technologies already discussed for wind can also apply to solar, the cost of producing electricity on a commercial-scale using solar PV systems in Canada still remains significantly greater on a cost per kilowatt-hour basis than the cost of producing electricity from wind and/or purchasing imported electricity.

**Solar thermal energy is another way to harness the energy in solar radiation and it is cost competitive and/or complementary with other thermal energy options.*

Hydro Power

Hydro power is electricity derived from the energy inherent in falling or flowing water that is harnessed to rotate the blades of a turbine connected to a generator. Development of hydro power is dependent on dams and reservoirs to control the water flow, and within Canada it is the predominant source for electricity generation. The provinces of Quebec, British Columbia, Manitoba and Newfoundland and Labrador all have an extensive hydro power resource that collectively accounts for more than 95% of the hydro electricity production in the country. Prince Edward Island does not have the natural features that enable the development of utility-scale hydro power facilities.

Muskrat Falls Hydro Development – The proposed Muskrat Falls Project (the first phase of the much larger Lower Churchill Project) is an 824 MW hydroelectric dam in central Labrador and is a partnership between Nalcor Energy and Emera Inc. (the parent company of Nova Scotia Power). The project cost is estimated to be \$6.2 billion and the Government of Canada has agreed in principal to guarantee the debt component of the project. The project includes the construction of 1,100 kilometres of high voltage transmission lines linking Labrador to Newfoundland and then Newfoundland to Nova Scotia. It is currently estimated to be completed in 2018.

Of the 824 MW, Newfoundland and Labrador would initially contract for approximately 330 MW, Nova Scotia 170 MW and the residual output (approximately 324 MW) would be available for open market purchases in the Maritimes and New England. It is understood that the 170 MW for Nova Scotia is dispatchable and intended to assist in the balancing of wind generation in that province. To export the 324 MW outside of Nova Scotia, the Commission understands that new transmission lines between Nova Scotia and New Brunswick may be required at a projected cost of about \$400 million. It is also anticipated that the 324 MW of residual output may be reduced over time as more power is used in Newfoundland and Labrador to meet domestic load growth.

The Commission recommends that Maritime Electric and Government should closely follow the development of the Muskrat Falls Project to determine whether there is an economically sound opportunity to contract for a portion of the power output for Prince Edward Island.

“Maritime Electric and Government should closely follow the development of the Muskrat Falls Project ...”

Two questions worthy of consideration are:

- Relative to the small load requirement of Prince Edward Island as compared to the project partners, would Muskrat Falls be a source of baseload or wind following power?
- Would it be feasible to move the power directly from Nova Scotia to Prince Edward Island?

Tidal Power - Tidal power is a form of hydro power that uses the flow of ocean tides in order to produce energy. In this region, the tides of the Bay of Fundy have the best potential for commercial-scale energy production and the Fundy Ocean Research Centre for Energy has been established to research and develop this promising natural resource. The project is being supported by the federal and Nova Scotia governments. Early indications suggest the resulting energy cost will be affordable and the future for the technology in the Bay of Fundy is positive because of the unique delta and consistency of the tides. However, because it remains a still-emerging technology and because the Island's tidal resource is not comparable to that of the Bay of Fundy, the cost of tidal power development in Prince Edward Island could be prohibitively high. As such, it is not currently a renewable energy supply option.

Wave Power - Wave power stems from wind passing over water which creates waves. The amount of energy in a wave is a function of wind speed, duration and distance travelled, which all affect wave height. Wave energy converters tend to generate electricity by rising and falling with waves, but this is another emerging renewable energy technology that is still some time away from being commercially viable.

2.5.5 Community-Based Renewable Energy

Through the public consultation process, the Commission received input calling for a strong commitment by the province toward community-based renewable energy development (with the primary focus on wind energy). While “community-based” may mean different things to those that promote the concept, it is generally founded on principles of providing:

- Social benefits from neighbors and local acquaintances working together toward a collective good.
- System efficiency benefits of local generation and distribution with little or no transmission component.
- Economic benefits of generating and retaining wealth within the community.
- Environmental benefits of reducing fossil fuel related emissions and the need for large centralized power plants.
- Logistical benefits of localized and streamlined project approvals and reduced public opposition common to “outsider” led initiatives.

Public Policy and Incentives - There are a number of ways to facilitate community-based renewable energy projects through public policy and incentives including:

- Distributed resource policies (net metering, net billing, etc.).
- Tax-based incentives (investment and production tax credits, sales and property tax policies, etc.).
- Financing incentives (subsidization loan programs, project aggregation programs, etc.).
- Direct cash incentives (production payment incentives, direct investment incentives, etc.).



While the Commission supports the concept of community-based renewable energy, it does not support the subsidization of electricity generation that is not economical and could result in increased costs to Island ratepayers and/or taxpayers.

“the Commission ... does not support the subsidization of electricity generation that is not economical ...”

Study Existing Installations - In just the past few years the number of small wind turbines on farms, at municipal facilities and commercial establishments has increased significantly across Prince Edward Island. The operational and financial success of these and other installations along with community reaction* needs to be studied to determine critical success factors before any decisions should be made by Government to encourage community-based renewable energy. The impact of such installations on the electric utilities also has to be considered as a component of any meaningful study.

**Support within the communities where these installations have occurred needs to be measured to determine if existing consultation and approval processes are in place and functioning. Public concern over the installation of wind monitoring towers and turbines for small-scale installations can be just as intense as it is for some commercial scale wind farm developments.*

There is already some work underway on this issue at the Wind Energy Institute of Canada. As a follow-up to the installation of a 50 kilowatt turbine at four community ice rinks in the province, WEICan is collecting and analyzing data from those projects and will be issuing a report in the spring of 2013. It is expected the results of the WEICan study will provide information relevant to the feasibility of community-based renewable energy in Prince Edward Island and also provide direction for additional work that needs to be done to move forward on this issue.

2.5.6 Clean Energy at What Price?

The Commission is very aware that many Islanders want to see leadership and vision on issues that will lead Prince Edward Island toward a state of renewable energy based self-sufficiency and a culture of energy efficiency and conservation. It is also very conscious of the fact that it is addressing issues with local, regional and to some degree, global implications. That being said, the Commission feels obligated to identify a balance between “any electricity at least cost” and “clean electricity at any cost.”

“Islanders should be aware and proud that in the very near future ... as much as 50% of their electricity supply will be from non-emitting sources.”

Islanders should be aware and proud that in the very near future their electricity supply will be comprised of approximately 30% wind power and 20% nuclear power, meaning that as much as 50% of their electricity supply will be from non-emitting sources. Even more impressive, this clean energy portfolio is being achieved at a time when the disparity between what we pay and what our neighbors pay for electricity is shrinking.

When it comes to Prince Edward Island’s electricity supply structure, the status quo should not be the end game and all Islanders should strive to do their part collectively and individually to ensure that our electricity future is both economically and environmentally sustainable. The good news is that there are synergies between these two objectives so it is not an “either/or” situation.

3.0 A Policy Continuum - Keeping Matters Current

Ultimately, the responsibility for how the province's electricity supply system is structured and operates rests with Government. However, for practical purposes, Government assigns the various structural components to a mix of public and private entities that possess the skills and resources to deliver specific services. Some such assignments and the expectations that go with them are policy decisions that may remain unchanged from one administration to another, while others require some periodic degree of major or minor adjustment.

Establishing a dedicated policy continuum practice within Government would help ensure that senior management, and thereby Executive Council, will have the capacity to continuously investigate and synthesize electricity sector research, data, trends, best practices, marketplace conditions and local economic conditions, allowing the province to respond with electrical energy policy that is always current.

In Section 2.0, the Commission outlined and addressed the structural components of Prince Edward Island's electricity supply system that it felt were of critical importance to keeping rates low and stable for the future. While the issues addressed in this section are also very important supply system components, they are complementary to the primary structural components already discussed.

3.1 Energy Efficiency and Demand Side Management

Recommendation: Return responsibility for Demand Side Management (DSM) initiatives to Island electric utilities and establish regulatory oversight of DSM by IRAC through the Electric Power Act.

Islanders tend towards being practical and frugal, and because most have been conditioned by their parents and grandparents that electricity is expensive and should not be wasted, concepts of energy efficiency and conservation are readily understood and accepted as simple common sense. In recent years, energy efficiency has also become as much about protecting the environment, as it is about saving money. The global issue of climate change as a primary example is one of several environmental concerns that increase the need for energy efficiency and conservation through various measures, including DSM.

“In recent years, energy efficiency has also become as much about protecting the environment, as it is about saving money.”

3.1.1 Reducing Electricity Consumption

DSM can be thought of as the modification of consumer demand for electricity through various methods that benefit both the consumer and the utility. Usually, the goal of DSM is to encourage the consumer to reduce electricity consumption, use it more efficiently and/or move the time of electricity use to off-peak times such as nighttime and weekends.*

**Peak demand management does not necessarily decrease total energy consumption, but the process could be expected to reduce the need for investments in networks and/or power plants.*



Common approaches to DSM include:

- Alternative rate programs such as time-of-use rates and load-shifting rates.
- Market transformation programs seeking to push more energy efficient technology into widespread use.
- Financing programs able to assist customers with paying for DSM measures, including loan, rebate, and shared savings programs.

In 2004, Government introduced the *Renewable Energy Act* which for the first time required Island electric utilities to file a DSM plan with IRAC.* The objective of the *Act* was to reduce the intensity of peak demand for electricity from the utilities in the years 2010 and 2015 by at least 5% and 10% respectively, from the 2004 intensity of peak demand. This led to Maritime Electric submitting plans for demand side management and energy conservation in 2006 (for the years 2007 to 2010) and 2010 (for the years 2011 to 2015). Subsequent annual status reports for the 2006 plan were also submitted, but IRAC's review of the 2010 plan was terminated through changes to the *Renewable Energy Act* that coincided with the PEI Energy Accord transferring responsibility for DSM to the province.

“The objective of the Act was to reduce the intensity of peak demand for electricity ...”

**Because of Summerside Electric's general exemption from regulatory oversight under the Electric Power Act, there was some ambiguity concerning its obligation to file a DSM plan under the Renewable Energy Act (which has no such exemption) and in the end, IRAC did not require Summerside Electric to do so.*

Since the *Renewable Energy Act* was amended in late 2010 to reflect the PEI Energy Accord, the *Act* has no requirements concerning DSM either in terms of which entity has responsibility for the process or what should be done about it. This appears to be a step backwards given the potential economic and environmental benefits that can be realized through DSM.

3.1.2 The Way Forward

To remain consistent with IRAC's past regulatory approach to DSM, most of the remainder of Section 3.1 does not apply to Summerside Electric.

DSM Responsibility and Funding

Although not specified in the PEI Energy Accord agreement, the stated intent of the province is to integrate what served as Maritime Electric's DSM program into the Office of Energy Efficiency. While the Commission understands the general logic of making the OEE responsible for DSM, it has concluded that responsibility for DSM should ultimately rest with Maritime Electric. The utility has the expertise, the direct access to relevant system information and the working knowledge that is necessary to design and manage the DSM initiatives that best fit its particular operational circumstance. Also, by transferring generation assets from Maritime Electric to the PEI Energy Corporation as recommended by the Commission, it removes the utility's potential investment conflict between either accepting or controlling increases in peak load.

“responsibility for DSM should ultimately rest with Maritime Electric.”

The role of the OEE specific to DSM should be that of an expert technical resource to IRAC (e.g., to advise on programs, set targets, assess effectiveness, etc.) and a program

delivery resource to Maritime Electric. Concerning program delivery, where there are obvious efficiencies for Maritime Electric DSM initiatives to be delivered through the OEE, this should occur on the basis that it is cost neutral to the OEE.

To fund DSM initiatives, the financial resources* that were previously assigned annually to Maritime Electric for DSM should be reinstated. While some DSM programs may span more than one year with the expenses not evenly distributed over the duration, IRAC should ensure that any deferrals can be recovered over a reasonable time period from Maritime Electric's DSM budget allocation.

**Maritime Electric had an annual budget of \$600,000 for DSM initiatives. This amount was recovered from the utility's customers as a component of rates.*

DSM Oversight

Another shortcoming requiring attention involves the DSM regulatory vacuum that now exists with the removal of DSM from the *Renewable Energy Act*. When responsibility for DSM is returned to Maritime Electric, the utility should be required to submit regular DSM plans and reports to IRAC in much the same way that it had been required to do prior to the PEI Energy Accord. However, instead of reinstating DSM requirements within the *Renewable Energy Act*, it would be more appropriate to include DSM as a requirement of the *Electric Power Act*. This would serve to clarify that the scope of DSM is not limited to renewable energy and it would also make it easier to formalize the Summerside Electric exemption. In addition, targets should be reviewed and there should be provisions for financial consequences to Maritime Electric should the set targets not be achieved.

DSM Innovation

Both Maritime Electric and Summerside Electric are involved in innovative DSM projects. Maritime Electric is a participant in PowerShift Atlantic (see Section 3.2.2) and Summerside Electric is pursuing its own initiative, the Smart Utility Grid project. The Commission recognizes that despite not having been required to consult with or answer to IRAC on DSM, Summerside Electric has been proactive in planning and piloting its Smart Utility Grid project. This activity has been driven by the high penetration of wind power in its system and the inherent economic advantages of local consumption through time-of-wind energy use and storage versus selling surplus wind energy to off-Island utilities. The early adoption of and communication about smart grid technology by Summerside Electric will also facilitate energy efficiency and conservation through automation, instantaneous feedback and generally better informed electricity consumers.

DSM Planning

In August, 2010 (prior to the PEI Energy Accord) Maritime Electric submitted the document "Demand Side Management and Energy Conservation Plan for Years 2011-2015" to IRAC, but changes to the *Renewable Energy Act* as a result of the Accord nullified this submission. Subsequently, in anticipation of assuming responsibility for DSM, the OEE hired a consultant to determine what DSM programs and delivery mechanisms it should pursue. The resulting report, "Prince Edward Island Energy Efficiency Study," dated August, 2011, provides useful recommendations that might form the basis for re-engaging Maritime Electric in DSM planning and program delivery.

"The resulting report, 'Prince Edward Island Energy Efficiency Study' ... might form the basis for re-engaging Maritime Electric in DSM planning and program delivery."



The Commission did not delve into the details of what specific DSM programs should be pursued in Prince Edward Island given that this matter was already addressed by Maritime Electric and the OEE. That being said, the Commission recommends that in addition to information already available through existing DSM studies and reports, more study and planning should be done to address the following questions:

- Increasing use of electricity for space heating – What impacts (positive and negative) does this have on the supply system and how can the negative impacts be minimized?
- Energy/building codes and standards – Also related to the increased use of electricity for space heating, are the energy/building codes and standards* that are currently in place (or planned) for Prince Edward Island adequate to mitigate the negative impacts on the electricity supply system?
- Public outreach and education – How can more attention be drawn on the part of Islanders with regard to day-to-day energy efficiency?
- Pilot projects for innovative technologies – What technology solutions best address the unique challenges and opportunities facing Island electric utilities?
- Collaboration with regional counterparts – What are the opportunities to achieve economies of scale, share resources and exchange expertise within the region?

**For example, the National Building Code of Canada and the new National Energy Code for Buildings.*

3.2 Regional Cooperation and Awareness

Recommendation: Prince Edward Island should continue to pursue regional cooperation on electricity sector initiatives with particular emphasis on PowerShift Atlantic and the strategic direction resulting from the Atlantic Energy Gateway initiative.

The management and movement of energy resources across provincial and national borders has become routine business for electric utilities and regulators. The resulting benefits of reliable and cost-competitive electricity are of increasing importance to the future of regional economic and community development. In addition, as the electricity sector shifts away from fossil fuels in the pursuit of clean and renewable electricity generation options, the potential benefits of regional cooperation become more evident as each jurisdiction's strengths come into play.

“the potential benefits of regional cooperation become more evident as each jurisdiction's strengths come into play.”

By achieving greater regional cooperation, Prince Edward Island will be in a much better position to reduce its reliance on fossil fuels, such as oil, and the related exposure to volatile commodity pricing. Further, the Island's electricity sector should keep strategically current and active regarding energy infrastructure developments in other provinces (e.g., Muskrat Falls Project).

3.2.1 Past Attempts at Regional Cooperation

The 1982 McQuaid Commission report addressed the impact of regional cooperation as it discussed the role of the now-defunct Maritime Energy Corporation.

"The Maritime Energy Corporation was the brainchild of the Council of Maritime Premiers and was conceived with the idea of providing a regional approach to the development of electrical power in the three Maritime provinces. Among the advantages of such an organization would have been the economies of which naturally flow from a coordinated large scale operation together with the cooperation, availability and use of the various sources of power."

Although the Maritime Energy Corporation had just recently folded, the McQuaid Commission still supported the development of a regional electricity generation supply approach within the Maritime region. The report also suggested the Government should immediately do everything possible to demonstrate to the Council of Maritime Premiers the benefits which could accrue to the area as a whole, and particularly to Prince Edward Island, from the formation of a new body similar to the Maritime Energy Corporation. To date, all three Maritime provinces continue to operate independently in the area of utility ownership and infrastructure.*

**There are some minor exceptions such as Maritime Electric's unit participation agreements with NB Power for Point Lepreau and Dalhousie (until recently), but even these agreements do not represent joint ownership in the same sense as was intended through the Maritime Energy Corporation concept.*

While there still may be some merit to the concept of some form of Maritime Energy Corporation, governments and utilities now tend to operate in a more project-centric environment. Cooperation on a project by project basis is more suited to this reality.

3.2.2 PowerShift Atlantic

PowerShift Atlantic is a four-year (2010 to 2014) collaborative research project involving Maritime utilities, government, academia and industry partners (Maritime Electric, the PEI Energy Corporation and WEICan are Island participants). The project focus is on finding more effective ways of integrating wind energy into the regional electricity supply system. Smart-grid utility technologies and compatible appliances are being deployed in pilot projects involving both residential and commercial electricity customers in various parts of the Maritimes.

3.2.3 The Atlantic Energy Gateway

One of the most current and important initiatives aimed at fostering regional energy cooperation is the Atlantic Energy Gateway (AEG). The AEG initiative seeks to bring together the federal and provincial governments, the private and public utilities, the private sector, and other energy stakeholders across Atlantic Canada toward the development of a regional clean and renewable energy strategy. To meet its objective, the AEG work plan was grouped within two general areas:

1. System planning and operations modeling.
2. Industry sector economic development and regulatory issues.



System Planning and Operations Modeling

The system planning and operations modeling exercise involved examining the potential costs and benefits of greater integration of the power systems in Atlantic Canada. Four interrelated study areas were identified and pursued as follows:

- Resource development modeling - To assess whether an integrated power supply system for the region would create more long-term economic and environmental benefits than stand-alone provincial systems.
- Transmission analysis - To assess the transmission interconnection upgrades and associated costs required to fully realize the potential benefits of an integrated regional power system.
- System balancing study - To evaluate additional benefits that could accrue by consolidating certain system functions under a common system operator across the Atlantic region.
- Overview of regional electricity system operations - To provide an overview of Atlantic Canada's existing electricity sector and to examine future options for structuring transmission system operations.

Industry Sector Economic Development and Regulatory Issues

The industry sector economic development and regulatory issues analysis examined aspects of developing the Atlantic region's clean energy industry. Four individual research projects were pursued as follows:

- Regional clean and renewable energy market opportunities - To assess and quantify opportunities for clean and renewable electricity export from Atlantic Canada to New England and for increasing the flow of clean and renewable energy based on an integrated regional electricity market.
- Financing of renewable electricity projects in Atlantic Canada - To identify and analyze the challenges associated with financing renewable energy projects by independent power producers in the Atlantic region.
- Renewable generation supply chain opportunities - To examine issues associated with opportunities for Atlantic Canada firms in the supply chain for various renewable generation technologies.
- Research, development and demonstration - To examine the current state of clean and renewable energy research, development and demonstration in Atlantic Canada and provide policy considerations that may further facilitate growth in this sector.

AEG Status and Results

The work and reporting of the AEG has essentially run concurrently with the work and reporting of the Commission. As such, the Commission did not have the AEG study reports at the time of writing this report.* However, through inquiries and briefings with Government, the Commission understands that the general conclusion from this collective body of work is that more effective regional cooperation would result in notable economic benefits for the Atlantic region.

“the general conclusion from this collective body of work is that more effective regional cooperation would result in notable economic benefits for the Atlantic region.”

*The AEG study reports were publicly released during the Canadian Energy & Mines Minister's Conference in Charlottetown, Prince Edward Island, on September 10, 2012.

3.2.4 Cooperation Opportunities

The national energy framework centres on provincial ownership of natural resources which vary significantly among provinces. Within each jurisdiction, there are differences of opinion concerning the overall direction of energy development. Achieving cooperation at the national level is difficult because of the different energy regimes and the strained relationships that may periodically exist among some provinces. Moreover, provinces are generally concerned that they should not lose control or power over such an essential service as electricity. Prince Edward Island is no different; however, with the exception of its development of wind power, the Island does not have the natural resources, such as coal, oil, gas, or hydro to enable affordable on-Island generation. Energy planners in the province have long recognized that the best alternative to expensive on-Island generation is to purchase electricity from neighbouring provinces and transmit it to the Island via the submarine cable interconnection. From all perspectives Prince Edward Island has no choice but to identify and cultivate opportunities for regional cooperation to facilitate the provision of electricity to all residents.

Regional cooperation priorities for the Island's electricity sector should include:

- Financial relief associated with the refurbishment delays at Point Lepreau.
- The new cable interconnection planning process.
- Balancing and load following locally generated electricity from wind.
- DSM and other matters of energy efficiency and conservation.
- Supporting and actively participating in PowerShift Atlantic, Atlantic Energy Gateway and related follow-up initiatives

3.2.5 Sector Coordination for the Common Good

Coordination of electrical sectors in Atlantic Canada can be achieved through a variety of frameworks ranging from basic bilateral and/or multi-party agreements between utilities, to regional organizations (e.g., an independent system administrator/operator) supported by participating utilities. To the extent that it can within the complexities of how electricity is legislated in each province, such coordination should be pursued because of the benefits that can result. By cooperating and planning regionally, the electricity sector can work collectively to better diversify the electricity supply mix and develop common practices to ensure the reliability of service and better pricing. The Commission believes these matters can be achieved while each jurisdiction still maintains control over its electricity policies and directions.

3.3 Facilitating Public Involvement

Recommendation: Establish a “consumer advocate for electricity” to represent individual ratepayers and help facilitate the participation of other interested parties at regulatory hearings.

As already stated in Section 2.2, IRAC currently looks to third parties to challenge the submissions of Maritime Electric. The complexity of electric utility matters makes effective intervention costly and consumptive in terms of securing the required legal and technical resources. Further, if interveners consistently fail to elicit any substantive impact on the regulatory Orders issued by IRAC, the result is likely to be increasingly less public participation in the regulatory process over time.



In the absence of other interveners with the technical and financial resources necessary to challenge regulatory filings by Maritime Electric, Government often takes on this role. An alternative approach would be for Government to appoint a consumer advocate to represent the interests of the residential and general service ratepayer on electricity issues filed with IRAC.

“The complexity of electric utility matters makes effective intervention costly and consumptive in terms of securing the required legal and technical resources.”

In addressing how best to give the electricity consumer a voice in regulatory oversight and the overall cost of electricity and performance of Maritime Electric, the Commission looked at four aspects of facilitating public involvement:

- Approaches to intervention.
- The role of a utility consumer advocate.
- The regulator as a utility consumer advocate.
- Modeling a utility consumer advocate for Prince Edward Island.

3.3.1 Approaches to Intervention

With the exception of the period of NB Power-plus-10 price cap regulation, Government has been the primary intervener in Maritime Electric rate applications since 1984. In recent years, Government has also intervened in the annual Maritime Electric capital budget proceedings.

Traditionally, Government has viewed its role as intervener in Maritime Electric regulatory submissions as representing the broad public interest. As well, Government believes it has the right to intervene in aspects of the regulatory process where it sees certain public policy issues at play. The decision to intervene is always made at the ministerial level, usually after departmental staff has provided a recommendation to do so. This practice should continue but there should not be a general expectation that Government will serve as the default intervener.

The level of effort involved in Government intervention has varied over time depending upon the specifics of the rate application under review, and sometimes included expert witness evidence and testimony.

Expert Opinion

With respect to the use of expert opinion at IRAC hearings, the Commission discourages this practice as it leads to one party (e.g., the utility) hiring an expert to present one side of an issue and another party (e.g., Government or some other intervener) hiring an expert to present an opposing position. In the end, it adds cost and complexity to IRAC hearings and the regulatory process. The Commission recommends that all parties involved in the regulatory process take a pragmatic approach to IRAC hearings and that expert opinion should only be used as a last resort.

“all parties involved in the regulatory process (should) take a pragmatic approach to IRAC hearings ...”

3.3.2 Role of a Utility Consumer Advocate

History of Utility Consumer Advocacy

The history of utility consumer advocacy began in the United States in the 1970s, when various individual agencies were created by state legislatures after natural gas and electric prices skyrocketed during that decade's energy crisis.

Since the 1970s and early 1980s, the role of the state advocates has been to challenge proposed rate increases by the electric, natural gas, telephone and water monopolies, primarily intervening in formal, economic regulatory cases before public utility commissions.

Since the 1990s, utility consumer advocates have focused on protecting consumers during the ongoing transition from monopolies to less regulated markets in which utilities and other firms increasingly compete with one another. As the trend toward competition and industry deregulation continues, utility consumer advocates have shifted their focus to consumer protection issues, such as service quality, reliability, and price stability.

The Canadian experience with utility consumer advocates is less structured and has a shorter history than in the United States. In a number of provinces, including British Columbia, Manitoba, and Ontario, consumers have been represented by organizations such as the Public Interest Advocacy Centre, the Consumers Association of Canada, and other organizations that purport to represent the broad public interest. In Alberta, New Brunswick, Nova Scotia, and Newfoundland and Labrador, a consumer advocate or public intervener can be appointed to represent electricity ratepayers.

Consumer Advocacy in Atlantic Canada

Of the three Atlantic Provinces that have experience with the use of a consumer advocate or public intervener, all make appointments to the position on a case-by-case basis.

This case-by-case appointment model presents both short and long-term problems. These problems were addressed by the New Brunswick Energy Commission (NBEC) in its report of May, 2011. The NBEC report included a recommendation for the appointment of a full-time Public Energy Advocate* to achieve two significant improvements. First, the permanent nature of the appointment would ensure that the steep learning curve associated with the regulation of a public utility would only have to be dealt with once, rather than repeated for each case-by-case appointment. Second, a permanent appointment provides ratepayers with continuous services, rather than a one-of representation that is connected only to a specific application.

**This recommendation was subsequently accepted by the New Brunswick Department of Energy and appointment of a full time public energy advocate was included as a component of the New Brunswick Energy Blueprint, October 2011.*

3.3.3 The Regulator as a Utility Consumer Advocate

There is a general misconception that the regulator or its staff should assume the role of a utility consumer advocate.

Frequently, individuals and interest groups appearing before utility regulators will argue that the regulatory board or panel should play the role of consumer advocate. This argument rests in the assumption that the public interest is served if the regulator actively represents ratepayer's interests during utility rate applications.



This points out that there is a misunderstanding over the concept of the public interest and the function of a regulator. Basically, a utility regulator must balance the needs of a utility with the needs of the utility's ratepayers. This balancing act requires the regulator to objectively assess the evidence put before it, not to act in a manner that advocates for one side or the other in regulatory proceedings. The public interest is served when a regulator understands this limitation and acts accordingly.

Despite the above, there are jurisdictions, particularly in the United States, where regulatory staff assumes an adversarial role against the utility in a manner similar to that of a consumer advocate.

In order for this to work there must be a strong firewall between the staff and the regulator, and most regulators in Canada are too small and thinly staffed to allow staff members to isolate themselves from the board or panel and perform an adversarial role in rate proceedings. Canadian regulators are more likely to have staff involved in rate case management, as well as providing assistance with the procedures involved in rate cases, including the development of interrogatories and cross examination during a hearing process. On the basis of conflict of interest, this type of activity precludes any involvement on the part of the regulator as a consumer advocate.

3.3.4 Modeling a Consumer Advocate for Prince Edward Island

Utility consumer advocates influence utility rates and service both through the formal regulatory proceedings and by advocacy on the "outside", such as through the news media. Perhaps the best definition of a utility consumer advocate comes from the Alberta Federation of Rural Electrification Associations (AFREA). For AFREA, a utility consumer advocate (UCA) is an individual or organization:

"Established to help monitor and protect the interests of Alberta's residential, farm and small business consumers of electricity and natural gas as well as adjust to the changes arising from Alberta's restructured marketplace. **The primary goals of the UCA are: to help consumers help themselves; to inform and empower consumers; to facilitate representation at regulatory hearings and other proceedings.**" (Emphasis added)

To assist with establishing a consumer advocate for Prince Edward Island, the Commission recommends the following basic parameters upon which to model the position:

1. The consumer advocate position should be a permanent appointment for an established term of not less than five years. This will allow the appointee sufficient time to become familiar with the relevant files related to the regulation of Maritime Electric.
2. While the consumer advocate's position should be a permanent appointment, it should not be a full-time position since the workload will be intermittent. However, use of the internet and the establishment of a website for the consumer advocate's office will allow the consumer advocate to serve the needs of residential and general service customers by providing information and updates, as well as a forum for bringing complaints forward for consideration and resolution.

"The consumer advocate should have a reasonable background in finance, economics, accounting, engineering or law."

3. The consumer advocate should have a reasonable background in finance, economics, accounting, engineering or law.
4. The consumer advocate would be the intervener of record for all Maritime Electric applications. As such, the consumer advocate will be copied on all documentation submitted by Maritime Electric and any interveners to a Maritime Electric proceeding. This would include applications, evidence, copies of interrogatories and responses, as well as transcripts of record, should these be available.
5. The annual cost of the consumer advocate's office should be covered by assessments against Maritime Electric. In order to ensure efficiency and effectiveness, the consumer advocate should be required to prepare a budget in advance that would be submitted to IRAC for assessment against Maritime Electric. In those years when there is a rate application, it may be necessary to provide a supplemental budget to cover the additional hearing costs.
6. The position of consumer advocate would be established by authority of the *Electric Power Act* and required to report to the Attorney General on an annual basis.

“The annual cost of the consumer advocate’s office should be covered by assessments against Maritime Electric .”

3.4 Observations and Best Practices

Recommendation: The electricity sector in Prince Edward Island should take advantage of its small scale by collaboratively developing best practices for integrated system planning and electricity price stability controls.

Over the course of the past year, the Commission has been privileged to engage with the key participants in the Island’s electricity sector and with various other stakeholders and electricity consumers. Along the way, questions have been asked, facts have been gathered and observations have been made and recorded. A significant body of knowledge has been gained through this process and is contained within this report.

3.4.1 Our Advantages

Within the regional electricity market and supply system, Island utilities are very small players in terms of energy, capacity and ancillary service requirements. While small may be a disadvantage when it comes to bulk purchasing through PPAs and other supply contracts, the Island’s utilities enjoy many advantages including:

- Appeal as a customer because suppliers can efficiently utilize existing surplus energy and capacity by matching their generation gaps with our requirements.
- The ability to use the regional grid to support a relatively high penetration of wind energy.
- Energy requirements that are relatively stable and predictable, and a wind resource that is at its best during the high load winter months.
- An electricity sector that is small and able to collaborate efficiently.
- Full status as a province which facilitates intergovernmental cooperation on regional and national energy issues.

“the Island’s electricity sector must make every effort to work collectively to ensure reliable electricity at stable and affordable rates.”



In recognizing and using these advantages, the Island's electricity sector must make every effort to work collectively to ensure reliable electricity at stable and affordable rates.

3.4.2 Integrated Sector Relations

The relatively small scale of the Island's electricity sector can be an advantage only if there is a strong collaborative effort working towards the common good of the electricity consumer. The Commission does not question that in its own way, each key sector participant* is driven by this objective however there is room for improvement in terms of resolving past differences and greater integration of planning. Cooperation after all, must begin at home if it is to be realized regionally.

**For clarity and the purposes of planning integration, key sector participants include Maritime Electric, Summerside Electric, PEI Energy Corporation, Energy and Minerals Division, Office of Energy Efficiency, IRAC and the proposed consumer advocate.*

Settling Differences - Without delving into the details of each individual issue, examples of differences between sector participants bear mentioning. Summerside Electric has expressed its concerns to the Commission that among other things, it has not been treated fairly by Maritime Electric and/or Government on matters including:

- On-Island transmission tariffs.
- Customers within Summerside city limits currently being serviced by Maritime Electric.
- Formal allocation of its proportional share of the cable interconnection.

The transmission issue dispute is well underway through legal channels, a process best left to resolve itself. However, concerning other issues that may be standing in the way of better relations, the Commission urges all involved parties to negotiate in good faith toward the resolution of their differences in a timely manner.

Planning and Reporting – Each of the key sector participants have planning and reporting functions built into their operations. Some are regulated under the *Electric Power Act* and the *Renewable Energy Act*, and some are voluntary as a component of responsible management. While there are understandable rationales for most planning and reporting functions needing to remain in individual silos, there would be benefit in convening the key sector participants for an annual information sharing and collaboration day, perhaps at the invitation of the Minister responsible for energy.

“there would be benefit in convening the key sector participants for an annual information sharing and collaboration day ...”

3.4.3 Electricity Price Factors

The information presented in this section of the report is focused on Maritime Electric. However, as Summerside Electric's practice has been to generally adopt the same customer service categories and rate structures as Maritime Electric, it follows that the direction and recommendations of the Commission concerning electricity price factors also indirectly apply to Summerside Electric.

Energy Costs

Maritime Electric's current electricity supply portfolio is primarily comprised of its core PPA with NB Power, wind energy PPAs with the PEI Energy Corporation, the Point Lepreau unit participation agreement, and its own on-Island generation. Point Lepreau essentially provides firm baseload energy, wind power is consumed as it is generated and the core PPA provides the bulk of the remaining energy and associated ancillary services requirement.

All energy costs incurred by Maritime Electric, both imported energy and on-Island energy, are passed on directly to customers; there is no premium or surcharge attached other than the applicable billing sales taxes. Although purchase agreements define all conditions of energy cost, there are monthly fluctuations in the total cost of energy depending upon market conditions, the quantity of energy used and/or the actual source of that energy. Cases of system failure or emergency, where the source of energy is changed and/or the fuel used is changed, can significantly increase the month-to-month energy costs.

Operating Costs

Aside from the cost of energy, the other major expenditure that directly impacts consumer price is the operating cost incurred by Maritime Electric. Most aspects of operating costs are decided by the utility and therefore offer opportunity for control and efficiency. These costs also provide opportunity for the regulator to critique and scrutinize the performance of Maritime Electric and then set the correct balance between service and cost, and avoid any trends towards reliability at any cost.

“The privilege of a monopoly concession comes with an obligation to serve the public interest ...”

Managing Operating Costs – Management of operating costs requires diligence, attention to detail, tracking and monitoring, and at times decisive action if forecasts and budgets are to be meaningful and accurate. The privilege of a monopoly concession comes with an obligation to serve the public interest, not just in terms of ensuring system safety and reliability, but also in terms of maximizing efficiency and spending prudently. The regulator also has a duty of responsibility to audit and challenge the utility in all aspects of its operations and to base its decisions and directions on the realities of the performance and the performance trends of the utility.

Electricity Pricing

Energy costs, Maritime Electric operating costs and customer debt repayments together with a forecast on annual energy use, determine the “required revenue” for Maritime Electric that has to be approved by IRAC, usually each year. This required revenue is allocated across all customer service categories in the form of per-unit billing rates (referred to as the basic rate), monthly service fees and for some rate categories, a load “demand” charge. These three charges and the energy consumed determine the price of electricity for each customer category. A separate and common per-unit energy cost adjustment mechanism (ECAM) levy is also applied to all billings, independent of the approved required revenue.

Energy Cost Adjustment Mechanism

Because energy supply costs are a “flow-through” charge to customers that can increase or decrease over relatively short periods of time, ECAM is utilized by Maritime Electric to smooth out short-term energy cost fluctuations. Accumulating these cost fluctuations into a customer deferral account and then paying-down this account over a longer amortization period has the effect of both averaging and delaying the payback. The

“... ECAM is utilized by Maritime Electric to smooth out short-term energy cost fluctuations.”



payback amount, albeit smoothed out, usually changes each month and appears as a per-unit energy billing levy consistently across all customer types. The ECAM amortization period currently utilized by Maritime Electric has been set by IRAC at 12 months.

Using ECAM, Maritime Electric is able to collect an approved base rate energy charge from its customers regardless of the exact cost. This fixed base rate enables a more accurate forecasting of required revenue and hence a more accurate setting of the individual billing rates. If the monthly cost of electricity exceeds the base amount, the excess cost is deferred for collection from customers over the ECAM amortization period. On the other hand, if the cost of electricity supply is less than the base amount, the resulting surplus is returned to customers or applied against any existing deferrals.

The ECAM base rate is set by an IRAC Order, in response to a Maritime Electric rate application, to reflect the expected cost of future energy. If the ECAM base rate is set too low, customers will receive a reduction to their power bill. However, a deferred account will accumulate with the money eventually being recovered through future increased rates. If the ECAM base rate is set too high, customers will be paying an inflated price and the surplus is returned by applying a per-unit energy billing discount.

In the interest of price stability, the Commission supports the continued use of ECAM in helping to avoid rate shock related to energy supply costs or variances between forecasted costs and actual costs. However, ECAM should be structured on the basis of the energy procurement situation at the time the rate application is being made. For example, Maritime Electric's current energy supply portfolio should result in stable supply costs to at least the end of the current PPA in February 2016. In this case, it is recommended to adjust for ECAM on an annual rather than monthly basis.

This would prevent budget conscious, limited means and fixed income customers having to deal with month-to-month changes. Also the month-to-month disparity of a single billing levy applied across different customer tariff classes would be avoided. Instead, an annual change in the ECAM levy would provide all customers with timely knowledge regarding changes in kilowatt-hour rates.

“... ECAM should be structured on the basis of the energy procurement situation at the time the rate application is being made.”

Deferral Account Practices

ECAM is simply tied to the cost of energy and there is no future benefit associated with any resulting deferred costs. As such, ECAM is used for rate smoothing through month-to-month cost deferrals with the balance being paid down over a rolling 12 month period; the intent is that there is no long-term build up of customer debt.

Maritime Electric is sometimes faced with extraordinary costs (beyond the scope of ECAM) that could cause “rate shock” but have a tangible future benefit (e.g., deferral of Point Lepreau operation and maintenance costs during the plant's refurbishment, deferral of Dalhousie Plant unit participation agreement exit fees, etc.). In these instances, it can be appropriate to establish longer-term deferrals.

However, for deferrals that are outside the scope of ECAM but have no future benefit (e.g., Point Lepreau replacement energy), they should be repaid as quickly as possible as an annual levy applied to service revenue. As a general rule, large deferrals with no future benefit should be avoided if at all possible. Otherwise, the subsequent repayment requirement is partially borne by future electricity consumers as a surcharge that drives up their rates, but provides them no benefit.

“As a general rule, large deferrals with no future benefit should be avoided if at all possible.”

Lower Prices and Price Stability – The PEI Energy Accord, by reducing and freezing the price of electricity for a two year period, appears to have significantly abated public concern over the high cost of power in the province. While Island electricity rates still remain higher than New Brunswick and Newfoundland and Labrador, the Commission received little input concerning the price of electricity during its public consultation phase.

“The PEI Energy Accord, by reducing and freezing the price of electricity for a two year period, appears to have significantly abated public concern over the high cost of power in the province.”

We are approaching the end of the second year of the PEI Energy Accord. For these first two years a price reduction and a freeze on rates was in place. It is expected that Maritime Electric’s rate application for 2013 will be in front of IRAC in the fall of 2012. The Commission has two recommendations regarding this rate application:

1. Extend price estimates and assumptions to include years 2014 and 2015.
2. Changes to the ECAM balance should be part of the rate estimates for the years 2013 to 2015, along with the accompanying rationale.

3.5 Electricity from Natural Gas

Recommendation: Island utilities should not pursue self-generation of electricity from natural gas until such time as monitoring and feasibility assessments warrant a policy review.

Although the Commission was not asked to comment specifically on the feasibility of natural gas for self-generation of electricity by Island utilities, it is nevertheless logical to address the issue given the recent record low prices for this commodity within the North American market. As well, the recent move to truck compressed natural gas from New Brunswick for use by Cavendish Farms for heating applications has raised questions as to why the same could not be done for larger-scale electricity generation.

On the surface, it might appear that if private industry is trucking gas economically to produce heat, then Island utilities should be able to do the same to produce electricity. However, it is necessary to draw the distinction between the relatively small scale movement of natural gas to the Island for heating applications (which displaces oil) versus what would be required on a much larger scale for electricity generation (to displace electricity imports). In using natural gas to displace oil, cost savings in the range of 50% are reported, even with allowances for the costs of equipment conversion, trucking and storage. If Island utilities were reliant on oil for electricity generation the same might be true. However, because the cable interconnection provides access to electricity that is already priced relative to the cost of natural gas (as opposed to the cost of oil), the discount is already built into the price that Island utilities have to pay for electricity. The remainder of this report section summarizes the highlights of a recent consultant’s report commissioned by the PEI Energy Corporation to assess the feasibility of several natural gas generated electricity supply options.

3.5.1 Gas Supply Options

Natural gas is available in the region from both the Maritimes and Northeast Pipeline (M&NP) system (which originates in Goldboro, Nova Scotia, and connects into the North American pipeline system in Maine, USA) and the Canaport LNG (liquid natural gas) facility in Saint John, New Brunswick.



The primary gas supply source for the M&NP system is the Sable Off-Shore Energy Project (SOEP) in Nova Scotia. It is important to note that natural gas supplies in Nova Scotia and New Brunswick from known sources (including SOEP) are uncertain beyond the next 10 to 15 years. The Canaport facility imports LNG through international suppliers.*

**An important differentiation between pipeline gas and LNG is that they are priced differently as commodities. Pipeline gas is priced to the North American market and is significantly less expensive than LNG (on an energy equivalent basis) which is priced to international markets.*

The route of the M&NP system has it passing through Baie Verte, New Brunswick (the pipeline off-take point for gas destined to Prince Edward Island), which is located a reasonable distance (approximately 50 km) from Prince Edward Island for either truck-trailer or pipeline transport of gas. In general, trailer delivery of gas is less capital intensive with higher operating cost, while pipeline delivery is the opposite.

Aside from transporting natural gas to Prince Edward Island for electricity generation, two other options for securing a portion of the Island's electricity from natural gas include:

- Situating a natural gas fueled generation plant near the pipeline off-take point in New Brunswick.
- Purchasing natural gas generated electricity from the regional market.

3.5.2 Generation Resources

Natural gas could be utilized by Island utilities to produce baseload energy or to compliment the Island's wind energy portfolio by operating generators in a wind-following mode.

In looking at natural gas generation options for the Island, the gas study consultant reviewed the opportunity to convert existing on-Island generation units for natural gas firing, as well as the possibility of adding new generation equipment into the mix.

Existing Units - Theoretically, all of the existing on-Island oil-fired generation units could be converted to operate on natural gas, but in practical terms only the LM6000 combustion turbine (CT3) in Charlottetown and the two small combustion turbines (CT1 and CT2) at the Borden plant could be converted economically.

New Equipment - In addition to the existing generation units, new equipment for adding a co-generation capability to the existing LM6000 or creating additional capacity (e.g., a second LM6000 to improve economies of scale) were investigated as a possible component of any natural gas generation initiative for the Island.

3.5.3 Gas Supply and the Electricity Market

As already noted, natural gas could be brought to the Island by either truck-trailer or pipeline. However, transporting LNG (from Saint John) or compressed gas (from Baie Verte) to the Island by truck would require a significant investment in multiple specialized trailers and a contingent of full-time drivers constantly travelling between the supplier and the point of use.** Delivering natural gas to the Island by pipeline would require the construction of a lateral approximately 50 km in length between New Brunswick and Prince Edward Island.

***To operate the 50 MW LM6000 as a baseload generator would require 39 trailer loads per day of compressed gas or 14 trailer loads per day of liquefied gas.*

Key to this discussion however, is that the electricity generated under any gas supply scenario must be competitive with the regional electricity market. It would not make sense to invest in a pipeline lateral, new compression, tube-trailers or new generation equipment if there is no cost advantage over simply purchasing the equivalent energy (and ancillary services as applicable) on the open market. Furthermore, the regional electricity supply market is accessible and competitive, and in recent years electricity prices have tracked closely to natural gas prices (as shown in Figure 3.1). This trend is expected to continue in the future and with natural gas prices projected to remain relatively stable and low for several years, the region's market price for electricity should follow.

“electricity generated under any gas supply scenario must be competitive with the regional electricity market.”

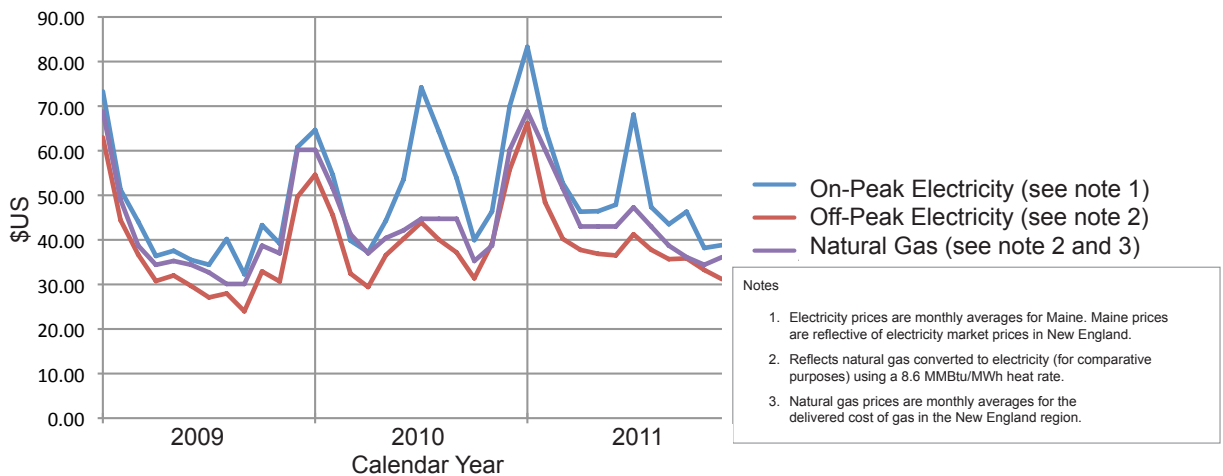


Figure 3.1: Natural Gas and Regional Electricity Market Prices (\$/MWh)

3.5.4 Gas Study Results

The gas study compared the projected market price for electricity to the most competitive natural gas self-generation options available to Island utilities. The study concluded that the most economic option over the long-term is the purchase of electricity as opposed to any method of self-generation with natural gas. The primary factor making self-generation uneconomic for Island utilities was the uncertainty over long-term availability of natural gas from sources in the Maritimes. Without a long-term Maritime gas supply source, it must be assumed that sooner than later, Island utilities would be forced to contract for gas from suppliers in the United States. It is this potential for extraordinary costs (American and Canadian gas transportation tolls) to move gas from the United States to the off-take point on the M&NP system that adds a significant degree of financial risk to self-generation. The uncertain supply situation, coupled with the expectation that natural gas prices are more likely to go up than down (as they are already at record low levels), suggests that any future decision by Island utilities to pursue self-generation of electricity using natural gas should be preceded by a detailed gas market study and cost-risk assessment.

“The study concluded that the most economic option over the long-term is the purchase of electricity as opposed to any method of self-generation with natural gas.”



That being said, and because (as previously indicated) regional electricity prices appear to track with natural gas prices, the supply cost of electricity in the region will most likely increase proportionately with an increase in the supply cost of natural gas unless some other as yet unforeseen large scale and less expensive generation source becomes available as an alternative.

The Commission's recommendation provided at the beginning of this section is intended to ensure that the feasibility of using natural gas for electricity self-generation by Island utilities will continue to be re-assessed periodically as industry changes occur and/or market conditions warrant. For example, new discoveries of long-term gas supplies in Nova Scotia* or New Brunswick could be the feasibility game-changer for electricity self-generation and possibly other energy applications in Prince Edward Island.

**Gas from Encana's Deep Panuke project is also a potential future gas supply option but that project is currently delayed until 2015, the gas output will not be known until production starts and the expected depletion time is estimated at 10 to 12 years, so it is still not a long-term supply solution.*

4.0 Conclusion

In examining the structural components that make up Prince Edward Island's electricity supply system, the Commission quickly came to the realization that there is no "silver bullet" or "eureka solution" that will suddenly and significantly reduce electric utility bills across the province. This is positive in the sense that there were no major structural problems identified but there is room for improvement across the sector. To this end, the Commission has identified several opportunities to change the status quo and restructure aspects of the roles and interactions of most key participants.

"there is no 'silver bullet' or 'eureka solution' that will suddenly and significantly reduce electric utility bills across the province."

It is the hope of the Commission that this report will serve as a platform for embracing the Island's collective strength as a small, collaborative and innovative province, and lead to the kind of energy sector cooperation that should occur on a local, regional and national basis.

Government capitalized on the challenges and opportunities of the times to develop the PEI Energy Accord initiative. Embedded within the Accord agreement was a long-term planning component intended to extend the benefits that Islanders are seeing now, in terms of affordable and stable electricity prices, into the future. Through this report the Commission has provided observations and recommendations that it believes will help to achieve this price objective but will also:

- Provide for more accessible and effective public participation in the regulatory process.
- Secure the Island's transmission interconnection within the region.
- Build on the Island's history of renewable energy and develop a renewed focus on future energy planning.
- Lay the groundwork for increasing communication and cooperation within the electricity sector both locally and regionally.

The Vision Ahead

Over the next 30 years there will be a substantial increase in demand for electricity. The first surge during the next 10 to 15 years will be caused by a shift to electric heat and the subsequent second surge will be due to a widespread transition to electric vehicles. To prepare for these changes, the Commission has reflected on the broad base of information that it has collected and studied over the past 16 months and identified issues that it believes the sector should continue to monitor, re-assess and/or take action on as factors change over time. The issues include:

1. Attention to environmental concerns and the resultant development of new and improved renewable energy products.
2. Increased harnessing of wind, hydro, tidal, wave and solar resources regionally as technology improvements render them more manageable and affordable in the future.
3. Opportunities to address environmental concerns with technology to achieve a goal of 100% clean affordable energy with a wind content of at least 50%.
4. Progress of the Island's electricity supply sector key participants in working more collaboratively with respect to planning and reporting.



5. Smart-grid technology developments tied to common household appliances and energy storage via thermal sinks, battery banks, electric vehicles, etc.
6. Progress of Island utilities in the PowerShift Atlantic and Smart Utility Grid projects and opportunities for widespread deployment of time-of-wind electric domestic hot water heating systems across the Island.
7. Public awareness of the importance of electrical energy conservation and the extent to which further education is required to instill a better understanding of how individuals can use electricity more efficiently.
8. The regional electricity market and opportunities for stable electricity pricing through long-term power purchase agreements.
9. The regional natural gas supply situation including the potential for constructing a gas pipeline to the Island.
10. The potential utilization of the Confederation Bridge structure to carry any future cable interconnection.
11. The performance of the refurbished Point Lepreau nuclear plant and the potential for further nuclear power development in the region.
12. Other emerging energy technologies as they develop (electric vehicles, utility-scale battery storage, etc.).

It is important for the Island's electricity sector to closely follow these and other emerging energy issues and to work closely with neighboring jurisdictions. On the basis that this follow-up occurs, the Commission is confident that over time, the ability of Island utilities to integrate even more locally produced wind power into their electricity supply mix will continuously improve.

A New Beginning

The process of "Charting Our Electricity Future" does not end here – this is just the beginning. It is now up to Government and the rest of the Island's electricity sector to review, consider and then act on this report for the benefit of Island electricity consumers today and tomorrow.

"The process of 'Charting Our Electricity Future' does not end here - this is just the beginning."

5.0 References

Athena Regulatory Research and Consulting (2009). Review of Utility Consumer Representation for Electricity Issues and Options for an Office of Consumer Advocate for Prince Edward Island, March 2009.

Atlantic Canada Opportunities Agency (2009). The Atlantic Energy Gateway B Making Atlantic Canada a Leader in Clean and Renewable Energy. Retrieved on 18 October, 2011 from <http://mediaroom.acoa-apeca.gc.ca/e/media/press/press.shtml?4320>.

Atlantic Canada Opportunities Agency (2012). Atlantic Energy Gateway B Release of Eight Regional Energy Studies. Retrieved on 20 September, 2012 from <http://www.acoa-apeca.gc.ca/eng/Agency/mediaroom/Speeches/Pages/146.aspx>.

Bell, A. Kenneth (1989). Getting the Lights – The Coming of Electricity to Prince Edward Island, The Prince Edward Island Museum and Heritage Foundation, 1989.

Buckland and Taylor Ltd. (2010). Assessment Study for Installation of a High Voltage Power Line in Confederation Bridge, November 18, 2010.

City of Summerside Electric Utility Exemption Regulations, EC 85/04, *Electric Power Act*, R.S.P.E.I. 1988, Cap. E-4.

Canadian Electricity Association (2009). Building Tomorrow's Electricity System: Electricity Fundamentals for Decision Makers, 2009.

Conestoga-Rovers & Associates (2011). Prince Edward Island Electricity Energy Efficiency Study, August 2011.

Electric Power Act, R.S.P.E.I. 1988, Cap. E-4, 2008 c.20.

Electric Power Act, R.S.P.E.I. 1988, Cap. E-4, 2010 c.9.

Government of Newfoundland and Labrador (2007). The 2007 Energy Plan: Focusing Our Energy, 2007.

Government of Prince Edward Island (2010). Prince Edward Island Energy Accord Backgrounder. Retrieved on October 14, 2011 from <http://www.gov.pe.ca/photos/original/energyaccord.pdf>.

Government of Prince Edward Island and Maritime Electric Company, Limited (2010). Prince Edward Island Energy Accord Agreement, November 2010.

Government of Prince Edward Island (2011). Prince Edward Island Energy Commission Terms of Reference. Retrieved on September 7, 2011 from http://www.gov.pe.ca/photos/original/eef_Energycomm.pdf.

Island Regulatory and Appeals Commission (2003). Report to Executive Council – Inquiry into Regulatory Options for Electricity in Prince Edward Island, June 2003.

Island Regulatory and Appeals Commission Act, R.S.P.E.I. 1988, Cap. I-11, 2012 c.17.

Maritime Electric Company, Limited (2010). Demand Side Management and Energy Conservation Plan for Years 2011-2015, August 31, 2010.

McQuaid, Melvin J. (1982). Report of the Commission of Inquiry into the Cost of Electric Power to the Residents of Prince Edward Island, August 1982.



New Brunswick Department of Energy (2011). The New Brunswick Energy Blueprint, October 2011.

Northeast Power Coordinating Council (2010). 2010 Maritimes Area Comprehensive Review of Resource Adequacy, August 2010.

Nova Scotia Department of Energy (2009). Toward a Greener Future – Nova Scotia’s 2009 Energy Strategy, January 2009.

Nova Scotia Department of Energy (2010). Renewable Electricity Plan – A path to good jobs, stable prices and a cleaner environment, April 2010.

Pineau, Pierre-Olivier (2012). Integrating Electricity Sectors in Canada: Good for the Environment and Good for the Economy, The Federal Idea, March 2012.

PowerShift Atlantic (2012). Overview: Working for a Cleaner Future for Maritimers. Retrieved on August 16, 2012 from <http://www.powershiftatlantic.com/overview.html>.

Prince Edward Island Department of Environment and Energy (2004). Energy Framework and Renewable Energy Strategy, June 2004.

Prince Edward Island Department of Environment, Energy and Forestry (2008). Securing our Future; PEI Environment and Energy Policy Series, Volume 1: Securing our Future: The 10 Point Plan, November 2008.

Prince Edward Island Department of Environment, Energy and Forestry (2008). Securing our Future; PEI Environment and Energy Policy Series, Volume 2: Prince Edward Island Energy Strategy - Securing our Future: Energy, Conservation and Renewables, November 2008.

Prince Edward Island Department of Environment, Energy and Forestry (2008). Securing our Future; PEI Environment and Energy Policy Series, Volume 3: Prince Edward Island and Climate Change – A Strategy for Reducing the Impacts of Global Warming, November 2008.

Prince Edward Island Energy Commission (2012). Discussion Paper – Charting Our Electricity Future, February 2012.

Renewable Energy Act, R.S.P.E.I. 1988, Cap. R-12.1, 2006 c.38.

Renewable Energy Act, R.S.P.E.I. 1988, Cap. R-12.1, 2010 c.9.

Scotia Capital. Electricity Industry Restructuring, Book 4: The Lingo – A Glossary for the Investor.

Thompson, William M. and Volpe, Jeannot (2011). Final Report - New Brunswick Energy Commission 2010-2011, May 2011.

University of Prince Edward Island, Institute of Island Studies (2012). PEI’s Energy and Electricity Future, June 2012.

Vermont Energy Investment Corporation (2008). Energy Efficiency Initiative Designs and Achievable Potential for Prince Edward Island, revised April 22, 2008.

Victor, Mark (2004). Distributed Power Generation: The Economic Feasibility of Small Wind Systems in P.E.I., St. Mary’s University, April 2004.

WKM Energy Consultants Inc. (2012). Natural Gas for Electricity Generation Study, April 2012.

Appendix A

Summary of Recommendations and Direction

2.1 The Utilities and Their Future Role

Key Recommendation: Allow Maritime Electric to continue as the Island's primary electric utility with the proviso that Government begins negotiations to acquire Maritime Electric's ownership stake in the generation component of the supply system.

1. The time is now for Maritime Electric to start thinking about and preparing for the next round of PPA negotiations. The negotiating team should again include Government and the starting point should factor in initiating discussions with all potential suppliers and the possibility of extending the current PPA with NB Power.
2. Any future proposed Maritime Electric participation agreements to acquire baseload supply must be subject to rigorous and thorough regulatory review prior to execution by the company. Further, this review should not just look at electricity supply cost issues, but also consider the risk of potential costs that could result from a future decision to terminate any such agreement.
3. Within a reasonable passage of time (e.g., within five years) all Maritime Electric assets determined to be for generation purposes should be transferred to the PEI Energy Corporation, thereby eliminating them from the rate and equity base.
4. The *Electric Power Act* should be amended to require that Maritime Electric maintain its equity stake at no less than 35% and no more than 40%. The allowed rate of return prescribed by IRAC would be calculated on the average equity maintained by Maritime Electric throughout the year (subject to a cap of 40%).
5. It is confusing and contradictory to have “return on average rate base” cap Maritime Electric earnings under the *Electric Power Act* and to have “return on average common equity” cap Maritime Electric earnings in the current IRAC Order concerning rates. While the Commission appreciates the reasoning and purpose of each rate of return mechanism, it should be made clear which one ultimately sets the cap on earnings. Accordingly, consideration should be given to amending the *Electric Power Act* for the purpose of providing the necessary clarification.
6. The Commission recognizes the fact that Summerside Electric is already a publicly owned utility and as such, believes that there is no need to change the ownership structure or involve Government in utility operations. However, should Summerside Electric seek Government involvement, be it for PPA negotiations or for other matters, that option should be available.



2.2 Regulatory Control

Key Recommendation: Secure and foster long term electric utility expertise within IRAC to ensure heightened scrutiny of Maritime Electric's cost of service, overall performance and future planning activities.

1. The cost of service model should continue to be followed for regulation of electricity in Prince Edward Island.
2. Since IRAC is charged with protecting the public interest, amending the *Electric Power Act* to include reference to “fair and reasonable customer rates” might balance the intent and regulating scope.
3. Responsibility for the *Electric Power Act* should be assigned to a new panel of commissioners that deals only with electric utility regulation and oversight. To this end, it is proposed that a three-person panel be established from a list of applicants possessing professional designations and business experience. Selection from the list of applicants could be made independently through Participate PEI to ensure that all applicants meet the required criteria and that the selection process is non-partisan.
4. When Government pursues the direction provided by the Commission, legislative amendments will most likely follow. When this occurs, Government needs to be mindful that the amendments should not detract from the authority already provided to IRAC. It is the view of the Commission that whenever IRAC's regulatory oversight role is diminished (intentionally or not) there is increased risk of future unforeseen increases to electricity prices in the province.
5. Summerside Electric does not need to be regulated by IRAC beyond what is currently required through the *Electric Power Act* and the City of Summerside Electric Utility Exemption Regulations.

2.3 Role of Government

Key Recommendation: Expand the scope of the PEI Energy Corporation to encompass the financing and recovery of all Maritime Electric customer debt associated with the Point Lepreau refurbishment project, all transferred generation assets of Maritime Electric, the cost of a new cable interconnection and any future investments in generation infrastructure.

1. To provide clarity and eliminate any direct conflicts that may arise as the Corporation becomes more involved in issues impacting electricity rates, the Commission sees the need for more a more distinct separation of the Government's energy interests.
2. As a provincial Crown corporation, the PEI Energy Corporation should be operated at arm's length from the Government, with direct Government control only being exerted over its mandate, budget and the appointment of its Board of Directors. (For clarity, the board should primarily consist of individuals independent of Government.)
3. Corporation Role
 - *Sustainable Energy Innovation* - The Commission fully supports Government's continuing leadership on innovative energy systems development initiatives and subsequent privatization when such an opportunity exists.

- *Wind Farm Ownership* - The Commission recommends that ownership of the North Cape Wind Farm and East Point Wind Plant remain as assets of the PEI Energy Corporation.
- *Financing Ratepayer Debt Obligations* - The Maritime Electric deferral amount related to Point Lepreau should be consolidated into the deferral account of the PEI Energy Corporation to take advantage of the fact that the Corporation can secure financing at more favourable rates than are available to Maritime Electric. Once consolidated, the deferral should be amortized over a period of 25 years to approximately match the new service life of the refurbished generation facility.
- *Point Lepreau Deferral Recovery* - Given the lengthy delays experienced through the refurbishment project, Maritime Electric and Government should work together to recover any damages that they may be legally entitled to as part of an NB Power claim and/or on their own as an aggrieved party.
- *Electricity Supply* - The Corporation should be directly involved with Maritime Electric in all aspects of electricity supply negotiations, including power purchase agreements, participation agreements, and other related contracts pursued by Maritime Electric.
- *Electricity Generation* - The Corporation should expand its current role as an owner of wind generation assets to include the ownership of all generation assets currently held by Maritime Electric, as well as any new generation assets required to support future system requirements.

4. Energy and Minerals Division Role

- *Policy and Planning* - The Energy and Minerals Division is the logical place within Government for the assignment of policy and planning functions.
- *Regulatory Intervention* – To the extent that the policy objectives of Government are relevant to any given regulatory issue under review or Order by IRAC, it would be appropriate for the Division to intervene and establish its position on the issue. The Commission however is not suggesting that the Division assume the role of default intervener but instead use the IRAC process where Government policy objectives dictate and then subsequently consolidate the (new) policy decisions within legislation as required.
- *Office of Energy Efficiency* - The Office of Energy Efficiency should remain a part of the Energy and Minerals Division as a means to deliver programs that meet Government's policy objectives.

2.4 A New Cable Interconnection

Key Recommendation: A reliable cable interconnection is essential to achieving security of electricity supply and price stability at the lowest cost to Islanders; therefore any issues delaying a new cable must be resolved quickly followed by installation at the earliest possible date.

1. The Commission emphasizes that the feasibility of installing the cable in or along the Confederation Bridge should continue to be pursued notwithstanding the report by Buckland and Taylor Ltd. which indicated that the installation of the cable in the bridge's utility corridor could weaken the structure.



2. The two existing interconnection cables that service Prince Edward Island are owned by Government and are leased under a long-term operation and maintenance agreement by Maritime Electric. A similar approach should be taken with any new cable project.
3. The technical approach to a bridge installation and the cost/benefit of installing a larger capacity cable (or having a two-phased project with two 150 MW or smaller capacity cables) needs to be determined.
4. Current conditions make long-term borrowing very attractive and the Commission recommends that the new cable be financed over a term that matches its design life. With an expectation that the new cable design life will be in the 35-year range, delaying the new cable risks an increase in interest rates that could negatively alter the economics of the project.

2.5 Stewardship and the Environment

Key Recommendation: Optimize Maritime Electric's core PPA so that on-Island wind energy penetration increases in the future and study the operational and economic feasibility of existing community-based renewable energy projects.

1. The PEI Energy Corporation and Maritime Electric have collaborated on projects aimed at improving wind power production forecasting ability and they have jointly achieved a level of precision that is considerably better than the industry standard. Work in this area should continue as it creates a positive impact on the cost of electricity in the province.
2. The potential to advance beyond 30% contractual wind integration and utilize even more of the wind energy generated by all of the wind farms in Prince Edward Island can be realized through time-of-wind electricity consumption initiatives. However, attempts at load control through such initiatives are marginalized if the contracted electricity import conditions do not recognize on-Island efforts to synchronize electricity demand with wind energy production. Summerside Electric has already managed to better match the terms of its core PPA to its wind energy resource; Maritime Electric should follow their lead and at the very least consider a similar approach for its next energy import supply contract.
3. Maritime Electric and Government should closely follow the developments of the Muskrat Falls Project to determine whether there is an economically sound opportunity to contract for a portion of the power output for Prince Edward Island. Two questions worthy of consideration are:
 - Relative to the small load requirement of Prince Edward Island as compared to the project partners, would Muskrat Falls be a source of baseload or wind following power?
 - Would it be feasible to move the power directly from Nova Scotia to Prince Edward Island?
4. The Commission supports the concept of community-based renewable energy, but it does not support the subsidization of electricity generation that is not economical and could result in increased costs to Island ratepayers and/or taxpayers.

5. In just the past few years the number of small wind turbines on farms, at municipal facilities and commercial establishments has increased significantly across Prince Edward Island. The operational and financial success of these and other installations along with community reaction needs to be studied to determine critical success factors before any decisions should be made by Government to encourage community-based renewable energy. The impact of such installations on the electric utilities also has to be considered as a component of any meaningful study.

3.1 Energy Efficiency and Demand Side Management

Recommendation: Return responsibility for Demand Side Management (DSM) initiatives to Island electric utilities and establish regulatory oversight of DSM by IRAC through the Electric Power Act.

1. While the Commission understands the general logic of making the OEE responsible for DSM, it has concluded that responsibility for DSM should ultimately rest with Maritime Electric. The utility has the expertise, the direct access to relevant system information and the working knowledge that is necessary to design and manage the DSM initiatives that best fit its particular operational circumstance.
2. The role of the OEE specific to DSM should be that of an expert technical resource to IRAC (e.g., to advise on programs, set targets, assess effectiveness, etc.) and a program delivery resource to Maritime Electric. Concerning program delivery, where there are obvious efficiencies for Maritime Electric DSM initiatives to be delivered through the OEE, this should occur on the basis that it is cost neutral to the OEE.
3. To fund DSM initiatives, the financial resources that were previously assigned annually to Maritime Electric for DSM should be reinstated. While some DSM programs may span more than one year with the expenses not evenly distributed over the duration, IRAC should ensure that any deferrals can be recovered over a reasonable time period from Maritime Electric's DSM budget allocation.
4. When responsibility for DSM is returned to Maritime Electric, the utility should be required to submit regular DSM plans and reports to IRAC in much the same way that it had been required to do prior to the PEI Energy Accord. However, instead of reinstating DSM requirements within the *Renewable Energy Act*, it would be more appropriate to include DSM as a requirement of the *Electric Power Act*. This would serve to clarify that the scope of DSM is not limited to renewable energy and it would also make it easier to formalize the Summerside Electric exemption. In addition, targets should be reviewed and there should be financial consequences to Maritime Electric if the targets are not achieved.
5. In addition to information already available through existing DSM studies and reports, more study and planning should be done to address:
 - Increasing use of electricity for space heating.
 - Energy/building codes and standards.
 - Public outreach and education.
 - Pilot projects for innovative technologies.
 - Collaboration with regional counterparts.



3.2 Regional Cooperation and Awareness

Recommendation: Prince Edward Island should continue to pursue regional cooperation on electricity sector initiatives with particular emphasis on PowerShift Atlantic and the strategic direction resulting from the Atlantic Energy Gateway initiative.

1. Coordination of electrical sectors in Atlantic Canada can be achieved through a variety of frameworks ranging from basic bilateral and/or multi-party agreements between utilities, to regional organizations (e.g., an independent system administrator/operator) supported by participating utilities. To the extent that it can within the complexities of how electricity is legislated in each province, such coordination should be pursued because of the benefits that can result.
2. Regional cooperation priorities for the Island's electricity sector should include:
 - Financial relief associated with delays at Point Lepreau.
 - The new cable interconnection planning process.
 - Balancing and load following locally generated electricity from wind.
 - DSM and other matters of energy efficiency and conservation.
 - Supporting and actively participating in PowerShift Atlantic, Atlantic Energy Gateway and related follow-up initiatives.

3.3 Facilitating Public Involvement

Recommendation: Establish a “consumer advocate for electricity” to represent individual ratepayers and help facilitate the participation of other interested parties at regulatory hearings.

1. Traditionally, Government has viewed its role as intervener in Maritime Electric regulatory submissions as representing the broad public interest. As well, Government believes it has the right to intervene in aspects of the regulatory process where it sees certain public policy issues at play. This practice should continue but there should not be a general expectation that Government will serve as the default intervener.
2. With respect to the use of expert opinion at IRAC hearings, the Commission discourages this practice as it leads to one party (e.g., the utility) hiring an expert to present one side of an issue and another party (e.g., Government or some other intervener) hiring an expert to present an opposing position. In the end, it adds cost and complexity to IRAC hearings and the regulatory process. The Commission recommends that all parties involved in the regulatory process take a pragmatic approach to IRAC hearings and that expert opinion should only be used as a last resort.
3. To assist with establishing a consumer advocate for Prince Edward Island, the Commission recommends the following basic parameters upon which to model the position:
 - The consumer advocate position should be a permanent appointment for an established term of not less than five years.
 - While the consumer advocate's position should be a permanent appointment, it should not be a full-time position since the workload will be intermittent.

- The consumer advocate should have a reasonable background in finance, economics, accounting, engineering or law.
- The consumer advocate would be the intervener of record for all Maritime Electric applications.
- The annual cost of the consumer advocate's office should be covered by assessments against Maritime Electric.
- The position of consumer advocate would be established by authority of the *Electric Power Act* and required to report to the Attorney General on an annual basis.

3.4 Observations and Best Practices

Recommendation: The electricity sector in Prince Edward Island should take advantage of its small scale by collaboratively developing best practices for integrated system planning and electricity price stability controls.

1. There is room for improvement in terms of resolving past differences and greater integration of planning.
 - Concerning issues that may be standing in the way of better relations, the Commission urges all involved parties to negotiate in good faith toward the resolution of their differences in a timely manner.
 - There would be benefit in convening the key sector participants for an annual information sharing and collaboration day, perhaps at the invitation of the Minister responsible for energy.
2. In the interest of price stability, the Commission supports the continued use of ECAM in helping to avoid rate shock related to energy supply costs or variances between forecasted costs and actual costs. However, ECAM should be structured on the basis of the energy procurement situation at the time the rate application is being made. For example, Maritime Electric's current energy supply portfolio should result in stable supply costs to at least the end of the current PPA in February 2016. In this case, it is recommended to adjust for ECAM on an annual rather than monthly basis.
3. Deferrals that are outside the scope of ECAM but have no future benefit should be repaid as quickly as possible as an annual levy applied to service revenue. As a general rule, large deferrals with no future benefit should be avoided if at all possible. Otherwise, the subsequent repayment requirement is partially borne by future electricity consumers as a surcharge that drives up their rates, but provides them no benefit.
4. It is expected that Maritime Electric's rate application for 2013 will be in front of IRAC in the fall of 2012. The Commission has two recommendations regarding this rate application:
 - Extend price estimates and assumptions to include years 2014 and 2015.
 - Changes to the ECAM balance should be part of the rate estimates for the years 2013 to 2015, along with the accompanying rationale.



3.5 Electricity from Natural Gas

Recommendation: Island utilities should not pursue self-generation of electricity from natural gas until such time as monitoring and feasibility assessments warrant a policy review.

1. Any future decision by Island utilities to pursue self-generation of electricity using natural gas should be preceded by a detailed gas market study and cost-risk assessment.

Appendix B

Commission Terms of Reference

Introduction

In November 2010 the Province unveiled its PEI Energy Accord, which had three goals:

1. Reduce the cost of electricity;
2. Stabilize prices; and
3. Expand renewable, locally owned energy reducing PEI's reliance on imports.

The Accord not only identified a number of short term measures towards these goals, but called for the establishment of a Commission to examine longer term structural issues in support of these goals. The Commission will be an expert, nonpartisan body and will draw on the views of Islanders through an open, inclusive public consultation process.

On June 7, 2011 Cabinet appointed its commissioners and approved the final version of these Terms of Reference.

Commissioners

The commissioners appointed have the individual and collective skills and background to address a number of complex matters particularly as it relates to financial planning, business planning options, public policy, engineering, and renewable energy sources.

The commissioners also represent a cross section of citizens from the two major urban centers and rural PEI.

Administrative & Secretariat Support

The Commission will have authority under *Public Inquiries Act* and will be supported by Mr. Bill Marshall, a leading regional energy expert who will serve as senior advisor to the Commission. The Commission will actively engage and draw on the support, advice and input of officials from Maritime Electric, the City of Summerside, IRAC and will have resources to engage subject matter experts (e.g. accounting firms, utility consultants, etc.) to facilitate their work.

The PEI Energy Corporation will provide lead Secretariat, administrative, financial and analytical support to the Commission. The Energy Corporation will be assisted by Executive Council Office (Economic & Fiscal Policy).

Mandate

The goal of the Commission is to examine and provide advice on ways in which PEI's high cost of electricity can be structurally reduced and/or stabilized over the longer term. Amongst other things the Commission will address:

1. Under the PEI Energy Accord, the Province has assumed short term debt associated with Pt. Lepreau refurbishment. The Commission will provide recommendations on how Pt. Lepreau deferral costs can best be financed over the longer term.



2. Examine and provide recommendations on long term ownership and management of electricity on PEI including the advantages and disadvantages of public ownership or Government owning generation with private control of transmission & distribution. This examination will draw on a review of best practices in other jurisdictions.
3. In addition to the work being undertaken by the Province to secure federal funding for a new cable, provide mitigation advice as it may relate to a new cable.
4. Provide advice and direction with regard to further regional energy collaboration, including demand side management approaches.
5. Provide advice and direction on how PEI can further advance its environmental stewardship responsibilities as it relates to electricity.
6. Examine and comment on all cost elements associated with PEI's current system.
7. Provide advice and recommendations as to the future role of the PEI Energy Corporation, IRAC (as it relates to electricity) and the Office of Energy Efficiency.
8. Provide advice on the optimal scope and size that locally generated electricity from renewable energy sources can play in addressing PEI's future energy goals.
9. Other matters in keeping with the overall goals of the PEI Energy Accord, as agreed by the Commission and Government.

Process and Timeframes

The Energy Accord has reduced and frozen rates on PEI for the next two years. The work of the Commission is longer term in nature and will be carried out in phases:

Phase 1: Fact Finding, Research Phase (June 2011 - December 2011).

The Commission will use this period of time to investigate and examine matters associated with its mandate, drawing on the assistance of its Secretariat and will include extensive interactions with Maritime Electric, Summerside, and IRAC. This work will be followed by the Commission developing and releasing a Discussion Paper which will outline options and analysis to assist Islanders leading up to and through the consultation phase.

Phase 2: Consulting Islanders (January - May 2012).

The Commission will actively engage Islanders and directly seek their input on mandate matters.

Phase 3: Preparation and Delivery of Final Report (June - September, 2012)

Appendix C

Commission Process

1. The PEI Energy Commission

The PEI Energy Accord specified that the Commission should be established as an expert, nonpartisan body that would seek the views of Islanders through an inclusive and transparent public consultation process. On June 7, 2011, Executive Council appointed five commissioners and approved the issues to be examined and addressed. The commissioners were appointed on the basis that they have the individual and collective skills and backgrounds to address a number of complex matters, particularly as it relates to financial planning, business operation, public policy, engineering, and renewable energy technology. The appointment of commissioners was also guided by the desire to establish a body that represented a cross section of citizens from the two major urban centres and rural Prince Edward Island.

The Commission appointees included:

- Mike O'Brien, FCA (Co-chair) - Mr. O'Brien is a Senior Business Advisor with McInnes Cooper. He is a former Deputy Minister of Development and Technology and a former Deputy Provincial Treasurer. Mr. O'Brien lives in Charlottetown.
- David Arsenault, BBA, FCA (Co-chair) - Mr. Arsenault is a general practice partner and the managing partner of Arsenault Best Cameron Ellis. He was admitted as a fellow of the Institute of Chartered Accountants of Prince Edward Island in 2007. Mr. Arsenault lives in Charlottetown.
- Richard Hassard, BBA, MBA - Mr. Hassard served for several years as the Chair of the Board of the Wind Energy Institute of Canada (WEICan) located at North Cape. He has worked at senior positions in the financial industry, and is a former Co-chair of the capital fund-raising committee for the Atlantic Veterinary College. Mr. Hassard lives in St. Peters Bay.
- Roger King, P.Eng., MBA - Mr. King has served as a member of the PEI Senior Citizens Federation and chaired that organization's sub-committee on energy matters. He is a technical operations manager with experience in managing large budgets and forming business strategies. Mr. King lives in Hunter River.
- Gerald Morneau, BA, B.Sc. Civil Engineering - Mr. Morneau has worked as construction manager on various private sector projects representing billions of dollars in investment, including the James Bay Hydroelectric Power Project. Mr. Morneau lives in Summerside.

2. A Three-Phased Process

The basic process and timelines for the process were provided in the Commission's terms of reference – undertaken in three phases – as follows:

Phase 1 - Research and Fact-Finding (June to December 2011)

Phase 2 - Consulting Islanders (January to May, 2012)

Phase 3 - Report Preparation and Delivery (June to September, 2012)



2.1 Phase 1 – Research and Fact-Finding

Following the establishment and appointment of the commissioners, secretariat services were assigned to staff of the PEI Energy Corporation and Executive Council Office to provide administrative, financial and analytical support.

In late June, 2011, an intensive one-day orientation session was organized as the kick-off to the work of the Commission and included a review of the mandate, an overview of key electricity stakeholders and a discussion of the challenges to achieving future affordability of electricity in the province. Shortly thereafter, the Commission began meeting weekly with its secretariat to thoroughly research and examine the mandate issues that it was tasked to address.

The weekly Commission meetings through Phase 1 were used to administer Commission business, discuss mandate issues, meet with industry experts and stakeholders, develop public consultation resources and plan consultation activities. Phase 1 also saw individual commissioners attend select industry events that were relevant to mandate issues and in November, 2011, three of the commissioners traveled to New Brunswick to meet with energy related government agencies and a municipal electric utility.

2.2 Phase 2 – Consulting Islanders

Phase 2 added a new dimension to the work of the Commission by opening the discussion of mandate issues to all stakeholders, including special interest groups and individuals, and the general public. The primary tool employed for public engagement was a discussion paper that was released by the Commission in early February, 2012, titled “Charting Our Electricity Future”.

Coinciding with the release of the discussion paper, the Commission launched a bilingual website which served as the information hub of the public consultation process. The website, located at www.peiec.ca, provided:

- Background information on the Commission and commissioners.
- The discussion paper as a downloadable file.
- Details on the consultation process.
- Resource information (e.g., relevant legislation, Energy Accord documents and web links to key stakeholder organizations).
- The content of stakeholder submissions.
- Options for citizens or organizations to submit feedback to the Commission.

The release of the discussion paper generated public interest resulting in several media interviews with Commission members and subsequent news reports in both official languages.

Three avenues were provided to the public for submitting information and opinions to the Commission. They were as follows:

1. Written submissions were accepted by on-line form via the website, by e-mail addressed to commissioners@peiec.ca and/or by hardcopy through hand delivery, mail/courier or facsimile transmission. The Commission received a total of 37 written submissions.

2. Stakeholder presentations were held over two days (February 22 and 23) in Charlottetown, providing an opportunity for organizations and individuals to address the Commission and put forward their position on the mandate issues. The stakeholder presentations were open to the public and where an accompanying PowerPoint presentation or written submission was provided, the contents were posted on the Commission website. The Commission received a total of 12 stakeholder presentations.
3. Public forums were held in late February and early March in six communities across the province including: Summerside, Abram-Village, Elmsdale, Montague, Souris and Charlottetown. (The Abram-Village public forum provided English/French translation services.) The public forums began with a brief facilitated presentation to outline the purpose of the Commission, identify mandate issues, provide discussion points and stimulate dialogue. The commissioners then provided introductory comments and invited attendees to present their views or ask questions. The public forums were audio recorded and the secretariat manually catalogued key points raised by participants. A total of approximately 60 people attended the public forums.

2.3 Phase 3 – Report Preparation and Delivery

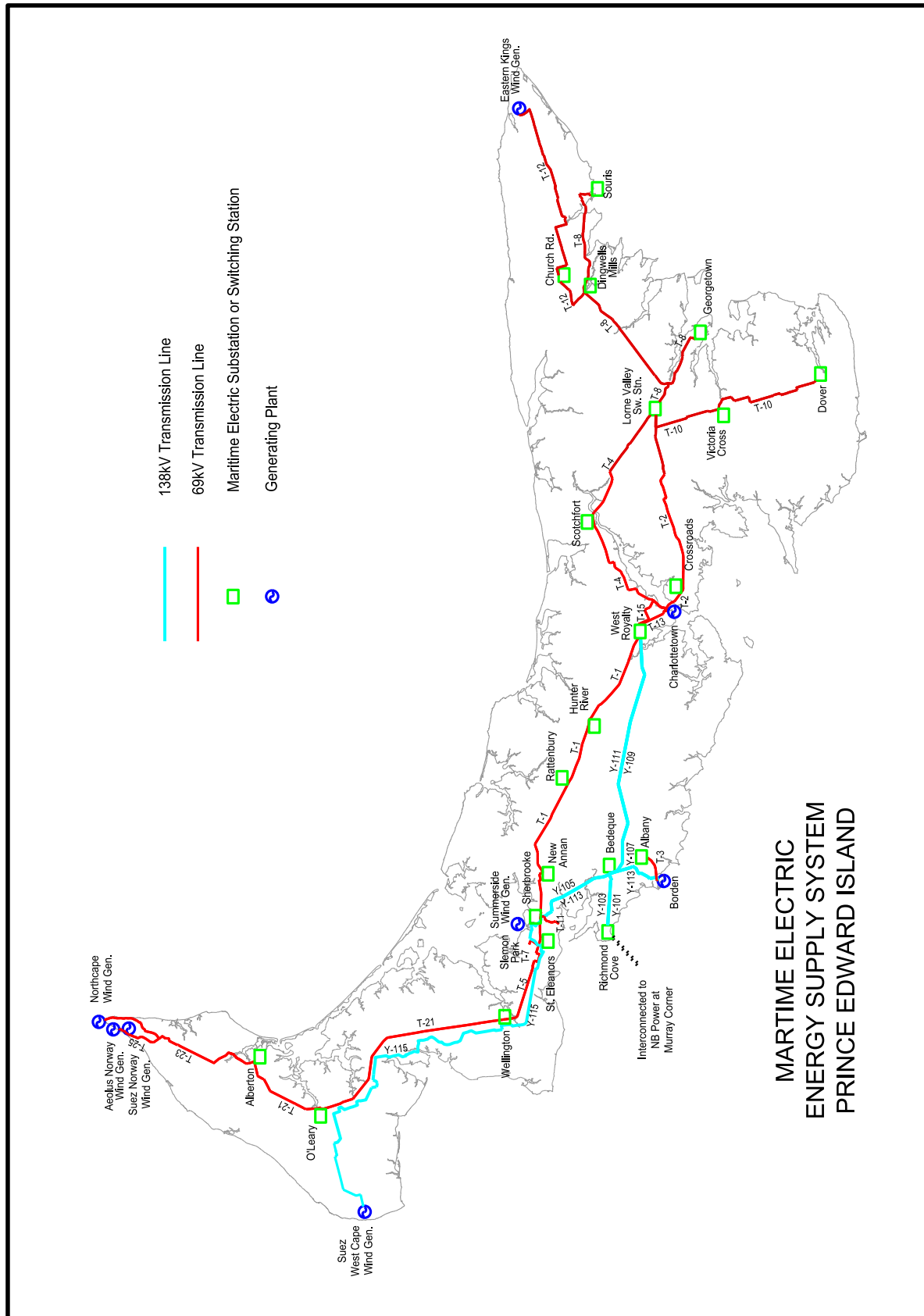
The final phase of the Commission's work began in May, 2012 and was primarily consumed with the writing of this report and preparations for communicating the Commission's findings and recommendations to Government and the general public.



Appendix D

Maritime Electric Energy Supply System Map

Courtesy of Maritime Electric Company Limited.



Appendix E

Elements in Electricity Legislation

1. **Definition of the type of regulation.** This is a necessary component of any legislation. It spells out what type of regulation is to be used, and whether alternative forms of regulation can be implemented by the regulator. The most common form of electricity regulation is the traditional cost of service regulatory model. Alternative forms of regulation can include price caps or price indexing.
2. **Authority to use settlement proceeding.** This authority is not a necessary component of legislation, but it is useful in providing a regulator with some procedural flexibility, particularly in dealing with rate cases. This provision would allow a regulator to use a settlement proceeding to isolate and settle contentious issues before they have to be dealt with at a formal hearing before the regulator. This can result in shorter and less costly hearings before the regulator.
3. **Ratemaking authority.** This is a basic provision to any electricity legislation. It requires rates be just and reasonable, although it leaves it to the regulator to determine exactly what just and reasonable means in the context of a specific application before it. Additionally, some electricity legislation gives the regulator the ability, with restrictions, to provide interim rate relief should it be requested by a utility.
4. **Powers of the board or commission.** These powers include the authority to compel evidence, set filing requirements, and set rules of procedure with respect to case filings and hearings. Such authority is essential if the regulator is to properly perform its responsibilities under the legislation.
5. **Regulation-making authority.** This authority would allow the regulator to develop regulations under specific legislation. Regulations can be used to spell out accounting policies, filing requirements, rules of procedure, etc. Some jurisdictions give the regulator complete freedom to create regulations; others require approval of regulations by the Lieutenant Governor in Council (LGIC), and still others reserve to the LGIC the right to issue regulations.
6. **Judicial review.** It is important that electricity legislation clearly define the grounds on which a party to a regulatory proceeding can appeal a decision of the regulator to the court. Legislation normally restricts courts to dealing with questions of law or jurisdiction, not questions of fact. As well, legislation should give the regulator the ability to state a case to the courts – a case based on a question of law or jurisdiction.
7. **Structure and independence of the regulatory body.** There are three elements in legislation that deal with the composition and independence of a regulatory board. First, the legislation should define the number of members of the regulatory body, as well as the existence of the positions of Chairman and Vice-Chairman. Second, the legislation should spell out the appointment process, the term of the appointments, and whether appointment renewals are possible. Some legislation also identifies particular qualifications and/or experience that might be useful when considering potential appointees. Third, the legislation should define the grounds for dismissal of any member of the regulatory body.

Infrequently, legislation might give the Lieutenant Governor in Council (LGIC) the authority to (1) order a regulator to take notice of government policy or, (2) overrule a particular decision of a board or commission.



8. **Financing for operations.** Legislation should spell out how the regulator is to finance operations. The most common method of financing is to give the regulator the authority to assess costs against the various entities that it regulates. The legislation might also spell out how the regulator develops the assessment, what notification is required, and whether there is any appeal process available for those entities that have been assessed.
9. **Provision for appointing a consumer advocate or public intervener.** If a consumer advocate/public intervener is an integral part of the regulatory process, then the procedure for appointment should be part of legislation. Legislation might also spell out the qualifications for such a position, the authority to make the appointment, situations that represent conflict of interest, the ability to engage experts, and how the costs of the office are to be recovered.

Review of Electricity Legislation in Atlantic Canada				
	Energy and Utilities Board (NB) ¹	Utility and Review Board (NS) ²	Public Utilities Board (Nfld & Lab.) ³	Island Regulatory and Appeals Commission (PEI) ⁴
1.0 Type of Regulation				
1.1 Traditional cost of service model	Yes	Yes	Yes	Yes
1.2 Authority to use alternative form of regulation (price caps, price indexing)	Yes	No	No	Possibly
2.0 Authority to Use Settlement Proceeding	Yes	Yes (indirect)	Yes	Yes
3.0 Rate-Making Authority				
3.1 Rates to be just and reasonable	Yes	Yes	Yes	Yes
3.2 Interim rate-setting authority	Yes	Yes	Yes	Restricted
4.0 Powers of the Board/Commission				
4.1 Compel evidence	Yes	Not found	Yes	Yes
4.2 Set filing requirements	Yes	Yes	Yes	Yes
4.3 Set rules of procedure with respect to filings	Yes	Yes	Yes	Yes
4.4 Set rules of procedure with respect to hearings	Yes	Yes	Yes	Yes
5.0 Regulation-Making Authority	Yes	No	Yes	Yes
6.0 Judicial Review				
6.1 Board/Commission can state case to court	Not found	Yes	Yes	Yes
6.2 Appeals to court restricted to questions of law and jurisdiction	No	Yes	Yes	Yes
7.0 Structure and Independence of Board/Commission				
7.1 Structure				
Chair and Vice-Chair	Yes	Yes	Yes	Yes
Number of members (including chair and vice-chair)	8 - 10	8 - 10 full time up to 8 part time	4 full time	3 full time 5 part time PT only
Appointments require particular expertise and/or background	No	No	Yes	
7.2 Independence				
Members dismissed for cause	Yes	FT: good behaviour	Good behaviour	Yes
Requirement to take notice of government policy	Yes	No	No	No
Decisions may be varied by order of Lieutenant-Governor in Council	Yes	No	No	No
8.0 Financing for Operations				
8.1 Assessment authority	Yes	Yes	Yes	Yes
8.2 Restricted ability to assess certain regulated entities	No	No	No	Yes
9.0 Provision for Appointment of a Consumer Advocate/Public Intervenor	Yes	Yes	Yes	No

¹ New Brunswick Legislation: *Electricity Act and Energy and Utilities Board Act*

² Nova Scotia Legislation: *Public Utilities Act and Utility and Review Board Act*

³ Newfoundland and Labrador Legislation: *Public Utilities Act and Electric Power Control Act*

⁴ Prince Edward Island Legislation: *Electric Power Act and Island Regulatory and Appeals Commission Act*

Appendix F

Glossary of Terms

Ancillary Services – Services necessary to support the electricity supply system such as voltage control and reactive power, load following, energy balancing, scheduling and dispatch, system protection, etc.

Baseload – The minimum steady amount of electricity that is demanded by the end users at all times.

Baseload Capacity – The generating units that are normally operated to serve loads on an around the clock basis.

Biomass – Fuel derived from current and recent organic plant growth (versus fossil fuels such as coal); includes wood, sawdust, bark and grasses.

Capacity – The load for which a generating unit or transmission circuit is rated by the user or manufacturer.

Capacity Factor – The measurement ratio of the actual amount of energy generated by an asset or portfolio, to the total amount of energy that would be generated if the asset or portfolio was running continuously.

Cogeneration – The production of both electricity and another useable form of energy form such as steam from a common fuel source. Cogeneration units are generally more efficient because thermal energy that would otherwise not be utilized is harnessed for productive purposes.

Demand – The rate at which energy is delivered to loads and scheduling points by generation, transmission and distribution facilities.

Demand Side Management – Management of demand for power typically through activities and programs of utilities to influence customer use of power for the benefit of both customer and utility (reduce need for new capacity / power purchases). It can include shifting demand to off-peak hours, reducing overall consumption, or increasing customer's energy efficiency.

Dispatchable – The ability of a generating source to be called upon to meet electricity demand as it increases and decreases.

Distribution – The delivery of electricity to households and small commercial customers.

Distribution System – The low voltage part of the electric power system dedicated to delivering electricity to an end user.

Firm Energy – A supply arrangement stipulating power or power generating capacity to be available at all times during the period governed by the arrangement to deliver, even under adverse circumstances.

Fossil Fuel – Any fuels (such as coal, oil and natural gas) that are the product of fossilized hydrocarbons.

Generation – The production of electricity from various input sources including coal, oil, natural gas, hydro, nuclear and wind.

Grid – The high voltage transmission network of wires and transformers that moves electricity from suppliers to consumers.

Interconnection – The connectivity of inter-provincial and international electricity grids for import/export of electricity for both reliability and commercial objectives.

Kilowatt Hour – Standard unit of measurement for electricity – typically used to bill customers for power. It is equal to the electricity consumed in illuminating ten 100 watt light bulbs for one hour.

Line Losses – Electricity lost as heat in electrical equipment or along transmission lines during the transfer of electricity from one point to another.

Load – The amount of electricity delivered or required at any specific point or points on a power system. The requirement originates at the energy-consuming equipment of end use customers.

Load Following – An electric system's ability to regulate its generation to follow the minute-to-minute changes in its customer's demand.

Operating Reserve – The reserve generating capacity necessary to allow an electric system to recover from generation failures and provide load following and voltage regulation.

Peak Demand – The maximum load required during a specified time period.

Policy Continuum – A continuous and seamless process of policy development, in contrast to, for example, policy development at study intervals.

Power Purchase Agreement – A bi-lateral agreement for the physical purchase and sale of electricity between a generator or marketer and a power purchaser.

Reliability – Consists of two components within an electric system: adequacy – the ability to meet load at all times taking into account scheduled and unscheduled outages; and, security – the ability to withstand sudden disturbances, such as short circuits or unanticipated loss of facilities.

Transmission – The transfer of electricity between generating units and distribution interconnections or industrial end-users over high voltage wires.





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