THE INFLUENCE OF ISLANDNESS ON ENERGY POLICY AND ELECTRICITY SUPPLY

A thesis presented to the Faculty of Arts (Island Studies)
at the University of Prince Edward Island

by
E. Kathleen Stuart

in partial fulfilment of requirements for the degree of
Master of Arts in Island Studies

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ABSTRACT

THE INFLUENCE OF ISLANDNESS ON ENERGY POLICY AND ELECTRICITY SUPPLY

E. Kathleen Stuart
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University of Prince Edward Island, 2006

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Despite global power reform, electricity is still provided in many islands by vertically integrated monopoly utilities. The aim of this research is to identify the impact and influence of 'islandness' on electricity policy decisions. This multi-disciplinary, exploratory study uses both quantitative and qualitative methods to explore islandness through such attributes as scale, remoteness, complexity, adaptive capacity and the small-scale syndrome of totality/monopoly/intimacy. The research includes a case study of Prince Edward Island, Canada, whereby the energy institution is examined through interviews with key informants. The study concludes that negotiated political solutions rather than market solutions offer more promising alternatives to solving energy issues in small islands. Recommendations include: encouraging alternative energy technologies given already high electricity costs; providing top level ministerial support for energy portfolio; implementing clear, comprehensive energy policy with sustainability targets enforced by legislation; and enhancing energy literacy through broadly based public debate and truly innovative energy policy.

Keywords: islands, energy policy, electricity, politics, society, sustainability, Prince Edward Island, energy literacy

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TABLE OF CONTENTS

Preamble

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PART III. THE RESEARCH

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LIST OF TABLES

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THE INFLUENCE OF ISLANDNESS ON ENERGY POLICY AND ELECTRICITY SUPPLY

PART I

INTRODUCTION

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CHAPTER ONE: BACKGROUND TO THE STUDY

AN ENCOUNTER WITH SOCIALLY-CONSTRUCTED KNOWLEDGE

Crisp air, fragrant air...
gulls float and dip on banks of mist.

Healing waves reclaim the beach,
balance the shaft of crystal light.

The crash of surf redeems the soul,
recharges the life,
recovers the force...
that surges deep within...

--K Stuart

My quest for a research topic crystallized precisely on the evening of January 12, 2004, as I responded to a 10-minute challenge from a seminar leader to write poetry grounded in island studies. The exercise was designed to draw upon the left side of the brain and engage intuitive ways of thinking. The hastily-penned poem above expressed visual images of solar energy from waves, wind, and sunshine on a rocky island shore at the interface between the land and sea. These images of direct energy were accompanied by an epiphany that led me to further explore electricity in small islands. I was intrigued that thought processes resulting in poetry could add a further dimension to objective reality. With the aid of references on epistemology and methodology (Creswell, 2003; Greene, 2003; Patton, 2002), I came to realize that such reflections were part of having a social constructivist viewpoint which could be used legitimately in interdisciplinary research often riddled by technologically-dense subject matter.

From Poetry to Politics

It was liberating to learn that research on institutions could be done by "looking from the outside in", as described in Dorothy Smith's feminist-inspired writings in sociology (Smith, 1977; 1987). I found solace in Foucault's view that "where there is power, there is resistance" (Deleuze, 1988; Smart, 1985). The theory implied a 'power' imbalance between those who consume and those who produce, which leads to a lack of responsibility for energy consumption. Rifkin (1980) had written:

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> Energy is the basis of human culture, just as it is the basis for life. Therefore, the power in every society ultimately belongs to whoever controls the exosomatic instruments that are used to transform, exchange and discard energy. Class divisions, exploitation, privilege and poverty are all determined by how society's energy flow line is set up.

From my position as an ordinary citizen, and sensing that the energy industry was an all-powerful, technological oligarchy in society, it seemed that the problem of energy over-consumption and waste was a responsibility not limited to consumers. As I began the research in earnest and narrowed the focus, my emerging ideas were bolstered by the concept of 'energy literacy' as a means of transforming power. In Milne's view,

> The educational framework appropriate for a transformative task must consider how power functions, globally and locally, through political action and inaction, corporate interests, economic measures, and citizen expectations to invoke the illusion that our everyday energy choices are based in common sense. Learning how to question the common sense of maintaining energy practices that are unsustainable is at the core of this energy literacy. (Milne 2003, p. 2-3)

Therefore, I set off rather fearlessly, and perhaps naïvely, given the broad scope of the challenge, to explore socially-constructed aspects of the energy institution involved with producing electricity in small islands. This introductory Chapter contains a description of the rationale and multidisciplinary character of the project, its aim, scope and significance, followed by a mapping of the study chapters.

Defining the Energy Institution

A preliminary review of the technological literature was conducted to gain an understanding of the very specialized, capital-intensive systems that exist for generating, transmitting and distributing energy, and electricity in particular. Electricity generation in small islands typically relies upon burning fossil fuels which are costly to import, handle and store, all aspects of the energy chain considered. I found that alternative renewable energy technologies that used locally available energy sources had already been introduced in a wide range of installations on islands throughout the world, and others were being investigated, although these technologies were by no means mainstream (van Alphen *et al.*, 2006). Despite challenges, islands such as Samsoe, Æroe, Pellworm, Gotland, El Eherro, Dominica and St. Lucia even aspired to being 100% renewable islands (FED 2000, p. v; Chen *et al.*, 2006). On Prince Edward Island, householders had eagerly paid a premium for "green electricity" from wind power, taking incremental steps towards transforming their energy institution (Estabrooks, 2002; Hopwood *et al.*, 2005). In the Greek islands, public attitude was clearly supportive of wind power while that on the mainland was either divided or clearly against wind power applications (Kaldellis, 2003; Manologlou *et al.*, 2004).

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Cost was a significant factor for energy choices in islands, as elsewhere, yet other intervening variables besides price seemed to be operating in small island societies. For the purpose of this study, 'islandness' became the operative word for these variables.

Researching 'Islandness'

Island life has for centuries been understood and depicted through observation and experimentation by outsiders such as colonizers, anthropologists, experts and tourists using metropolitan paradigms (DeLoughrey, 2004). In the past thirty years, a body of research has been developing about all aspects of islands on their own terms, with attention paid to the condition of 'islandness' that differentiates these territories from elsewhere. The world's islands, home to almost one-tenth of Earth's population (Baldacchino, 2004a), provide diverse and discrete sites for comparing small-scale holistic systems in a wide range of societies and environments influenced by nature, humans and society-nature interactions. In the 21st century, islands have expanding influence in policy-building and social communications, based on a growing knowledge of diversity, identity, small-scale, remoteness, isolation and segregation, among other topics (Vallega 2004, p. 15).

Within island studies, the energy topic has frequently been given little more than a paragraph of its own in sector studies or is embedded within a discussion of economic development (McKee & Tisdell, 1990). Case studies, new methodologies and technological research about energy systems in small islands are being seen more frequently in the energy literature, but there is little in-depth social research on energy topics from an island standpoint, and very little work on the influence of energy systems in the realm of sociology which studies human society. Research is needed to understand society-nature interactions with regard to energy in order, for example, to effect corporate social responsibility for clean energy systems, especially in islands.

In scientific literature, the electricity topic is typically viewed through the lens of realism which accepts that there is a biophysical world independent of human interpretation (Murphy 2004, p. 251). Realism is characteristically the polar opposite of social constructionism where human accounts constitute reality, and in its extreme form, where nature is assumed to be a malleable resource to be socially reconstructed in the form of new technologies (Murphy, 2004, p. 251). This document attempts to integrate social constructionism and realism on a discursive level in a way described by Murphy (2004, p. 252-3):

> Humans socially construct their conceptions and practices (including those concerning nature and risk), as well as technologies, according to their culture and power. They are not, however, purely discursive spirits in a material vacuum,

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> but instead embodied beings embedded in a biophysical world. Social constructions occur on both the discursive level—the focus of social constructionist analysis—and on the material level...Humans construct technology by recombining nature's dynamics to accomplish particular goals. This "recombinant nature" recomposes the social on a different level, creating new possibilities, but it also creates additional unintended risks of exploding, collapsing, corroding, etc...As humans eliminate pristine nature on our planet and construct new technologies, they do not abolish nature, but instead internalize new autonomous dynamics of primal nature into their societies...the autonomy is that of two dancers: entangled and affected by the other's movements, yet independently making moves that may either be in harmony or out of step...

Because a focus on technology and cost predominates in the everyday treatment of the electricity subject, it is hoped that by introducing socially-constructed perceptions into the analysis, this research will lead to a more holistic understanding of electricity in islands. Quotations from interviews conducted by the researcher are used anecdotally throughout to capture those perceptions.

AIM AND SCOPE

This study addresses the problem of how island governments, electrical utilities and other stakeholders may provide more diverse and sustainable energy solutions for islanders. The aim of this research is to identify the impact and influence of islandness on electricity policy decisions.

To limit the scope of such a broad study for the purpose of Masters research, this document focuses in areas where jurisdiction over energy policy is visible and concentrated, in the realm of government policy and implementation by electrical utilities in sovereign islands, small island developing states (SIDS) and sub-national island jurisdictions (SNIJs).

In this study, energy consumption generally refers to the use of fuels by utilities for the conventional production of bulk electricity. There is limited reference made to energy consumption by individuals and households or use of on-site distributed systems of electricity production. While the notion of minimizing energy losses or increases in entropy from conversion or transformation during energy production may have implications for alternative energy choices and energy policy in islands, it is beyond the scope of this study to consider radical departures from technologies currently in general use.

Although the main focus of this research is limited to the conventional electricity sector of the economy and its many aspects, this does not preclude use of the broader term 'energy' in such ways as 'energy consumption', 'alternative energy' and 'energy policy'. 'Electricity' is specified where the meaning is specifically limited, for example, to 'electricity production', 'electricity consumption' and 'electricity policy'.

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SIGNIFICANCE OF THIS STUDY

The provision of energy on islands is one of those complex phenomena involving global and local systems simultaneously. There are important sustainability issues to consider which arise out of the production and use of energy. It is hoped that this research will assist in the understanding and attainment of sustainability goals based on environmental, human and social capacities beyond simply economic and technological realism.

While islands are typically importers of carbon-based energy resources at great cost, research on social and political aspects of energy and corporate social responsibility for clean energy systems can assist the understanding and attainment of sustainability goals. A goal of this research is to provide island policy makers and energy executives with a new range of perspectives on their energy institutions. Beyond that, it is hoped to raise questions that eventually contribute to a redefinition of what constitutes best practice energy solutions for small islands based on a broader and longer term assessment than is usually considered. Small islands can become better prepared to achieve sustainable development goals with direct local knowledge and paradigms that are enlightened by island studies, environmental sociology and ecology theory. It is hoped that this research contributes to a better understanding of the factors underlying higher quality, more sustainable life on islands, and leads to an island's insistence upon integrated and appropriate energy systems for itself.

OVERVIEW OF THE STUDY

This research, entitled "The Influence of Islandness on Energy Policy and Electricity Supply", is presented in four main parts.

Part One – Introduction

Chapter One, "Background to the Study", briefly outlines how the study evolved alongside my intellectual journey through socially-constructed knowledge, energy literacy, the energy institution and islandness. The Chapter includes the problem statement along with the aim and scope of the study, followed by its significance and this overview of how the study is organized.

Part Two – Context

Background information for the research, and reviews of the literature, both theoretical and applied, are found within this section.

Chapter Two, "Electrical Utilities and the Cost of Electricity in Islands", outlines the special physical, technological and economic influences on electrical

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utilities in islands. Global and island context is followed by a review of the literature on electricity in island studies. A section on electricity economics and pricing contrasts the approaches taken by neo-classical and institutional economics to broaden the understanding of cost paradigms. The next section compares electricity costs per kilowatt hour in nine small islands, confirming that islandness influences the cost of electricity particularly with small scale and less clearly with remoteness measured by distance from fuel source. This is followed by a review of the influence of small scale and remoteness on generation, transmission and distribution technology, financial risk and environmental risk. The final section provides perspectives for islands on human welfare, fossil fuels and alternative energy sources, as well as cogeneration and conservation issues.

Chapter Three, "The Social, Political and Ecological Context of Electricity in Islands" contains broadly-based theoretical material which is intended to lead the reader into new approaches to the familiar. Theoretical material on small-scale social environments, politics and jurisdictional capacity from island studies is presented, as well as ecological notions of adaptive capacity and complexity, nature-society interaction and sustainability in islands. The Chapter aims to raise philosophical and theoretical questions for further research about the special situation on islands and the influence of islandness and small-scale.

Part Three - The Research Process

Chapter Four, "Research Design", is concerned with the design of this research, choice of method and application of an embedded case study method. The Chapter introduces the hypothesis, describes the pilot studies used, explains the development of the semi-structured questionnaire as an interview tool and describes how the research was conducted. It describes a heuristic device developed by the researcher in her analysis of selected events and processes from the case using a series of socially-constructed concepts of islandness.

Chapter Five, "Case Study of Prince Edward Island – Part A: The Energy Institution and Electricity", describes the environmental, social, economic and technological conditions underlying the institution of energy and electricity production in this Island case.

Chapter Six, "Case Study of Prince Edward Island – Part B: Interviews of Key Decision-Makers", provides a grounded theory compilation of socially-constructed perceptions by key decision-makers in the energy institution of Prince Edward Island as an exploratory device. This data includes selected verbatim accounts and passages from interviews about perceptions, along with analytical commentary on islandness, sustainability, research & development and energy policy.

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Part Four – Synthesis

In Chapter Seven, "Discussion", implications of the study results are discussed in light of the theoretical material reviewed and described in the context chapters. Chapter Eight, "Conclusions and Recommendations", concludes the study and provides recommendations for policy-makers in the energy institution and suggestions for further study.

Endnote

A Bibliography and five Appendices containing the Ethics Review Board approval certificate, other permissions, interview transcripts, supplementary quantitative materials and the researcher's *curriculum vitae* are found at the end of this document.

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THE INFLUENCE OF ISLANDNESS ON ENERGY POLICY AND ELECTRICITY SUPPLY

PART II

CONTEXT

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CHAPTER TWO: ELECTRICAL UTILITIES AND THE COST OF ELECTRICITY IN ISLANDS

INTRODUCTION

> There is no substitute for energy. The whole edifice of modern society is built upon it. It is not 'just another commodity' but the precondition of all commodities, a basic factor equal with air, water, and earth.
>
> --E. F. Schumacher (1973)

> Society has to drive the policy process in terms of being interested or willing to pay for it. And invariably, the issue always, sooner or later--quite often sooner--comes down to cost.
>
> --CEO, Island Regulatory & Appeals Commission (IRAC), (interview, February 2006)

The Global Context

By year 2030, global demand for electricity is expected to increase by two-thirds (PWC, 2004). This is partially driven by power sector reform, believed to promote economic growth through increased efficiency and competition among market players seeking to maximize profit over the short term (Weisser 2004b, p. 102; Meyer 1998, p. 220). Free market mechanisms have resulted not only in more consumer choice and reduced electricity prices but in turbulence also: the global utilities landscape has been punctuated by corporate failures and major blackouts (PWC 2004, p. 1). The industry fears that rising demand will outpace needed investment in transmission and distribution infrastructure for the future, projected at US$ 3 trillion by 2030 (OECD, 2005). In a 2004 survey of executives throughout the power industry world-wide, great concern was expressed over security of supply, increasing regulation and obligation, as well as wholesale price volatility (PWC 2004, p. 5). Uncertainty continues in world petroleum markets also, with the price of oil on New York markets exceeding $78 US per barrel in July 2006. Against this global backdrop, most small island states (SIDS) and sub-national island jurisdictions (SNIJs) remain heavily dependent upon imported fossil fuels for electricity generation (Weisser 2004a, p. 127).

Electricity Dynamics in a Small Island

Out on the periphery, small, open island societies have been weathering global turbulence, at times with sharp intensity, for a very long time. In fact, the conditioning influence of small scale as an intervening variable, along with peripherality and other variables, has been the focus of much study, especially as it relates to manufacturing, economic development and competitiveness (Baldacchino, 2005, 2006; Briguglio & Cordina, 2004; Armstrong & Read, 2002).

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Curiously, electricity production and distribution have not generated much interest in island studies research, perhaps due to reluctance to wake a stranded Gulliver with a technological bent.

At first glance there appears little room for small island governments and consumers to influence the power sector because, in most small islands, this sector continues to be dominated by publicly or privately owned monopolies that control all stages of generation, transmission and distribution. These utilities typically have a high degree of control over investment decisions and programs, employment and tariff setting (Weisser 2004b, p. 108; Domah 2002, p. 9).

More recently, it has been recognized that many SIDS and SNIJs have exhibited resilience and achieved greater prosperity for themselves through the broader pursuit of a long list of non-market solutions and unorthodox approaches to development, including the use of jurisdiction as an economic resource (Baldacchino & Milne, 2000; Prasad, 2004; Baldacchino, 2006). A study of manufacturing in SIDS has confirmed that small size, associated with higher cost per unit produced, is indeed a disadvantage. However the good performance of small countries, and SNIJs in particular (Armstrong & Read 2000, p. 303), is in evidence, in spite of their alleged vulnerabilities (Briguglio, 1998, p. 507-508). It seems plausible to apply the same reasoning and approaches to the production of electricity, a form of manufacturing.

Aim of This Chapter

The main aim of this Chapter is to determine how the 'islandness' condition may influence the cost of electricity, which, in turn, affects island economies and progress towards sustainability. After an introduction, the first section describes the power sector in small islands. Explained next is the influence of underlying cost paradigms on analytical methodologies and energy policy choices. In the third section, data from the Caribbean region is used to illustrate how electricity cost is related to scale in small islands. The final part of the Chapter provides a discussion of other islandness factors such as geography and remoteness that may influence electricity cost in SIDS and SNIJs.

THE PECULIAR ROLE OF PROFIT-DRIVEN PUBLIC UTILITIES

The pressure to unbundle that drives the power industry in large economies does not necessarily translate successfully at small scale. Electrical utilities continue to be organized as vertically-integrated monopolies. Stand-alone island electric power systems have special reliability problems and other economies of scale impacts (Mayer 2000, p. 319). These technical issues, combined with growth-

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inhibiting limited (but captive) local demand, reinforces the natural monopoly due to inherent indivisibility of infrastructure.

Electricity production and distribution in small islands straddles the economic and political terrain between local and global enterprise. Monopoly utilities, while required to provide electrical service under regulation by government agencies or under self-regulation, generally operate freely within a framework of private enterprise, charging customers for their full costs plus a profit margin and being accountable to their shareholders (Weisser 2004b, p. 102). The utility is typically capital-intensive, competing in bond and equity markets for investment to enable infrastructure, while importing an ongoing stream of fuel (petroleum) at fluctuating world prices that are ultimately passed along as electricity costs to the consumer.

Such public utility companies may be completely government-owned, examples being the British Virgin Islands Electricity Corporation (BVIEC), sole distributor of electricity in the British Virgin Islands in the Caribbean (www.bvielectricity.com), and Enemalta in the Maltese Islands of the Mediterranean Sea (www.enemalta.com.mt). In some public utility monopolies in islands, shares may be partially held by private interests. Mirant, a large US multinational energy company, owns preferred stock of Aqualectra, the electrical and water utility in Curaçao, Netherlands Antilles (www.aqualectra.com). Utilities may also be completely privately held, as in Prince Edward Island, where the locally managed Maritime Electric Company Ltd. is the wholly-owned subsidiary of Fortis Inc., a multinational energy company headquartered in St. John's, Newfoundland (www.fortisinc.com). Whether publicly or privately owned, profitability is a required outcome of all these operations to varying degrees.

Electrical utilities in islands often have decades of experience distributing electrical power to their retail and industrial customers and managing with pride their specialized knowledge, skills, resources, equipment and generation capacity. They exemplify 'unproductive' capital being made productive, promoting the physical welfare of island residents (Bertram 2006, p. 2). Because they are protected monopolies, their customer base is guaranteed and they are fiscally conservative. With well-defined inputs and outputs, they have technological interest and state-approved means to obtain considerable physical assets and financial resources. Being successfully embedded as they are in their local communities, island utilities have little incentive to change, innovate or encourage the research and development that is required by their larger deregulated counterparts, the multinational power companies, to stay competitive.

One government observer from Prince Edward Island (PEI) expressed an opinion as follows on the impact of unbundling on consumers and exporters:

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> When you are talking about any kind of commodity, a monopoly is not necessarily in the best interests of the consumer. it tends to inflate the price they are going to pay for the commodity if there is no competition in the market . Here on PEi we pay the highest rates for electricity as anywhere in Canada. So whether that speaks to the fact that we have had a monopoly, i'm not sure, because most jurisdictions don't have a huge variety of players. Ontario does--it has a number of different players--a lot of the power corporations are crown corporations of provincial governments in most of the other provinces. That's not the case here. This is a private utility. But I think it would be to the consumer's best interest to have a greater variety of providers... (interview February 17, 2006)

Pressures to unbundle their infrastructure are vigorously opposed by monopoly island utilities. Questioned about relative electricity rates, a utility CEO defended his company's electricity pricing as follows:

> No, there are areas of Ontario that are higher than us. New Brunswick is probably about the same as us now. Nova Scotia, if they get the rate increase, will be the same as us. Ours are very competitive now. (interview February 20, 2006)

The creation of more economic space in the provision of energy is therefore one of the more difficult challenges facing a small island government seeking to change the status quo.

Energy-Related Literature

Applied scientific research appears in a vast array of energy publications for the purposes of advancing and evaluating technological progress (Altaii & Farrugia, 2003; Green, 2004; Karbuz, 2004; Koh *et al.*, 1996; Maloney, 2001; Mayer, 2000; Parker *et al.*, 1985; Sorenson, 2000; Weisser, 2003). While energy-related issues cover a huge scope, much has been written from a realist perspective (Ashraf *et al.*, 2004; Domah, 2002; Koh *et al.*, 1996). As well, there is much corporate research and annual reports from utilities, global energy corporations, private consultants and governments in metropolitan areas (Anglec, 2004; NV GEBE, 2004; City of Summerside, 2004). The extensive literature on global energy markets and financing considers such areas as price differentiation and exit strategies, tariff structures and trading schemes, capital grants and soft loans, tax incentives, and financing alternatives (Gilbert & Kahn, 1997; Gunton, 2004; Junginger *et al.*, 2004; Kalogirou, 2003; Rutherford, 1979; Slingerland & DeJong, 1998; Turvey & Anderson, 1977; Upreti, 2004; Wolsink, 2000). Further research is needed on the application of such instruments to the small-scale conditions in SIDS and SNIJs.

COST PARADIGMS

So what does cost include? The scope of cost can be unduly limited by the economic paradigm in use, since alternatives are excluded in principle. This section briefly examines the dominant neo-classical economics paradigm

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underlying global pressures to deregulate and unbundle, and the competing models and methodologies of ecological and institutional economics.

Neo-classical Economics

Neo-classical economic models are heuristic devices built around "maximizing behaviour of individual firms and consumers" (Bannock *et al.* 2003, p.273), with a view to interest satisfaction. In the parallel political realm that supports this paradigm, neo-liberal theorists, deeply concerned with state failure, criticize state-centred development, believing that political interference can lead to rent-seeking and productive inefficiencies (Haglund 2005, p.1). Such views, which underlie deregulation and unbundling programs, encourage private sector participation in the provision of public utilities and a belief in markets rather than governments or monopolies as a solution to deficiencies in basic services (*ibid.*, p.1). It has also led economists and advisors at agencies such as the International Monetary Fund (IMF), World Bank and U.S. Agency for International Development (USAID) in the last twenty years to promote privatization in order to solve what were believed to be problems of corruption and inefficiency in state-owned enterprises in countries and regions around the world (*ibid.*, p.1).

Productive capital is defined in both neo-classical and environmental economics to include the total stock of human-made, non-renewable and harvested renewable resources, as well as land, human capital, social organization, institutions and current technology, *all of which are measurable* (Hediger, 1999). Typically excluded from neo-classical analysis are those costs and consequences of a process or activity that are borne by society rather than by the individuals who benefit directly from the activity (Slobodkin, 2003). These 'externalities' can include positive 'free' goods and services which are *unmeasured* or *inadequately captured,* such as clean water and air in natural environments, and social equity, social capital and healthy social environments, elements which become more critical to manage in bounded small islands with sensitive ecosystems.

There are also negative externalities, or 'costs':

> "Unaccounted, or inadequately captured externalities include all immediate and short-term negative impacts related to the discovery, extraction, distribution, and conversion of energy resources as well as the costs related to decommissioning and dismantling of facilities, long-term storage of wastes, and long-lasting effects on ecosystems and human health (Hubbard, 1991). There is no doubt that most fuel and electricity prices still either ignore, or greatly undervalue, these externalities that range from largely quantifiable local environmental impacts to global consequences that are impossible to monetize in a satisfactory manner, and from health effects on general population[s] to substantial economic and social burdens of large-scale military interventions" (Smil 2003, p. 88).

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Neo-classical approaches using computerized models can now quantify some of these external costs but have been criticized by other economists for resting on "a shaky and faulty methodological foundation" (Nagarajan 2003, p.2; Kim 2005, p. 6). In other words, such an approach can leave out significant social, environmental or institutional externalities that are assigned a zero value if the cost of long and short term damages, for whatever reason, cannot be assigned a dollar value.

Ecological Economics and the Institutional Approach

By contrast, ecological economics nests the economy within the finite and non-growing global ecosystem, the environment (Costanza *et al.*, 1991), using "a holistic and organic view about economic systems" (Kim 2005, p. 9). The ecological economics paradigm has spawned social cost valuation and multi-criteria decision-making (MCDM) methods to measure social and ecological externalities using different concepts of capital (Abel, 2003; Singh & Grünbühel, 2003; Brunckhorst, 2004; Bastianoni *et al*, 2005a, 2005b), as surveyed by Hediger (1999) and Abel & Stepp (2003). Under such a paradigm, depleted stocks and waste build-up in the environment must be accounted for and reversed to reach a state of equilibrium (steady state). This view of economics complements a more activist political stance. Haglund (2005, p. 3) describes the institutional approach as a citizenship-based democratic model that places resource protection and defence of social and economic rights in the foreground.

General equilibrium models have been able to capture linkages between the economy and other variables such as energy and equity (Naqvi, 1998). One study uses full-cost accounting to measure environmental externalities associated with generation of electrical power from coal, gas and oil by quantifying public health costs caused by sulphur and nitrogen oxides and volatile organic carbons in eastern Canada (Venema & Barg, 2003). Another Canadian study uses a modeling framework to prove that lower income groups do not have the ability to cope with changes in energy prices as well as other income groups due to their inability to change their technology (Kanudia *et al*, 2003).

An island case study by Cavallaro & Ciraolo (2005) about Salina, an island in the Aeolian archipelago of Italy, describes in detail how MCDM was effectively used to determine the feasibility of installing wind energy turbines. The costs of producing energy from traditional sources were much higher on the small Sicilian islands compared to costs for the mainland (*ibid.*, p 238). The top option to build a 150 kW wind turbine emerged as a "*compromise* between the costs of realization, local energy requirements and the need to conserve the area and the environment, especially in view of the high/medium-bracket tourism business on the island" (Cavallaro & Ciraolo 2005, p.235). The MCDM approach was the most

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appropriate tool to understand all the different perspectives involved and to support decision makers by creating a set of relationships among the various alternatives (*ibid.*, p. 235). Another important study using MCDM examined renewable energy options in the Maldives (van Alphen *et al.*, 2006, p.3) and showed that a technology with a high probability of adoption will not automatically be implemented as the technology diffusion process is influenced by various social, institutional and political factors beyond the technology itself.

Despite its flexibility, MCDM has been criticized for its subjectivity in the weighting of criteria and for its uncertainty or lack of precision. Using ordinal information, only the plus or minus sign of differences between alternatives is taken into account rather than an indication of the magnitude of such differences (Kim 2005, p.10). However, MCDM was found to be useful and workable in dealing with multidimensional energy issues where part of the input data is perhaps ill-defined and not easy to measure (Cavallaro & Ciraolo 2005, p. 243), a situation often encountered in small islands.

In practical applications, research on electricity costs has generally used a neo-classical economics framework to measure technological progress (Turvey & Anderson, 1977; Maloney, 2001) or to allocate costs for tariff setting (Gilbert & Kahn, 1997). Giving more weight to alternative, institutional approaches alongside the conventional economic framework can only improve energy policy decisions by better accommodating social and environmental externalities otherwise excluded.

ELECTRICITY COSTS AT SMALL SCALE

Economic vulnerabilities of SIDS associated with small size, insularity, remoteness and proneness to natural disasters have been identified (Briguglio, 1995; Commonwealth Secretariat, 1985, 1997). Conditions in the natural, political and social environments of small islands often preclude lower cost electricity in SIDS and SNIJs, especially when combined with the need for additional shipping and handling due to lack of a local fuel source. For example, data compiled by the Department of Energy (EIA, 2006) shows that the highest retail price[1] for electricity generation in 2003 in the United States was found in the small oceanic island state of Hawaii, at 15.7 cents (US) per kilowatt hour, compared with the average for all mainland states at 7.4 cents (US) per kilowatt hour. Hawaii ranks 42nd in population size when compared to the rest of the 49 (mainland) US states.

If electricity prices are higher on islands, then does electricity actually cost more on smaller islands? It seems so. Using a simple visual method, a group of SIDS

[1] corresponding cost data was unavailable

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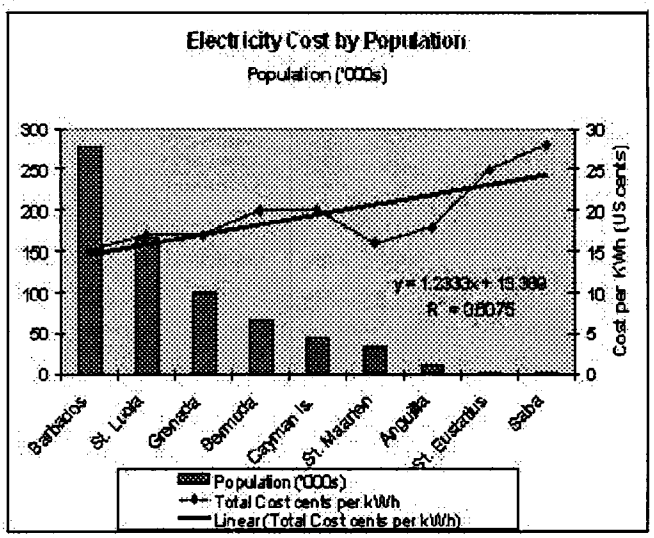
and SNIJs in the Caribbean region are ranked by relative size in terms of population and cost of electricity per kilowatt hour (kWh), using data for the 2003 year. To determine total cost per kWh and standardize the data, total annual fixed and variable costs were derived from 2003 financial statements from each island's electrical utility; these costs were divided by the total annual kWh produced per year, including losses and electricity used in production. Table 1 shows that, in general, the smaller islands have higher costs per unit of electricity produced.

Table 1. Electricity Cost by Population ($US)

Island/ Territory	Population ('000s)	Total Cost cents per kWh
Barbados	279	15
St. Lucia	166	17
Grenada	101	17
Bermuda	65	20
Cayman Is.	44	20
St. Maarten	33	16
Anguilla	12	18
St. Eustatius	2	25
Saba	1	28



These nine islands in the Caribbean region, including two cable-linked archipelagoes (Bermuda and Cayman), were selected for having relatively similar electricity production systems. The three SIDS and six SNIJs are cosmopolitan tropical islands with small land bases exhibiting considerable jurisdictional capacity and political stability. They have service-based, open economies relying heavily on global tourism, primarily from the Americas, Europe and within the Caribbean, which has fostered the development of related airport and seaport infrastructure. Without their own sources of fossil fuels, however, they rely almost exclusively upon fuel imports to supply thermally-generated electricity. This exploratory analysis shows a direct relationship between small scale and electricity cost in the smallest islands in one particular year. It suggests that the cost of utility-generated electricity becomes relatively high in smaller islands due to scale.

These exploratory results may indicate that the influence of small scale on cost per kWh also affects archipelagoes that include small islands. Electricity costs are predicted to be higher in the outlying islands of archipelagoes which have lower populations. From the graph, it appears that the overall cost per kWh in

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the Bermudian and Cayman archipelagoes is higher than in all but the very smallest single islands in this study. Turning to price, this pattern has also been found in the Maldives where, in 2004, residential users paid 15 cents (US) per kWh and businesses 25 cents (US) per kWh in the larger inhabited islands (including Malé), while prices in the small outer islands with lower populations were approximately twice as high (van Alphen *et al.*, 2006, p.5).

That retail electricity prices are indeed higher on small islands provides ample justification for questioning further why islands pay so much more for their energy than some mainland areas. How different can it be, for example, in electrifying small St. Eustatius (host of a large, modern oil bunkering facility) from providing electricity to a remote area in Wyoming in the middle of the North American continent?

In 2003, it cost 25 cents (US) to produce one kilowatt hour of electricity in St. Eustatius; meanwhile, the retail price was only 4.7 cents (US) per kilowatt hour in Wyoming[2] (EIA, 2006). Obviously, price data cannot be directly equated with cost data due to market power and subsidies, but as indicated under cost paradigms above, ordinal information is useful to provide pointers and raise questions. It is beyond the scope of this exploratory study to compare these results using detailed statistical analysis. Overall, estimating and comparing the cost function of electricity production in different localities is a very complicated matter due in part to the multiple dimensions of capacity utilization and load profiles, as well as differences in fuel type, generating equipment, pollution control measures, and many other factors. For example, because electricity cannot be conveniently stored, generation facilities are built to follow load. As a result, capacity utilization is captured both when the generating units are connected to the system and when they are idled (Maloney 2001, p.165). In general, higher capacity utilization causes average variable cost to decline, based on US data (*ibid.*).

Related to this, Mayer (2000, p. 320) in a study of 37 island electric utilities in the Caribbean and the Pacific, showed that while the qualitative impacts are the same for tropical and temperate islands, there may be quantitative impacts due to seasonality. In a temperate climate, maintenance can be scheduled during the low demand season, allowing greater reliability from a given capacity relative to annual peak load (*ibid.*). Also, evolving technologies are rapidly changing the thermal energy options for small islands as generation becomes more efficient: modern small scale power plants using modular design are competitive, less capital intensive and more efficient; they are flexible in operation, size and expandability; they are quicker to build; and they have more sophisticated control

[2] corresponding cost data was unavailable

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technologies for operation and transmission networks (Weisser 2004, p. 105; IEA 2002, p. 37-39).

All of this points to an overwhelming concentration by governments and utilities on the fine details of cost and technological efficiency of thermal generation, and at times a lack of focus on the more fundamental issues of sustainability, jurisdiction and social context, all of which should be associated with the formation of an island's energy policy.

GEOGRAPHY, REMOTENESS AND TECHNOLOGY

Natural Resources

Small islands around the world rely heavily on imported fossil fuels (oil, natural gas or coal) for electricity generation, and having a secure energy supply is of critical importance for economic growth and development in small islands, as it is elsewhere (Weisser 2004a, p. 127). Paradoxically, many islands have ample but under-utilized renewable energy resource potentials from geothermal or solar (direct or stored) sources that can contribute to sustainability (Haraksingh 2001, p. 648). Only a few small island states like Trinidad & Tobago, Papua New Guinea, São Tomé & Principe, Bahrain, and to a limited extent, Cuba and Barbados (Binger 2005, p. 5), actually produce petroleum. Some islands such as the Faroes in the North Sea have natural gas deposits offshore, Iceland has abundant geothermal energy, and some, like Cape Breton Island on Canada's east coast, have known sources of coal.

Distance

To what extent does distance influence electricity cost? This is difficult to measure quantitatively. In Table 2, Electricity Cost by Distance to Petroleum Source, an attempt is made to plot cost per kWh against the shortest distance in kilometres between each of the capitals of these same Caribbean islands and Trinidad, a common source of petroleum fuel. This simple eyeball test illustrates that while cost rises slightly as distance from the source of supply increases, (indicated by Bermuda and the Cayman Islands which are furthest away from Trinidad), cost per kWh is higher in the smallest islands, Saba and St. Eustatius, which are midway among the islands in distance to the hypothetical supply from Trinidad. However, such ordinal information is inconclusive. Any correlation between cost per kWh and distance needs detailed confirmatory studies that may have flaws as well: a great number of intervening variables need to be taken into account, some of which might be considered 'externalities'.

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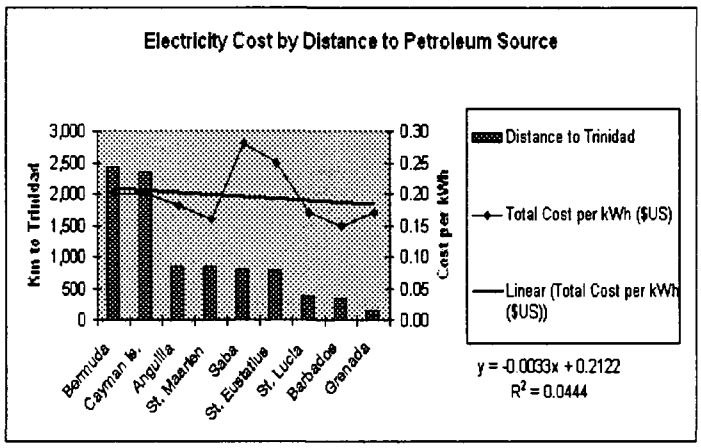
Table 2

Island/Territory	Distance to Trinidad	Total Cost per kWh ($US)
Bermuda	2,425	0.20
Cayman Is.	2,335	0.20
Anguilla	853	0.18
St. Maarten	846	0.16
Saba	799	0.28
St. Eustatius	783	0.25
St. Lucia	376	0.17
Barbados	340	0.15
Grenada	156	0.17



For instance, supply vessels are not apt to take straight routes from the source of supply to each island as this graph models. Complex research beyond the scope of this study is needed to confirm the lesser significance of distance upon electricity cost in these small islands.

Transmission Systems and Access to Markets

There are clearly possibilities for economic advantage at a local level for the subset of small islands which can obtain reliable, high-voltage electricity from continental systems via undersea or overhead transmission cables. In such islands, on-island distribution may be unbundled from the generation function in the spirit of power reform. There are economic advantages if high-voltage electricity can be purchased from an outside source that is able to provide cheaper electricity due to economies of scale in production elsewhere. A link to a larger system also provides the technical stability necessary for backstopping alternative energy, as will be discussed later in this chapter. As well, islands which are linked may be able to export electricity. With successful interaction in the marketplace, they may be better positioned for price setting rather than price taking. For example, Prince Edward Island, which has a productive wind regime, could convert from importing to exporting electricity with appropriate transmission infrastructure, according to PEI's Climate Change Co-ordinator:

> "If energy demand says anything, there is going to be demand for [our wind energy]... It's not as if there is not going to be a buyer here for the electricity...and even if there is not going to be a buyer here, there is a huge export market for electricity. New Brunswick and Nova Scotia are already exporting pow er to the New England States, potentially with more electricity being produced here on the island, it stands to reason we would be entering that market as well, and I don't think that market is shrinking."

Despite advantages of becoming linked to a mainland, however, there are still obstacles in these situations: gaining access to markets and overcoming

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remoteness is typically problematic for small entities. The power industry has long defined generation and transmission as "natural monopolies" since duplicating such facilities is accepted as being inefficient and more costly to consumers (Stretton 2000, p. 340). As a result, electricity coverage is incomplete in some areas as transmission systems are not considered as public utilities with government support. Throughout North America, this has discouraged the introduction of decentralized generation by competing producers of alternative energy. Small suppliers often have difficulty connecting to the monopoly-owned transmission grid. The way transmission services are perceived by the dominant power industry and ubiquitous governments is illustrated anecdotally in the words of another industry player, a wind turbine manufacturer in Prince Edward Island:

> One of the biggest hurdles wind energy faces in North America is that there are not enough transmission lines. Utilities, for basic survival purposes, have never built sufficient transmission lines to be able to do anything other than to serve their own needs. They don't have any global responsibility. And in Canada and the US, the federal governments have never taken it upon themselves to look at electricity as an essential service like they do to some extent highways, railways, defence. ...governments should be looking at it...that capacity is there in some places and not in others. The incentive to build those distribution systems and interlink...the infrastructure...is not there to deliver it.

The point of this anecdote is to illustrate that continental islands as well as oceanic islands may experience competitive disadvantage due to separation and inadequate long-distance transmission even when they are able to generate excess electricity. The term 'remoteness' captures this concept, which has been cited as a disadvantage for many small islands which have to import fuels (Briguglio, 1995; Fischer & Encontre, 1998). It is clear that even islands close to continents must use political mechanisms such as negotiating with neighbouring governments and providers of generation and transmission facilities, or skilfully using jurisdictional power, to overcome the disadvantage of remoteness.

Technological Choices

Remoteness may also contribute to higher construction costs of infrastructure and fuel storage facilities on islands (Briguglio, 1995; Fischer & Encontre 1998, p.81). However, recent improvements in technology have made smaller capacity engines and turbines more fuel efficient, often with fewer emissions. Distributed generation systems (which include engines, small turbines, fuel cells and photovoltaic systems), may contribute to sustainability since they can produce electrical power not only from fossil fuels but from other sources such as household waste, biomass or photovoltaic cells (IEA 2002, p. 8). However, the latest modular generating equipment and maintenance services may not be available locally, requiring imports from abroad that can add costs. In a situation

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coined as the "Virgin Islands paradox", overbuilding technological capacity can create an illusion of prosperity but inputs become costly as demand increases for further inputs and infrastructure (Fischer & Encontre 1998, p.79). Choosing technology for energy production in small islands, whether buying new or used equipment, is therefore a complex and critical decision involving political savvy and long term planning, especially with increasing awareness of climate change and sustainability issues that accompany fossil fuel use.

Industrial gas turbines and reciprocating engines are the workhorses of conventional electricity plants. While gas turbines run for longer hours with lower emissions and higher thermal efficiency, diesel or gas reciprocating engines are less costly to install, require less time to start up, but have higher emissions and costly maintenance requirements (Swanekamp 2002, p. 71). On the plus side, both offer great flexibility in their operation and expandability, and can be built quickly and easily on relatively small sites, incurring little or no environmental damage. Gradual changes in demand can be matched without over-building unnecessary capacity, freeing up capital for other purposes. Although their major flaw lies in their appetite for fossil fuels, they are better positioned for conversion to inexpensive renewable fuels such as landfill gas or biodiesel (IEA 2002, p. 25).

Research in developing countries indicates that most of the highly efficient power plants are relatively large, with increasing returns to scale prevailing (Domah 2002, p. 4). While mainland Caribbean countries like Belize and Guyana can interconnect to a relatively stable continental grid which incorporates large hydroelectric power, stand-alone systems on islands are required to build larger reserve margins for reliability. To allow the electricity supply to continue when a generator is shut down for planned maintenance and another is accidentally unavailable, industry standards specify that power plant capacity minus the two largest generators must be greater than the peak load to guarantee service (Mayer, 2000). When a utility decides to obtain larger generators, even greater redundancy of installed capacity will be required to ensure reliability (Weisser 2004a, p. 132) and the stakes are high. For example, in 2005 after lengthy deliberation, the regulator in Prince Edward Island (PEI) allowed the electrical utility to spend $30 million Cdn to install a new gas turbine that will only be used for back-up purposes (www.irac.pe.ca). Although PEI is linked to the mainland high-voltage grid, the generation equipment was installed mainly to obtain greater bargaining leverage when negotiating to import "blocks" of cheaper power from larger or continental neighbours.

Large scale wind farms and solar energy technologies are beginning to supplement but not replace conventional electricity from fossil fuels. Wind rarely blows constantly, and wind farms are usually located where grid systems are robust enough to absorb the variability of these alternative sources of energy.

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Wind infrastructure can also be at risk of total destruction in hurricane zones. With alternative energy technology at relatively early stages of development, maintenance issues on it may be more significant than with familiar thermal generation units. Traditional island utilities are reluctant to commit resources to accommodate the risks of alternative energy. For many small island economies, such programs are beyond reach entirely, according to one executive observer from PEI:

> Most of those countries couldn't do something that's not least cost. They have no choice. That's why you see some pretty rough environmental situations. You go down there and see some of these diesel plants. There is just oil oozing out of the ground. They can't afford anything else. If it took 10% of the bills to clean up the environmental messes they've created, and lots of them have them, the country would be in open revolt. Cash just isn't there. These work like lots of people use their family bank accounts. If there's not enough money in the account by the end of the month, they wait until the next cheque comes in. I've seen that. Countries say, "Sorry, we don't have that." You have to buy fuel in US dollars, you go to the national bank to exchange local currency for US dollars. "We don't have any." We have a bill we have to pay. "Can't help you. Come back next week." The flexibility is all gone. (interview Feb. 20, 2006)

In some ways, generation of electricity on islands is not so different from that on mainlands, except that on small islands, there is no hinterland where power production can be isolated. Both oceanic and cable-linked islands are required to purchase generation and distribution equipment that frequently requires additional handling, transportation and installation, adding to electricity costs, as well as what may amount to significant costs to mitigate severe environmental damages at existing generation sites.

Financial risk

Even when they are able to import blocks of cheaper power from efficient generators through undersea cables or aerial transmission lines, small islands close to continents may still be unable to take full advantage of economies of scale due to higher financial risk. Smaller markets tend to be less liquid and capital is normally available to them at a higher premium. The Chief Executive Officer (CEO) of Maritime Electric Ltd. provides an insight into human motivation and agency as well as economics in this anecdote about the situation in Prince Edward Island:

> ...as the company grows and we make additional investment, we have to go out and finance more debt. Because of the size of the operation, for us a big debt issue would be $30 million...That is teeny tiny in the bond markets. And as a result, we have to do what are called private placements. You can do a public debt issue, and you see bonds traded the same way you see stocks traded. We just can't afford to do that. But if you look at what they call the spreads, the difference between the interest rate on our bonds and the long term Canada

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> [bond]s, we have a much higher spread than a public issue simply because they argue things like liquidity—if you are holding our bond and you need to sell it, you are going to have a rough time selling it just because there is no market for it, not because people are going to say "heck no, I'm not doing that", but if you just need the cash for some reason, the number of people you can go to sell it that will say, "yes, I'll buy that bond", is pretty limited. So we pay for that. That's a size issue.

It is not only the bond market but also the equity market that costs more due to scale in small islands:

> We also pay in terms of the equity returns we are allowed. Typically returns on equity are higher, for example, in Prince Edward Island and Newfoundland than they are in Nova Scotia. There aren't so many electric utilities in Canada but gas utilities compare pretty directly to them. And our returns are higher. The arguments are the same there--the investor risk is higher there because it's a smaller economy, the risks, with the economy very narrowly based on agriculture and tourism, so investors say, "No, if you're asking me to invest in Maritime Electric vs. investing in Union Gas", which is a big gas company in Ontario, they're going to say, "Sure, Union Gas, I can earn 9.5%, Maritime Electric, I want 10.5%. Cayman Islands, I want 14%. Belize, I want 16%. Turks & Caicos, I want 18%." (CEO, Maritime Electric Ltd.)

How weather risk is perceived also impacts decision-making around energy policy (Murphy, 2004); this anecdote about hurricanes from the same CEO demonstrates that nature has affected the access to capital in some islands:

> Turks & Caicos is an interesting example. It is a privately owned one... they've got some real concerns. Although the returns are very good, they are terrified they are going to be wiped out by a hurricane and the whole thing is gone. How would they be compensated for that? The country doesn't have the money to do that so there is a huge risk to operating there, and consequently, if they want to attract an investor in there, they are going to have to pay a huge amount for it.
>
> (interview February 20, 2006)

In summary, premiums paid by islands because they are islands arise, not necessarily from real supply cost differences from mainlands, but from perceptions of financial risk due to scale, remoteness and environmental vulnerability. For example, receiving bulk fuel by sea is apt to be more efficient than shipping it overland. However, islands which are able to import blocks of cheaper power through undersea cables often must buy these blocks at a premium, not only because cabling itself is very expensive to install, protect and insure, but also because of perceptions about islandness. Therefore, on many dimensions, electricity remains more costly on all islands, raising important questions about equitability, cost sharing and energy alternatives.

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ACHIEVING BALANCE IN ISLANDS

Fossil Fuels and Human Welfare

Although energy is a key for relieving poverty, improving human welfare and raising living standards, there is no energy production or conversion technology without risk or without waste. Energy is only a means to achieve good health, high living standards, a sustainable economy and a clean environment. For most of human history, the key to abundant energy was to burn wood and then to obtain and burn fossil fuels (peat, oil, natural gas and coal). Despite their drawbacks, fossil fuels have high net energy per unit (Heinberg 2003, p. 152) and are hard to replace because they are so convenient. Almost every aspect of modern life in the developed and developing world, including the production of electricity, depends upon the easy availability of the chemical energy in fossil fuels. Much physical science research is available dealing with fossil fuels and alternatives. Comprehensive reports of the energy sector on islands world-wide have been compiled (FED, 2000; ADB, 1997).

Energy is an invisible lever in the economy, but we know from the global climate change debate that continued overuse of chemical energy from fossil fuels is not environmentally sustainable. Not everyone agrees, arguing that technology can overcome the 'supply problem' (Huber & Mills, 2005). Yet many scientists consider that the volume of cheaply produced oil world-wide has already passed peak production (known as Hubbert's Peak) and is now in decline (Campbell & Laherrere, 1998). U.S. domestic production reached its peak in the 1970s; consumption there has been increasing due to imports (McFarland *et al.*, 1994). Consumers complain about the exorbitant prices they now pay at gas pumps; yet, oil and gas continue to be consumed as if the supply were limitless.

Taking geopolitics and the global environment into account, at some point, a real lack of access to fossil fuels will limit a society's ability to produce electricity, desalinate water, drive vehicles, service tourism, maintain air and sea transportation links and support today's lifestyle, unless alternative strategies are in place. Since most small islands are heavily dependent upon imported fossil fuels at world price to generate electricity, dramatic fluctuations in oil prices can have measurable impacts on these small economies. For example, when oil and petroleum prices doubled in 1999, Bermuda's rate of inflation rose significantly, affecting social services, the cost of food and other standard prices (Kamarakafego, 2001). Such bottlenecks are likely to emerge earlier on small islands. A focus on energy issues is timely as finite fossil fuels become more expensive to access for islands on the periphery.

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Alternative Energy Technology for Islands

Many small islands have abundant renewable energy potential of one form or another for development. Alternative energy sources are relevant to supplement, if not replace, thermal generation with locally available renewable energy resources, especially on small islands where the cost of importing fossil fuel tends to be high (FED, 2000; J-Project, 2006).

Those Eastern Caribbean islands that have excellent unused geothermal resources but use fossil fuels to generate electricity face some of the highest electricity rates in the world, inhibiting their economic development. However, developing alternative technologies has not been easy for such small islands. In St. Lucia, private developers have been licensed to develop geothermal energy since the late 1980s but this form of energy is very site-specific and capital-intensive. Over 30 starts and failures have occurred due to a lack of understanding of both the locations and characteristics of the subsurface resources, resulting in well casings on producing wells being dissolved by the acidic resource or dry holes being dug (Armstrong, 2004). It is hoped that a new multi-island geothermal project currently under development with the support of international organizations will overcome policy and regulatory barriers, technical issues and financing obstacles to better support future geothermal initiatives (Lambrides & Morgan, 2005). Beyond that, this project presents an opportunity to further energy literacy. To achieve success in the long term, it is critical to also use a bottom-up approach that fosters inter-island cooperation and incorporates a local and island point of view.

Off-grid energy systems using wind and photovoltaic (PV) renewable energy technology can be an important option for rural parts of the developing world, many which happen to be in islands and archipelagoes. In one extensive Asian study, where small hybrid wind/PV systems were compared with small-scale gasoline or diesel generator sets, the annual levelized cost of the wind system was only US $5 per year compared with US $18 for a gasoline generating set (Byrne *et al.* 1998, p. 45). The fossil fuel generating set had high delivery costs for fuel and comparatively large repair and maintenance expenses (*ibid.*, p.51).

Cogeneration and Conservation

Existing industrial, commercial and household systems can be retrofitted for more efficiency through cogeneration and waste recovery (Gunpat, 2005; Sinclair, 2005). There is much untapped potential almost everywhere for improving the energy efficiency of built environments. In Tuvalu, for example, where both sides of the airstrip were lined with pig pens made from loose timber and corrugated iron, it was suggested by an expert that the hundreds of pigs could be placed in

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structures enabling the waste to be collected and converted into gas for cooking, replacing expensive imports (PIEPSAP, 2005). Further on-island research may have predicted that local energy literacy and buy-in to biogas was also needed for successful implementation. In spite of decades of setbacks for alternative energy at various locations around the world, and although island governments and utilities with narrowly defined businesses may resist the increased costs of energy diversity in the short term, alternative renewable energy is still a goal worthy of vigorous pursuit on all fronts to mitigate the true costs of conventional electricity over the long term.

CONCLUDING REMARKS

This Chapter has addressed cost and technology issues, illustrating a relationship between small island size and higher cost per kilowatt hour of electricity in a range of small Caribbean SIDS and SNIJs. There is a more complex and inconclusive relationship between distance from fuel source and the cost of electricity in the same Caribbean islands.

The cost of electricity, whether it appears in national accounts, on the income statements of electrical utilities, or in the pocketbook of the consumer, is generally higher in small islands for a complex array of reasons. Many of the reasons relate to economies of scale, remoteness, physical supply and technological effects such as type of fuel and capacity utilization. Significantly, however, reasons for high electricity cost may also relate to political and jurisdictional influences, which are conditioned by the perception of 'islandness'.

The way costs are currently theorized and specified for the purpose of decision-making for energy policy under the dominant economic paradigm may eliminate or exaggerate variables that take on more relative importance in the constrained island milieu where costs are harder to measure. Most utilities in SIDS and SNIJs are regulated monopolies with guaranteed rates of return allowed and major shares held by government and a few private shareholders. The small isolated market furthermore suggests that such monopolies are natural.

Each energy policy decision is a trade-off that could be aided using multi-criteria decision methods (MCDM) when assessing costs, for instance. A key element is energy literacy where decision-makers and consumers develop critical understanding of energy systems and take responsibility for reshaping the world (Milne 2003, p. 19). Consumers hold the key to the kind of society they want, and many policy-makers would prefer to represent what they hear from the public rather than act unilaterally in silence. The cost of electricity is a loaded term; cost is not just a simple calculation. It must be analyzed from multiple viewpoints that take many factors into account. Cost is a key factor that affects whether to

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supplement or replace conventional generation with more environmentally sustainable sources of electricity. In small islands, the already high cost of conventional electricity opens up possibilities for implementation of renewable energy options that are fast becoming more 'economical' as well as sustainable when looked at in a holistic way.

The next Chapter reviews in more depth the socio-cultural, political and environmental contexts in which the energy institution operates. It focuses on the more fundamental issues of sustainability, jurisdiction and social issues that should be associated with the formation of an island's energy policy.

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CHAPTER THREE: THE SOCIAL, POLITICAL AND ECOLOGICAL CONTEXT OF ELECTRICITY IN ISLANDS

INTRODUCTION

> The actions of organizations are not determined soiely by the iogic of economic and technological factors, but also by the institutions which comprise their social environments. These inciude, for example, the state, professions, other organizations, together with the vaiues and culture of the broader society in which an organization is embedded. Institutional pressures influence both organizationai goals and means.
>
> --Abercrombie *et al.* (2000, p. 180)

The aim of this Chapter is to take a closer look at the social, political, jurisdictional and ecological context in which energy systems are conceived and implemented, particularly on small islands. By understanding ways in which island societies interact with their technocentric energy institutions, insights may be gained about the use of appropriately-scaled energy technology for sustainability, while islands may become better prepared to gain more control over their energy resources and obtain the technology they need. The Chapter begins with an overview of the literature about islands and their value in research, followed by an introduction to small-scale social environments. Issues of politics and jurisdictional capacity having an influence on the electricity sector are reviewed. Theory from ecology and environmental sociology, including concepts of complexity and adaptive capacity, provide background on nature-society interaction and sustainability concepts as an aid to understanding the holistic context of small islands.

SMALL, COMPLEX SOCIETIES

To the rest of the world, what others know and understand about an island often has more to do with their cultural connections to the world outside of the island. They project islands with their own metaphoric "continental, as well as colonial, constructions", leaving the reality of island living unremarked (Hay 2006, p. 30). DeLoughrey describes "the convergence of imperial, scientific, literary and anthropological discourses" that have overlaid notions of "geographic, botanical, and social fixity upon islands and islanders' mobility" (DeLoughrey 2001, p.24). In addition, the small bits of anecdotal data gathered from islands may be overlooked or considered inconsequential and unworthy of obtaining or comparing in relation to larger nations and states.

Researchers have discovered, however, that lessons can be learned from islands as total societies, even though they might be small; and that it is a mistake to consider small islands as simple societies (Baldacchino 2004b, p. 276). That the

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definite, bounded geography of islands set off by the sea intensifies identity is readily acknowledged by many scholars in literature and culture (Brinklow *et al*, 2000; Weale, 1998). Islanders, also, have applied their island identities selectively to stress or deny the concept of insularity and its social implications, depending on the occasion (Steinberg 2005, p.254). Identity politics have been deployed successfully by islands, ranging in applications as diverse as branding potatoes or obtaining derogations on hunting regulations to negotiating with a higher level of government to fund electricity infrastructure on the basis that islanders should pay no more for electricity than their mainland neighbours despite the extra distance under water.

Many small island economies have even been characterized as 'modern-day pirates' as they go about their "search for exceptions, loopholes, special arrangements and derogations in the world systems" (Prasad 2004, p. 59-60). Islands resort to such tactics, and exhibit other forms of resourcefulness, for economic survival in a competitive and unequal world. Islands provide diverse geographic samples of small, holistic systems which are complete with human behaviour and institutions, social capital, productive or unexploited capacity, good or bad governments, and much, much more. Along with being convenient test sites, islands "can contribute to the extraction of general principles," and they also "tend to be advance indicators of what is happening elsewhere" (Baldacchino 2004b, p.278). This study, therefore, uses the convenient opportunity that islands provide for comparative study of electricity systems which occur just about everywhere that is populated.

SMALL-SCALE SOCIAL ENVIRONMENTS

In local marketplaces and workplaces of small islands, transactions involve more than just obtaining economic advantage for oneself.

The Small-Scale Syndrome

Small-scale social environments typically found in island workplaces have been theorized by Baldacchino using a typology of totality, monopoly and intimacy (1997, p. 67-79). His 'totality' theme is derived from critical mass and indivisibility constraints mixed with social compactness, visibility and interconnectedness on an island. Needing to perform similar functions as larger polities, small autonomous islands reflect almost the same total number of institutions and capacities but not in such volume. It should come as no surprise, then, that the activities of the ubiquitous island electrical utility can be linked to the concept of island identity through its physicality. In the words of a wind turbine manufacturer in Prince Edward Island about the island community:

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> "we have always identified ourselves as islanders, as a society and a community who feel we have our own systems...we have outside ownership but we still feel we have local management of all of the kWh" (interview, February 14, 2006)

Usually as a monopoly on an island, a public utility's service area merges with the political boundary of the island or archipelago. When the company develops its corporate identity, this can take on an island dimension, straddling the line between the public and private domains on an island. Where electrical service exists, utility company infrastructure and personnel (trucks, poles, wiring, crews) are a very visible part of the landscape, and the company maintains its communication in some way with each island residence and business on a regular monthly basis, often extending over many years. Even the names of electrical utility companies such as LUCELEC, GRENLEC and ANGLEC reflect the names of their host islands. The strong company identity bolsters the utility's entrenched position in the tight economic and political space. Wages and salaries paid to an electrical utility's workforce (including management) can have significant direct and indirect economic impact in a small island. For instance, the cost of labour at the utilities in St. Maarten, St. Eustatius and Saba were equivalent to 2.4%, 2.1% and 5.9% respectively of their whole island's GDP in 2003, as shown in Table 3. This may make the concept of unbundling (network sharing) unimaginable to the public, or at least very traumatic, as islanders claim the monopoly utility as 'their' company, even if the profits flow to outside owners and investors.

Table 3. Ratio of Labour Costs to GDP in Three Small Island Utilities (2003)

ISLAND	POPULATION	LABOUR COST AT ELECTRICAL UTILITY PER CAPITA ($US) (2003)	GDP PER CAPITA ($US) (2003)	LABOUR COST AT UTILITY TO GDP (%)
St. Maarten	33,101	$217	$ 8,961	2.4%
St. Eustatius	2,373	$337	$15,792	2.1%
Saba	1,138	$572	$ 9,630	5.9%

(Sources: *NV GEBE Annual Report 2003; Central Bureau of Statistics for the Netherlands Antilles*).

On small islands, either overcapacity or doing without are common conditions of small scale that create role multiplicity and role enlargement by those who must perform within the system (Baldacchino, 1997). By this, workers may diversify to fulfill overlapping roles as a matter of routine, and roles that are insignificant in a larger milieu elsewhere become infused with greater importance and complexity (Baldacchino 1997, p. 69). These individuals also often need to fulfill many roles which are required only occasionally. Consequently, an island community, and by extension, an island workplace, may consist of independent, self-motivated

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individuals who have broadly-based general knowledge, bolstered and strengthened by immediate access to many overlapping interpersonal networks and important volunteer activities in the social economy.

An island's human resource base, or social capital, thus may consist of multi-skilled generalists rather than specialists who would have limited ways to apply their craft. Such individuals often have ability to approach problems in a holistic way, but through gaining additional education or experience, often abroad, some may also wield the tools of the specialist. While economists may disagree over theory such as constancy of factor shares (Boldrin & Ruiz, 2006), a threshold number of labour units is needed to run certain operations like an electrical generating plant, beyond which relative factor indivisibility of labour becomes less significant (Domah 2002, p. 10). This 'minimum lumpiness' or 'critical mass' is related to that which can lead to disproportionately large government or infrastructure in a small state (Baldacchino 1997, p. 69).

Benchmarking statistics and indicators based on GDP (Eurisles, 2005), which are viewed by the world outside, may record only a lack of productivity as a result of small scale. While a small island may be vulnerable due to its small pool of skilled workers (Briguglio, 1998; Fischer & Encontre, 1998), a superficial understanding by policy analysts and financial institutions of an island's productivity disadvantage in labour employment may mask the underlying stable social capital enriched by worker quality and flexibility.

The relatively large workforce of a monopoly dictated by critical mass is a stable one in a local economy where reliability is the main company driver, according to several executives (interviews, February 2006). On an everyday basis within the institutions of an island, there can be social rewards in small-scale societies for those with special skills but also disruption and loss of efficiency when they leave. 'Monopoly' power is a ready tendency in small scale societies where there is "a stronger competitive urge because of constant public scrutiny and personal rivalry" (Baldacchino 1997, p. 73). People can become 'experts' more easily on the smaller social ladder even though the fewer competitors may be harder to dislodge:

> "And with the human resource chain thinly stretched, while expertise can... be rewarded relatively rapidly by social, economic and political spin-offs,...a single break (through sickness, absence for training, or emigration) can cause disruption and major loss of efficiency." (Baldacchino 1997, p.74)

The element of 'intimacy' in Baldacchino's trilogy of attributes of small-scale societies refers to residents learning to get along in the small-scale social environment knowing that

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> "they are likely to renew and reinforce relationships with the same persons in a variety of contexts over a whole life-span." (Baldacchino 1997, p.77)

and that

> "group conflicts are rarer but explosive when they occur and more likely to polarize the whole community." (*ibid.*, p.78)

Institutional Barriers and Capable Leadership

Without understanding the possibilities of these social dynamics that inform the "island" point of view, there can be a lack of both external and internal institutional support for appropriate systems, creating obstacles to innovative solutions, especially in small developing islands. Aid agencies and development banks frequently prefer projects of three years or less over longer-term ones (Liebenthal *et al.* 1994, p. 9). Often, donors to energy infrastructure consider such small islands incapable of implementing renewable energy projects due to a lack of skilled human resources and efficient energy institutions (Yu & Taplin 1997, p. 114), when, in reality, it may be donor expectations that do not meet local standards and cycles.

Institutional barriers are not restricted to external donors by any means, also extending to local officials and elites. Island studies theory predicts that the social dynamics of a small-scale society (Baldacchino, 1997) are likely to preempt any radical move to replace the energy status quo on the island. Given the exaggerated tendency of islands towards monopoly, identified above, local officials and elites may become powerful 'experts' who are hard to dislodge or replace. Senior officials of public or private utilities or electricity boards of islands are likely to have been educated elsewhere (Bray & Packer, 1993). They often do not support local small scale development in renewable energy technologies, preferring instead to promote conventional energy technologies within their own area of expertise that apply to large-scale, more complex systems, reinforcing institutional obstacles (Weisser 2004b, p.112). The corporate culture of utilities has been described by an island energy minister as "very, very, very conservative" (interview, February 13, 2006).

Despite such drawbacks, it may still be relatively easier in a small-scale society than elsewhere for someone to break through the shallower depth of obstacles to 'make a difference' when they are given the opportunity as a 'big fish in a small pond' (Baldacchino 1997, p. 76). A society which has created economic, social and political space to empower a majority of its citizens to 'make a difference' is a very special place. DeLoughrey (2004, p. 303) writes, "[islands have] not only functioned as colonial or socio-political spaces of experiment, but have facilitated tremendous ecological, biological and social theory". One needs only to witness the creative renewable energy projects that have been adopted

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early on many islands throughout the world (FED, 2000; Chakrabarti & Chakrabarti, 2002; Kaldellis, 2003).

Utility Regulation

As monopolies, utilities have traditionally been subject to price regulation. Regulated utilities tend to be very risk averse due to their mandate to keep power flowing in a secure and reliable manner. Traditionally, their legislated mandate has been simply to keep power on for the least cost. Anecdotal evidence from PEI's Minister of Energy illustrates that while cost is important, the main driver of utilities is reliability:

> Utilities as a beast, if you will, are very, very, very conservative. They are not risk takers, even a iittie bit. So they are going to iook around and say, "My mandate is to make sure the iights are on. I have to get the most reiiable form of energy, cost is a factor but it is not the main factor"...

On small islands, where information may flow easier and faster due to small scale (Baldacchino 1997, p. 81-85), there may be more cooperation and less formal regulation where industry players and government or regulatory officials are well-known to each other. For instance, the simplicity of the expedited process on PEI for the monopoly utility is explained by the Minister of Energy as follows:

> So if I can go and buy all my power from New Brunswick, and i don't care if it comes from Lepreau or Dalhousie or Coulson Cove, it really doesn't matter to me as long as there are 200 MW coming across those cables, and I can take and distribute it. I can go to IRAC [the regulator] and say, "Here's what my cost is, no one can get it any cheaper, we have done the best job we can, give me my mark-up and I will make sure people have it.

However, and for similar reasons, the social dynamics and tendencies towards the particular and traditional on islands could have the opposite effect, entrenching a regime of over-regulation (Baldacchino 1997, p. 73-75). A professional engineer highlights the circular nature of the problem as follows:

> [The utility] has a mandate to offer power that's reliable at a low cost. They don't have any significant interest in leading the way in terms of renewable energy, and they're mandated that way because of the way that their monopoiy in the island is set up, having to go through IRAC for most everything in terms of decisions. So they haven't an ability to make significant decisions. They don't have an interest in making novel decisions...

A glance at the reams of transparent corporate information and reliability records of regulated electrical utilities indicates that many are doing quite an adequate job within their limited mandate of keeping the lights on within their communities, albeit with a top-down approach. In oceanic islands, utility companies are required to operate their own stand-alone generating facilities within very difficult reliability and resource constraints using imported fuels which may be

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more readily available than other options, given that the sea provides an easy and flexible means to ship heavy or bulky goods.

By and large, island energy utilities have traditionally been left to pursue whatever course of action they choose to obtain the allowable level of profitability within the limits of their mandate. In the case cited, the public is able to access most applications and background documentation on the website of the Regulator as part of a transparent approval process. While it could be argued that these administrative requirements are excessive for normal decision-making, and that the process lacks potential for adaptive capacity due to its top-down approach, others may argue that this process adequately safeguards the public interest.

How the aims and objectives of regulation are carried out is largely determined by what occurs in the political context. Using jurisdictional capacity, islands can choose to initiate, continue or change the way their utilities are regulated.

POLITICS AND JURISDICTIONAL CAPACITY IN ISLANDS

Although electricity might be considered just a common commodity, the flow of electrical energy has important political and jurisdictional implications in small islands. The energy institution described in this study may encompass a number of organizations and interests on islands besides the electrical utility firm, including government departments, regulatory bodies, financial institutions, private sector suppliers, shareholders, and finally users in industrial, commercial and residential sectors.

Community Empowerment

In small islands, where the small-scale social condition has been conceptually described in terms of totality, monopoly and intimacy (Baldacchino 1997, p. 67-79) individuals can, and do, make a difference. In some areas, public concerns are expressed about harmful emissions and changes induced by such an industrial facility within the fragile environment of an island and its waters. Although these voices may also be wilfully ignored for a time, they are politically significant. On the other hand, there are often entrenched elites in utility management, regulatory bodies and government energy departments of small islands who have been educated in larger conventional technology systems and organization management elsewhere (Baldacchino 1997, p. 70; Weisser 2004, p. 112). Such individuals can make it more difficult to create support for alternative technology, local innovation or island-informed expertise which could invite a broader range of longer-term and local energy solutions into the economy. Innovations may be beyond the comfort zone of management and politicians who are under pressure

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to obtain least cost results within the shortest timeline by using off-the-shelf solutions from outside. As a result, private initiatives and experiments which could be initiated by communities, such as renewable energy installations, have often had mixed or limited results due to lack of capacity and resources, a hostile or limited business environment and competition from subsidized conventional energy (MacEachern, 2003).

There is also resistance to certain forms of alternative energy by observers and activists where it becomes a highly charged emotional issue. A review of the world wide web reveals political web sites where resistance is expressed, but few of these are peer-reviewed sites. A number of academic studies analyze NIMBY ('not in my backyard') phenomena and resistance to wind power in communities in general (Kaldellis, 2003; Wolsink, 2000). In extensive survey research around three major wind farms in the Netherlands (Wolsink 2000, p. 50), arguments against wind power were tested, including noise pollution causing annoyance, spoiled scenery, interference with natural areas (particularly bird endangerment), unreliability of the energy supply, and the (supposed) expensiveness of wind as a source of energy. It was found that survey respondents simply assessed the applicability and acceptability of wind turbines in terms of visual intrusion and the consequences for the chosen location; institutional constraints were shown to be more important than public acceptance of wind power (*ibid.*, p. 61). The study recommends:

> "a collaborative style in siting renewable energy infrastructure...will probably be more effective than top-down planning. Strong public support is not sufficient for the development of wind-power capacity, but it will contribute favourably to siting policy. ...Policy actors and wind-power developers should direct themselves towards building up institutional capital for wind power and other renewable resources, instead of complaining about public attitudes...This implies that more open planning practices are needed. " (*ibid.* p. 63)

This is echoed in a study of geothermal energy for water production in Milos, Greece, which documents a number of studies which show that major needed projects have been delayed because the "public opinion" factor was not properly taken into account in planning (Manologlou *et al.* 2004, p. 625). Further academic studies of the European experience, particularly in the Netherlands, point to the need for policies that reduce uncertainty (van Rooijen & van Wees, 2006) and address local concerns with renewables development such as better consumer awareness, greater knowledge of existing renewable energy options, development of adequate institutional capacity, adequate human resource capacity, innovative financing frameworks, availability of financing opportunities and long-term planning (Agterbosch et al., 2003; Junginger *et al.*, 2004).

Community development, community empowerment and community capacity building all describe a process of increasing the assets and attributes

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which a community is able to draw upon in order to improve their lives (Labonte & Laverack, 2001). A review of literature in community empowerment found several models related to health and education development, along with articles on methods for evaluating community capacity (Gibbon et al., 2002; Labonte & Laverack, 2001; Milne, 2003). Empowering a community, which includes heightening energy literacy, has the potential to strengthen its identity, reverse out-migration and contribute other positive social consequences. Citing an example he had visited, the Energy Minister in Prince Edward Island described how a small, remote town of 4,000 in Europe had reversed its declining fortunes and loss of young people by taking initiative and developing a co-operative that produces woodchips for central heating, producing all of the town's electricity and heat from a local fuel source (interview, February 13, 2006).

Political Resourcefulness

As complex adaptive systems, islands that have retained administrative autonomy have a better opportunity to shape their own economic destiny, development and prosperity by becoming politically resourceful (Baldacchino & Milne, 2000). For example, a small, autonomous sub-national island jurisdiction such as Anguilla belongs to regional and global organizations such as CARICOM (Caribbean Community), CDB (Caribbean Development Bank), Interpol, OECS (Organization of the Eastern Caribbean States), and the Marine Conservation Society (*www.cia.gov*), resulting in a higher profile in negotiations and political matters in the Caribbean region and on the world stage than if it were simply a municipality or administrative district of a larger nation. Gaining, having or retaining control over important jurisdictional powers is critically important to the prosperity of a small territory. Jurisdictional leverage is critical in dealing with the capital-intensive power sector, which often requires the single largest fraction of public investment in an island economy (Weisser 2004, p.127).

The stakes are high in electricity politics, as encountered by the Canadian island province of Newfoundland & Labrador which signed a long-term power agreement in 1969 with neighbouring Quebec. Newfoundland agreed to sell power to Hydro Quebec with no price increases for 65 years; it is now unable to reap full benefits from its Labrador hydroelectricity development, the world's second-largest (DeMont, 1996).

Some small island developing states (SIDS) and sub-national island jurisdictions (SNIJs) are situated closer to reliable and efficient electricity generating systems elsewhere, such as large hydro or thermal installations. It may be possible for the utility to obtain high-voltage electricity through cables from those sources for redistribution to their customers. SNIJs such as Ascension, Bioko, the Cook Islands, Rapa Nui and Saba are today

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beyond the reach of high-voltage cables to large-scale, continental electricity grids (J-Project, 2006). The cost of installing undersea cabling is estimated by utilities to be at least ten times the cost of installing overhead transmission. Additional challenges arise, not only from construction but also from maintenance on the sea-bottom involving corrosion and faults associated with conducting a very high voltage current through a watery medium (interview, CEO, Maritime Electric Ltd., February 2006). Problems of variability and efficient use of capacity in a 'weak' stand-alone system are exacerbated when intermittent alternative energy systems such as wind turbines are added to the mix. In a small island like Anguilla, for example, the utility has been circumspect in considering the introduction of wind power because of technical problems associated with interconnections to stand- alone island power systems. Another consideration is its location in an active hurricane zone where wind turbine masts must be able to withstand hurricane force winds (interview with CEO, April 2005).

Often, an electrical utility has an imposing presence on a small island, occupying all of the political and economic space. This is especially true where energy policy and regulation are weak or non-existent, where the utility is an arm of government with little or no profit motive. When a regulated utility's mandate is left undeveloped by government, the company is left in a vacuum to pursue its own, least cost agenda. However, some SNIJs have been able to harvest ample alternative energy from wind turbines, coconut oil, geothermal power or other forms, and some are even exporting excess electricity at a profit where transmission infrastructure exists. To do this, energy policies may need to be altered to enable unconventional systems, and this will likely require strong and consistent political leadership and determination to bring about amendments to energy legislation to change the status quo (PEI Dept. of Energy, 2004). Each type of system has long-term and short-term implications for the cost of electricity. Skilful use of jurisdictional powers by SNIJs and SIDS may tip the energy balance more in their favour.

It is not only governments which can bring about change in small island environments. It has been the small island utility executives in the northeastern Caribbean who have demonstrated the resilience of SNIJs in the face of significant vulnerabilities by seizing a window of opportunity to be innovative, using a bottom-up approach to jurisdictional obstacles. They are planning to install a new cable in 2008 between the electrical utility plants in Anguilla, St. Martin, St. Maarten and St. Barths, a total distance of 51 km (*The Daily Herald*, 2006). This should create more stability and reliability from having a larger system. With current capacities ranging from 22 to 81 megawatts, the total capacity of the four plants together will be about 180 megawatts (*ibid.*).

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Linking these SNIJs will be a remarkable achievement, not only in solving technical issues, such as the mismatch of systems which operate on different standards and voltages. What is most remarkable is that these four autonomous islands with their own island governments operate on different languages, are distant overseas parts of three members of the EU, namely the UK, France and the Netherlands (the legacy of their colonial heritage), and three of them are further parts of the Caribbean region SNIJs of Guadaloupe and the Netherlands Antilles where the seat of government lies on other distant islands (J-Project, 2006). The linking thus involves cooperation among nine asymmetric governments (three of which are part of the EU) and four asymmetric utility companies, involving the largest and smallest utilities in the world. To accomplish this feat will require the meshing of not only disparate electrical systems but also their distinct organizational cultures as well as energy policies, legislation and regulations. This is a prime example of how sub-national island jurisdictions can be on the leading edge of jurisdictional experimentation in the global environment, leveraging their social capital, not to mention opening up greater possibilities for incorporating alternative energy generation, as feasible, due to improved system stability—and none too soon for the provision of this essential service to the populations of these small SNIJs.

ISLAND ECOLOGY, COMPLEXITY AND ADAPTIVE CAPACITY

There is much research and commentary in energy literature on climate change, environmental regulation and international mitigation instruments such as the *Kyoto Accord*, along with interdisciplinary materials and commentary from international organizations and conferences on sustainability (FED, 2000; IAEA, 2005; IPIECA, 2002; NRC, 2002; UN, 2005). Prescriptive articles abound on web sites for the general public and educators on energy conservation.

Adaptive Capacity to Prevent Collapse

Although bounded by geography, islands are not closed systems. Importing energy stored in finite fossil fuels from abroad to burn for electrical power, space heating, air conditioning and transportation requires the export of a considerable portion of an island's gross domestic product (GDP). Islands that need to import more and more of these fuels into their economies at the expense of a growing proportion of their productive capacity are incrementally moving towards further dependency, complexity, greater risk and reduced diversification, which could ultimately result in collapse rather than sustainability (Tainter, 2006; Paterson, 2000).

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The lively spectrum of opinion on future energy supplies ranges from the cheery, "Energy isn't the problem. Energy is the solution" (Huber & Mills, 2005) to rather gloomy predictions that "the global industrial system will probably collapse in one way or another within the next few decades" (Heinberg 2003, p. 206). Heinberg is actually referring to "collapse" in the sense of any sudden reduction in "social complexity", a developing concept from the field of ecology (Tainter, 2006). According to ecologists, hierarchies and adaptive cycles comprise the basis of ecosystems and social-ecological systems across space and time scales. Holling's definition of sustainability is "the capacity to create, test and maintain adaptive capability", while development is "the process of creating, testing and maintaining opportunity". Sustainable development is therefore "the goal of fostering adaptive capabilities and creating opportunities" (*ibid.*, p. 399), which resonates with an island studies approach:

> Smallness and islandness can provide the geographical stimulus for administrative autonomy; the economic stimulus for a 'political economy' approach to growth, development and prosperity; the cultural stimulus for a unitary, communal identity; and the social fabric to manage all this in a flexible, rapidly reactive manner. This is perhaps the closest we have come to grasp the proper 'ecology' of small islands (Baldacchino 2000, p. 74)

Small islands are or have been conceived as natural laboratories for the study of evolution (natural selection) with their high levels of endemism and hotspots of diversity, as exemplified in popular imagination by the research of Charles Darwin and Alfred Wallace. Many islands have some of the most imperiled ecosystems on the planet in danger of collapse due to overpopulation and overexploitation; habitat fragmentation, clearing and degradation; and invasions by exotic species, oil spills, global warming and other perils (Price 2003, p. 34; Burns 2002, p. 113-131). Globally, the majority of species losses have been of endemic island species (Quammen, 1996). In earlier times, human societies like those on Easter Island and Greenland have collapsed for failure to adapt to the ecosystem (Diamond J, 2005). An extinction exemplifies an island's response to depleted resources and a lower level of complexity (less diversity). The lessons can be applied to electricity on islands: electricity providers need to remain innovative yet ever-vigilant to the possibilities of greater harm in the sensitive and limited environments on islands.

Complexity Theory

Ecology theory also addresses the social as part of the overall environment. Tainter (2006) theorizes that humans are averse to complexity, citing the example of subsistence farmers who prefer to produce only as much as is necessary, under-utilizing labour and spending time in social activities and at rest:

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> People solve the problems of obtaining resources and producing information in ways that are economically rational. They prefer behaviour and institutions that are inexpensive. When problems require new ways of meeting their needs, they adopt increasing complexity and experience diminishing returns.
> (Tainter 2006, p. 94)

Cultural expressions such "island way of life" and "being on island time" may, in some intuitive way, measure the level of complexity in an island where problem solving may be proceeding at a pace that is compatible with natural adaptive cycles. An electrical utility without challenge from consumers, regulators or governments can be expected to use the least amount of effort and cost to distribute electricity. When problems need to be solved, more complexity develops:

> We are, on balance, better off for having grown complex. Complexity clearly has great utility in problem solving. At the same time, we are paradoxically averse to complexity. This is because every increase in complexity has a cost. The cost of complexity is energy, labour, money or time that is needed to create, maintain, and replace systems that grow to have more and more parts, more specialists, more regulation of behaviour and more information. Before the development of fossil fuels, increasing the complexity and costliness of a society meant that *people* worked harder. (*ibid.*, p. 93)

Social complexity theory alerts us to the need to halt or mitigate complex institutional or technological processes in order to keep them less damaging in the long run. The lessons of complexity theory may be especially relevant to islands where processes are more dynamic, transformative and prone to collapse (or resiliency) due to scale constraints on energy, labour, money or time. Islands need to operate at optimum complexity in order to conserve energy, labour, time or money within levels that are appropriate at that locality. Top-down development and globalization can often disturb the balance of these four factors in an island setting, reducing sustainability. Islands which have robust adaptive capabilities and the jurisdiction to implement island-appropriate solutions may be able to offset and integrate such disturbances, encouraging innovation and diversity.

NATURE-SOCIETY INTERACTION AND SUSTAINABILITY

Any discussion about the energy institution in small islands would be incomplete without considering what the 21st century might ultimately bring and whether any energy path taken herein by islanders is going to be sustainable. As a result of the climate change debate and the work of international agencies such as the United Nations Environment Program (UNEP), it has become better understood that low-lying coastal areas are considered at greater risk from sea rise due to climate change and global warming effects. Without hinterlands, small islands are most of all at risk from both local and global energy misuse and uncontrolled waste. On bounded islands, impacts of production and consumption can be

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heightened or mitigated due to local geographical, ecological and human resource endowments and constraints (Fischer & Encontre, 1998; Baldacchino & Greenwood, 1998).

The literature on sustainability has been vast since efforts were made in 1972 at the Stockholm Conference on the Human Environment, held to tackle threats to the environment. "Our Common Future", or the Brundtland Report, defined sustainable development as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (WCED 1987, p. 43): "an unashamedly anthropocentric concept" (Lee 2000, p. 32). This was followed by the Rio Earth Summit in 1992 which produced "Agenda 21", an action plan for countries to get onto the path of sustainable development. In Barbados in 1994, the Programme of Action for the Sustainable Development of Small Island Developing States (SIDS) listed 15 priority areas for specific action. By January 2005, the UN Conference on Small Islands had concluded with the Mauritius Declaration and the Mauritius Strategy, a pro-active program of action to further support sustainable development in small island developing states (UN, 2005).

Proponents of sustainable development argue that society's political and economic structures and human-environment relationships have to change to achieve sustainable development, but a fundamental divide exists between supporters of the status quo characterized by an expansionist worldview; supporters of reform who do not wish a full rupture of existing arrangements; and supporters of transformation where the very economic and power structures of society need a radical paradigm shift to deliver a steady state (ecological) alternative (Rees 1995, p. 343-361). Hopwood *et al.* (2005, p.41) provide an overview of the wide ranging interpretations of sustainable development using a mapping methodology to organize the literature on axes of emphasis towards either environmental concerns or socio-economic well-being and equality. Approaching a transformational view of sustainability which emphasizes both equality and environment is Schumacher (1973), who argues that the economy should be run 'as if people mattered', with the implication that small and local is more sustainable than large and global. Interestingly, according to Hopwood *et al.* (2005, p.45), Schumacher envisages small as being privately owned and operating in a market economy. Douglas (2003) adds health status determinants to the list of impacts that should be given more emphasis when sustainable development projects or policies are being planned in island states, territories and regions by government, planners, developers and researchers. He recommends that health impact assessments (HIA) be linked to the environmental impact assessment (EIA) process at the design stage (Douglas 2003, p. 123).

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Clues that nature's dynamics are cloaked in socio-cultural phenomena should be obvious, but they are often obscured under the weight of public debates inspired by environmentalism, politics and economics. Much has been written to either support or refute the claim that easily-accessed petroleum will run out within a generation (Heinberg, 2003; Huber & Mills, 2005); conflicting signals about the energy supply are encountered in the media as journalists, environmental activists, nuclear power lobbyists, politicians and NIMBY activists vie for public support (Brown, 2004; Sutherland, 2005; Thibodeau, 2005; Wolsink, 2000). The rhetoric often supports increasing the supply of energy rather than decreasing consumption and the build-up of waste when the opposing paradigms collide.

The climate change debate has brought public awareness and now consensus among scientists that human-induced effects from consumption of fossil fuels are harming our global and local environments (Environment Canada, 2002; David Suzuki Foundation, 2006). The expansionist worldview (Rees 1995, p. 347) promotes economic growth, resulting in ever-greater consumption of fossil fuels. Petroleum products constitute or impact much of our consumption, from fabrics to fertilizers to food to fuels to furniture. Expanding economic systems add incrementally to energy input requirements and waste accumulation, in turn requiring more energy-intensive design of communities, homes, vehicles, appliances and lifestyles in a never-ending spiral.

Modern society has few options for effectively and holistically managing complete production and consumption chains, like energy-intensive transportation systems. Product designers, manufacturers and distributors are usually not required to, and seldom do voluntarily, take responsibility for the complete production chain including the export and disposal of their products and by-products in the waste stream, even if they profess to be environmentally aware. Any one of the supply chains that provides for human desires and needs, such as mobility, includes components as diverse as automobile manufacture, petroleum extraction and distribution, highway infrastructure, extensive land-use, regulation and waste mitigation from beginning to end of each component and process in the system, which also includes export beyond political borders. For regulators and the large–scale energy industry driven by free-market economics and faith in technology, ethical responsibility for the whole system remains optional. Powerful groups within these chains shape energy knowledge and technology which in turn, affects people's lives and the choices they make (Buttell 1997, p. 47; Redclift & Woodgate, 1997). Much greater eco-efficiencies and cooperation are possible, and indeed are morally required today, both locally and globally.

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There is an abundance of positivist-inspired research in pursuit of the advance of energy technology, regulatory regimes and energy business growth and development, themes dealt with in the previous Chapter. Energy studies using a sociological perspective are less prevalent. Pop culture expresses concern for the environment and campaigns exist to conserve rainforests in exotic places, but consumers have been slow to demand greater energy efficiency and better access to renewable energy technologies at home. It is not surprising, given the context, that the ordinary citizen who just flips the switch to obtain seemingly limitless power remains paralyzed by the immense global challenges presented by current levels of energy consumption and waste. A direct link between technologically-complex electricity generation and consumption of an invisible product is remote in the minds of consumers (Shove 1997, p. 261-273). There are great difficulties in relating "deliberate energy-saving action to conceptually remote indicators of energy use", and to making a connection between energy consumption and environmental change, where "further translations are required, first into units of CO_2 and then into effects on global warning" (*ibid.*, p. 261).

Given the focus on least cost energy under the dominant economic paradigm, supply-side initiatives seem to predominate in the form of existing, large centralized technology. Alongside this, because energy is invisible, creating more consumer awareness of energy efficiency and focusing on reducing individual energy consumption has not been particularly effective. A second approach focuses instead on decisions embedded in the infrastructures and institutions that create the relationships between energy and the environment (Shove 1997, p.264). Air conditioning, for example, has created indoor climate change with enormous impacts on social and institutional dynamics. Analyzing the energy institution also creates possibilities for programs that not only look for system alternatives to the large centralized technology, but also promotes efficiency through such devices as propane cook stoves, solar-powered outdoor lighting, and off-peak water heaters. This alternative focus on the institution of energy offers a more promising agenda for "a sociology of the hidden dimensions of energy use" (*ibid.*, p.268) and is the approach encouraged by this study, combined with an island studies perspective.

CHAPTER SUMMARY

In summary, this Chapter provides theoretical background on small, complex societies, small-scale social environments; politics and jurisdictional capacity in islands; island ecology, complexity and adaptive capacity; and finally, nature-society interaction and sustainability.

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In many island electrical utilities, which often have had their management personnel trained elsewhere, the organizational climate can be very conservative, putting reliability foremost and experimentation a distant priority behind least cost. Regulatory infrastructure may be weak or ineffective and the monopoly utility may be given free rein, dominating how energy policy is implemented. Predicted by the 'small-scale syndrome' (Baldacchino, 1997), relationships between small island governments and utilities cover a broad spectrum between harmony and discord over longstanding disagreements. At the same time, these utilities have a great deal of experience and support in local communities, which can be a great resource if properly harnessed for change.

Taking a sociological approach, and a focus on the institution of energy, it can be seen that electricity, even at the highest price, is still an extraordinary bargain that allows people to accomplish a great deal of needed services when treated with intelligence and respect. Environmental concerns are a major issue in the context of small island energy systems. Denuding a remote island of its vegetation to burn for energy is an alternative far worse than developing electricity based on other technological options available such as hybrid photovoltaic and wind-diesel applications. However, in some island locations, burning biomass may indeed be a renewable solution to deal with by-products of sustainable agriculture and forestry practices that have been occurring for centuries. Energy policy needs to take such particularities of islandness into account.

Part III begins next with Chapter Four outlining the hypothesis, research design and method used in the study. The case study is presented in two parts in Chapters Five and Six.

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THE INFLUENCE OF ISLANDNESS ON ENERGY POLICY AND ELECTRICITY SUPPLY

PART III

THE RESEARCH PROCESS

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CHAPTER FOUR: RESEARCH DESIGN

INTRODUCTION

Aim and Scope

The aim of this research is to identify the influence of islandness on electricity policy decisions.

The problem is to assist island governments, electrical utilities and other stakeholders to provide more diverse and sustainable energy solutions for islanders. Sub-problems to be addressed within this study include the following:

a) What is islandness? What is the influence of islandness on decision-making towards energy?

b) What is the nature of the "energy institution" in a small island? Who makes decisions on energy development?

c) How are decisions made on energy policy? What formal and informal mechanisms exist for providing input into the system?

Limitations of the Study

This research makes limited reference to energy consumption by individuals and households, focusing instead on electricity supply and distribution processes, and on energy consumption by public and private utilities as they produce electricity. Interviews are limited and indicative, providing perceptions and anecdotal information that add richness and intuitive understanding of complex subject matter.

It is assumed in this research that desirable energy policy decisions refer to those that promote further sustainability; also that the island governments referred to have jurisdiction over their own energy policy and operate in a conventional free market economic environment.

RESEARCH METHODOLOGY

The evolution of this exploratory study has followed a rather tortuous path. Launched with only a few hunches in a vacuum of information, gaps in the literature were found in various disciplines including island studies, energy policy, environmental studies and sociology. The development of a suitable working hypothesis was a major challenge initially, due in no small measure to taking a social constructivist stance to what is normally an applied physical and highly technological, capital-intensive subject. There is a great deal of applied positivist research, as noted from the literature review in Chapter Two, but very

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little qualitative social science research on the relationship of electricity production to island societies. This is surprising, given the importance of electricity supply and energy policy to millions of island dwellers throughout the world.

Hypothesis

For the purpose of guiding the research, this study aims to confirm the null hypothesis that islandness nuances electricity production in specific ways.

Theoretical Framework and Epistemology

This study is framed from the researcher's underlying social constructivist viewpoint that perceptions of individuals are subjective yet relevant. Perceptions of the interview participants, as well as those of the researcher, need to be observed within context rather than used as measures of objective reality. The informants in the study were selected on the basis of their unique positions and roles within the constellation under study, with the understanding that their perspectives would be well-informed and grounded, yet personally interpreted. The outcome of the research focuses on islands, institutions, and energy policy rather than on the interviewees, although their collective responses would be used to identify patterns. Interview data would be used to provide clusters of descriptive information and corroboration of other evidence where possible.

Role of the Researcher

The researcher was the primary agent for data collection, interpretation and synthesis in this study. The study was conducted from the perspective of an ordinary citizen and consumer, with a general rather than technical background in economics, engineering and electricity production. The researcher was able to approach each interview participant with open interest in their perspectives throughout the wide ranging conversations. During each interview, the researcher was aware that the perspectives encountered differed from hers, but by engagement in active listening, the other person's point of view was accepted in context.

Educational background, culture, gender and life experience give the researcher an unique perspective. In this study, broad theoretical background derived from ongoing graduate study in island studies and undergraduate degrees in arts, science and business administration have provided a basic understanding of a wide range of viewpoints. In addition, independent travel and over 30 years of relevant work experience in many sectors of the economy, has equipped the researcher with the diversified skills portfolio needed to carry out this broad, multidisciplinary study.

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RESEARCH DESIGN

Both quantitative and qualitative methods were selected to provide a more holistic approach to the topic.

Phase One: Secondary Information and Quantitative Study

At the outset, the literature review was designed to determine the context in which electricity is supplied in islands. It was assumed that ideal electricity supply systems should be based on sustainability principles[3] as contemplated by the Brundtland Report (WCED, 1987) and subsequent international agendas. The first phase of this exploratory study was designed to develop an understanding of islandness as it pertains to the production of electricity:

1. examine electricity costs and capital markets in islands to document to what extent electricity restructuring, privatization and deregulation have occurred and why;
2. examine jurisdictional capacity and how it is leveraged by islands with respect to electricity;
3. examine the degree of progress towards sustainability goals in the electricity sector on islands, using international standards and indicators where possible;
4. analyze the nature of regulation and deregulation on the attainment of sustainability goals in the electricity sector on islands; and
5. identify trends in the light of the hypothesis and make recommendations for further study.

Phase Two: Comparative Case Study

In a second phase of the research, a case study method was selected to augment and triangulate the secondary information, and to explore emergent themes towards grounded theory by the researcher (Ryan & Bernard, 2003). It was a significant breakthrough to realize the power and convenience of using an islands lens for comparative study of complex subject matter (Lijphart, 1971; Armer, 1973). Islands offer an opportunity to isolate and explore complex phenomena which are located in a holistic environment. Purposeful sampling of particular islands as cases was identified as the means to study the selected information-rich

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[3] Prior to and during this study, the researcher has presented research at three international sustainability conferences having to do with 1) the impact of scale on energy costs in small islands and 2) policy standpoints for energy in small island states and territories, the latter of which has been published in a peer-reviewed scientific journal (Stuart, 2005a; 2005b; 2006). This thesis research builds upon that earlier work.

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case in depth. This method would be preferable to a statistical sampling method where selectivity is considered a bias (Patton, 2002).

Although the original intention was to undertake a comparative study of at least two islands, as the study progressed and the focus narrowed, it became clear that obtaining primary data in a second island would be beyond the scope of this study. An island was selected as the single case in which was embedded a constellation of roles in the energy institution.

Achieving Reliability and Validity

By systematically analyzing the various filters through which the discourse would flow, the researcher became more sensitive to possible problems in gathering the data. Discourse filters and the ways they would be dealt with included the following:

- researcher's structuring of questions – not a validity issue as the questionnaire would be open-ended to explore socially-constructed perceptions;
- researcher's selection of individual participants – not a validity issue as they would be selected by their defined roles as knowledgeable representatives within the energy institution and not sampled;
- participants' understanding of questions – this could be clarified through conversation during the interview;
- participants' structuring of their responses – the general topic would be sent to participants in advance for reflection, but the questions would not; the interviewer would be able to observe in context and explore subjects further during the interview;
- researcher's understanding of the responses – by audio-recording the interviews, the researcher could concentrate fully on the conversation; each participant would be sent his/her written transcript for verification following the interview and asked to notify of any corrections or comments;
- researcher's recording of their responses – verbatim transcripts would be prepared by the researcher on the same day or as soon as possible the next day from the audio-taped interviews which would remain available for verification for not less than five years;
- researcher's selection of their responses – selecting relevant material would be interpreted in context, conditioned by the awareness and skill of the researcher;

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- researcher's interpretation of the responses – this would be based on awareness at time of interview, aided by the shared understanding of the culture in Prince Edward Island, with its nuances confirmed by transcript and audio-tapes.
- researcher's bias - the inability to control any bias relating to the interviewer is acknowledged.

THE CASE STUDY

Choosing an island on which to conduct research about the influence of islandness involved a compromise in this Masters study. Prince Edward Island offered certain advantages as a research subject: on balance, it was selected as an information-rich case from a database of over 100 sub-national island jurisdictions on the basis of the island's explicit energy policy framework, its status as a sub-national jurisdiction with authority over energy, its progressive *Renewable Energy Act*, and transparency of information within the island community.

As well, the researcher had relative ease of access to and familiarity with the key stakeholders that would not be available elsewhere, since the researcher is from PEI (which, in itself, is another compelling reason for choosing PEI). Prince Edward Island has a wide range of intersecting community networks to which the researcher has access in her native language. Information could be easily obtained from key informants and locally-available sources of secondary information such as official statistics, legislation and newspaper accounts. On the other hand, a large proportion of the Island's electricity is obtained from continental sources via undersea cable, enhancing security of supply and potential availability of cheaper power produced in large generating facilities at economies of scale. As well, the presence of the fixed link to the mainland contributes to ambiguity about the impact of islandness on Prince Edward Island. However, it was determined to proceed with this case despite awareness that its close proximity to a mainland system may result in fewer constraints and greater options for implementing alternative energy than are available on an oceanic island which generates its own electricity.

The single case study method seemed appropriate given that generalization would be to theoretical propositions rather than to a population or to a universe of islands (Yin, 1994). However, it was expected that similarities or differences to other islands might be detected during the investigation.

The researcher sought to determine what implicit assumptions had been made by the implementers of energy policy about a range of topics including those outlined in the research design, including islandness and sustainability. Reasons were explored as to why small Prince Edward Island had aggressively

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asserted its power of jurisdiction in the creation of progressive energy legislation towards future sustainability goals. For this, a constellation of key informants was interviewed using an embedded case study format. These participants were selected by the researcher either because they had significant input into energy policy or they were observers with informed or critical perspectives that the researcher thought were relevant. Some public figures in key roles were the obvious choice as participants; others represented a range of differing perspectives. The choices were made knowing it would be impossible to represent all existing perspectives but it was felt a sufficient range of relevant ones would be present for the purpose of this research.

DATA COLLECTION STRATEGY

Quantitative Data

The researcher used factual evidence from secondary data, including energy-related empirical data, statistics, legislation and newspaper accounts to provide multiple data sources for the case study, triangulating the conclusions drawn. As well, comparative anecdotal data from other islands was gathered through the researcher's first-hand experience as well as through secondary data and literature review.

Chapter 2 contains a segment of quantitative research on electricity costs at small scale (pages 16-17). This research explores the concept that islands with the smallest populations tend to pay more for electricity per kilowatt hour. The raw data used for the calculations in Table 1 was obtained from 2003 annual reports of nine electrical utilities in the Caribbean region and appears in detail at Tab 1 in Appendix B. As well, statements on page 17 comparing energy statistics in the United States mainland and the State of Hawaii are based on raw data from the US Department of Energy, as compiled by the researcher under Tab 2 of Appendix B.

Pilot Studies

In March, 2005, the researcher met with the Chief Executive Officer (CEO) of Prince Edward Island's electrical utility, and following that, with the provincial Minister of Energy, to gain a better understanding of the business of providing electricity in general and in Prince Edward Island in particular. These experiences helped to focus the study.

In April, 2005, to get first hand experience on other islands, a pilot study was carried out in Anguilla, an autonomous British overseas territory in the northeastern Caribbean region. A semi-structured interview about an hour in

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duration was held with the CEO of Anglec, at his office at the electrical utility. A short list of questions around electricity pricing probed the role of the regulator, the impact of any new regulation on electricity, the impact of the rise in fuel prices, and the impact of deregulation and unbundling on the Caribbean. The social and technological problems of supplying electricity in a small Caribbean island were also discussed at length. At this stage, the process was quite exploratory and very worthwhile. A subsequent report written by the researcher based upon information provided in the interview was subsequently verified by this CEO through e-mail and telephone follow-up.

While in the Caribbean, the researcher also attempted to have a similar interview with the CEO of NV GEBE, the electrical and water utility in Dutch St. Maarten but he was not available. A copy of the company's annual report was obtained. Attempts were made to tour the thermal generation facilities in both St. Maarten and the Electricité de France (EDF) facility in neighbouring French St. Martin but security did not permit entry.

In August 2005, the researcher visited Curaçao, Netherlands Antilles, to present a paper (Stuart, 2005b) at an international solar energy conference which focused on renewable energy applications for tropical islands in the region. She met with the CEO of Aqualectra, the public/private integrated electricity and water utility of Curaçao, to obtain further background on the state of deregulation and reform in Caribbean island utilities. During the 4-day conference, the researcher observed an ocean thermal energy conversion (OTEC) site under development, a seawater desalination facility, remote solar energy collectors used for highway lighting, and the first large wind farm built in the Caribbean. As well, the challenges of the island's oil refinery were observed and discussed.

Ethics Review

An application to the University of Prince Edward Island Research Ethics Board to conduct this research with human participants was approved on February 17, 2006. A copy of the certificate is attached under Tab 1 in Appendix A.

Interviews

It was determined to interview knowledgeable elites as primary sources of qualitative information, verifying and enriching the researcher's observations, factual secondary data and the literature review. Potential respondents were identified by their role within the province or from referrals. To set up interviews, initial contact was made by telephone. Upon receiving a positive response and setting up an interview date, the consent letter and form were sent to each interviewee by e-mail and picked up at the beginning of the interview. A copy of the generic consent letter and form are attached under Tab 2 of Appendix A.

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Signed consent forms for each interview, copies of which appear under Tab 3, will be kept on file by the researcher for five years or the appropriate period.

At the outset of the interview phase, the survey instrument and recording equipment were tested in a simulation with a staff researcher in the Island Studies Program. Interviews for the Prince Edward Island case study were conducted over a two-week period during February 2006. Subsequent to the interviews and completion of transcribing, each participant was sent a thank-you letter and a copy of his or her individual transcript. Participants were given contact information and a request to contact the researcher in the event any of the material was not considered accurate or suitable for the public record, but no responses have been received to date. A copy of the letter is attached at Tab 4 of Appendix A.

Primary data was gathered from a constellation of eight key respondents. All participants were asked, and none objected, to having their interviews audio-taped. They all signed a letter of consent to this effect. All were accustomed to providing similar types of information to the public and the media in their normal day-to-day roles. A battery-operated audio cassette recorder with a remote microphone was used, which reduced noise and interference. The tapes were tested during each interview to ensure recording quality. Initially, at the end of the interview, several participants were asked if he or she would like to suggest other potential interviewees. One of the participants was included in the research as a result of a referral. Another potential interviewee from the agricultural community was contacted but time constraints did not allow the interview to proceed.

Questionnaire

A carefully constructed list of six open-ended questions was used as a basis for interviews held in Prince Edward Island during February 2006. The interview process took about an hour. Most of the interviewees were quietly enthusiastic and ready to begin upon the researcher's arrival.

The participants were not given an opportunity to see the questions prior to the interview although they had received the briefing letter. The questions were modified or expanded during the interview to obtain any special insights, knowledge or viewpoints held by the participant about the subject matter. The open-ended questions included the following:

1. **Do you see any specific advantages or disadvantages in pursuing an energy policy from/for a small island?**

   Provides warm-up and introduces island point of view.

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2. **Does the Province use any international benchmarks or indicators to measure progress towards sustainability in the production of electricity? If yes, what are they? To what extent has the PEI Energy Framework helped to consolidate progress towards sustainability?**

   Explores how the province and the respondents define sustainability, timelines for development and issues around effectiveness of a written energy policy.

3. **If you were to implement all the changes you see are needed for future sustainability, what would they be and how would you go about it? What are the barriers to implementation?**

   Focuses on process and political power, and explores how the Minister becomes informed; it also elicits how other interviewees might take a different approach.

4. **How is energy policy determined? How are the various interests expressed?**

   Creates a map/model of the energy institution and impacts of national, provincial, local jurisdictional control, as well as utilities, investors and other players.

5. **What input do communities have into the creation of energy policy? What has been the impact? How might this change?**

   Explores the dynamics of public input, responsibility for control over energy and whether there is enough space for more public input.

6. **What are the contested areas between energy interests affecting Prince Edward Island? How has being an island shielded us or exposed us to these issues?**

   Probes clash of environmental, social, political and economic forces and how these are represented by each of the players. To find gaps and hot spots.

Qualitative Data

Audio-tapes of the interviews were labelled and transcribed by the researcher on the same day of the interview or the next to facilitate recall. The transcriptions were compared with the tapes and edited for accuracy, ensuring that they were *verbatim*. The material was formatted with a wide column for making notes. Overall, the participants provided a great deal of information in a snapshot of the energy institution that fills 92 pages of verbatim accounts. This material (under Tabs 1-8 of Appendix C) includes the researcher's notes and highlighting as part of coding and analysis.

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DATA ANALYSIS

Coding and Sorting

The questionnaire was designed to elicit a broad range of information. Using a formal procedure to make sense of the voluminous data, each transcript was closely read several different times to determine themes and understand responses, and topics highlighted. Approximately 60 topics were identified and sorted in the transcript material to separate out patterns of topics relevant to the thesis. These topics and patterns are listed in the working notes under Tabs 1 and 2 of Appendix D.

Model Development

A useful device for initially categorizing the data was the familiar strengths/ weaknesses/opportunities/threats device, or SWOT analysis, a simple business management technique. Around this time, I became aware that I was engaging in an iterative process that involved switching back and forth between left-brain and right-brain activity involving creative thinking as well as analysis. There are some aspects of this process which are difficult to articulate as they were intuitive and rapid, resulting in a series of insights where knowledge crystallized. I remembered at this time how it was helpful to evoke a sense of creating visual images beyond written language to enter the creative realm. This led, upon reflection, to substituting SWOT categories with a model for islandness as the theme became clarified.

It was an insight that islandness could provide a heuristic device or lens through which specific energy-related events and processes can be systematically analyzed. In this research, 'islandness' refers to a cluster of concepts which are associated with islands but which are not necessarily exclusive to islands. They include, but are not limited to: remoteness, holistic complexity, diversity, 'natural monopoly', adaptive capability and scale challenges. Not only physical and geographic attributes but also socially-constructed perceptions of decision-makers have an influence on shaping the production of energy in unique ways related to islandness.

Selected events and processes from the case material, such as installation of the under-sea transmission cable and the adoption of the *Renewable Energy Act*, provide a canvas to illustrate islandness concepts such as issues of scale, holistic complexity and adaptive capability. The Islandness model provided a mental platform to examine perceptions of interviewees for socially-constructed influences related to these events and processes using relevant theory from island studies, ecology and environmental sociology.

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These intuitive thought processes gave way to analytic processes which led to the final stages of case analysis as presented in Chapter 7.

CHAPTER SUMMARY

This Chapter presents the research design for the problem of identifying the influence of islandness on electricity policy decisions. The first part of the Chapter sets out the aim and scope of the problem, and the limitations of the study. The next section on research methodology presents the hypothesis that islandness nuances electricity production in specific ways. The theoretical framework, epistemology and the role of the researcher are also found here. The challenge of such an interdisciplinary project is described.

The research design is then described as being carried out in two phases. In Phase One, secondary information was to be gathered to understand the production of electricity. This would include a quantitative study of electricity cost data in nine small islands in the Caribbean region in relation to scale and distance from the energy source. Phase Two would involve the choice of a case study method to obtain in-depth data on one island through secondary information and interviews of key decision-makers. How the research was actually carried out and measures taken to ensure validity and reliability are described. The data collection strategy is reported in detail, from secondary information and pilot studies through to ethics review, interviews, sample questionnaire, and treatment of qualitative data. The section on data analysis includes methods for coding and sorting and development of a visual model as a heuristic device for analysis of the data. Additional details of the research activities are included in four Appendices.

In the following two Chapters, the case study of Prince Edward Island is presented in two parts. Part A in Chapter 5 describes the energy institution, providing details on electricity production and distribution, regulation and capacity, green power, energy politics, infrastructure financing and the *Renewable Energy Act*. Part B in Chapter 6 presents selected passages from interviews of key decision-makers involved in the institution of energy on four main topics, namely islandness, sustainability, research & development and energy policy.

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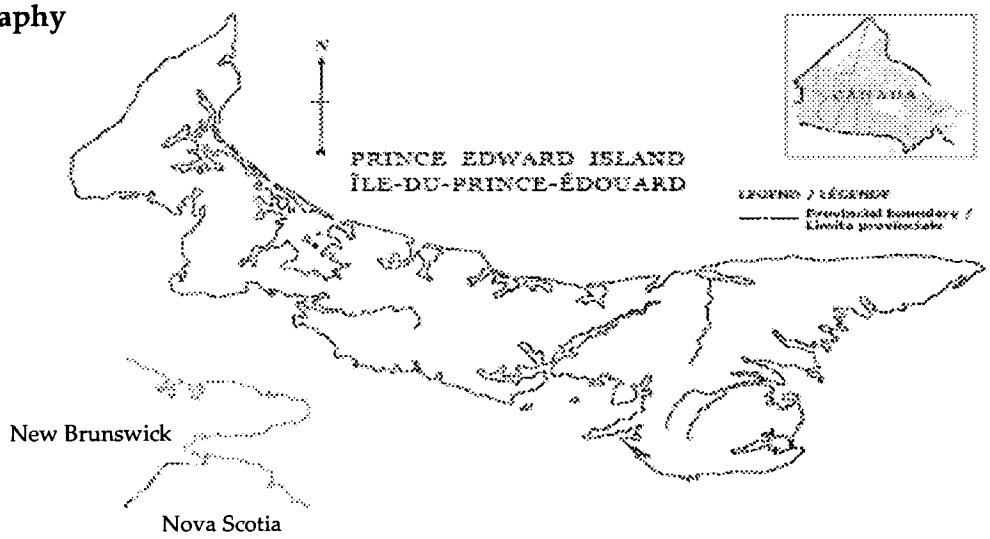
CHAPTER FIVE: CASE STUDY OF PRINCE EDWARD ISLAND PART A: THE ENERGY INSTITUTION AND ELECTRICITY

INTRODUCTION

This Chapter presents Part A of a case study of Prince Edward Island in eastern Canada and its electricity institution. The Chapter begins with a present-day snapshot of the Island's geography, economy and energy regulation requirements, providing specific details on electricity production and distribution, regulation and capacity, green power, energy politics and infrastructure financing. The final section includes an overview of significant legislation, the *Renewable Energy Act,* that was passed in 2005.

PROFILE OF PRINCE EDWARD ISLAND

Geography



Prince Edward Island is located on Canada's east coast in the southern part of the Gulf of St. Lawrence which connects to the northern Atlantic Ocean. This fertile, crescent-shaped island is 224 km (140 mi) long by 6-64 km (4-40 mi) wide. Formed from soft sandstone bedrock covered by red clay soil, the island has a total land area of 5,660 sq. km (2,184 sq. mi) within a coastline of 805 km (500 miles) (PEI Govt., 2006).

Geography and patterns of settlement can impact significantly upon the amount and type of energy used by an island. PEI was once branded by tourism promoters as "Canada's Million Acre Farm" due to its scenic beauty and pastoral landscape dotted with patches of woodland, farms and small communities. The

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gently rolling topography allows the total human population of 138,100 (2005) to be fairly evenly distributed throughout the Province, with 75,000 residents who are considered rural (PEI Govt, 2006).

Situated at 46° north latitude, Prince Edward Island experiences a wide range of weather conditions during the year. Mean temperature ranges between 18.3°C in July and –7.3°C in January. Precipitation averages 78.5 mm of rain in July and 67.4 cm of snowfall in January (PEI Govt., 2006). The cold winters and windy conditions justify considerable home insulation, extra window glazing and space heating from fall to spring, as well as precise climate-controlled barns for livestock and warehouses for agricultural produce. Petroleum suppliers consider the "heating season" requiring fuel oil to extend from mid-September to mid-May.

Economy

Despite continued growth, the Prince Edward Island economy remains one of Canada's most fragile. It relies heavily on three seasonal industries of agriculture, fisheries and tourism, with federal transfers of around 35-40%.

The Province's Total Gross Domestic Product (GDP) was Can$4 billion in 2004 while the rise in energy prices in PEI was 8.7% over the previous year. (PEI Provincial Treasury, 2005). According to a commentary from the Provincial Treasury, PEI's Consumer Price Index (CPI) rose faster than the national average because oil prices had increased significantly and the energy component of the CPI basket for PEI has a larger weight of heating oil and gasoline compared with other provinces. The PEI economy is therefore sensitive to the cost of energy.

Table 4. Percent Increase in GDP and CPI in 2004 over 2003.
(Source: PEI Provincial Treasury, 2005)

% RISE (2004 OVER 2003)	CANADA (AVERAGE)	PRINCE EDWARD ISLAND
Total GDP	2.8%	1.7%
CPI	1.9%	2.1%

In Prince Edward Island, energy prices are regulated by the Island Regulatory and Appeals Commission (IRAC). IRAC administers the *Electric Power Act* and the *Renewable Energy Act* to regulate the provision of electricity, affecting the timing and degree of energy price increases (*ibid.*). Commissioners of this quasi-judicial body provide a human interface between the public interest and electrical utilities through public hearings and rate applications, which are available to the public on the Commission's website (www.irac.pe.ca).

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ENERGY IN PRINCE EDWARD ISLAND

Imported Energy (93%) (2004)	
Electricity	13.0%
Petroleum	80.0%
Local Energy Generation (7%)	
Biomass	6.5%
Wind	0.5%

In 2004, Prince Edward Island imported 93% of its total energy requirements, of which only 13% was for high-voltage electricity (PEI Dept. of Energy, 2004). About 80% of the energy bill was in the form of petroleum products. The remaining 7% of energy requirements was supplied by renewable energy generated in PEI, of which 6.5% was from biomass including cordwood, sawmill residue and municipal garbage; the rest (0.5%) came from wind power (*ibid.*). The Province has little potential for producing its own oil, or for generating large hydroelectric or nuclear power. Natural gas has yet to be discovered in commercial quantities, but a wind-hydrogen project is currently being researched (*ibid.*). Tidal power is not yet developed, and while solar power has potential in PEI with 288.2 days of measurable sunshine per year[4], it is not considered as promising as in more southerly latitudes.

Electricity

Electric lights first came to the City of Charlottetown in 1885 from locally produced sources. The Summerside Electric Company was incorporated in 1896. By 1920, customers there were paying 10.7 cents per kWh for their energy (City of Summerside, 2006). Historian MacDonald indicates that by 1928, there were eleven power plants on Prince Edward Island using a combination of mill-fed water wheels and engine-powered turbines for a total production of 2.3 million kWh of electricity. Electricity was still expensive and localized. The highest elevation is only 152 m (466 ft) and numerous but short streams are present. All of the micro-hydroelectric dams had been abandoned by about the mid-1950s when the Island power grid served about 4,000 rural customers and just over 2,000 farms (MacDonald, 2000; PEI Govt., 2006).

The primary distributor of electricity in Prince Edward Island is the regulated public utility, Maritime Electric Limited, a completely privately-owned subsidiary of Fortis Inc., a multinational corporation headquartered in the sister Canadian province of Newfoundland and Labrador. The City of Summerside still has the capacity to generate its own electricity from fossil fuel in a municipally-owned facility as well as to supply back-up power to Maritime Electric (City of Summerside, 2006). Today, electrical energy is distributed to approximately 66,000 customers on PEI along over 5,000 kilometres of power lines (Maritime

[4] http://www.climate.weatheroffice.ec.gc.ca/climate_normals

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Electric, 2006). The total electricity supply in 2004 was 1,123,917 megawatt hours (MWh), of which only 8,227 MWh were generated within PEI. In January 2004, the net peak load within the province was 209 MW. The net generation capability within the province that year reached 249 MW, of which 13 MW were wind-generated (PEI Provincial Treasury, 2005).

Although obtaining total energy represents a significant outlay for PEI, electricity accounts for only 13% of the Province's energy requirements (PEI Dept. of Energy, 2004). Maritime Electric's energy delivery system is linked to the New Brunswick Power grid. Most of the electrical energy supplied by Maritime Electric to customers on PEI is purchased from the mainland under various contracts which supply power that has been generated in New Brunswick and Nova Scotia from nuclear, hydroelectric and coal-fired sources. High-voltage electricity comes to the Island via two submarine transmission cables under the Northumberland Strait.

Besides power which comes across the cables, Maritime Electric has two Electrical Generating Stations on PEI which are kept in a standby mode and put into operation when energy supply from off-Island sources is interrupted. In 2004, the Charlottetown Generating Station located on the waterfront had six fossil fuel-fired units with a combined capacity of 65 megawatts (MW). The Borden-Carleton Generating Station has two diesel-fired combustion turbines with a combined capacity of 38.5 MW. A high-voltage transmission line runs between the Borden-Carleton substation and the West Royalty substation on the outskirts of Charlottetown (Maritime Electric, 2006).

Maritime Electric was allowed[5] to install and commission a new $35 million generator in Charlottetown in November, 2005, adding up to 50 MW of output during its operation. Among the concerns expressed were its location and the potential for overbuilding generation capacity which can be inappropriate for a small island unless some way is found to increase demand or export the excess power. The new unit provides backup capacity for energy purchases from off-Island sources and contingency backup for the submarine cables. Service personnel from General Electric in California were flown to PEI to install the unit which is a combustion turbine fired on diesel fuel, basically a 747 aircraft engine. The installer reported that running this turbine for one day requires six tanker-trucks of fuel.[6] The unit is capable of providing enough power to supply almost one quarter of the peak electrical demand on PEI and can be adapted for a variety of fuels including natural gas should a local source be developed.

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[5] Approved after a lengthy and lively regulatory process in which responses to 76 requests for further information were filed: http://www.irac.pe.ca/publicnotices/documents/IRAC-UE20711-MECL-CT-2004.pdf

[6] Information provided to researcher during tour of new turbine facility, November 2, 2005.

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Green Power

It has been accepted that Prince Edward Island does have an excellent wind regime (PEI Energy Corporation, 2006), and by 2004, wind was being used to generate 5% of the province's supply of electricity through the PEI Energy Corporation's wind facility in North Cape.

In November 2003, the PEI Energy Corporation, a provincial Crown corporation, installed eight large wind-powered generators at North Cape for a capacity of 10.56 MW. Aeolus PEI also installed what was claimed to be North America's largest wind turbine there, the V-90, for an additional 3MW of capacity (PEI Dept. of Energy, 2004). Using wind to generate electricity is considered "green power", because it is renewable and displaces the burning of fossil fuels, thus reducing emissions of greenhouse gases. A Renewable Portfolio Standard of electricity of 15% by 2010 has been set by the *Renewable Energy Act* to encourage and develop wind resources for electricity. In the short term, green power costs more to produce than electricity from conventional sources such as oil and coal.

One way to provide for this extra cost is for electricity users to pay a premium for green power, arguably a reverse incentive for renewable energy. The wind farm at North Cape was made possible because the Governments of Canada and PEI agreed to pay a green power premium for most of the electricity it generates. This electricity is designated as being used in government buildings in PEI (Maritime Electric, 2006). A portion (up to 20%) of the output from the wind farm was made available for the public to purchase through Maritime Electric's distribution system since the public utility was already purchasing this electricity from the wind farm at a price equal to the cost it would have incurred to purchase or generate this electricity from conventional sources. Despite its premium price, the public fully supported green power and all of the electricity available under this program became fully subscribed very quickly (Estabrooks, 2002). The electricity company passes these green power premiums on to the PEI Energy Corporation which owns and operates the wind farm to support the development of a renewable energy resource in PEI (Maritime Electric, 2006).

Electricity Politics and Financing

Wind energy has had a long history of interest in the province as a means to increasing self-sufficiency. Prince Edward Island has hosted Canada's national wind laboratory, the Atlantic Wind Test Site (AWTS) since its inception in 1980 (PEI Dept. of Energy, 2004). In September 2005, the Government of Canada announced the creation of a new Canadian Wind Energy Institute in North Cape, PEI, which would replace the AWTS and focus on testing and certification, research and innovation, industry training and public education, and technical

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consultation and assistance. The new institute was to receive over $3.5 million (Cdn) from the Federal government and over $0.9 million in land and assets from the Province. Additional funding for annual maintenance was to come from both partners in years following (ACOA, 2005).

On November 18, 2005, prior to an election, it was announced that the Federal government and Maritime Electric would cost-share equally a $60-million project to run a new 200 MW capacity cable inside the Confederation Bridge between PEI and New Brunswick (*The Guardian*, 2005). This project was expected to double the current cable capacity to 400 MW and act as a backup for the two existing cables. Increased capacity with the new cable would allow the Island to export wind power. As envisioned under its Energy Framework, the PEI government hopes to attract a range of new private-enterprise wind generation facilities. In addition to reversing the outflow of capital, an additional "200 MW of wind power would cut greenhouse gas emissions by at least 500,000 tonnes and sulphur dioxide levels... by 5,700 tonnes." The Environment Minister was quoted as saying "That's equal to removing 75,000 cars from P.E.I. roads" (*The Guardian*, 2005).

In January 2006, a new Federal government was installed in the national capital, Ottawa. The new administration has not been prepared to honour the pre-election promise of the predecessor government to participate in funding a new cable to export wind power from PEI despite the reasonable economic and environmental arguments in its favour (CBC PEI, 2006). Further research is needed to determine whether the private utility would be willing to implement the project on its own or seek a funding partnership with another party such as the island government. This anecdote underscores the critical importance of politics as a risk factor in outcomes for small islands, in both local as well as inter-jurisdictional spheres, especially in a large federation.

Overall Energy Use in Prince Edward Island

Although electricity is the central focus of this research, during the course of the study it became apparent that other functions besides electricity caused more concern for sustainability and overuse of fossil fuels. While it is beyond the scope of this project to analyze overall energy use *per se*, this section provides further background on the Island and a brief overview of transportation issues as well as possibilities for further research.

The Province's Energy Minister was asked what changes were needed in the energy system. His responses revealed concerns over transportation and heating costs at the heart of supply and demand for energy:

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> "When gas was $1.35 a litre, we did a survey. We went to the four major entrances to the city and we did it morning and night for a couple of days. 70% of the vehicles that came through those checkpoints, and everyone was the same, had one person in them. So, is it government's responsibility to say, you should be looking at carpooling? If you are going to live in the country, and I know friends in Montreal, Toronto, Calgary, that live right in the city, take a whole lot longer to get to work than if you live 20 miles outside of Charlottetown. But are there things people can do? Yes there are, but *they* need to do them."
>
> "...people look at biodiesel, for example, and they say, "we can produce it here and we can use locally grown crops, but the cost of conventional fossil fuel diesel is still cheaper than the bio". That's this year. But what about in 5 years time, or in 15 years time?...we need to start looking down the road, and making more tougher decisions today, paying a little more today, so that in the future we will be competitive."
>
> "...in terms of the other forms of energy, the home heating and the fuel, gasoline distributors, they haven't been an issue. I mean, we've talked about biodiesel, we've had oil companies come in here and say, "can we be part of this?" They are still going to sell regardless of what the fuel is. I even had one home heat oil company come in and had plans to put in a pelleting machine. They wanted to start selling pellets. They said, "i know my customers are buying pellets as an alternative heating source, so i want to keep my customers, so I'm going to provide them with the fuel they are looking for, and if that's produced locally, then why shouldn't I produce it?"...Those folks know that they're going to be producing or going to be distributing energy of some sort, they just want to be part of it."

Transportation and space heating have always been challenges in infrastructure and energy for the economy of Prince Edward Island. Transportation within, to and from PEI is almost completely reliant on imported fossil fuels, as are most thermal requirements for heating homes, commercial buildings and powering industrial operations, which use light and heavy oil or propane.

The Province is separated from neighbouring provinces of Nova Scotia and New Brunswick by the Northumberland Strait to the south. It has been linked year-round to New Brunswick since 1997 by the 12.9 km Confederation Bridge and to Nova Scotia by three diesel-powered car ferries between May and December when the Strait is free of ice. Another car ferry links PEI and the eastern town of Souris to the Magdalen Islands (Îles de la Madeleine) lying 134 km to the north. Four commercial ports handle small ocean-going vessels and many small harbours service inshore fishing boats and pleasure craft during ice-free months (PEI Govt., 2006). There are currently joint initiatives underway by the federal, provincial and municipal governments and private developers to further develop port infrastructure for mass cruise tourism in the capital, a move not supported by those concerned about the health of the Northumberland Strait.

In the previous two centuries, trains carried heavy produce, freight and passengers to and from each end of the Island in a meandering path (MacDonald, 2000). When the railway was discontinued in 1969, it brought more intensive

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wear-and-tear of paved highways and roads by heavy vehicles and the trucking industry. On the positive side, however, tourists and quality-of-life advocates benefited from the modal change: the railbed was converted to a 225 km linear park which functions as a bicycle path and walking trail from April to November; the trail is leased for recreational snowmobiling from December to March (PEI Govt., 2006).

There is already an extensive infrastructure of paved and gravelled roads in all areas of the province due to the historic need to move farm produce. This pavement requires intensive maintenance due to the structure of the soil as well as to the spring freeze-thaw cycle that damages roads and requires winter snow-removal activities. Gravel is obtained in quarries at a few sites on the Island but due to a lack of granite and other road building materials, heavy materials must be imported by barge and trucked to construction sites, further damaging roads. In total, 456,500 metric tonnes of sand, stone and gravel were unloaded at the four Island ports in 2004, representing 74% of the total freight unloaded (PEI Provincial Treasury, 2005). Moving all of these heavy loads requires imported fuel for ferries and trucks as well as further infrastructure for storage and handling. The demand for energy is exacerbated when the economy is expanding, especially when heavy construction is underway.

No public transit exists outside of the capital city, Charlottetown, requiring residents and visitors to use private vehicles or taxis. The number of households on the Island is just over 50,000 (2001) but by 2004, the number of motor vehicle registrations in PEI had reached 99,050, of which 63,663 of these were private passenger vehicles and 22,636 were trucks; total gasoline sales reached almost 210 million litres (PEI Govt., 2006). Therefore, motor vehicles in motion and at rest, and all of the related activities and structures including road and port infrastructure, have enormous impact on Prince Edward Island's energy use and lifestyle.

PRINCE EDWARD ISLAND'S *RENEWABLE ENERGY ACT*

Legislating for Sustainability

To address the growing need for new economic and environmental measures to combat over-dependence on imported fossil fuels, in December, 2005, the *Renewable Energy Act* was proclaimed in Prince Edward Island, Canada's smallest province. The preamble to this new *Act* declares:

> WHEREAS the use of non-renewable energy sources for the generation of electric energy may be damaging to the environment;

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> AND WHEREAS the use of renewable energy sources for the generation of electric energy will allow environmentally friendly energy to be produced in the province and reduce dependence on imported energy and fuels;
>
> AND WHEREAS the use of available renewable energy sources for the generation of electric energy will encourage the establishment of new energy suppliers in the province, enhance the capacity and reliability of the provincial energy supply system for present and future needs and offer potential price stability;
>
> AND WHEREAS it is desirable to promote the development of a Prince Edward Island solution to the energy requirements of the province;
>
> BE IT ENACTED by the Lieutenant Governor and the Legislative Assembly of the Province of Prince Edward Island as follows: . . .
> *(www.gov.pe.ca)*

The democratically-elected legislature of Prince Edward Island (PEI), guided by the Provincial Government's *Energy Framework and Renewable Energy Strategy, 2005*, passed regulations enabling the following three key provisions:

- **renewable energy sources**: by 2010 and after, public utilities are required to obtain at least 15% of the energy they sell each year from renewable energy sources.
- **demand-side management**: public utilities are required to file a demand-side management plan to reduce the intensity of peak demand by ratepayers, starting with a 5% reduction from 2004 levels by year 2010 and a 10% reduction by 2015.
- **net-metering**: small capacity renewable energy generators are allowed to sell excess generation capacity to a public utility through net-metering, and public utilities are required to pay small generators a prescribed rate set by the Island Regulatory and Appeals Commission.

The spirit of this legislation anticipates a time frame extending beyond any particular government when heavy reliance upon fossil fuels may become too expensive or cause excessive pollution (Smil, 2003). Prince Edward Island is well on its way to developing its abundant wind energy resources with 5% of its electrical capacity from wind power (PEI Provincial Treasury, 2005). The Province expects to meet its 2010 renewable energy targets well ahead of schedule. Wind power is now a mature industry with proven technology, and although significant investment in turbine infrastructure is required (as it would be for any new power plant), the wind itself is free, abundant and clean. The preamble to the *Renewable Energy Act* clearly sets out environmental goals, but there are social, political and economic goals evident in this legislation as well.

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NEXT ...

This Chapter has provided selected empirical data about energy and the provision of electricity in Prince Edward Island. The purpose of the Chapter is to familiarize the reader with the geography and economy of the Island, the nature of the energy institution, electricity politics and financing. Commentary on overall energy use and electricity consumption is provided. Key provisions of the progressive PEI *Renewable Energy Act* are described.

Although the Chapter contains objective facts and figures about various facets of the energy institution, each component is influenced by the people who make decisions and operate in relationship to one another. Part B of the case study will continue in the next Chapter with a social analysis based on selected passages from interviews of key participants in the Prince Edward Island energy institution.

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CHAPTER SIX: CASE STUDY OF PRINCE EDWARD ISLAND PART B: INTERVIEWS OF KEY DECISION-MAKERS

INTRODUCTION

During February, 2006, key decision-makers in the electricity industry, energy policy sector and government in Prince Edward Island were interviewed as part of this exploratory study. Eight knowledgeable participants were selected who either had a role in energy policy through government and industry, or who were in a position to take an active role in public debate in Prince Edward Island.

The constellation of interview participants, including seven men and one woman, consisted of PEI's Minister of Environment, Energy and Forestry; the CEO of a private wind turbine manufacturer; the Climate Change Co-ordinator employed by the Provincial Government; the Chief Executive Officer (CEO) of Maritime Electric Ltd.; a Professional Engineer on faculty at the University of Prince Edward Island (UPEI); a Federal Member of Parliament for PEI; the Chair of the Island Regulatory and Appeals Commission (IRAC); and a Green Party electoral candidate who is a proponent of the Co-operative Movement.

Qualitative anecdotal evidence from the interviews was examined and selected to highlight various topics associated with Prince Edward Island, islandness in general and the institution of energy. Main sections reported below include islandness, sustainability, research and development, and energy policy. The clusters of verbatim accounts are designed to illuminate a range of general concepts and insights in light of the previous Chapters rather than to highlight the viewpoint of any particular individual.

ISLANDNESS

Advantages of Islandness

Participants were asked if they saw specific advantages or disadvantages in pursuing an energy policy from or for a small island. Initial responses focused on economics, technology and politics, since these were the main day-to-day interests of most of the executives. Perspectives on the ease of managing change and decision-making within PEI were cited without hesitation, along with positive reflections on island identity, independence and self-sufficiency. The government representatives cited ease of administration, ease of communications and networking associated with the dynamics of a small scale jurisdiction:

"ability to affect change and manage change"

"we can do things province-wide that other jurisdictions can't do"

"the ability to be part of it"

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"we're able to make contact with decision-makers"

"decision-makers can talk a lot and quicker and easier here in a small jurisdiction. We have a better feel for what the residents of the province want."

"A lot of progressive ideas have sprung up out of here. So this is really not breaking new ground in terms of doing something that a lot of other jurisdictions would see as risky or not the traditional way to go."

One respondent, in opposition to the government, critically remarked on the rich and effective networking approaches he saw in PEI communities that played against a backdrop of resisted, ineffective or non-existent land-use planning. He appears to suggest that while a robust, bottom-up approach to land-use is the norm, some measure of top-down approach or leadership in rationalizing land-use and energy policy is needed and could work to the benefit of PEI:

"The piecemeal expansion of communities beyond the boundaries and the lack of any cogent application of planning principles and the constant deviation from whatever planning policies that have been established doesn't create a very viable situation in terms of community energy policy."

"...'networking', the word, describes what people do, whether they are doing it electronically or not, and PEI tends to be a very networked place. So I think that the potential is there to have networked energy solutions that would be beneficial to the social, environmental and economic situation."

Both provincial and federal politicians noted the advantages of having powers of jurisdiction as a province:

"PEI may be the best place to go and model these types of initiatives where, in the federal government's eyes, you don't have to spend very much money, relatively speaking, to get a good project...other jurisdictions...are looking at us and saying 'maybe we can learn from PEI'"

"we're a province, small."

Some respondents easily commented about individual island identity, suggesting that it creates a sense of responsibility which enhances potential to achieve goals:

"we have always identified ourselves as islanders, as a society and a community who feel we have our own systems...we always pride ourselves as being able to survive and be self-sufficient in our island identity"

"identity as energy unit even though outside ownership"

"memory of what could be done"

"PEI owned by 150,000 individuals. Nobody owns big piece of it. Owners and developers feel responsibilities for making it and helping it survive."

"i think people strive for independence more than they do in other jurisdictions, just to keep the identity of who they are."

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Disadvantages of Islandness

Islandness was also seen as a disadvantage by some. Respondents specifically identified small size, insular attitudes, the tendency to follow rather than lead in setting independent policy and prices, the lack of innovation due to overwhelming influence from outside, and the lack of local natural resources.

On insularity:

> "PEi is a community unto itself. It has certain insular attitudes" (wind turbine manufacturer)
>
> "I don't think there is anything about insularity that specifically mitigates against having diverse solutions, but certainly it does tend to mitigate against innovation because people have got into the habit of looking to capital intensive solutions outside, and I think we are still fixated on looking at capital intensive solutions and those tend to happen elsewhere. That's perhaps why we don't adopt them as early as some jurisdictions do. (Green Party candidate)

These comments on the impacts of openness and outside influence, primarily from other Canadian jurisdictions, were expressed by the utility regulator:

> "we really don't think separately from rest of the world, so we are in a situation where our policies...mirror what's happening in the surrounding jurisdictions, and the opportunity for truly independent policy, i don't think it ever really emerges...we are integrated in with other utilities, a lot of the infrastructure, the types of facilities that you have to buy are really geared for other markets, and you're looking almost at following what others are doing, as opposed to being able to really branch out on your own"
>
> "I think we've become so sort of inundated with information and expertise from others that in some respects islanders have lost a bit of that entrepreneurial edge. But there are certainly still many individuals who are extremely ingenious and have done extremely well and have adapted and created and generated and invented things on Prince Edward Island that are extremely innovative. But, generally overall, I think there's a lot of people who have sort of backed away from that..."
>
> "Islands are unique and they have some tremendous opportunities. But the challenge, as I see it, is to somehow be able to chart a course that doesn't automatically follow and compare to the rest of the world. Part of the communications system, international travel, all of those things, cause us to tend to look to others to set the standards, as opposed to set them ourselves. Whatever the way of life is in Toronto or Halifax, that's becoming our standard, as opposed to, 'we don't care what they're doing in those jurisdictions, this is the way we want to do it here on Prince Edward Island.' We want all of the same things they have as opposed to looking at what we can do on Prince Edward Island that may be different and that, in the longer term, may in fact be the best way to go."

One respondent expressed the uniqueness in all energy situations, while another saw no immediate effects of islandness-energy interactions on PEI:

> "every place has its own unique characteristics...we're an island, we're surrounded by water, so that may have an impact, but that's no different than if we

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> were in the prairies surrounded by wheat. Both have energy implications. So I don't think our islandness really has a unique role to play in that."
>
> "integrated with other utilities"

Government representatives noted vulnerabilities due to wind technology and small scale, and one commented upon the complete dependency on fossil fuels:

> "because of our size, for us to maximize our wind in this province, we have to export almost all of it. The utility just can't handle large amounts of wind energy. Trying to backstop a renewable resource like wind is extremely difficult when you have a small load." (government representative)
>
> "no natural energy. Need to combust carbon fuels" (federal government rep)
>
> "when you rely on some other jurisdiction to produce your electricity for you, supply and price are not always what you want...when you cannot export, it deters conservation effort" (government representative)

SUSTAINABILITY

Awareness of International Benchmarks or Indicators

To explore how these key informants relate to sustainability, they were asked if the Province uses any international benchmarks or indicators to measure progress towards sustainability in the production of electricity. Although the question may have been misunderstood, the almost unanimous negative response was unexpected from this sophisticated group whose function would normally be to evaluate processes from a broad perspective. It initially raised questions about the relevance of larger global, national or regional sustainability debates to the Island and whether this demonstrates insularity.

> "no, I'm not [aware of any benchmarks]"
>
> "no, I'm not aware of any international formula or anything like that that's going on"
>
> "no, I'm not"
>
> "I don't know of any international benchmarks other than percentage of electricity from renewable sources"

More enthusiastic responses came from Provincial government representatives:

> "we look at what people are doing in small jurisdictions"
>
> "we have, as set out in the Framework a sustainability standard, the Renewable Portfolio Standard...a lot of jurisdictions don't have them, so the fact that we have one is quite special. Fifteen percent for a province that doesn't have hydro is substantial...I'm assuming that is part of the reason why on the national and international scale, this policy is called one of the most progressive in North America, for taking a big step towards more difficult renewables."

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PEI Energy Framework

A related question asked whether the participants thought the Province's Energy Framework has actually helped consolidate the progress towards sustainability. Responses were mixed. Several considered criteria beyond economic concerns:

> "absolutely. What is really important as far as progress is setting very measurable targets." (climate change co-ordinator)
>
> "well, it is going a lot more the right way than it is the wrong way." (wind turbine manufacturer)
>
> "the benefit of doing things in long term investment in renewables is enormous... need to look at renewables in islands as the ultimate to our long term sustainability." (wind turbine manufacturer)
>
> "there seems to be a new willingness in government to look at partnership solutions around renewable energy sources." (Green Party candidate)
>
> "we can't be the great big 1,000 MW project that they have in Quebec. So we need to keep it in a size that suits PEI and what can we use as fuel sources for our energy that are locally produced?" (Energy Minister)
>
> "Sustainable energy policy has to be part of a sustainable community planning, and sustainable community planning has to address the determinants of health, in terms of support systems, jobs, employment and clearly environment as well...I'd feel a lot happier if energy policy was evaluated in terms of its impact on the overall health of the community." (Green Party candidate)
>
> "I'm not in the loop to know that." (university professor)

Satisfying cost criteria and staying competitive was foremost for others:

> "what commitment should we as a province be prepared to make in terms of environmental sustainability? Because there is always going to be a trade-off...to the extent that we impose on ourselves limitations or targets that are going to have a negative impact, for example, on our economic productivity. To the extent that we do that but our competitors don't do that, we are going to create just one more barrier to our economic viability." (CEO, utility)
>
> "society has to drive the policy process in terms of being interested or willing to pay for it" (regulator)
>
> "then of course you have jurisdictions that...are encouraging the production and export of consumption of electrical power because it is of benefit to them, it's a money maker." (regulator)
>
> "it's the final cost that really keeps utilities away from setting significant benchmarks in terms of where they should be going in the longer term, in terms of getting off traditional reliance on fossil fuels..." (regulator)
>
> "well, it's difficult to say...now I should say most of the wind finance is coming from the federal government through the WPPI Program and technology is advancing considerably...but there is a lot of talk, and I assume that there is some basis for that talk...that we're going to see some private players in the market based upon the great costs that they'll get from Maritime Electric plus the WPPI from the federal government, that it is self-financing." (federal MP)

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Environmental and Social Concerns

As expected, the discussion of sustainability raised global issues about fossil fuels and the international Kyoto Protocol to reduce greenhouse gas emissions, revealing economics standpoints held by the key decision-makers ranging from neo-classical to environmental, stopping just short of ecological economics.

> "we're not going to wean ourselves off fossil fuels quickly any more than we did from sail to steam. But we do need to move, we need to perceive, that there is a way of moving from here to there." (wind turbine manufacturer)

> "You can't go anywhere from North Dakota to the south of New Mexico and not find people boring holes trying to find oil. They are not going to find much. Every stroke of those rods sometimes brings up a thimble full. You add it all together and it is very expensive oil." (wind turbine manufacturer)

> "there are a lot of people who have some really good ideas about how you can manage the issue on a global basis. It is a big technological challenge but it can be done." (CEO, Utility)

> "I can argue that Kyoto is a colossal failure and it's time to move on, for a number of reasons...on the other hand I could call Kyoto a success too, because it has raised the issue on a global basis, and i think it is now to the point where people are acknowledging that this is very serious, and I do believe it is a very serious issue..." (CEO, Utility)

> "it can't be just 'let's mow the island of all the trees' and then when it's done we'll go on to something else. It has to be not just a one-shot deal." (Energy Minister)

> "if you don't have at least a triple bottom line, then you just get bogged down in the economic bottom line. And the economic bottom line is not about who's getting rich, it's about somebody getting richer. If in fact you apply the economic paradigm solely, then you will do whatever makes somebody richest and that may very well be somebody living in Arkansas, and i just fail to see how making somebody rich in Arkansas is of any great benefit to people living in a small island jurisdiction in northeastern Canada." (Green Party candidate)

> "I think all corporations attempt to be socially responsible. They're also accountable to their shareholders and to their customers, and they have to be able to demonstrate to customers that any initiative they're taking, or measure they're taking, benefits the customers. And sometimes there's a disconnect. And I think this may be especially true on PEI, of a distrust of corporations. People think they're bad. So whatever they're trying to do is not the best way to go." (regulator)

RESEARCH AND DEVELOPMENT

Turning to strategies, the related issues of research, development and human resources arose with some passion and frustration from participants with a range of concerns:

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Competitiveness

"we need to start looking down the road, and making more tougher decisions today, paying a little more today, so that in the future we will be competitive....we have to make decisions not based on today's numbers but on projections of the future." (Energy Minister)

Lack of resources

"There are so many things we could be doing that we're being stymied because we don't have enough human or financial resources. But we are making a difference." (Energy Minister)

"We don't have any expertise here...it's a huge problem because we don't have critical mass and we don't have any major resources being steered at it right now. So again we are at the mercy of offshore, off-island companies, individuals and the like who our government is hoping to recruit, to come and be a part of this. We don't have anybody really in the game for us who knows what's going on." (university professor)

"We have no researchers that seem to be interested in the issues, we don't have any either social researchers or researchers in the faculty of science that are doing anything in this area, so we've been really sidelined through it all." (university professor)

"In terms of expertise, I think there is a great deal of consumption expertise and very little conservation expertise. If I open the Yellow Pages, I'll find umpteen burner technicians and parts suppliers for consumption, but PEI is still very much taking a back seat when it comes to things like Energuide for houses and retrofits. It's beginning to happen more now but it's been a slow process. Education, we do have very skilled people on the Island who have architectural, planning and design skills that pertain to sustainable housing, sustainable building, and we've had large projects like the Advanced House projects, and you have things like, of course, the ill-fated Ark Project. Many of the people associated with those projects and other energy self-sufficiency and sustainability issues are still around on PEI, ...and most of them would find it very hard to make a living because of the fact that ...most buildings on PEI, the system of plunking something down parallel to whatever road you happen to live on, and then throwing in a bit more insulation than you were used to putting in, in 1970... there are R-2000 contractors, there are people with experience of passive solar, but there's not...you cannot open the Yellow Pages and look under "energy efficient homes" and instantly find a range of contractors who are going to help you out." (Green Party candidate)

Sustainability

"[re cogeneration]...do you spend more energy getting the energy than you are saving? You have to do those measurements, for sure." (Energy Minister)

"I think there is no one simple solution for us to provide sustainability for our farmers and help them rebuild their land...we have to work with the agriculture community to come up with revenue generating crops for the non-potato year." (Energy Minister)

"we talk very little about reducing demand. That to me would be the low-hanging fruit, would be the 20% that we could save by just making a concerted effort to use less electricity." (federal government representative)

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ENERGY POLICY

How Energy Policy is Determined

Participants were asked how energy policy is determined, what organizations were involved, who the players were that feed into energy policy, and how the various interests were expressed. The Energy Minister responded as follows:

> "Energy policy was primarily developed internally by government. What direction do we want to take? We went out and had public meetings in the summer of 2003, and it was primarily dealing with electricity at that time. We asked Islanders two questions at those meetings: do you think we should be pursuing a policy of more renewables? and if so, what role do you want government to play? An overwhelming majority said, 'yes, we think we should be doing more in renewables, and we think the government should take the lead'... while the initial policy was developed internally in government, it's evolving, whether it's with groups, Environmental Advisory Council, which is made up of ten ordinary islanders who meet monthly, and they advise me."

When asked if an Environmental Advisory Council was a common structure in other jurisdictions or was it peculiar to PEI, the Minister replied:

> "No this is PEI. I don't think anyone else, I'm not aware of any other jurisdiction that has a formal body that's appointed by Executive Council. There's government support on it, but the people who sit on that council do not get a per diem, an honorarium."

The CEO of Maritime Electric Ltd. commented as follows:

> "...it's government's role to affect public policy. I personally might not agree with all of their public policy decisions but in the context that they make them, that have an influence on electricity, if we knew they were considering it and we had concerns about it, we would probably express those concerns. But if they were ignored, or they explained to us why they were carrying on anyway, and they carry on, we just say fine, we raised the issue, it's government's mandate to make those kinds of decisions, they made them. Our role is to implement them....In the absence of government policy, it is tough for us to go to the regulator and explain why we want to spend a whole bunch of money to encourage customers to use less of our product. There's just no economic basis within the existing regulatory framework. This [new legislation] creates that framework so it allows us to go ahead and do it. That's an example of a reasonable policy I can see coming out of it."

The Climate Change Co-ordinator commented as follows about public policy:

> "Here I see it mainly as government-driven. That is one thing that is very different about being in an island jurisdiction. Politics is a very different realm, and having lived in different places, the access that islanders have here to their elected officials is phenomenal. To have lived even in New Brunswick, small population, and in Ontario, there would be no way I could call up the Minister's office and say, 'Can I do an interview?' That just wouldn't happen, nor would just the average citizen who had a concern about X run into somebody in the mall or at Tim Horton's and say, 'I have concerns about this, I'd like to talk about this.' That doesn't happen in other jurisdictions."

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> "The feedback that people here have with respect to government policy is extraordinary. A lot of policies here in government don't proceed without substantial consultation and that doesn't happen in other jurisdictions. Even this Framework policy, substantial consultation, and not just, like a lot of governments do, they put out a discussion paper and they kind of circulate it out there, and "if you want to comment on it, then go ahead, but we are not necessarily going to have a lot of forums where we are going to do that in person." Here that is not the case. I don't know that there is a whole lot of policy that gets developed here without public consultation. In that respect, it is not just government driven. It's definitely driven by concerns of the public, but it has to be pushed forward by government. It has to be led by government. And that is because the people expect it to be led here by government." (Climate change co-ordinator)

The Wind Power Debate

The specific issue of wind power is a contested area that stimulates passionate responses from some participants. The following comment suggests a history of poorly structured political space and operational problems within the institution of energy in PEI, despite charismatic leadership by government. It also suggests that more independent public debate and greater energy literacy is needed to drive a renewal process that addresses fossil fuel consumption and sustainability:

> "...the provincial government is out speaking quite vocally about progressive ideas and renewable energy, but they don't have any significant resources to turn to it, so they are hoping that companies from offshore are coming to invest in wind power parks, for instance here on the island, etc., but they don't have any way really to guide that other than encouraging, saying, "come here, put up turbines for us". And the major energy consumers, both individuals and companies, don't seem to have a whole lot of ability to force the public issues either. So we seem to be spinning our wheels in some ways with a government that wants to be proactive but doesn't have the handles to control it, with an electric company that doesn't want to be proactive and wants to be as stationary as they possibly can because of the structure that they're working in, and a public that is all over the place. So I think we've got some big challenges in getting people together on this." (university professor)

The next comment describes the social milieu in which wind power is being introduced, as assessed by a government representative. This passage connects to the material presented in Chapter 3 on community empowerment which suggests that such concerns are politically significant, especially if ignored. This points again to the need for energy literacy and a strategy to engage the public to move forward on sustainability principles. The comment also suggests that, even though islandness may influence social capital and a connection to primal nature in rural areas that support wind power, successful implementation of wind power will hinge on economic benefits to the agricultural sector which controls the land.

> "There's always been some concern with wind energy as far as destroying the aesthetics of the Island--'the views and the vistas'--people being able to drive along a coastal drive and their view not being obscured by a turbine. That has

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> certainly been expressed in a number of locations, Malpeque for example. Major outcry there when the Irvings [food processing plant] wanted to put up wind turbines in that area. So much so, it's to the power of the community that it hasn't happened (despite the fact that as a province, and most of the province here who are very supportive of wind energy), [it] still did not happen, due to the outcry of the community. Very powerful movement there, and they were concerned about aesthetics. They were concerned about noise, which I think is a bit of a myth about the turbines themselves, but it was enough of a concern to them that they certainly voiced that. There are some concerns about people being able to put up turbines wherever, and that's not the reality either. With the legislation and the policy, it's designed so that that doesn't happen. So those are ones that I've heard.....
>
> But for the most part, people here on the island, are very supportive of renewable energy.... A lot of areas in the U.S., where you want to put up these turbines, are coastal, a lot of valuable properties in that area, and people feel that it would devalue their property to be in the vicinity of a wind turbine. Some major opposition there to move forward and that's not what you see here. The farmers see an opportunity to rent out their land and get some additional revenue, which is due to how the policy has been developed. It has been developed in order to elicit cooperation from people like farmers and so now they are all clamouring to say, 'here's my land, put a wind turbine on it, I'll rent it out to you', because they're going to see royalties from it." (climate change co-ordinator)

The status quo in the energy institution is clearly entrenched, apparent from the dance between the government and the utility, illustrating monopoly as a social concept of the small-scale syndrome, as outlined in Chapter 3:

> "Maritime Electric is not a generator. We generated more electricity last year from our little wind farm at North Cape than they generated here. They are a transmission and distribution system. They buy the power from New Brunswick and they get it into our homes and our businesses. They, at least to date, have had no desire in getting involved in base load generation. They talked about it a couple of years ago with natural gas, and were prepared if the province or the federal government built a pipeline to bring natural gas, they would put up a generating plant, but in terms of renewable energy, they aren't doing anything." (Energy Minister)
>
> "The question of whether or not there should be wind generation on PEI, if it's at a premium, is not one that Maritime Electric should make. Maritime Electric's mandate by legislation is to provide electricity at least cost. To go beyond that is social policy and that's the role of government. So we said we were pleased when government introduced the *Renewable Energy Act* because it clarified for us government's position, and that's their role, to make that public policy kind of decision. Having made that, it paved the way for us now to become more active in it. So people say, 'you've changed your tune'. We haven't changed our tune. We've always said...somebody's finally listened to us... and they've made the kinds of decisions that we said had to be made before we could proceed. And we said, 'fine, we'll do it.'" (CEO, Utility)
>
> "I think that Maritime Electric has a mandate to offer power that's reliable at a low cost. They don't have any significant interest in leading the way in terms of renewable energy, and they're mandated that way because of the way that their monopoly in the Island is set up, having to go through IRAC for most everything in

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> terms of decisions. So they haven't any ability to make significant decisions. They don't have an interest in making novel decisions, so they're on one side of the coin..." (university professor)

Participants were asked to comment on any contested areas between energy interests affecting Prince Edward Island, and how being an island may have shielded or exposed islanders to these issues. The CEO of IRAC responded as follows about the price of future wind energy supplies:

> "The biggest contested issue to me remains cost. People want power at a reasonable price. There are those who certainly believe that we should have more on-Island wind generation. There are moves in that area. The question becomes, 'who pays for that generation?' Do you allow the private sector in and allow them to develop it and sell it to whomever they can for whatever price they can get for it? Do we either make a buck or lose a buck? Do you have the public sector develop that and then sell it to the utility? Do they compete with the private sector to sell it to the utility? Do they have the opportunity to say, 'No, we're going to have a higher rate for wind'?
>
> ...We've gone through a process where the government itself is setting the return for wind which is higher than the traditional price that would be paid by the utility for other sources of power. That's only 15% of their requirements, though. If you move to 30, 40, 50, 100%, then Prince Edward Islanders will be paying significantly more for it, certainly in the short term. No one knows what may happen in terms of oil prices, but in the short term would be paying more for the electricity that they use. The question is, 'Will they do that or will they revolt?' If they don't do it, will they cut back?...which could be a good thing....
>
> ...so, to me, come back to the central point—the main issue relates to individuals, to the customers, the consumers, to the general public of Prince Edward Island as to what they want for their island, what types of mix of generation they want, and whether or not they are willing to pay to contribute towards achieving the objective of a more sustainable operation. And then the other is we have to see the maturing of the technology. There is no doubt that the wind turbines of today are significantly better than the wind turbines of 20 years ago. Whether in 5 years time they'll be even better than they are today, there's been talk of tidal power, any of those types of things, but the technology again is somewhat untested, I guess is the best way to describe it, and there are certainly costs associated with developing that and getting it up and operational." (regulator)

Cost and Beyond

The cost of electricity was also perceived by the Energy Minister to be potentially a contested area affecting consumers:

> "There is nothing I can do for $2.50 a day that provides me with the convenience that electricity does". So it is still too cheap."

Ownership of transmission facilities by the monopoly utility was considered contestable by a wind turbine manufacturer who felt that the current system is a barrier to more equitable access and to self-sufficiency in electricity:

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"With electricity, because of its nature, a distributed system, Maritime Electric have a monopoly. They have it protected under the *Electric Power Act*, that they have a monopoly to sell, and meter and distribute electricity. Because it's always been considered as a dark science that nobody understands. It's considered as something that's beyond the common people, so that has been the norm...

...the next step is even more profound. That will be, that if you have a nice piece of land in windy place, you can put up that turbine on your land, and you can sell that power to your mother or your sister or your cousin who lives 10 miles away. For these you can say, "I'm making this, I'm putting it into the system", and they're going to draw it out the other end...

...the next step that really makes energy self-sufficiency work is that all of this awful overhead stuff, which we have to look at, for goodness sakes, we still should be allowed to use it. There is no common fare. The common fare on the highway is, we pay for the use of the highways in one tax or another, and once in a while in a toll. It's all basically a toll. So every mile you drive on a highway anywhere, you're paying for it one way or another through some kind of taxation or fee for its use. That should apply to electric lines as well." (wind turbine manufacturer)

SUMMARY

This Chapter provides a compilation of perceptions by key decision-makers in the energy institution of Prince Edward Island as an exploratory device. As a means to identify social patterns in a qualitative manner, selected responses to interview questions and patterns of discourse were structured into clusters around main topics of islandness, sustainability, research and development, and energy policy.

Ease of administration, communications, networking, enhanced jurisdiction and identity were seen to be advantages of islandness, while insularity, globalization effects and vulnerability were seen to be disadvantages of islandness. Responses to questions about sustainability suggested an insularity or lack of awareness or interest in the topic. There seemed to be greater awareness of global environmental concerns due to more exposure to the climate change debate, although many of the responses were inconclusive. Concerns were heightened over lack of human and material resources for research and development in the Island which could result in reduced economic competitiveness ahead. The Chapter concludes with a section outlining how energy policy is determined, what some critics perceive, contested areas in the wind power debate, and perceptions about the future beyond cost considerations which remain paramount for some members of the energy institution.

Analysis of the case materials follows in Chapter 7, including a synthesis with the theoretical and applied background introduced in Chapters 2 and 3 of this document.

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THE INFLUENCE OF ISLANDNESS ON ENERGY POLICY AND ELECTRICITY SUPPLY

PART IV

SYNTHESIS

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CHAPTER SEVEN: DISCUSSION

INTRODUCTION

The topic of electricity is dominated by economic and technological issues so much that holistic examination of the energy institution which produces electricity is often overlooked. Granted, it is difficult to overlook the cost of electricity in small islands, which is generally higher for a complex array of reasons relating to economies of scale, remoteness, supply mode and technological effects. A brief analysis of the ways economic costs are calculated points to a need to use 'soft' multi-criteria methods as well as conventional methods to better assess cost in decision-making for small islands. Issues of rate regulation and cost distribution dominate the agenda as well: most utilities in small islands are regulated monopolies with guaranteed rates of return allowed and major shares held by government and a few private shareholders. The small isolated market suggests that such monopolies are natural.

It has been the aim of this research to examine the influence of 'islandness' on energy policy decisions. The findings suggests that the reasons for high electricity costs in islands also extend to political and jurisdictional influences which are conditioned by islandness. Energy policy decisions are made by people in the energy institution who bring to the table a host of influences across a full spectrum of economic, social, political and environmental processes. While this Chapter discusses the findings, the conclusions are reserved for Chapter 8, along with recommendations for policy and further research.

'ISLANDNESS' CONCEPTS

It is evident from the case study and previous Chapters that 'islandness' nuances the institutional context of electricity in specific ways. In this research, islandness is described as a cluster of intervening variables associated with islands including but not limited to remoteness, holistic complexity, diversity, adaptive capability and scale challenges.

Islandness also can provide a heuristic device for mentally organizing and analyzing social, political, environmental and economic processes on islands. In the Prince Edward Island (PEI) case, for example, selected events and processes from the case material, such as installation of the under-sea transmission cable and the adoption of the *Renewable Energy Act*, provide a canvas to illustrate concepts such as remoteness, complexity and adaptive capability. Using relevant theory from island studies, ecology and environmental sociology, perceptions of

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interviewees are examined for socially-constructed influences arising from islandness that can shape these events and processes.

ECONOMIC AND POLITICAL IMPACTS OF SMALL SCALE

In Chapter 2 (p. 17), data from the Caribbean was used to illustrate how electricity cost tends to increase per kilowatt hour as population size decreases in small islands. Outside investment was believed necessary in many small island territories due to the lack of capacity by local investors to provide sufficient capital for electricity operations and infrastructure. In addition, small scale was indicated as a disadvantage in obtaining debt and equity financing at preferred rates in small islands (Chap. 2, p. 23). Potential investors in small islands are informed that the island's economy is less diversified, therefore presenting more risk to their loaned capital, which raises its price. This risk is due to the free-market premise that a narrower economic base will provide fewer opportunities to earn profit, and that the limited number of investors available to invest in the island economy at any one time will result in a restriction on the liquidity of their capital. It is believed that if individual investors loan their capital at a fixed price to the electricity institution, they may not be able to quickly recover their capital to move it elsewhere to gain even higher profits.

Given the perceived bias towards large scale, capital markets in metropolitan centres elsewhere may not necessarily provide an acceptable solution for small islands needing long-term commitment of financial resources. The problem is to raise capital at reasonable rates to invest in what should be a very reliable investment, namely fixed, long-term renewable or conventional infrastructure such as a transmission cable or a wind farm. Some islands or island regions such as the Eastern Caribbean have found ways to create regional investment banking infrastructure and capital funds within their own local island economies. This may be able to stem, or at least reduce, the permanent outward flow of productive capital from the region. This could allow local investors such as island or municipal governments, pension funds, insurance or ethical funds, co-operatives and islanders at home and abroad to take an equity interest in the island's infrastructure at a reliable rate of return over a longer term.

An 'islandness' lens reveals support for local institutions that is often very robust due to a local sense of identity and ownership of both the problem and the solution. Support for green certificates at a premium in PEI is evidence that some islanders may be very willing to financially support long-term development of renewable energy in their respective islands through appropriate financial instruments.

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Having control over banking and taxation can be a major advantage for small islands when power of jurisdiction is effectively deployed (Baldacchino & Milne 2000, p. 231-2). Where this is not possible, another strategy is to negotiate for financial assistance from an outside source such as private industry, an international organization or a federal government. Prince Edward Island has provincial jurisdiction over energy policy but very limited jurisdiction over banking and financial institutions which are a federal matter. In 1977, the Island's transmission cables were first constructed with 50% federal funding and a further 25% federal loan as a result of its participation in the Canadian Federation (ACOA, 2005). It was successfully argued using identity politics that residents of PEI should not pay more than the market rate for electricity than other Canadians simply because they lived on an island.

But in the current political climate, there are vulnerabilities involved in negotiations and wrangling between governments and corporations over ownership and equity throughout the country; moreover, federal financial support can appear or disappear equally rapidly. A case in point is the recent reversal of federal plans to fund a new cable due to a change in government at the national level. Although unsuccessful in this round, small-scale attributes nuanced by islandness will no doubt be tried again to influence political machinations, perhaps obtaining cooperation from more powerful regional players, including the private sector. Not only economic arguments but identity politics and power of jurisdiction of small islands can play an important role in outcomes of critical decisions.

An economic lens with regional, national or even global scope may focus just on the cost of the service over a payback period compared to other sources of electricity, precluding further possibilities. By contrast, a holistic lens nuanced by islandness can argue values of long-term self-sufficiency and independence alongside energy diversity and good business. As well, the commitment that would be required of larger players to the additional cost of carrying a small island is often portrayed as minuscule. Larger players might even find the lure of an island as a laboratory sufficient incentive to undertake a tidy pilot project as a visible means to justify their involvement in environmental mitigation programs.

In an economic sense, the most critical factors affecting cable development are cost and time. Actual cost, a broader concept than economic cost, represents items such as labour, materials, energy, measurable environmental inputs, social impacts, unmeasurable environmental impacts, and much more. Time represents processes over the life of the infrastructure such as lobbying, assessment, financing, approval, design, manufacture, installation, operation, maintenance, repair, demolition, disposal and recycling. Since the 1970s, the Prince Edward Island economy has been very dependent upon its electricity cables. The almost

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complete dependence on imported power from neighbouring provinces has been mitigated recently with local wind power and the on-island augmentation of spare generating capacity by a new 50 MW diesel turbine.

With the further addition of sufficient cable capacity to reach large markets on the mainland, the Island could export its abundant wind power rather than being overly dependent upon imported fossil-fired or nuclear electricity from neighbouring regions. Further economic as well as environmental benefits could be leveraged from investment by islanders in alternative technology such as wind, along with the increased wealth and economic space made possible from the sale of new energy to new markets that want a clean, renewable source.

REMOTENESS AND ISLANDNESS

Complex islands like Montreal, Manhattan, Hong Kong and Singapore are not presently considered remote, yet at one time they were. Remoteness, a negative connotation reminiscent of colonial empire, has often been associated with islandness. Modern definitions of remoteness include: "located far away; distant in space; hidden away; secluded; distant in time; faint; slight; far removed in connection or relevance; operating or controlled from a distance" (*www.thefreedictionary.com*). By some measures, Prince Edward Island may still be considered remote from the central Canadian urban heartland. In relation to global metropoles, the island territory is strategically situated between, but considerably distant from, powerful urban centres of North America and Europe. It lies in the southern Gulf of St. Lawrence adjoining the north-western Atlantic Ocean, roughly halfway between the equator and the north pole. With respect to electricity, Prince Edward Island is not remote.

Geographical locators are significant only in relation to how long it takes to transfer goods and services between points. Flows such as fuel supplies, transport, acid rain, food and durable goods may take some time to be exchanged between islands and elsewhere, but intangibles such as knowledge, financial transactions, jurisdiction, and access to expertise flow instantaneously via satellite media. Therefore, whether an island is influenced by remoteness is determined by what is flowing and how long it takes. Remoteness and separation are thus relational and qualitative, becoming socially-constructed at the point at which choices are made as to what flows take place and how. As illustrated in Chapter 2, the quality of remoteness is poorly captured by distance, a geographic variable.

Electricity is a flow that can be generated in large central facilities and transmitted over long distances, especially where islands are adjacent to continental or large grid systems, but it can also be efficiently generated at the same site or near where it is consumed, employing locally available energy

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sources from the sun, waste, biomass, wind, seawater and the earth. Policy-making guides these choices.

In the 1970s, policy-makers chose to augment Prince Edward Island's small amount of locally-generated hydroelectricity with two very expensive under-sea transmission cables which import high-voltage electricity from neighbouring provinces on the mainland, backed up by the North American continental electricity grid. As a result, PEI can no longer be considered remote in terms of electricity. Geography presents a range of choices, sometimes limited, for obtaining energy. In PEI's case, remoteness could be more easily overcome using technology: the distance and condition of the sea-bottom enabled cable construction. By contrast, the islands of Saba and St. Eustatius, mentioned in Chapter 2, experience greater implications from remoteness as they are currently not being considered for the regional cable project underway, primarily due to geographic reasons, but perhaps also due to political and economic reasons related to small scale.

The influence of remoteness as a component of islandness on electricity production was illustrated in Chapter 2. In a brief exploratory study of nine Caribbean islands, relative distance was not significantly related to relative electricity cost. From a purely economics standpoint, and requiring further study, the cost of cabling may outweigh the current cost of shipping fuel to these small islands. In weighing options for islands in terms of mitigating remoteness, methods for generating electricity should strongly consider not only high voltage transmission but alternative forms of energy that support diversity and security as well as long term cost saving. With appropriate development objectives, environmental vigilance and good management, it may be possible for these smaller, more remote islands to achieve a more sustainable outcome through capitalizing on their limited and costly supply of thermal electricity and using alternative forms of energy such as solar or geothermal.

INSULARITY AND SUSTAINABILITY

Elsewhere in the world, the notion of sustainable development evokes many responses, arising as it does from broad and even opposing interpretations of humanity's place on the planet and the relationships between humanity and nature (Hopwood *et al.*, 2005). Several constructs of sustainable development have been discussed in Chapter 3 of this study. Although it is a mantra for change everywhere, the sustainability agenda has become, in many respects, a complex, urban political agenda.

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Insularity

Whether Prince Edward Island's new *Renewable Energy Act* will actually result in a tangible, more balanced and diversified approach to development of healthier energy resources and related industries on the Island remains to be seen. If the reactions of key decision-makers mean anything, 'insularity', a construct of islandness used to describe a particular attitude, may have an influence on the outcome.

The responses by key executives to the questions about progress towards sustainability and international benchmarks or indicators were null or negative. The respondents for the most part exhibited a certain stiffness or lack of interest in a topic which they perhaps considered unnecessarily complex and external to the local circumstance. Although interaction or familiarity with the interviewer may have influenced the respondents, perhaps the topic presumed a threat to the sustainability of their current operations; or possibly the lukewarm response was caused by a lack of literacy on sustainability issues. A combination of these tendencies is captured in the term 'insularity'. It seems that once participants had warmed further to the topic, their discourse largely featured economics references such as "trade-off"; "barrier to our economic viability"; "society has to drive the policy process in terms of being interested or willing to pay for it"; and, "final cost that really keeps utilities away from setting significant benchmarks".

Questions leading further into the implications of the more familiar Kyoto Accord discussions brought a more energetic response, and discourse opened up to include some social and environmental concerns, again expressed in a range of economic and managerial terms familiar to the participants. These concerns were expressed in the phrases, "wean ourselves off fossil fuels"; "very expensive oil"; "how you can manage the issue on a global basis"; "people are acknowledging that this is very serious"; "not just a one-shot deal"; "a triple bottom line", "all corporations attempt to be socially responsible"; "a distrust of corporations".

As the conversations progressed, one executive expressed concern about the impact of globalization in the phrase:

> "we've become so sort of inundated with information and expertise from others that in some respects islanders have lost a bit of that entrepreneurial edge".

It is precisely the impact of that "information and expertise from others" that makes the islandness lens more and more difficult to focus, especially in Prince Edward Island, a medium-sized island province of a large, developed country, and which is connected by a bridge to the mainland.

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Innovation and Problem Solving

In earlier Chapters, it was reported that islands are small, complex societies that function as total, not simple, societies. Chapter 3 outlined a series of social dynamics in the workplaces of island societies related to small scale, such as totality, monopoly, intimacy, role multiplicity and role enlargement. It was also reported in Chapter 3 that ecologists believe that societies become increasingly complex as they engage in problem-solving, producing a broader range of functions within society and its institutions. Islands become more complex by necessity as open societies which interact and exchange people and resources with the rest of the world for their survival. As human resources, island workers are often required to perform most of the same functions and solve the same problems, albeit at a smaller scale, as larger societies. This may be especially true in small island states and autonomous sub-national jurisdictions which are part of larger, asymmetric federations. Prince Edward Island exhibits the tendency 'to have one of everything' and reproduces a sophisticated array of skills and competencies within its small workforce, required for its interaction in the complex Canadian milieu.

However, complexity may not necessarily be seen as a desired goal in small island societies. The small island society, always close to its limitations, is unable to develop the rampant complexity and diversity sometimes found in large federal or multinational organizations and bureaucracies with more resources:

> "There are so many things we could be doing that we're being stymied because we don't have enough human or financial resources. But we are making a difference."

As a result, solutions from large top-down organizations designed for dedicated or specialized work environments are rarely applicable to the island in their entirety without modification for scale and ranking on a priority list. Nevertheless, this does not preclude the achievement of significant advances in small societies which may exhibit holistic vision, broad scope and desire for innovation. These societies may also be prone to many false starts led by well-intentioned individuals which may even advance to legislation or expression as an ideal, even if these measures cannot or will not become executed for want of resources.

One participant's opinion recognizes the paradox and seems to suggest that islanders are not early adopters of capital-intensive solutions:

> "I don't think there is anything about insularity that specifically mitigates against having diverse solutions, but certainly it does tend to mitigate against innovation because people have got into the habit of looking to capital intensive solutions outside, and I think we are still fixated on looking at capital intensive solutions and

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> those tend to happen elsewhere. That's perhaps why we don't adopt them as early as some jurisdictions do."

If true, it can be argued that island workers are continually selective about solutions from elsewhere, cutting through red tape more easily, keeping basic processes simple and efficient by a clear sense of what works in a holistic manner, not necessarily what is needed in some distant head office. The adaptation of complex solutions is likened to the ecological principle of adaptive capacity introduced in Chapter 3, where local bottom-up processes are quicker and more innovative, and broader top-down processes are slower and more incremental. With fewer resources due to scale, and greater risk of instability, island institutions may be aware of innovative solutions but less willing to implement them. Changes leading to more complexity, which may produce more diversity in a larger milieu, may occur at an excessive price for a small-scale society.

RESEARCH AND DEVELOPMENT

Despite the perceived lack of interest in sustainability, by contrast, comments were passionate about the need for research and development in renewable energy on PEI. This enthusiasm appears to be driven primarily by an economic interest based on future export revenues for wind power and royalties on land used to host turbines. There is evidence that broad public consultation was carried out in the formation of PEI's energy policy, and that support for renewable energy is shared broadly in the society, according to interviews of government representatives. On the other hand, frustration was expressed by several interviewees that there was little planned in the way of obtaining expertise and financial resources to implement the positive changes contemplated under the new *Renewable Energy Act*. These comments may also reflect the perception that outside expertise is more desirable than local knowledge, networking and experience.

The proclamation of the progressive *Renewable Energy Act* by Prince Edward Island, the first jurisdiction in Canada to do so, offers another energy-related example to which the heuristic device of 'islandness' can be applied. Economic space has been created for new suppliers of energy, challenging the legislated monopoly position long held by Maritime Electric Ltd. under Section 2.1 of the *Electric Power Act*. Under this new legislation, no one is prohibited from supplying themselves with renewable energy, although they must become a public utility if they sell to others. Net metering paves the way for islanders to construct their own decentralized energy systems in which energy is generated close to or at the user's site. The political landscape has been altered too: this legislation has stiff enforcement provisions. Utilities and commercial developers must comply with the legislation or face penalties.

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By incorporating renewable sources of energy such as wind, and allowing more than one public utility, the stated aim of this legislation is to encourage a more balanced and diversified approach to development of healthier energy resources and related industries on the island. That small Prince Edward Island, of all the jurisdictions in Canada, was able to pass this progressive energy legislation first is very positive but not surprising given the island's jurisdictional capacity and ability to mobilize its social capital (Baldacchino & Greenwood, 1998; Baldacchino & Milne, 2000), a process described anecdotally in Chapter 6.

With respect to this new *Act*, because the government appropriates any "environmental attributes", that is, environmental premiums or internationally-recognized tradable credits, the strategic importance of these tradable credits remains to be seen. Whether there will be sufficient incentive for private developers to choose PEI when they invest may depend on the characteristics of any trading schemes that filter down from national and global levels and how nimbly the PEI government manages the Island's opportunity to compete. At the time of writing, no new private wind energy partners had been announced beyond the Province's own Energy Corporation. The government has created potential for innovation while it still has the status quo for a fall back position that also appeals to some constituents.

A critic of the government's double-edged strategy to control wind power development made the following comment:

> We don't have any expertise here...it's a huge problem because we don't have critical mass and we don't have any major resources being steered at it right now. So again we are at the mercy of offshore, off-island companies, individuals and the like who our government is hoping to recruit, to come and be a part of this. We don't have anybody really in the game for us who knows what's going on.

Whether pragmatic islanders actually prefer the less risky route, squelching innovation and resisting change is questionable. Rather than jumping blindly into complexity, there may be mechanisms at work which parallel the ecological concepts of avoiding complexity and preventing collapse from Chapter 3. Using an islandness lens, one can see an island workforce as being selective in resisting the onslaught of change for change sake rather than not having innovative tendencies. It depends upon what socially-constructed standards are being used.

By understanding and enhancing its processes of diversification and complexity, an island society holds the key to its adaptive capacity, or development at an appropriate rate for the scale. Further exploration of these concepts and longitudinal studies are needed. It seems, however, that an island which has become more complex by diversifying its organizations and institutions at an appropriate rate of development for the island will have more ways to mitigate the effects of small scale and remoteness, based on the premise

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that remoteness, complexity and diversity are all social constructs which are amenable to change.

ON BECOMING ENERGY LITERATE

Examining the electricity sector for the influence of the 'islandness' condition presents a formidable challenge when electricity consumption is made the focus of the inquiry. While patterns of electricity use are related to patterns of daily life and to people's habits and expectations, electricity is still an invisible commodity to consumers, especially when it is performing well. Also, electricity produced on mainlands cannot be differentiated from that produced on islands. In a social sense, whether the electricity comes from fossil fuel or wind makes no difference at all to consumers, but having more reliable high-voltage electricity has profound impacts, which are heightened in the sensitive ecological environments of islands.

Electricity without limits has changed indoor climates, outdoor lighting and lifestyles for people and domesticated animals, for example. The results of electrification in turn have created secondary and tertiary effects on wildlife, landscapes, the marine environment and climate. Streetlights have created 24-hour days in many parking lots, with extensive pavement and other built environments concentrating rainwater run-off and changing species habitat, leading to extinction of many endemic species and replacement by pests. People have become accustomed to being indoors, experiencing only a few degrees difference in air temperature year round, perhaps limiting their weather tolerance and reducing the importance they attach to understanding and protecting the natural environment. As mastery over the environment becomes complete, the economic growth paradigm strengthens. At the same time, electricity has had enormous impact on where and when people can travel, live and work, placing great pressure on the supply of electricity to expand.

In an environmental sense, much less is really known about human impacts and the effects of human-nature interaction, for example, that have arisen on the Strait bottom since the existing high voltage cables were installed in 1977. Little is known or likely to be known about permanent effects of installing the Borden-West Royalty transmission spine on the Island, or whether cutting the forest to make room for it has lowered the water table, increased the bee population or indirectly exacerbated asthma levels in PEI. These questions about the long-term effects of human intervention on island environments are important directions for further research and education programs.

In terms of the global atmosphere, having cables has exported the problem of fossil fuel emissions from PEI to another part of the region where the electricity

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is generated, out-of-sight and out-of-mind. This regional mode of generation, however, still contributes to acid rain which falls on PEI. Representations still need to be made to regional and national governments and mainland energy corporations benefiting from subsidized fossil and nuclear fuel about developing cleaner, more sustainable energy. As well, in many islands there is great need to mitigate environmental damages that have already occurred and those yet to come. The emissions from burning dirty coal and oil extend well offshore to the rest of the planet.

This analysis questions whether policy-makers in the energy institution demonstrate a holistic understanding of the environmental limitations on islands. Did comments by interview participants reflect on the electricity system itself as a consumer of natural goods and services or as a producer of toxic substances into the environment? The interviewees seemed to be well aware of politics, commenting primarily on the impacts on humans in dealing with minority concerns about the effects of wind turbines on bird migration. Recalling the wide gap in approach between neo-classical and institutional economics that was described in Chapter 2, the prevailing economic paradigm does not support attempts to reduce production. Such a paradigm, which drives expansionist ideas and production for the least cost, is anthropocentric and dominates the natural environment instead of being part of it and accepting its limits. Therefore, putting the onus on individual consumers rather than on the energy institution to reduce the environmental impacts of consumption would be the path of least resistance for these policy-makers to take. Although these executives shifted responsibility to consumers as predicted, they left the door open slightly for environmental strategies beyond strictly an individual consumer solution:

> "we talk very little about reducing demand. That to me would be the low-hanging fruit, would be the 20% that we could save by just making a concerted effort to use less electricity...the first thing I would attack would be the demand side...the second step would be, I think the wind energy is the correct policy...." (federal government representative)

> "We don't just want to be able to produce as much green electricity as we can, because at some point we just can't produce any more. Our resource in that way is tapped, just like it's becoming tapped as far as oil. But our demand is still out of control. We want to produce a good sustainable electricity and we want people to use less of it." (climate change co-ordinator)

Therefore, appreciating the institutional impacts of the production system on the environment, in addition to the individual consumer dimensions, is an important component of energy literacy for policy makers and utility managers. Awareness of environmental impacts of energy production is a critical first step in developing a comprehensive energy policy that protects the environment for future sustainability.

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SUMMARY

In summary, this Chapter synthesizes material from the preceding chapters into an overall understanding that islandness nuances the institutional context and thus the production of electricity in specific ways. In the first section, islandness was described as a cluster of intervening variables associated with islands including, but not limited to, scale challenges, remoteness, holistic complexity, diversity, and adaptive capability. Islandness also provides a heuristic device for mentally organizing and analyzing social, political, environmental and economic processes on islands, applied particularly in the discussion to the topics of cable construction and the Prince Edward Island *Renewable Energy Act.*

Small scale, bounded by islandness, impacts economic costs in a variety of ways, from diseconomies of scale in technology to reduced access to lower cost financing. However, there may also be advantages associated with small scale in non-economic areas where political and jurisdictional strategies can leverage islandness to achieve policy goals.

Insularity and complexity were described as components of islandness that may influence decision-making. These concepts were illustrated in relation to the *Renewable Energy Act.*

With overall sustainability goals in mind, research and development strategies described in the Prince Edward Island case study were analyzed, along with questions about openness to innovation. The knowledge of policy-makers about sustainability and environmental themes from an institutional perspective was analyzed. From this study, it appears that awareness of long-term impacts of energy production on the environment may be compromised by a deep commitment on the part of energy institution managers to support existing systems. There is a tendency to overlook institutional responsibility in favour of emphasizing consumer responsibility for reducing consumption of electricity, despite its essential commodity nature and its invisibility to consumers.

Overall conclusions and recommendations from the study are presented in Chapter 8.

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CHAPTER EIGHT: CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

> Where the champions of the traditional Prince Edward Island saw integrity, tradition, stoic endurance, and a sense of place, planners found apathy, narrow parochialism, and petty jealousies—an oligarchic society, dominated by potato dealers, fish buyers, merchants, and other elites, that was suspicious of new ideas and new people.
>
> Of course, both were right.
>
> --E. MacDonald (2000, p. 339)

Vestiges of traditional Prince Edward Island society, glimpsed in MacDonald's description of the 1970s Development Plan era, along with the legacy of modernization in subsequent decades, continue to shape institutions in PEI today. As explored in the previous chapters, access to energy remains a complex challenge to solve on many fronts as island citizens enter a new cycle of world oil price volatility and insecurity of supply.

This research into the socially-constructed aspects of the energy institution on islands, as purposefully sampled in the information-rich case of Prince Edward Island and supported by data from other islands, notably in the Caribbean, concludes that:

The resort to negotiated political solutions is particularly suited to small islands which otherwise, under a market solution, face massive dependency, high elasticity of energy supply as well as obligations to pay excessive energy costs. Electricity costs more per unit to produce on islands with small populations, but it is more difficult to implement reform due to natural monopoly; elite interaction and implicit collusion; and the overwhelming presence of conservative, neo-classical paradigm thinking by island citizens which inhibits energy literacy. Political solutions include outward-looking policies such as equity deals in a federal arrangement or bundling deals across different island jurisdictions in a region. Negotiation rests on an awareness of, and skill in handling, the often under-utilized resourcefulness of jurisdiction, with appropriately mobilized public engagement.

Small island governments have power to set clear and comprehensive energy policy with sustainability targets. It has been illustrated from the literature and the case study that individual leadership and transborder cooperation can make a significant difference in the economic success of small islands through skilful negotiations. In the light of this research, a crucial question arises: How can island governments, electrical utilities and other

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stakeholders provide more diverse and sustainable energy solutions for islanders? The recommendations below identify a series of opportunities for action for small islands.

RECOMMENDATIONS

1. **Use the already high cost of electricity as an incentive to encourage alternative energy technologies.** For island governments and regulators, it is acknowledged that electricity costs more per kWh in smaller islands. As presented in Chapter 2, the cost of electricity, whether it appears in national accounts, on the income statements of electrical utilities, or in the pocketbook of the consumer, is generally higher in small islands for a complex array of reasons. Many of the reasons relate to economies of scale, physical supply and technological effects such as type of fuel and capacity utilization. Significantly, however, reasons for high electricity cost also relate to politics and jurisdiction conditioned by 'islandness', and as such, are subject to influence, managerial strategy or public policy.

The way costs are theorized may eliminate or exaggerate variables that take on more relative importance in the constrained island milieu where costs are harder to measure. Electricity producers have a captive market, generally use heavily subsidized oil (Brown, 1980) and supply an invisible commodity. In Prince Edward Island, executive opinions on electricity costs range from "still too cheap" to "will they revolt?" (see p. 78). Therefore, market signals alone are a poor gauge of what the public wants or needs as far as sustainable electricity is concerned.

The cost of electricity is a loaded term; cost is not just a simple calculation. Further in-depth research is needed to determine the level of consumer tolerance for electricity cost and its relationship to sustainability initiatives. It must be analyzed from multiple viewpoints that take many elements into account. Cost is a key factor that influences the decision of whether to supplement or replace conventional generation with more environmentally sustainable sources of electricity. In many small islands around the world, the already high cost of conventional electricity has opened up possibilities for the implementation of renewable energy options (see p. 3).

For example, the introduction of the *Renewable Energy Act* in PEI requires the public utility to obtain at least 15% of the energy it sells each year from renewable energy sources. By tapping into the abundant wind energy source, which is readily available and environmentally friendly, large wind turbines will provide relatively self-sustaining electrical energy once the initial costs of research, development, construction and transmission are absorbed. Requiring

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the utility to consider longer term investment in wind energy, and providing targets and financial incentives that make the venture initially feasible for the corporation, this legislation demonstrates the use of jurisdiction and cooperation between the government, the public and the utility to achieve sustainability goals in the short term. In the case of PEI, the possibility of exporting wind energy to the continental grid makes the venture even more promising in the long term. Oceanic islands which do not have the stability of a large grid system should seriously investigate emerging alternative energy technologies and decentralized power systems as part of their long-range strategy, and create enabling legislation accordingly.

2. **Provide top level ministerial support for the energy portfolio**. Since politics and jurisdiction figure prominently in energy management, it follows that individual leadership can make a significant difference in small islands. The presence of one or more competent leaders can significantly influence the formation of a sustainable energy policy. A politically astute champion for enlightened ideas in a position of authority within government can accomplish a great deal in a small-scale society with few resources other than social capital and access to needed information. The success of renewable energy initiatives in PEI since the 1970s, culminating in the recent *Renewable Energy Act,* has been shepherded largely through the efforts of a handful of energetic politicians who have garnered the support of their government caucuses and who have used their political savvy in mobilizing social and financial capital from outside sources towards renewable energy within the island. As reported in Chapter 6 (see p. 69), having jurisdiction as a province is a significant advantage for modeling energy initiatives and pilot projects of the federal government. A skilled administration within a small island jurisdiction can often tap networks and hierarchies to implement decisions quickly, overcoming barriers related to complexity (see p. 69).

However, it is not only politicians in government which can provide progressive leadership, but utilities can as well, operating as they do within the mandate they are given by governments. The case of the four public utilities in the northeastern Caribbean co-operating to bring about a cable interconnection between different autonomous territories demonstrates the resourcefulness of jurisdiction brought about by private sector leadership and intergovernmental cooperation (see p. 38). In this example, utilities and sub-national island jurisdictions are working together to achieve regional objectives for the benefit of their populations while cutting their own per capita costs.

A major challenge for national and sub-national small island governments is to overcome parochial suspicion and simply make a commitment to cooperate

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with neighbours. Within small-scale societies where the layers of bureaucracy are shallow, such co-operative arrangements are possible; they are created as a result of skilled negotiations by competent and responsible leaders who know and understand their constituents. Under such conditions, governments can work more quickly and easily to consolidate purchasing power, treating jurisdiction as an economic resource (Baldacchino & Milne 2000, p. 2).

By the same token, policy makers should be fully aware that politics on a small island, conditioned by insularity, can also present major obstacles that can stall enlightened progress. Powerful individuals at the helm are also capable of blocking progressive ideas or making inept decisions, and inequitable or short-sighted agreements between large and small parties can result. An example in hindsight is the hydroelectricity agreement signed in 1969 between Newfoundland and Quebec (see p. 37). Energy policy may be significantly shaped in sub-national jurisdictions such as PEI through its relations with the federal government and national energy policies emanating from Ottawa and elsewhere. If an island government does not present a strong position and exercise its prerogative to further social and non-economic goals with respect to energy, outside partners and monopoly utility firms are more likely to exclusively follow their own economic goals that further erode the island's power of jurisdiction.

3. **Implement clear and comprehensive energy policy with sustainability targets enforced by legislation**. Generally, energy policy within an island needs to be led by government in the best interests of the population at large and for sustainability, based upon wide consultation beyond the utility, and mobilization of island social capital. In doing this, government must still retain control over jurisdiction and set a clear mandate for the utility, as the PEI government has done in the *Renewable Energy Act*. Relationships between small island governments and utilities can range across a broad spectrum between harmony and deep discord over longstanding disagreements. At the same time, island utilities may have much experience and support in local communities, which can be a great resource if properly harnessed, or a significant obstacle to overcome. Governments that obtain the support of the utilities and other stakeholders in achieving island energy policy objectives can go a long way in overcoming disadvantages and developing synergies for competitiveness.

In a small island, such transactions as purchasing and leasing capital equipment may be made in the context of the public sector where advantages of scale in financing may be obtained. Before the new *Renewable Energy Act* was proclaimed, when new generation capacity was being proposed for PEI in 2005, government offered to use its financial leverage to purchase four new small

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turbines which would then be leased back to the utility. These turbines, eventually to be run on biodiesel, could serve as decentralized units to back up demand across the island using a local fuel source. The private electricity corporation, for its own reasons, subsequently chose to follow the status quo and purchased instead one large, centralized thermal unit to use fossil fuel, with approval from the regulator.

Using an island's political clout, government can amend regulations to allow or encourage private companies to add renewable energy installations. Interim incentive programs that allow utilities to achieve sustainability goals extending beyond short-term economic goals may assist in transitioning them to the new mandate. For example, the PEI Energy Corporation, owned by the island government, plays an important role as an incubator in research and development of alternative renewable technologies such as regional biomass systems and wind-hydrogen power.

Electricity, even at the highest price, is still a great bargain which, when treated with intelligence and respect, allows people to accomplish needed services. Improving and upgrading an island's electricity system, even for a price, should ultimately mean safer, more secure and more equitable electricity for all. Government can employ social service policies to enable electricity services for disadvantaged groups rather than interfering with the operation of the utility by subsidizing electricity prices. The caveat is to provide for environmental protection and improvement by helping everyone become better informed and able to speak out on issues that threaten the environment. Such protection is less likely when decisions are made unilaterally or without broad consultation and due regard for sustainability.

In-depth environmental awareness leading to action is required within the energy institution itself, especially on islands where engagement with the public and challenge from activism may have been traditionally limited. The environmental costs of electricity production such as space requirements, fuel spills, heat and waste discharges, and noxious by-products are an issue in the context of small island energy systems which are especially vulnerable in nature.

Energy policy with respect to renewables needs to take such particularities of islandness and alternative local sources of energy into account. For instance, in PEI, when electricity prices rise, the use of wood for fuel increases. Denuding an island of its vegetation to burn for energy beyond its sustainable limits is an alternative far worse than developing electricity based on other technological options available such as hybrid photovoltaic and wind-diesel applications. However, controlled burning of excess biomass may indeed be a renewable solution to deal with by-products of sustainable agriculture and forestry practices

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that have been occurring for centuries. In certain areas, gathering, preparing and burning of wood fuel in the home is also a cultural practice that enhances energy literacy.

4. **Enhance energy literacy and public engagement in energy policy**. A critical step in developing a comprehensive energy policy is ensuring the energy literacy of policy makers as well as consumers. Understanding the economics and technology of energy production is insufficient without a clear appreciation of the institutional and environmental dimensions of electricity in islands. Energy producers and policy-makers are also consumers. At the same time, a strategy that only focuses on cutbacks to consumption by households is incomplete. Strict standards for meeting obligations appropriate for the location must be applied to commercial and industrial sectors as well.

Informed public debate on energy and sustainability may be limited prior to the formation of energy policy. Energy developments are generally announced in the media after the fact; on such an announcement, there may be more focus on the personalities than on the goal achieved. In many small islands, a top-down approach to sector-based technological decisions is often taken without significant public input, resulting in misunderstanding and resistance of advances towards sustainability, possibly laced with party political intrigue. Although much information of an economic nature is available through regulatory bodies, more public debate and ongoing input into energy policy beyond cost is greatly needed. This will not only identify energy needs but traditional knowledge and lived experience of energy practices, important in light of the changing realities of fossil fuel limits.

Community-based energy advisory boards appointed by government can also aid in exchanging important information between the public and government about the energy institution, but only if they can escape partisanship. A more comprehensive viewpoint can be obtained from an island research and educational institution at arms-length from government and the power industry, such as the Institute of Island Studies on Prince Edward Island. A public policy institution such as this can arrange balanced and objective public forums and provide opportunities for frank and open discussion about energy options and sustainability island-wide.

Enlarging the amount of public consultation has potential to educate the media and amplify the effectiveness of alternative energy strategies to increase the energy security of islands. A public utility has a responsibility to make the public aware of what steps it has taken at the institutional level, not only to identify any negative effects of its activities on the environment, but also to mitigate such effects. It must take a leadership role by supporting research and

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development and increasing its communication efforts. Utilities, governments and suppliers in the whole production chain need to demonstrate that they are providing good stewardship at all interrelated levels of the environment through community outreach and stronger support for research and development of alternative energy technologies beyond fossil fuels.

Energy literate consumers have the potential to develop critical understanding of energy systems and take responsibility for reshaping the world (Milne 2003, p. 19). These may include consumers who generate their own electricity. Literate consumers hold the key to the kind of society they want, and policy-makers prefer to represent what they hear from the public rather than to act unilaterally. Comments from the case study indicated that local expertise from previous alternative energy projects and the knowledge base at the local university were not being effectively utilized (see p. 74). The involvement of educational institutions is particularly important to generate pilot projects and synergies from academic research and student learning opportunities. It is hoped that the new Canadian Wind Energy Institute in North Cape, PEI (see p. 62) will benefit from its location in a holistic island society. It plans to showcase a variety of approaches to small wind energy applications and foster energy literacy in local communities throughout Canada. This can only happen if disciplinary silos and structural barriers between competing institutions and government facilities are removed and communication is encouraged to flow more freely. Mobilizing social capital for innovation involves not just obtaining feedback from community-based advisory boards but also engaging in a broadly-based public debate that produces critical analysis and innovation.

By genuinely promoting alternative energy technologies and strategies, engaging the public in innovation and critical analysis, and ensuring the training and development of a workforce to support these technologies, policy-makers can increase the long-term security and sustainability of an island's energy supply. Such strategies, which can be driven for business reasons as well as for sustainability, include the use of both large-scale as well as micro-scale distributed generation. The installation and use of renewable energy technology in public areas such as national and provincial parks, municipalities, hospitals and schools, as well as in manufacturing and industrial sites, even in individual homes, can be implicitly promoted throughout all programs. The advantages of a strong social network and short communication chains in islands can facilitate implementation of well-designed energy programs through various commercial sectors and educational programs to accomplish sustainability goals.

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SUGGESTIONS FOR FURTHER RESEARCH

The broad, interdisciplinary scope of this research has, by necessity, limited its depth in many areas. This is particularly an issue in Chapters 2 and 3 on context where threads from economics, ecology and environmental sociology offer a multitude of ideas about nature-society interaction for further exploration in island studies. Due to limited familiarity with some of the disciplines from which material is drawn that forms the basis for this work, there may be a superficial grasp of important concepts. However, it is hoped that such a trade-off has advanced the starting point rather than provided a definitive end to exploring socially-constructed aspects of the energy institution in small islands.

Suggestions for further research arise in many areas, including the following:

- A list of literature on global energy markets and financing is noted (see p. 13), along with various strategies and structures for enhancing alternatives. Further research on appropriate instruments and incentives for supporting alternative energy in small islands is required, since much of this literature applies to large-scale societies.
- Regarding costing, it is important to include non-economic variables based on the specific configuration in each particular island. This study recommends that alternative costing approaches such as multi-criteria decision methods (MCDM) be used in addition to conventional costing methods. Based on a limited review of the literature regarding such methods, the study of wind energy options on the island of Salina in the Mediterranean (see p. 15) illustrates how MCDM may be used. Further research in the economics and environmental literature on costing methods may yield more robust approaches.
- The quantitative data on the impacts of scale and distance on electricity costs (see p. 16-19) are exploratory for the purpose of this Masters research. Without reducing the illustrative value of the findings in this study, use of a larger population is recommended if confirming the results for statistical purposes.
- The case study in Chapters 5 and 6 has provided a limited snapshot of the Prince Edward Island energy institution at one point in time. Also beyond the scope of this research, longitudinal studies beginning in the era of fluctuating oil prices in the 1970s and 1980s might yield further insights on development of the economic and political relationships with outside governments to show how this has affected the energy institution in PEI.

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SUMMARY

This exploratory research began with an intuitive awareness of alternative forms of energy in the natural environment of islands; questions about transformation, exchange and consumption of electrical energy in islands; and curiosity about the relationships among the energy institution, the consumer and energy technology, and their impacts upon the environment.

The long research process has resulted in the knowledge that the provision of electricity indeed is different in small islands. Compared to mainlands, electricity costs more, but it is also more challenging to implement power reform in a small-scale island society where there is natural monopoly; elite interaction and implicit collusion; and overwhelming presence of conservative, neo-classical paradigm thinking by island citizens which inhibits energy literacy. Negotiated political solutions such as those with other jurisdictions offer the most promise for overcoming massive dependency, high elasticity of energy supply as well as obligations to pay excessive energy costs as a result of market solutions.

Recommendations for policy-makers include use of the already high cost of electricity as an incentive to encourage alternative energy technologies; provision of top level ministerial support for the energy portfolio in island governments; implementation of clear and comprehensive energy policy with sustainability targets enforced by legislation; and enhancement of energy literacy and public engagement through broadly-based public debate, critical analysis and truly innovative energy policy.

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THE INFLUENCE OF ISLANDNESS ON ENERGY POLICY AND ELECTRICITY SUPPLY

APPENDICES

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APPENDICES

A: Permissions

Tab 1: Research Ethics Board Certificate

Tab 2: Interview Consent Form

Tab 3:

Tab 4: Sample Letter to Interview Participants

B: Raw Quantitative Data

Tab 1: Electricity Cost per kWh in Selected Caribbean Islands

Tab 2: Selected US Electric Industry Summary Statistics by State, 2003

C: Raw Interview Data

Tab 1: Respondent 1

Tab 2: Respondent 2

Tab 3: Respondent 3

Tab 4: Respondent 4

Tab 5: Respondent 5

Tab 6: Respondent 6

Tab 7: Respondent 7

Tab 8: Respondent 8

D: Data Coding

Tab 1: Categorization of Interview Questions and Topics

Tab 2: Coding of Interview Data

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THE INFLUENCE OF ISLANDNESS ON ENERGY POLICY AND ELECTRICITY SUPPLY

APPENDIX A

PERMISSIONS

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[Name]
[Address]

Dear [ ] :

Re: Graduate Research Project: Electricity and Sustainability in Islands

As you are aware, I am conducting research on issues surrounding the provision of electricity in Prince Edward Island as requirement for a Master's thesis in Island Studies. The aim of this study is to better understand the degree of impact that power of jurisdiction makes upon progress towards sustainability goals. My research will explore relationships between governments, electrical utilities and private sector markets on islands as each pursues sustainability goals within certain constraints.

My guiding questions are, "Can effective use of jurisdiction be a positive strategy to attain sustainability goals even in the presence of privatization?" and "Can enlightened control by island governments result in more diverse, resilient and sustainable energy solutions for islanders at reasonable cost while still attracting private investment?".

Background

With a worldwide energy challenge on the horizon, the problem of energy supply in small islands demands more than superficial examination. Global pressures have introduced competition and reform in the electricity industry worldwide but electricity is still provided in many small islands by vertically integrated monopolies with major shares held by government with some private investment. It seems that what drives the power industry in large economies does not necessarily translate successfully at small scale. While it is a desired goal to provide electricity at least cost, externalities in natural and social environments of critical importance to small islands are generally excluded from these calculations.

Electrical utilities have well-defined inputs and outputs, technological interest and state-approved means to obtain considerable physical assets and financial resources. As a consequence, there may be more cooperation and less formal regulation on small islands where information flows are easier and faster, and where industry players and government or regulatory officials are well-known to each other. On the other hand, and for the same reason, the social dynamics and tendencies towards the particular and traditional could have the opposite effect, entrenching a regime of over-regulation. How the aims and

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objectives of regulation are carried out is determined by what occurs in the political context. Using their jurisdictional capacity, islands can choose to initiate, continue or change the way their utilities are regulated.

Energy utilities have traditionally been left to pursue whatever course of action they choose to obtain the allowable level of profitability. A mechanism is needed to ensure that the interests of all stakeholders are included. Corporate social responsibility may be imposed by regulatory authorities who seek least cost options, but who is ensuring clean production and innovation? What is the impact of energy reform on sustainability? How can small islands obtain the benefits of energy reform without losing control over the keys to sustainability? It is a major challenge, therefore, to capture sustainability principles within conventional energy costs.

Invitation to Participate in Case Study

This research uses the case study method and purposeful sampling to obtain data. As a knowledgeable executive in the energy sector, you have been selected to participate in this research project as a key informant. I would be honoured if you would allow me to interview you on this topic. It will take approximately one hour of uninterrupted time. The interview will consist of six open-ended questions to obtain factual information about energy policy, sustainability issues, stakeholder interests and contested areas. You may signify your willingness to participate by completing and signing a copy of the attached consent form. Participation is voluntary and you are free to withdraw from the project at any time.

I will endeavour to protect confidentiality and anonymity within the limits of my academic requirements. Interview notes and tapes will be controlled and kept in a private area accessed only by myself until destroyed after five years or at the conclusion of any required storage period. Within the final report, participants will be identified by pseudonym to reduce any unintended risk of revealing politically sensitive information. However, you should be aware that participants may be identified by stating their names in the acknowledgements of the final report, and by identifying information in the data.

If you are in agreement, I will be in contact with your office to set up a time at your convenience. If you have any immediate questions or concerns about this request in the meantime, do not hesitate to contact me at [redacted] or [redacted].

Thank you very much for your positive consideration of this request.

Sincerely yours,

E. Kathy Stuart
Graduate Student
Master of Arts (Island Studies)
University of Prince Edward Island

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Research Project: **Jurisdictional Leverage and the Supply of Electricity in Sub-National Island Territories**

Researcher: **E. Kathy Stuart, Graduate Student**
University of Prince Edward Island

Consent Form

_____ I have read and understand the material in the information letter.

_____ I understand my participation is voluntary.

_____ I have the freedom to withdraw at any time.

_____ I have the freedom not to answer any question.

_____ I understand that the information will be confidential within the limits of the law.

_____ I understand I can keep a copy of the signed and dated consent form.

_____ I understand that I can contact the UPEI Research Ethics Board at [redacted], or by e-mail at [redacted] if I have any concerns about the ethical conduct of this study.

_____ I understand that there will be no compensation for participating in the project other than satisfaction of contributing to knowledge and providing valued assistance to the educational process.

Signature _____ Date_____

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THE INFLUENCE OF ISLANDNESS ON ENERGY POLICY AND ELECTRICITY SUPPLY

APPENDIX B

RAW QUANTITATIVE DATA

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Table A1. Electricity Cost per KWH in Selected Caribbean Islands

Sources: Annual Reports (2003) from ANGLEC; Barbados Light & Power; BELCO Holdings Ltd.; Caribbean Utilities Company Ltd.;GRENLEC; LUCELEC; NV GEBE.

Island/Territory	Anguilla		St Maarten		Saba		St Eustatius		Cayman Islands		Grenada		Barbados		St. Lucia		Bermuda	
Year ending	Dec 31/03		Dec 31/03		Dec 31/03		Dec 31/03		Apr 30/04		Dec 31/02		Dec 31/03		Dec 31/03		Dec 31/03	
	EC$'000	%	ANG'000	%	ANG'000	%	ANG'000	%	US$'000		EC$'000	%	Barb$'000	%	EC$'000	%	Ber$'000	%
Total assets																		
Other assets	0	0%	1,285	1%	0	0%	0	0%	246,910	86%	87,051	59%	633,194	88%	252,887	85%	718	0%
Current assets	9,174	20%	54,508	31%	719	22%	245	6%	5,761	2%	3,715	3%	168	0%	1,983	1%	53,665	20%
Long term investments	0	0%	0		0		0		26,534	9%	30,303	21%	67,625	9%	33,396	11%	0	0%
Inventories	3,863	8%	12,004	7%	0	0%	0	0%	4,077	1%	17,003	12%	0	0%	610	0%	16,837	6%
Property, plant and equipment	32,417	71%	106,234	61%	2576	78%	3648	94%	2,818	1%	9,432	6%	21,946	3%	10,122	3%	201,059	74%
Total assets	45,454	100%	174,031	99%	3,295	100%	3,893	100%	286,100	100%	147,504	100%	722,933	100%	298,998	100%	272,279	100%
Total liabilities																		
Current liabilities	6,150		-4,091		15190		15752		23,180		28,190		56,081		35,742		20,823	
Long-term debt	11,519		32,176		0		329		133,521		42,384		87,682		75,927		13,000	
Other	2,380		27,000		620		760		2,956		10,513		84,728		64,352		1,998	
Total liabilities	20,049	44%	55,085	32%	15,810	480%	16,841	433%	159,657	56%	81,087	55%	228,491	32%	176,021	59%	35,821	13%
Shareholders' equity	25,405	56%	118,946	68%	-12515	-380%	-12948	-333%	126,443	44%	66,417	45%	494,442	68%	122,977	41%	236,458	87%
Total equity and liabilities	45,454	100%	174,031	100%	3,295	100%	3,893	100%	286,100	100%	147,504	100%	722,933	100%	298,998	100%	272,279	100%
Gross operating revenue	31,665		84,940		2,183		3192		106,643		77,072		272,490		150,813		148,009	
Cost of operating revenue																		
Fuel cost	12,412	55%	29,055	100%	1,118	100%	1588	100%	6,431	9%	26,271	51%	124,964	60%	45,669	50%	70,183	64%
Other	902	4%	0	0%		0%		0%	12,508	18%	2,969	6%	52,447	25%	0	0%	17,918	16%
Generation	4,498	20%	9	0%		0%		0%	50,176	70%	13,138	26%	21,849	10%	22,550	24%	5,342	5%
Transmission and distribution	4,651	21%	0	0%		0%		0%	2,166	3%	8,828	17%	9,557	5%	23,886	26%	15,599	14%
Total cost of operating revenue	22,463	100%	29,064	100%	1,118	100%	1,588	100%	71,281	100%	51,206	100%	208,817	100%	92,105	100%	109,042	100%
		82%		38%		37%		40%		81%		74%		80%		70%		83%
Gross margin	9,202		55,876		1,065		1,604		35,362		25,866		63,673		58,208		38,967	
Operating expenses																		
Administration	3,526		32,780		1,522		1869		8,658		8,870		26,098		20,447		17,781	
Other	378		10,235		396		515		2,189		3,317		12,501		270		63	
Total operating expenses	3,904	14%	43,015	57%	1,918	63%	2,384	59%	10,847	12%	12,187	18%	38,599	15%	20,717	16%	17,844	14%
Cost of finance	1,134	4%	2,696	4%	15	0%	40	1%	5,433	6%	3,774	5%	3,786	1%	7,344	6%	625	0%
Taxes	0	0%	1,018	1%	0	0%	0	0%	0	0%	2,387	3%	10,552	4%	10,530	8%	3,229	2%
Total costs	27,501	87%	75,793	89%	3,051	140%	4,012	126%	87,561	82%	69,554	90%	261,754	96%	130,696	87%	130,740	88%
Net profit	4,164		9,147		-868		-820		19,082		7,518		10,736		19,617		17,269	
Earnings per share	0.36								0.77		0.40		0.74		1.67		3.39	
Dividends per share	0.10								0.66		0.40		0.00		1.14		1.54	
Return on equity - ROE (%)	16.4%		7.7%		6.9%		6.3%		15.1%		11.3%		2.2%		10.5%		4.4%	
Total kWh Produced per Year [1]	58,387,932		275,060,000						429,282,000		153,302,672		900,500,000		298,980,000		664,355,564	
Total Cost per kWh [2]	0.47		0.28		0.50 [4]		0.45 [4]		0.20		0.45		0.29		0.44		0.20	
Total Cost per kWh ($US) [3]	0.18		0.16		0.28		0.25		0.20		0.17		0.15		0.16		0.20	

[1] includes losses and electricity used in generation
[2] Total costs divided by Total kWh produced
[3] converted to US dollars as at July 5, 2003
[4] source: NV GEBE spokesperson quoted in *St. Maarten Herald* Vol. 14 No. 273

Table A2. Selected US Electric Industry Summary Statistics by State, 2003

State	Primary Fuel Source*	Net Generation (MWh)*	All Sectors Average Retail Cents per KWh*	All Sectors Avg Retail Price US$ per KWh	Population** July 2004
Alabama	Coal	137,354,771	6.08	0.06	4,530,182
Alaska	Gas	6,526,717	10.99	0.11	655,435
Arizona	Coal	104,564,143	7.45	0.07	5,743,834
Arkansas	Coal	51,927,632	5.67	0.06	2,752,629
California	Gas	194,780,355	11.45	0.11	35,893,799
Colorado	Coal	47,869,492	6.95	0.07	4,601,403
Connecticut	Nuclear	32,633,408	10.26	0.10	3,503,604
Delaware	Coal	7,855,553	7.53	0.08	830,364
District of Columbia	Petroleum	36,487	7.47	0.07	553,523
Florida	Gas	218,117,928	8.16	0.08	17,397,161
Georgia	Coal	126,812,715	6.58	0.07	8,829,383
Hawaii	Petroleum	11,410,403	15.70	0.16	1,262,840
Idaho	Hydro	10,863,039	4.97	0.05	1,393,262
Illinois	Coal	191,957,778	6.80	0.07	12,713,634
Indiana	Coal	127,770,396	5.58	0.06	6,237,569
Iowa	Coal	43,248,189	6.40	0.06	2,954,451
Kansas	Coal	46,782,659	6.37	0.06	2,735,502
Kentucky	Coal	94,529,947	4.63	0.05	4,145,922
Louisiana	Gas	98,172,309	7.13	0.07	4,515,770
Maine	Gas	19,098,885	9.69	0.10	1,317,253
Maryland	Coal	52,052,770	7.15	0.07	5,558,058
Massachusetts	Gas	47,500,483	10.77	0.11	6,416,505
Michigan	Coal	118,487,269	6.94	0.07	10,112,620
Minnesota	Coal	52,364,127	6.24	0.06	5,100,958
Mississippi	Coal	43,662,613	7.00	0.07	2,902,966
Missouri	Coal	87,632,910	6.07	0.06	5,754,618
Montana	Coal	26,788,768	6.40	0.06	926,865
Nebraska	Coal	32,008,709	5.70	0.06	1,747,214
Nevada	Coal	37,667,435	8.56	0.09	2,334,771
New Hampshire	Nuclear	23,875,787	11.37	0.11	1,299,500
New Jersey	Nuclear	55,882,342	10.29	0.10	8,698,879
New Mexico	Coal	32,940,361	7.10	0.07	1,903,289
New York	Nuclear	137,964,794	12.55	0.13	19,227,088
North Carolina	Coal	126,329,957	6.97	0.07	8,541,221
North Dakota	Coal	29,936,106	5.69	0.06	634,366
Ohio	Coal	148,345,905	6.89	0.07	11,459,011
Oklahoma	Coal	60,729,560	6.50	0.07	3,523,553
Oregon	Hydro	51,381,278	6.21	0.06	3,594,586
Pennsylvania	Coal	214,658,501	8.00	0.08	12,406,292
Rhode Island	Gas	4,939,420	10.96	0.11	1,080,632
South Carolina	Nuclear	97,939,929	6.22	0.06	4,198,068
South Dakota	Coal	7,510,214	6.44	0.06	770,883
Tennessee	Coal	97,594,542	6.14	0.06	5,900,962
Texas	Gas	390,299,132	7.95	0.08	22,490,022
Utah	Coal	38,211,977	5.69	0.06	2,389,039
Vermont	Nuclear	5,470,379	11.02	0.11	621,394
Virginia	Coal	78,900,040	6.43	0.06	7,459,827
Washington	Hydro	102,165,052	5.80	0.06	6,203,788
West Virginia	Coal	89,749,562	5.13	0.05	1,815,354
Wisconsin	Coal	60,444,933	6.88	0.07	5,509,026
Wyoming	Coal	44,807,604	4.98	0.05	506,529

*Source: Energy Information Administration (EIA).
http://tonto.eia.doe.gov/ftproot/electricity/stateprofiles/03st_profiles/062903.pdf [27 June 2006]

** "Population by State" Fact Monster. http://www.factmonster.com/ipka/A0004986.html [04 Jul. 2006]

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THE INFLUENCE OF ISLANDNESS ON ENERGY POLICY AND ELECTRICITY SUPPLY

APPENDIX C

RAW INTERVIEW DATA

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Interviewer: E. Kathy Stuart

Interviewee: Respondent #1

Contact Information:

Location:

Date:
Time:

Do you see any specific advantages or disadvantages in pursuing an energy policy from a small island?

I think there are a number of advantages, especially if you're pursuing new and different types, like a renewable energy strategy, that we are doing here in our province. We're able to get, as you said in your letter, make contact with, decision makers can talk a lot quicker and easier here in a small jurisdiction. We have a better feel for what the residents of the province want. The ability to be part of it. That I think is a major advantage in doing something. The biggest disadvantage is, because of our size, for us to maximize our wind in this province, we have to export almost all of it. The utility just can't handle large amounts of wind energy. It's great on a day like today because the turbines are turning, but yesterday this time, there was dead calm. Trying to backstop a renewable resource like wind is extremely difficult when you have a small load.

In terms of jurisdiction and national energy policy, are there any concerns in terms of being small, being a small jurisdiction, in that, when you go to conferences and you are the energy minister of PEI, are there any issues about smallness that affect you as an energy minister in a group of national energy ministers?

Most jurisdictions, regardless of the portfolio, whether it's energy, health, education, whatever, will sort of look at a small place like PEI and say, almost dismiss you because what do you know about it. What we have been trying to do in last number of years, and I think with a reasonable amount of success, is to use our size as an advantage instead of a disadvantage, that we can do things province-wide that other jurisdictions can't do. They know that for us to have a target of 15% of our electricity from renewables by 2010, the next closest is somebody who wants to have 5% by 2015. We will reach our 15% target by the end of this calendar year, or very close to it, so we'll be there 4 years ahead of schedule. So when we look at interconnection agreements, when we look at getting the public onside, at legislation of where developments should go, we are trying to portray that PEI may be the best place to go and model these types of initiatives where, in the federal government's eyes,

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you don't have to spend very much money, relatively speaking, to get a good project. We announced last fall, and I'm cautiously optimistic that the new government will honour it, a $60 million transmission upgrade where we will be putting a new cable in the Confederation Bridge. We will be upgrading our onland transmission capabilities. That's all scalable. So, we've already had other jurisdictions look at us and say, "ok, how are you dealing with a large scale wind project, relatively speaking, getting it into your transmission lines, getting it into the system", and they are looking at us and saying "maybe we can learn from PEI". That's what we are trying to do. What has traditionally been a negative, I think we are slowly but surely turning it into a positive.

Does the Province use any international benchmarks or indicators to measure progress towards sustainability in the production of electricity? What are they? To what extent has the PEI Energy Framework helped to consolidate progress towards sustainability?

I don't know of any international benchmarks other than percentage of electricity from renewable sources. I think when we look at the largest, and I keep referring to wind because that's the focus for our energy generation right now, (although we have a couple of other renewable sources in the works, and hopefully in the next few months will become public). You take a country like Germany, which has by far the largest amount of wind energy in the world, and that's 6% of their total energy, now we can't compare. That's apples and oranges in a big way. But we look at what are people doing in small jurisdictions, and we looked at an island in northern Germany, called the island of Feemarn. A company in Germany that had done some developments there, they took us to visit this island. You drove over, in this case a one km causeway/bridge, and the three main industries of the island are agriculture, fisheries and tourism. It's about a quarter the size of PEI, has about 33,000 residents and they had 133 turbines on that little island. But what they were doing, is the residents of the island owned it. And so, when we, the German company we were dealing with, they didn't take us there by accident. They had been to PEI a number of times. And you drove on the island, and you looked around, and said ok, "am I coming off the Confederation Bridge or am I coming off the bridge in Germany?" From that we learned the ownership model, we learned about how you get people to accept it. Now on a little island like that, to have that many turbines, how do they do it? Not cause riots with people screaming about NIMBY. And it was the ownership model that was the key. They had them in designated areas, they couldn't put one on every corner, they had to be where the best wind, where transmission lines, were. So we looked at those kinds of things. The premier and I visited a small town in Austria called Gushing, and they produce all of their electricity, and all of their heating, the central heating system, from a wood chip plant. The town was dying, the young people were moving away, there was no major industry there, it was off the beaten track, very close to Hungarian Border, and they said, "what can we do?". And here's how much money we are exporting out of our region just for energy. So they've got a coop that produces the woodchips for

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them, and here is this little town of 4,000 that's producing all of their electricity and all of their heat from a local fuel source.

So we look at those examples and say, ok, that's what we need to focus on. We can't be the great big 1,000 MW project that they have in Quebec. So we need to keep it that's in a size that suits PEI and what can we use as fuel sources for our energy that are locally produced? I had a guy approach me and say we should put in a wood pellet generating station using wood pellets as the fuel. I said, "where will I get those", and he said, all kinds from mainland. Well, what difference if I'm buying oil from the mainland or wood pellets from the mainland. We need to focus on what we can produce here.

When I was mentioning benchmarks for sustainability, I was thinking more in terms of sustainability benchmarks. The measurement of ecological footprint.

The environmental side of the Department has looked at our ecological footprint, and without having an official measurement, I know that our climate change coordinator is measuring all of the things we are doing on the energy side to show that what are we doing, what is it costing us to produce the goods and services that we produce, and the big one for us right now is the energy side. But if we can produce, for example, biodiesel, that our farmers are growing the crops, and using the biodiesel in their tractors for the next year, then that's going to again reduce the ecological cost for us. In terms of benchmarks, I'm not aware of any that we're using.

I was aware of a company in Bornholm in the Baltic Sea at one of largest cement plants in Europe, a lot of the excess heat from that plant is used to reduce their electricity requirements and it also produces heat for greenhouses. There are a lot of efficiencies to be gained through industrial processes although I don't think we are considered an industrial island.

No, but we do have some manufacturing. You take our French fry plants for example, that require a certain amount of heat. I know that cogeneration is a buzzword, that people are saying "well, everything should have cogen". I had an interesting conversation with a developer who is looking at a biomass and wood waste electrical generating plant and I asked him if he was going into cogen. He said, "if there was an obvious business close that could use the heat 12 months of the year, yes we would consider it, but there's very few", even greenhouses, they don't need as much heat in the summertime. One obvious one for us would be a wood drying kiln. But do you spend more energy getting the energy than you are saving. You have to do those measurements, that's for sure.

If you were to implement all the changes you see are needed for future sustainability, what would they be and how would you go about it? What are barriers to implementation?

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That is a projection into future, given current plans, if you were to go beyond what you are doing...

We have been focusing primarily on electrical generation with wind. Some other forms like with wood waste and biomass, again electrical generation. An area I would like to see us do more on the energy side would be the transportation and the heating side. Electricity is only 13% of our energy use in the province, so if we were 100% renewable, 100% produced in PEI, it is still only 13% of our energy needs. The area that I would like to do more on is the developing of fuels, whether it's biodiesel or ethanol, even though I know the cost to produce them today is not economical. The use of pellets as a fuel source, or barley or wheat, and a guy showed me a burner that he built himself that burns barley. That's products we can produce here. In order to do that, I think government is going to have to make the decision that we're prepared to subsidize the production costs until the costs become competitive. The challenge that we have right now is that when people look at biodiesel, for example, and they say "we can produce it here and we can use locally grown crops, but the cost of conventional fossil fuel diesel is still cheaper than the bio. That's this year. But what about in 5 years time or in 15 years time. And I think we need to start looking down the road, and making more tougher decisions today, paying a little more today, so that in the future we will be competitive. Our price that we announced on electricity is 7.75 cents per kwh. Some people looked at that and said that's way too high, nuclear power is cheaper than that, yes it is, but according to the senior member of management of Maritime Electric said, our 7.75 will soon be the cheapest power they buy. Our fuel costs never change in wind, so we have to make decisions not based on today's numbers but on projections in the future.

I think that's an area that the public are prepared to accept, simply because when I spoke to a Rotary Club two weeks ago, and I said "if I had asked you a year ago what you would think if you were paying $1.05 a litre for gas, and I'm sure most of you would say, there's no way, I'll buy a smaller car, I'll cut back on my driving", well here we are a year later and nothing is changed except that we spend a month with $1.35 a litre. People seem to be getting used to high cost. Well, if we are going to pay a high cost, we should be producing it here and have the economic benefits here.

How do you get people to believe what you want them to do?

The biggest influence on people obviously is their pocketbook. And if it's going to cost me more, and I'm going to have to do something about that, will I cut back? Will I use less electricity? In the electricity side of it, our cost here is a little more than half Europe, but our consumption per capita is almost double. And they're not, you know I've been to Europe many times, they're not in the dark. They don't have their thermostats down to zero. They're just saying we're going to take the steps, we are not going to leave the computer on all day. So I think it's a process that people have to evolve into. But I've found since I came into this Department 2.5 years

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ago, the change in attitude in islanders is that they're now prepared, "if I'm going to have to pay a high price, then I want it to be produced here. I'm prepared." They see the price of all their energy going up and all the benefits going across the Confederation bridge. Well, maybe if we started producing things here. I have communities fighting over wind farms. "Put it in my area. Put it in my area." We're looking at a biomass generating plant. When we announced our program last fall to do energy retrofits instead of giving out a rebate for home heating, some of my colleagues thought we were going to get hammered because people were looking for that cheque in the mail. We didn't. People weren't screaming at us. We had 1,500 homes who did a retrofit. We had 150 pellet stoves installed as alternative heating systems. People are now looking at it and saying "I am going to". This is not a blip, so we are going to look at what we can do. They are looking to government to provide leadership and say, "you have to help us".

How does the province define sustainability?

We have 23 members of caucus, and I'm going to use those as defining government. If you asked us all Individually, you'd probably end up with 24 or 25 different definitions of sustainability. My personal definition is that using products that we produce here, and can produce here, it's not a one-shot deal. I've got an appointment pending to have barley tested, and barley pellets tested in NB for BTU value. What can we use that our farmers can produce? We have our people in forestry are looking at what we can use as a fuel source to generate heat, electricity, biogas, but it can't be just "let's mow the island of all the trees and then when it's done we'll go on to something else". It has to be not just a one-shot deal. In my mind it's something we produce here and can for the foreseeable future.

One of the concerns is with agriculture being fairly intensive and the degradation of land, and air and water, those things that don't cost anything now being used up. Just looking for how the Province deals with that, expansion...?

The most pressure put on our natural resources, whether it's our land and our water, obviously comes from potatoes. In a three-year rotation, which we've legislated, and I'd say 95% of farmers are following a 3-year rotation or more, the challenge for farmers is that "I get no net income in 2 out of my 3 years on my land". So for us, if I can go to a farmer and say, "instead of you getting $80 a ton for your barley, which is what you got last fall, if I can give you $140 a ton and use it as a fuel source. If I could take your grass, that's the third year of your rotation, where right now you get nothing for it, you mow it down and get to plow it back into the ground and get some benefits for organic matter, if I can take some of that grass and put it into pellets, and use it as a fuel source and pay you for that crop, or you can grow canola instead of barley, and produce as an energy crop", that takes the pressure off the potato year. And I think there is no one simple solution for us to provide sustainability for our farmers and help them rebuild their land, and there is some land that really needs to be

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rebuilt. Then we have to work with the agriculture community to come up with revenue generating crops in the non-potato year. And the obvious one for us would be energy because we need the energy here. And if we try producing a commodity, like right now, barley is nothing more than a commodity. I am a dairy farmer, I am not buying barley from an island farmer at $50 a ton more than I can get it from western Canada. But if I can buy it as an Energy Minister, and use the barley to produce energy, then that benefits all of us.

You don't see energy costs go down?

Right today the BTU value of, the research that I've been able to do, the BTU value of products like wood pellets or barley per BTU is cheaper than oil. The issue that we have, is that right now, whether it's home heating or the use of oil to produce energy, electricity or thermal heat, we're set up to use oil. So the capital, the infrastructure is there for fossil fuels, it's not there for other crops. So how do we get from A to B? Government has to work, I had a conversation this morning with the federal environment minister—she called just to touch base with all her provincial colleagues—she is hoping to be here next week to meet with me—that's the kind of thing I want to talk to her about. We're prepared as a province to, percentage wise, to convert, whether its our electrical generation, our heating for buildings, commercial buildings, we'll convert a couple of schools over to barley heaters, but we need some help with the capital to get the infrastructure in place. And I think if we can set that process in motion that allows people to make that conversion, when my oil furnace needs to be replaced, and they have a certain life span, if there's a biomass, a renewable source, a pellet furnace that's available locally, and the pellets are here, then maybe I'll convert to a pellet furnace, but it's not going to happen in the next year or two years. It is going to be a long process.

Everything that is visible is geared for the automobile and people build their homes along highways. People live out in the country instead of together in smaller, more efficient clusters, and so there is a lot that has to happen to people's thinking around alternatives and using other sources of energy that don't necessarily play out the way fossil fuels do...

Fossil fuels are still cheaper. Electricity is cheap. When people tell me, "are you going to change your light bulbs?" And I had one lady tell me, "my light bill is about $75 per month. There is nothing I can do for $2.50 a day that provides me with the convenience that electricity does". So it is still too cheap. When gas was $1.35 a litre, we did a survey. We went to the four major entrances to the city and we did it morning and night for a couple of days. 70% of the vehicles that came through those checkpoints, and everyone was the same, had one person in them. So, is it government's responsibility to say, you should be looking at carpooling? If you are going to live in the country, and I know friends in Montreal, Toronto, Calgary, that live right in the city, take a whole lot longer to get to

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work than if you live 20 miles outside of Charlottetown. But are there things people can do? Yes there are, but they need to do them. The transit system. People are still using it, but not nearly as many as you see in larger cities.

How is our energy policy determined? We have an energy policy but what are the organizations, what are the players that feed into energy policy? How are the various interests expressed?

Energy policy was primarily developed internally by government. What direction do we want to take? We went out and had public meetings in the summer of 2003, and it was primarily dealing with electricity at that time. We asked Islanders two questions at those meetings: do you think we should be pursuing a policy of more renewables? and if so, what role do you want government to play? An overwhelming majority said yes, we think we should be doing more in renewables, and we think the government should take the lead. Our policy, while it has been developed internally, has been twofold. One is that the production of as much energy using renewable resources, energy sources produced in PEI. That's on the production side. On the other side, we have legislated that the utility is supposed to come in with a demand side management plan It was supposed to have been last fall, but our legislation wasn't proclaimed, so it will be this fall. We've got a climate change coordinator, we're working with nonprofit organizations to try and come up with plans, we have campaigns to try to encourage people to use less energy. It's more of a combination. While the initial policy was developed internally in government, it's evolving, whether it's with groups, Environmental Advisory Council, which is made up of ten ordinary islanders who meet monthly, and they advise me.

So this Environmental Advisory Council, is it a common structure in other jurisdictions, or is this peculiar to PEI?

No this is PEI. I don't think anyone else, I'm not aware of any other jurisdiction that has a formal body that's appointed by Executive Council. There's government support on it, but the people who sit on that council do not get a per diem, an honorarium.

What input do communities have into the creation of energy policy? What has been the impact? How might this change?

They held public hearings and submitted a report to me with 40 some recommendations on pesticides. They did one last year on construction/demolition sites. We're meeting tonight or next week. They take specific issues and then will go to the public and they'll do reports.

There was an energy-specific report in, you said 2000?

2003. We had public hearings with a facilitator—it wasn't hearings, it was public meetings across the province, government sponsored, it wasn't the EAC that did it. At that time Energy was in the Department of

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Development & Technology, and they hired a facilitator who went to public meetings.

Is this the first initiative of that sort?

That was our first movement into the energy field that we actually sought public input. In 2001, when we put up the first phase 1 of our wind farm in North Cape, we offered packages of green energy, where people could sign up and pay extra for it, and it was fully subscribed. That was five years ago.

What is the relationship with IRAC and with Maritime Electric? They have their own initiatives and so on in the energy field?

IRAC has no initiatives. IRAC's role as a regulator is that, in the energy side, they set the price based on a number of factors. Maritime Electric applies for a rate increase. They have to go in and justify it. If someone, any individual or government, wants to intervene, you're allowed to do that, and at the end of the day, IRAC decides whether the rate increase is justified or not. Maritime Electric has its own agenda. Their mandate by law is to make sure that the lights are on. As a private company, they have to make sure that they get a return on investment and make a profit for their shareholders. We allow under legislation that they can have a certain percentage, I think it's up to 10% profit or return on investments. There's not the incentive for them to look at new sources of generation.

So generation would be the primary way that it would affect sustainability, in terms of pollution, or processes that may or may not be good for the environment, as opposed to distribution which would be fairly passive on the environment.

Maritime Electric is not a generator. We generated more electricity last year from our little wind farm at North Cape than they generated here. They're a transmission and distribution system. They buy the power from New Brunswick and they get it into our homes and our businesses. They, at least to date, have had no desire in getting involved in base load generation. They talked about it a couple of years ago with natural gas, and were prepared if the province or the federal government built a pipeline to bring natural gas, they would put up a generating plant, but in terms of renewable energy, they aren't doing anything.

How much autonomy do they have, or do they have to satisfy the government's policies? How much is regulated of what they do?

Well, they are regulated in terms of what their price is. They have to justify that the price they are paying for electricity is, they've gotten the best price they can get. The autonomy...technically they don't have to buy our power from our proposed wind farm in eastern PEI. All our legislation says is that they have to have 15% of their electricity from renewables by 2010. They could say to us, "no, we'll wait and buy it in 2009". So, I guess they do have some autonomy, but there's the public

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pressure. The public wants this wind farm. I think they would be in a public relations nightmare if we built a wind farm in eastern PEI owned by islanders, that islanders invested in, and we are selling the power into New England because Maritime Electric wouldn't buy it. So I think there's, while it's not 100% legislated that they have to buy it, there is a lot of moral pressure.

Does PEI Energy Corporation power go through same marketing processes as Maritime Electric? Do you do negotiation for blocks of power, only in a reverse direction?

We will have a power purchase agreement with Maritime Electric, the same as they would have a power purchase agreement with Point Lepreau. So, we are an electrical generator. And if Maritime Electric said, we don't want to buy your power, because we don't have to, then we as a corporation would have to go to NB Power.

Is there a possibility that that could happen?

Slight. We are in the final stages of signing our power purchase agreement for our 30 MW wind farm in eastern PEI. But if the points that are not agreed to yet, if they become deal breakers, then we will have to look at selling off island.

And do you sell power to individual facilities like large industrial users?

No. Under our current legislation, renewable energy can only be sold to a utility, which would be Summerside, which has its own utility, and Maritime Electric. I'm proposing to amend the legislation that will allow people to sell to someone else. They're not looking--I know a number of developers are looking at developments here-- that Maritime Electric won't buy their power, but under the Act, they can't sell it to anybody else, so they have to sell it to Maritime or Summerside who then wheel it through someone else. So we are changing the Act, or I'm hoping we will change the Act, that will allow me, as an individual, to develop renewable energy and sell it to another customer who is not a utility.

What input do communities have into the creation of energy policy? If there was a community that wanted to produce power, I guess you've answered that already, about this Board that provides advice to government, but is there another, more of an independent mechanism for communities that want to input into energy policy?

There is. We have had representation from Federation of Municipalities, we've had individual communities, whether it's Community Councils, the city of Summerside, the town of Souris...they have the opportunity to come in and meet with me or other MLA's, cabinet ministers, and say "we would like to be involved in the production of energy—what can we do as a municipality to reduce our cost, not just as a Council in our community buildings but for our residents". So yes, there is an opportunity there, both

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in a formal way through their Federation of Municipalities, and an informal way or an individual representation.

Would Maritime Electric have some concerns for technical reasons with generation coming from different sources?

We allow for net metering which is for individual businesses or individual homeowners that can produce electricity themselves and the surplus goes into grid. There is an issue for the utility, no question. If all of a sudden, ten different communities put up a windmill or put up a small generating plant, "how do I fit that into my grid?" But they are aware that it's coming, so they are doing some work on technology side of it. We do work together on planning what the new transmission system will look like. There is no point in putting a 138 KV line, transmission line, to Murray Harbour because we will never have wind turbines in Murray Harbour—it's just the wind regime isn't good enough. So they are working with us to look at our wind atlas—where's the best wind regime, where do you have your designated areas for wind development. That's going to be the major generating capacity. So how do we get our transmission lines that get the power from East Point to wherever the use is? And if the use is Charlottetown, Moncton or Bangor, Maine, they still have to work out how they get the power from A to B.

What are the reasons why Prince Edward Island has been able to develop along this line with these advanced developments? It seems fairly coordinated and well developed, whereas other islands are a long way behind in terms of having their energy legislation in place to allow these things.

There's a combination of things. One is that islanders have had an opportunity to be involved in the discussion from beginning. So there's an ownership role, that "it's mine". We could have had a bond issue available this RRSP season if we really rushed it, but we said, let's hold off and make sure when we release it. I anticipate islanders are going to invest in it. They don't like looking across the Northumberland Strait and seeing lower energy prices and all the money going there. I have been very fortunate in having a Premier who supports what we are doing. He's allowed me to be very aggressive. There's no other energy minister in North America has been able to do what I've been able to accomplish--and that's not Jamie Ballem patting himself on the back saying I've done wonderful things—I've been allowed to do it. And I think the utility, to date, has been dragged kicking and screaming into the 21st century because why would they change? We can still buy our energy from coal production in Dalhousie and antiquated nuclear plants, as long as the power is coming, what difference does it make whether its environmentally clean, whether there is any economic benefit to PEI, whether the price is higher or lower than other jurisdictions? They bring the power in, get their mark-up and distribute it. So I think the two major challenges that PEI has faced in terms of economic development in our history has been transportation and energy. Transportation has been dealt with for the most part with the

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Confederation Bridge. Energy has been a lot slower. But as fossil fuel prices go up, and technology gets better on renewables, and people are looking around and saying I'm tired of sending $350 million across the Confederation Bridge, let's do what we can do here. And there's no one factor was the main reason. It's just right place, right time, right circumstances.

The fact that Prince Edward Island had an energy revolution back in the '70s, do you think that is still having an impact?

People who have been involved in projects like the Ark, who were involved at the time, are saying they were 30 years ahead of themselves. That if somebody came along with an Ark project today, it would take off and be so successful. I think we've had enough people over the last 30-40 years who have been working on it quietly, developing their ideas, and it's almost like we hit a tipping point. Like I said, a lot of factors all came together at same time, and the right people and the right positions. I can't overemphasize the fact—I don't mind admitting or taking some credit—because I've developed a very aggressive stance when it comes to renewables. I've had the opportunity to speak at conferences all over Canada, and people will say, "do you want to move here, because I'd just love to have our politicians take your attitude". But if I didn't have the support of the Premier and caucus, I couldn't do these things. I can't go off as a rogue minister. Like I said, we just had the right people at the right place, and the staff in here.

The other big factor, I'm the only minister in Canada that has environment and energy in the same portfolio. When the Premier announced that, there were some eyebrows raised, "that's a conflict"—well, every time we look at new project, or a new proposal, or a new development, I have my environmental advisory coordinator, climate change coordinator, CEO of the energy corporation, they're all in the same room at the same time. And before a project gets the first run through, we've looked at the environmental side of it as well as the energy side. And when I go to my respective national meetings and the energy ministers are complaining about the environment people slowing down their projects, and I go to the environment ministers' meetings and they're complaining because the energy people are running roughshod over them, I say, "do you ever talk to one another?" Well, what do you mean? and I say, "yes, I talk to myself in the shower or on the way home from work or when I'm sleeping". But having your senior staff people talk to each other before the projects get very far, you just can't measure the value of that. And we are starting to see results nationally with Environment Canada, Enercan, who are saying, "lets go to PEI with this idea because maybe this is the place to model it. They actually talk to one another". We're the first province to have a climate change coordinator, we're the first province to sign an MOU with the federal government on climate change, we've got the most aggressive policy by far on renewable energy, we have a population who wants to see more homegrown sustainable energy production. It's just, the ingredients are all there to end up with just the perfect cake. And that's my challenge

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right now. I don't have a lot of people working for me. There's so many things we could be doing that we're being stymied because I don't have enough human or financial resources. But we are making a difference.

What about on the social side, equity and availability, access to power and energy for people who are in lower income brackets? Has that been a part of your energy policy?

Last fall when we announced our residential energy assistance program, that was aimed at low income islanders. What we wanted to do was instead of giving a grant, or a rebate cheque, was "we're going to help you reduce the amount of energy you consume". So we'll go in and we'll do weather stripping and caulking, programmable thermostats and things to improve your home so that you use less. We're working on a project to supply at a lower cost the energy efficient light bulbs. We have very little impact in a province of 138,000 people on price but what we can do with people is reduce the amount that you use. And that's the focus that we are trying to take to get back into sustainability. If we can produce energy here, even though the price is not going to be cheaper, let's not kid ourselves, prices are not going to go down significantly, if we can stabilize it and be competitive while producing it locally, then our objective, especially for the social side of it, is to help people use less.

What are some contested areas between the energy interests in PEI? You mentioned the utility.

Our biggest challenge on that side is with the utility. In defense of Maritime Electric, if I was in their place with their mandate, they are doing a good job. Our poles and wires, the distribution, the transmission of electricity, very few times is the power out in PEI. You have the same storm as they have in Nova Scotia, 100,000 people in Nova Scotia without power for a week. We don't have that here. But having said that, their job is to buy power and get it into our homes. I have been critical of our utility and will continue to be critical because they do not look, it is not their mandate, I said "fine, guys, don't be part of our development strategy, don't be part of our plan to have sustainable and renewable energy produced in this province, but don't fight me on it, don't put up the roadblocks," which is what they have been doing. And I think they are slowly and surely coming around to say "islanders want this, the government wants this, so gee, maybe we should try to catch up". That's the main stumbling block or obstacle that we faced.

In terms of the other forms of energy, the home heating and the fuel, gasoline distributors, they haven't been an issue. I mean, we've talked about biodiesel, we've had oil companies come in here and say, "can we be part of this?" They are still going to sell regardless of what the fuel is. I even had one home heat oil company come in and had plans to put in a pelleting machine. They wanted to start selling pellets. They said, I know my customers are buying pellets as an alternative heating source, so I want to keep my customers, so I'm going to provide them with the fuel

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they are looking for, and if that's produced locally, then why shouldn't I produce it? Those folks know that they're going to be producing or going to be distributing energy of some sort, they just want to be part of it.

Is there some explanation why a utility would have the views they do? Are they getting influenced by continental regulation or continental electricity utilities or models? Is it something to do with the way they are educated or the way their thought patterns are?

Utilities as a beast, if you will, are very, very, very conservative. They are not risk takers, even a little bit. So they are going to look around and say, "My mandate is to make sure the lights are on. I have to get the most reliable form of energy, cost is a factor but it is not the main factor." The issue for them is keeping the lights on. "So if I can go and buy all my power from New Brunswick, and I don't care if it comes from Lepreau or Dalhousie or Coulson Cove, it really doesn't matter to me as long as there are 200 MW is coming across those cables, and I can take and distribute it. I can go to IRAC and say here's what my cost is, no one can get it any cheaper, we have done the best job we can, give me my markup and I will make sure people have it."

Wind, and you asked the question earlier about the technical issues of dealing with large scale wind projects, utilities have never had to deal with any amount of intermittent power, so that's more management. "I'm going to buy 50 MW of wind power when the wind is blowing, so as it drops down, I have to make adjustments some place else. What's the cost going to be? Reliability, I have to have a certain reliability factor." So it's a new way of doing business that they have never ever had to do. If the power goes out and it's out for a week, who gets yelled at? Chances are the politicians in PEI are, but more, it is the utilities that are taking the pounding, and they don't want to do that. They want to just be able to do their job. It's requiring a change in attitude, it's requiring a change in how they do business.

We've gone through a cycle, we are on the way back around. Electricity a century ago was very localized generation, localized distribution, and we've gotten away from that to the mega plants, and let's have the 1,000 MW or the 500 MW and we'll get the power and we'll centralize our generation. We're now getting back around to decentralizing generation. Let's have, instead of a 500 MW generating plant, let's have 10 x 50's closer to where they are needed. But you just don't throw out the great big one. The Point Lepreau at 630 MW, the government had a decision to make in New Brunswick. Do we refurbish or do we mothball or decommission it? Too many high-paying jobs in an area of the province that doesn't need them. That was a no-brainer. They were going to refurbish. But do we build another 630 MW nuclear plant in this region, or do we say, let's put up a biofuel plant in Souris, PEI that produces 30 MW which will do all of Kings County. That's where I'd like to go. I'd like to see us using smaller scale units that we can. We argued in IRAC (unsuccessfully but we still went there) when Maritime Electric was putting

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in their gas-fired turbine in the waterfront. 50 MW plant. We proposed to IRAC, let us put up three 15s, let's put one up in North Cape with our wind farms so that we can backstop our wind, let's put another one in Eastern PEI and another one in Charlottetown. If the line in Richmond goes down, then you could just flip a switch and turn everything on up West and they still have power. But we lost that battle.

What are the influences that would tip the balance one way or another on those kinds of decisions?

One of the influences, and that's why we have been successful, is I was able to get legislation in. You can use moral suasion until you are blue in the face, you can use public pressure until you are blue in the face, but when I said we dragged them kicking and screaming, that's what we had to do. We had to legislate.

Is this totally a provincial responsibility or is there a federal component?

There are federal requirements in terms of Maritime Electric must have capacity to meet demand. So they have to meet certain criteria in order to be a utility. Where they get their capacity from really doesn't matter. Our wind will be recognized as a capacity factor of maybe 40% if we are lucky, because that's all the wind blows. So there are national and international rules. The Americans have their reliability factors. The utility has to follow those. But when comes to electrical generation, the distribution/ transmission, that's primarily a provincial responsibility.

Do those national and international reliability guidelines present a problem in PEI?

It presents a challenge for us. I wouldn't say it's a problem because they are there for a reason. They are there to make sure that, whether it's the dead calm we had yesterday morning or the wind that we have today, that the lights are still on in both cases. So you have to make sure that the utility has the reliability, has the capacity regardless of weather conditions to produce the energy and distribute the energy that is required. The challenge for us is that our easiest and most obvious energy production is wind, well, by the end of this calendar year, as I said we'll reach our 15% or very close to it. Any new developments after that will have to be exported. So how do we get the power from East Point to Bangor, Maine or Boston, Massachusetts. It's a little more challenging technically, but it's not rocket science.

So overcapacity is not a problem?

No. In the scheme of things, our peak demand is 210 MW. That's the equivalent of one aluminum smelter in Quebec.

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Interviewer: E. Kathy Stuart

Interviewee: Respondent #2

Contact Information:

Location:

Date:
Time:

Do you see any specific advantages or disadvantages in pursuing an energy policy from or for a small island?

Being an islander, having always felt that PEI is a community unto itself. It has certain insular attitudes about what we need to do to deal with our own issues. We have always identified ourselves as islanders, as a society and a community who feel that we have our own systems. Not a culture as such because I don't think you can tell much difference between someone from Kensington and someone from New Denmark in Nova Scotia. We all have the same experiences, climate, the development of the area historically, agriculture, forestry, shipbuilding, all the kinds of development experience we have had. But being an island and separated as we were for a long time by a significant barrier to day-to-day contact. In the 10 years or whatever since the bridge was built, I don't see any difference. All the concerns about losing our identity are not there. Our dollars move differently, our goods move differently.

Islands have very big significance and that goes all the way up to Australia, a continent, but it's an island. Or Great Britain, which is an island. Great Britainers still feel they are islanders. They've got a tunnel, they don't have a bridge yet, but they're still islanders. Danish people have never been an island but they are still an island in Europe, a group who are altogether different from the other side of isthmus.

So we always pride ourselves as being able to survive and be self sufficient in our island identity. Prince Edward Island is that way. When you go to an island you know there is something different about this island. It has to do with historic isolation because of transportation and day-to-day activity and all sorts of social, cultural, and military implications. PEI was so isolated, no one ever fought over it, just sort of assumed that we went as a prize to whoever had control of the larger area. And no one ever paid any attention to us. When that happens you become insular, you become masters of own destiny.
For many years PEI was that way in energy and we still are to some extent because we still have maintained our identity as an energy unit.

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We have outside ownership but we still feel we have local management of all of the kwh, BTU's that are distributed here. I think there is an important characteristic to us. It opens to me a great opportunity, that the things that used to make us self- sufficient 200 years ago because we were out of touch, will make us so now. We have developed that attitude that we are willing to do things on our own. I think some of the things we have seen here, we have rural memory there that this could be done. Willing to do things on our own; energy from waste plant, city district heat system, rural wood fired boilers that were in some schools, most of them are not operating now, but nonetheless, the memory is there that this is the way it could be done. When push comes to shove, and you realize that we have renewables here, that we should be exporting. Maybe we can improve our self sustainable ability to look after ourselves and not have to import things from outside, where all of our efforts to do the things we can do to survive, the profits and the margins and the markups, we should avoid exporting [those things] as much as possible.

That translates into capital. If we put capital in here now, it is pretty well proven that that capital stays. And if it reduces the cost of living here, that's what we should be thinking about. Unfortunately with energy, education, and so many things, there is no 2-3 year return on investment. If you talk to a processing plant or a business that does the work of production, eg cleaning potatoes and putting them in a box, or blueberries, or any other product, they expect to their shareholders that they will invest money and will want a return on their investment in 3-4 years. In many cases, that investment has only life of 3-4 years; a lot of equipment wears out early, energy equipment stays.

Every turbine that Maritime Electric ever bought is right down the street, still operating, even though it is 50 years old. Some of oldest steam turbines in world are still running down there because they still considered them as equity and capital equipment. Go to a potato processing industry and ask them how many conveyor belts they still have running 5 years since the time they were installed, "well, we threw it out and got a wider and bigger and faster one. We didn't save the old one and run product through it with the same old people picking potatoes out of it manually. We put in a 20 foot wide modern, super electronic totally imaged processing potato chip line. We just shut the other one down because we know that the life of our equipment is 3-5 years. After that we're not insured for it." It's worn out, used, just like your car. Even our cars we keep for 10 years now. One time we used to keep them 20 years, then we went to 5 years, they all rusted away, but now we're back up to looking at cars a little longer term value because of the high capital cost. There is a big need for islands to invest in the capital that keeps them self-sufficient. Otherwise we are going to disappear. It's going to be impossible to keep people here. The children will all go to Alberta and drive trucks for the oil business. We need to create an self-sufficient energy portfolio here that can keep people here.

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Does the Province use any international benchmarks or indicators to measure progress towards sustainability in the production of electricity? What are they? To what extent has the PEI Energy Framework helped to consolidate progress towards sustainability?

The Province has in last half decade identified that we have enormous opportunity here in wind energy. Historically, 20 years ago, the thought was that we could do a lot of things with energy efficiency and energy diversity; and that's where the district heating system, the energy from waste program started, and distributed energy in schools, forest residue, biomass. If you looked for a source of initiative for that, go to Denmark where all of those things are done on a regular basis. There's a dozen communities in Denmark that have a small district heat plant, some of them burn straw, some have wind turbines, they're community owned, there was a cooperative program put together where individual property owners, farmers and people who lived in the region of the project could invest in a project that supplied energy close to them, some of which they used in the case of district heat, or some of which went to the electric grid.

I have a good colleague, I plan to go to his retirement party in Denmark at the end of March, he is retiring from their National laboratory there;.... he has been able to look out the window of his home at a turbine that he owns a percentage of, and it's paying for his retirement. The profit from the many years that the turbine has run, has been upgraded, it's been made bigger, they have taken the old one out and put a new one in. It is a wind generation facility that grows. One time it was a 65 kW machine, now it's a 600 kW machine. It's on the same foundation in the same place a half a mile from his home. He owns a piece of it, and if you asked many people 20 years ago when he bought into it, why did you do that, he said, I believed in it--a good investment. Absolutely. Did it have immediate payback? No. But right now it is making $1,000 per month for him.

The benefit of doing things in long term investment in renewables is enormous. What Province is doing here now is a very fine investment. The technology works. It is a serious industry now. 30 years ago it was difficult. Not easy today but it is a lot easier than coal, or natural gas or nuclear to develop, to own, to operate, and it makes life possible here. We can learn to use an awful lot less. Can do a lot with renewables. Need to look at renewables in islands as the ultimate to our long term sustainability. Given last 100 years of the carbon age and the petroleum age, we're not going to wean ourselves off fossil fuels quickly any more than we did from sail to steam. But we do need to move, we need to perceive, that there is a way of moving from here to there.

It is interesting you say that people have to perceive that they have to move. It is something that people have to believe in. There is a process to develop that?

Absolutely. Society is made up of all kinds of individuals, people of various backgrounds, and skills and knowledge and attitudes, experience.

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There are many people who feel that the conventional energy industry is holding back, just trying to drive the price up and they've got lots of this stuff. How do you convince them otherwise? The reason they're paying a young friend of mine $40 an hour to go looking for oil is that they are desperate, because he couldn't do anything for $10 per hour here. So why is there such a demand for developing tar sands? Why are there so many people boring holes in the bottom of the Gulf of Mexico looking for that last little bit of oil. Scratching around for that last bit of oil in America's heartland. Sinking holes everywhere looking for oil. You can't go anywhere from North Dakota to the south of New Mexico and not find people boring holes trying to find oil. They are not going to find much. Every stroke of those rods sometimes brings up a thimble full. You add it all together and it is very expensive oil. North America has extremely big addiction. As GW said, "We're addicted to it and we keep trying to find more and more of it, and we'll do anything we can to get it." I'm not pulling any punches about my attitude about why George Bush is in Iraq—he's in Iraq because there's oil there.

So do you think the PEI Energy Framework is going in the right direction?

Well, it is going a lot more the right way than it is the wrong way. You know we capitulated to Maritime Electric to put in their gas turbine over here, I don't think it's running yet, and they don't ever want to have to run it. It's a battery.

It's a 747 engine.

They bought a battery. It's like your tape recorder. You have batteries because it's convenient. You didn't want to come in here and have an adapter you have to plug in. They bought a battery. And the battery has...instead of carbon and acid in it, it's got oil in it. They can't afford to use it but it's important to have. I don't have an emergency generator in my house or my cottage because I don't care if the lights go out. The attitude that Maritime Electric was, is, "we need to have our own autonomy and capacity to generate in order to make transactions with NB". No one wants a dependant child any more. You want them to have a bus ticket so that they can go somewhere. You want to get rid of them. And that's what that facility is. We capitulated to that. The province probably could have stopped it and said "we'll build it". but why not, let them have it. They're going to make a return on their investment on that. It's capital equipment, and you know the history of the Cathy Callbeck rule change.

Basically what happened is Catherine Callbeck's government forced a takeover on Maritime Electric. So that the Province was going to take over assets of Maritime Electric and hire then NB, and under the Electric Power Act, the Province had the right to do that. Maritime Electric cried foul and said "you're taking away, you're going to close down a company that provides a lot of jobs, private company, private investors, private shareholders, and you're going to take our livelihood away, and you're

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going to try to run a business. Government can't run a business." That's why they don't make potato chips or pack lobsters. They do a fair job of some things. But the Province was going to nationalize Maritime Electric. Maritime Electric came back and said, and the plan was that the Province would acquire all of the assets of Maritime Electric, own and operate them for two or three years until they sort of levelized the situation, and then sell the business, sell the whole, sell all the assets to New Brunswick Electric Power Commission. That would then put us in strange situation in Canada where a provincial jurisdiction being supplied energy from another provincially owned and operated utility. But at the time, NB Electric Power Commission seemed to be the gods of the energy system in the Maritimes. They were going to sell power to Maine, NS, they were just going to become the big power brokers in the whole Atlantic region. Maritime Electric came back and said, "well, sorry, let me finish, the Provincial plan was to nationalize it, operate it to NB with the agreement that NB would sell us energy at their cost and their retail rates plus 10%." Because at that time we were paying 25% over NB. So, and this is key to where we are now, Maritime Electric came back and said, "that's not fair ball because we've been a company on this island since the 1930's, early '40s, and we've been doing the best we can with what we've got, and we offer a lot of jobs, investment downtown in our office building, plant in Borden, we've got all this infrastructure here, we're an island company, everyone sees Maritime Electric as a good corporate citizen", and in fact they were.

So Maritime Electric counter offered to the Province and said "we will reduce our costs to NB plus 10%, we'll buy our power from New Brunswick, as we have been", because 95% of the power that comes into PEI comes from NB today and has for quite a few years, ever since they built the cable. "We'll match that offer but let us run the company. But one concession: Don't make us report to the Public Utilities Commission (PUC). Don't make us justify every pickup truck, every set of snow tires we buy, because that's costing us $10-15 million per year just to do the accounting and make all the submissions and get them approved by old Bill Brennan." It was a nightmare to manage the company to make sure that everything they reported was fair. It was a very Machiavellian kind of management approach. They said they can't trust Maritime Electric because "how do we know blah blan 12% blah blah" So they said, "OK Maritime Electric, we will make you truly private, you don't have to report to us any more, you just show us if you're charging NB rates +10% to industry, residential, all of the sectors in the rate structure." They did that. They actually dropped rates by 22% and were heroes. People's electric rates went down.

Then Bernard Lord came along, said "hey, Cathy was smart but she was being misled. No matter how smart you are, to be lied to, you make the wrong decisions." NB Power were subsidizing their rates at home, so the price they were offering +10% was low. And then they looked into their own legislation and said, "Hey, we're not allowed to do that. The province of NB cannot give the people in PEI any money, and by subsidizing our

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own rates, and then selling it to them at 10%, we are also subsidizing them." So they said, "we have to cancel the deal." So the Provinces were saying "whoops", Maritime Electric was saying "whoops, we're going to go out of business, can't do this because we have to run our own stuff and our costs are higher." So they went back to Joe Ghiz and they renegotiated the whole deal, and said "now we are going to go back on a kind of a semi-regulated business to IRAC, and we're now going to be somewhat regulated." More efficient formula. So they are going to have to have all these hearings and stuff. That opened the door for renewables. The Province said, "we gave you the right to get back in your own business as an unregulated utility operating in private sector." That would be the only one in the world.

[Unless the Curaçao one in the Caribbean...

I think the institutional capacity to regulate is a lot lower there, it's more of a free-for-all...]

Being it's being policed fairly well. Basically the machinations Maritime Electric had to go through to get approval to go with the gas turbine. It wasn't hard for them to make the case that if we cannot deliver power, if a ship drags its hook through the cables, then the lights go out here and we would be on an emergency situation in Prince Edward Island at this time of year if for some reason the cables went flashing, and they easily could. If one goes down because it's got a technical fault, and the other one goes down because it's overloaded, a double [...] sort of thing. "So we then have to generate our own power, we can't do it". So they run this gas turbine down, this 747 down here, at the same cost as flying a 747. And they run what they had at Borden, which is the same thing, burns the same fuel. The two generators work the same system, just that this one's warmer. And they start winding up that old thermal plant down there. And immediately on the radio there's an announcement that says, "People please don't do anything you don't have to do. Anyone whose name begins with a, c, e, g, j, whatever, use your washing machine on the odd days of month, the rest of you stagger yourselves", and you could do it. Amazing what we could learn by conserving. But I think, summarily, we are on right path. We have a much more hands-on understanding of those issues, and that's part of what I read in your disclosure agreement, is that we're small and there's a better understanding in small places of these issues. Where you get into the larger utilities, there is much less flexibility because no one fully understands or has the decision-making powers. There's got to be a much wider discussion of these things before anything happens.

Do you think that the fact that we had a lot of initiatives back in the '70s has made a big impact in terms of the general acceptance of renewables and policies now?

Oh, I think so. In spite of all the, not negative results, but all of the lessons learned during the '70s with the Institute of Man and Resources, Resource Ventures, Enersave and other programs, we did learn that these

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technologies are there, and then we learned that some worked and some didn't work, eg., solar installations, many of them are still running but the big institutional ones like the ones at UPEI, they're not running. They were too much too soon. But in the big scheme of things, they cost very, very little money. But there was an exposure to those technologies, and particularly wind technology. People have watched the building of the Atlantic Wind Test Site and the many years of hand-to-mouth small projects, but now it's caught on. There's serious people in the business now, serious engineering companies, consulting companies and contractors and investors saying, "we have investors who believe in this". You can go and raise capital to do the wind projects now. The biggest problem now is you can't buy wind turbines, because the demand is so high. If you want to buy a wind turbine today, you've bought a 3 year waiting list or 4 years. If you're wanting to buy at the declared price, but if you offer an incentive, you can get early delivery because you will pay more for it. The demand is so high on renewable energy systems today, especially wind energy, the suppliers can't meet the demand.

What input do communities have into the creation of energy policy? What has been the impact? How might this change?

From the community scale, almost none. Charlottetown had input here into some of the energy policy with respect to the energy from waste, district heat, providing easements, right of ways for pipes and that sort of thing. I think many times when we talk about energy, we talk about electrical. It's the one thing we can't quite see ourselves doing without, really, flipping on the switch and doing all this magic stuff we can do with electricity. Communities don't really have any power in electricity. For example, in Prince Edward Island, and I don't know this for a fact, but I surmise it, Maritime Electric just goes and builds power lines down the side of the road –ugly, awful picket fence of poles down both sides of the road which destroys, to me, what could be a lot of natural beauty. People from away come here, look around, say hey, they're beautiful. I think it's ugly when I see all these poles, because I go to Spain, I drive from Madrid down to Alicante, and I watch a machine running across farmland burying high voltage cables underground, never to be seen again, and they deliver energy from here to there. But from Bedeque to West Royalty, there's a transmission line that runs all the way from Bedeque to West Royalty. There's no one connected to it. Goes from there to there, 35-40 kms. There's not a person who has anything to do with it. It's overhead, why couldn't it be buried? A little bit of cost, because historically, the Public Utilities Commission said, "You can't put that in the rate base," so they built it to the minimum cost, because the transmission system's not in the rate base. That's expense. So we have all this overhead crap all around the island. And if we get an ice storm like we did in 1956, then we'll all be in the dark. So, the community has no control over that. If you wanted to build some other infrastructure from Bedeque to Charlottetown, you'd have to get permits and things, basically just to build it. And if they go down the public roads, they just put it up, it's in the right of way.

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It does seem to me to be a bit of hypocrisy the way people complain about wind power as unsightly when they don't even notice the fact that we have poles. What about individuals and input into public policy and energy policy...is there a mechanism for people who could...as a supplier, have you had input into energy policy?

Historically, I have attempted to get wind energy accepted into public policy so that persons, groups, individuals, communities, who wanted to develop energy supply system of their own, could integrate it with the Maritime Electric system. Electricity is not like heat. I burn oil in this house because I'm downtown and handling wood wouldn't be practical. If I had chosen to put in a wood-fired system, to put in a wood house and all the things I needed to burn wood here, it would be totally separate from the oil supply company that I buy oil from. They wouldn't have any say--I buy oil from Coop. If I decided to put in another furnace in the basement, buy oil from Esso and put a tank on that side of the house, I could buy fuel from Coop and I could buy fuel from Esso, they'd never know the difference. I could connect the tanks, I could use same tank. They don't have any input on that.

With electricity, because of its nature, a distributed system, Maritime Electric have a monopoly. They have it protected under the Electric Power Act, that they have a monopoly to sell, and meter and distribute electricity. Because it's always been considered as a dark science that nobody understands. It's not saying it'll burn you and cook you, shock you and kill you, but it's that magic stuff that comes in through wires in your house and it's here. If you want to make some of your own, you can't do it. It's like booze. You're not allowed to make your own booze. You're not allowed to make and sell distilled, you're not even allowed to make and sell wine or beer because there's a monopoly. It's considered as something that's beyond the common people, so that has been the norm.

And in the last year you may have heard of the new net energy billing act. I fought for that for 30 years. Finally they accepted it. As a matter of fact, finally today it was accepted in Quebec. And it's moving across the country. Because, in spite of the fact that it will reduce the revenue a little bit—you worked with lawyers for a long time, they're protected too, I can't practice law, I'm an engineer--but it was almost to point one time that you would not be allowed to go to a bookstore to get a book to protect yourself against a lawsuit. That book would be kept off the shelves, because that kept away from the monopoly of the legal profession to provide legal advice. Now, the door's been pried open. Now you can install a wind turbine, in the right place, you can't do it downtown here, but like the one we have at Superior Sanitation. They can sell that wind turbine, connect it into Maritime Electric, make some of their own electricity, and they do it in synchronism with the whole system under the same standard of quality, voltage incurred, things that makes it important.

The next step is even more profound. That will be, that if you have a nice piece of land in windy place, you can put up that turbine on your land, and

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you can sell that power to your mother or your sister or your cousin who lives 10 miles away. For these you can say, "I'm making this, I'm putting it into the system", and they're going to draw it out the other end. It's like going to the bank. If you're going to send your mother $1,000 for Valentine's Day, you go down to the Bank of NS's little slot and you put in her number, and it goes to her account. And her account's in Toronto. Did the bank charge you anything for that? Not if you have a million dollars in the account. That's your card. She's got the same thing. So the money went in there and the dollar bills came out the other end. She goes down and pops the money out tomorrow. So you have this common carrier. If you're trucking mussels out of Savage Harbour and you want to deliver them to Halifax, put them in a truck in Savage Harbour, you back them up to a loading dock in Halifax, and the only toll you pay is on the Bridge and on the Cobequid Pass. Nowhere else says anything to you. There might have to be the standard quality, make sure there's no disease or anything wrong with them but no charge for the use of the highway. It's a common carrier. The next step that really makes energy self-sufficiency work is that all of this awful overhead stuff, which we have to look at, for goodness sakes we still should be allowed to use it. There's no common fare. The common fare on the highway is, we pay for the use of the highways in one tax or another, and once in a while in a toll. It's all basically a toll. So every mile you drive on a highway anywhere, you're paying for it one way or another through some kind of taxation or fee for its use. That should apply to electric lines as well. You should be able to say, "I want to put up a wind farm and I don't care whether it makes any financial sense or not. I believe in it and I want to do it. And I can afford to do it so I'm going to do it. And I want to give that energy to all of the seniors homes in Prince Edward Island, because that's my goal in life. " You cannot put up a wind turbine in a windy place and say "I'm going to give that power to Lennox Nursing Home free ball." Can't do this. Maritime Electric would say "That's our customer. You can't give nothing."

So are there jurisdictions...that's the unbundling of transmission lines?

They're coming very gradually.

Do you think that will ever happen?

Yes it will. It takes political will. Jamie Ballem wants to go there. It's a hard nut to crack because the shareholders of Maritime Electric will cry foul. "You're taking away revenue. We make a markup on revenue. If you reduce our sales, we still have the same capital equipment, we have these generating plants over here."

How do you get around that?

Public policy.

But who pays for distribution?

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Through the consumers.

Through taxes?

No. Through the rates.

So would the rates have to change?

They may go up or down. But if you look at Prince Edward Island, we pay, I think, a pretty honest rate. We pay for what we get. Maritime Electric doesn't have any subsidies. No one is giving Maritime Electric money to operate. But in New Brunswick they are.

So the company now is including the cost of maintaining those transmission lines and including that in the rate applications?

No. The rate that you pay...We have essentially two components. It's got to have a fixed rate to retire the capital and it would have a variable rate to look after the energy, the fuel. So if you look at the marginal cost of electricity, it's related to what happens to the price of fuel. It's like driving your car. If it sits in your driveway, it is still costing you something, depending on how you finance it or the value of money. If you never drive it, and it sits there for 20 years, and you depreciate it and it's gone, haul it away and crush it, then you've bought it. However you've bought it, you have some amortization or recovery of that investment. And then you have fuel and operating cost like the cost of fuel and the cost of fixing it, putting new tires on it, servicing it. That variable cost has a lot of components. One is transmission and distribution systems, which needs to be upgraded and replaced, generally it's not included in the capital. They're not allowed to capitalize the transmission line any more than when you go to buy a car you can capitalize a driveway that you use to get it back and forth from the street. Then you've got the maintenance, the mechanics, the people who fix the stuff, then you buy the fuel to put in it. And so you have those fixed and variable costs, and even within the variable costs are some that are more or less fixed, because that's the cost of your labour, the fixed people and the overhead in the office, and the bill collectors and the people that sort of have to be there to run the business. Calculate pretty well what they cost to run a specific business, then you've got the variable costs which is the fuel. And that's why you've got these fuel riders in the costs. They will say, "well the price of fuel went up. We know what everything else is costing but man, we can't outguess Saddam Hussein and George Bush. It's what may [---] up the cost of fuel." So that's the way the utility prices their electricity.

If someone comes in and says, "you have a transmission line running from Bedeque to West Royalty, and there's lots of wind in Bedeque, so I'm going to put in a big wind farm there, and I know, because I can look at the numbers, there's 50% capacity available on that transmission line from Bedeque to West Royalty, it's not being used, it's like an extra lane on the highway, I want to use it, give me a price. Tell me what it costs. Show me actuarially what it costs to own and operate that line when you don't have

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to maintain transmission lines, they're not in your rate base so you can't recover a profit on them. All you can recover on them is depreciation. Transmission line has a 30-year lifetime? It costs a $million, that's $33, 000 a year, I'm using half of it, I'll give you $16,000 a year and I'll put $1 million worth of energy through it." Nice deal. Maritime Electric gonna say fine? Oops, there's a loophole in our system here, we have to find another way of costing things. It's going to happen, because one of the biggest hurdles wind energy faces in North America is that there is not enough transmission lines. Utilities, for basic survival purposes, have never built sufficient transmission lines to be able to do anything other than to serve their own needs. They don't have any global responsibility. And in Canada and the US, the federal governments have never taken it upon themselves to look at electricity as an essential service like they do to some extent highways, railways, defence. So in my mind, governments should be looking at it. Other things are essential services like health and education. But that capacity is there in some places and not in others. The incentive to built those distribution systems and interlink so that you can take a lot of wind energy off the upper plains and the great plains in the US and transport it to California and some of the urban areas in Texas. The infrastructure is not there to deliver it. But we have the same problem in the Maritimes. There is no ability to share energy between NB and NS because they don't like each other from an energy point of view. They've isolated themselves. They don't have the ability to be able to efficiently take energy and trade it back and forth, time of day, or because of more wind on one place than another, or to take excess power from Quebec and take it to New Brunswick, or Nova Scotia, "sorry, can't do it".

And they all look at the...split saving concept between utilities. And this is essentially the way that we operated, and I think still operate that way now since they've been deregulated.. If it costs four cents to produce electricity in New Brunswick right now, and it costs six cents here, we buy at five, so it's a split savings. So New Brunswick makes a cent over what it costs them to produce, we save a cent over what it would cost us to produce, is that fair? Might sound like it but it isn't. It's not fair because we get to buy energy less than it costs us to produce it, therefore we use more. New Brunswick gets to sell it for more than it's worth without costing it, but they sell it more and have to invest more capital. What's happening in New Brunswick is, they invested capital to build more plant, Point Lepreau, Coulson Cove, but they did it, not at the cost of the consumer but they did it at the cost of the taxpayer, so they're using public money and crying that they don't have enough for other stuff, enough for education, social services, or health because they're spending it, building more power plant to sell more power for which they're not being paid enough.

And that's why, right now, Nova Scotia and New Brunswick, they're looking at applications from both power corporations for 15% rate increases, because the premiers and cabinet are saying, "hey, what are we doing subsidizing electricity? Why don't we make people get the true signal of what electricity costs, and then they'd use less." It's a very

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insidious policy tool that governments have used. Ontario did it for many years. That's why they are in desperate shape in Ontario—they haven't paid for anything. All the nuclear power plants, they all belong to the people of Ontario, they've been paying for them and they'll be paying on them for the rest of their lives. Billions and billions of dollars of debt and they haven't even paid the interest on debt.

So what do you see as the contested areas in PEI, for instance the utility and the government, what issues are contested?

The contest now is between the private utility, Maritime Electric, and the Energy Corporation. Maritime Electric can see their customer base and their business being eroded by public investment in wind farm and they're...without being guilty of double-speak... wind energy is subsidized to some extent, through the WUPPI, the windpower production incentive, you may have heard of it.

From the federal government?

The federal government offers an incentive to people to own and operate wind plants. The rationale is that it's clean and it doesn't create greenhouse gases. I don't know if you saw the most recent map of organizations, showing the situation with the ice in the Arctic Ocean in the last 30 years...our glaciers have gone back and what that means long term to costs, not just of energy but the environmental damage that occurs, dislocation, and all the other things, rising sea levels and so on. Still skeptics whether that's really happening. So there are incentives to wind energy to do things. There's other types of incentives to oil, coal, other energies, but they're not based directly on the kilowatt hour produced. They've got to do with other types of tax credits, resource development, exploration. So the contest right now is between Maritime Electric. How do they continue to do business in the face of rising expectations that they should be going renewable, and as a result, Maritime Electric, Jim Lea's retired now, in the last few days, but they see handwriting on wall. Renewable energies are going to become a part of the supply strategy. And in some places they may produce a lot of energy and in some places they may produce less. In larger scale, and electricity is not quite like sunlight, it's not distributed kind of uniformly, everywhere and randomly, you know it's connected with discrete network of lines and resources. And you can't transmit electricity extremely long distances. A few 100 miles or 1,000 miles is kind of the limit. Natural things that go on in environment and the atmosphere that prevent you shipping power thousands and thousands of miles. So you tend to have to have, need this blanket, you spread around, makes people warm here and warm there, but there are spaces in between where it is not used much. The ultimate goal is that we want to make as much use of it as we can. Next big contest is going to be with the population. Right now, we use an inverted price structure. The more you use the less you pay. If you look at the elasticity of price and demand and you say to someone like me, and most of my lights are compact fluorescents, what does it take to get

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people to save, to reduce their demand? Now the more electricity you use, the less you pay. Not so much residentially but in industry there are these rates—you've probably seen them. So the more energy you use, the less per unit cost of electricity becomes. There's no disincentive to increasing the demand, other than the fact that you pay for it in a way. If you inverted the block rates, and said—and even at residential level—and said," all right, someone like me who lives alone, my light goes $35-40 a month, $60 at Christmas, but the rest of the time it's pretty low—and I use 300-400 kwh a month—if you said, anything over 300 kwh a month would be double the rate, I would try to find some other way to save electricity. And that happened in the late '70s. People started to conserve energy and reduced demand enormously. But we forget. Forget the skills and know-how about reducing energies. People start using more energy. Politically, that's a very difficult thing to do. And it's not in the best interests of Maritime Electric. It's not in their best interests to reduce their customers' demand.

I always wondered what happened, it used to be at Christmas time we were asked to conserve energy, and then they turned around and started boosting it so that the whole town is brightly lit.

Maritime Electric is sponsoring some lights.

Is that because we have overcapacity?

No. We've changed technology, you know. The lights we use now use less energy, like the Christmas lights and things.

But it still must be a higher load..

Oh yes.

But I guess measuring peak load isn't that critical at Dec 15 as the way it used to be.

Not quite like it used to be. As a matter of fact, in PEI we're starting to push the peak load now into July because of air conditioning and the tourism business. And you know because of the lights you saw on my wreath when you came in. Those are those LED ones. They cost peanuts to operate. They're not quite as pretty. Those sorts of incentives will always be there. But inverting the block rate would have a substantial influence on how much electricity we use. I am an electrical engineer and my practice has always been wind energy and I've done a lot of conventional electrical engineering in buildings, in streetlights and along the streets of the city here. And I used to get, I don't do so much any more since I've started manufacturing wind turbines, but I..I don't know if you heard the controversy with Kirk and J'Nan Brown out on the, you're from Meadowbank? You can almost see these lights from your place...you know the subdivision they're complaining about that Donnie Allan has...he wanted the street lights, he didn't want to pay for one like these, in spite of all the money he...because if we put in these low pressure sodium

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heritage lights, which are pretty benign, I don't like them, if you look at the one out front here, can you see the tape on it-- I put that tape on it because it shines in the windows so they wouldn't put direct glare in here—it was like daylight! Most of street lighting in North America is not there for right reason. It's to make people feel safe. Street lighting has one function—it's so that vehicles can see pedestrians. So if you are driving on the road, you can see a pedestrian even though your headlights are off. Historically, that was the reason for streetlights. It's not so you can find way down street, it's not to make the street pretty. It's a safety issue for vehicles.

I always thought it was to help level off the generation capacity!

Oh my, you drive through Trois Rivieres in Quebec, it's like the sun came out, but street lighting is a big load. If you fly over the world, have you seen the light pollution happen here?

I just flew over Paris.

And Paris is not bright, by New York standards, or Quebec standards, Montreal standards. All these artificial suns up over parking lots on all night. I had to get big one turned off across the street. There was a big one over there in the parking lot. It used to come on every night at dusk, stay on all night. It bothered me, I called up the Department of Transport and said "why do you have that light on". They said, "well we can't turn it off, we don't have a switch on it. It comes on when it gets dark and it stays on until it gets light again". "What? There's nobody over there. It's 1200 watts, that's $870 per year". That's what finally got them to turn it off. They had never done a calculation to say this light is costing us $870 a year.

I've walked in German cities and French cities, Paris, you can't read anything at night—if you're lost on a side street, you walk underneath a street light, you need a flashlight to read a roadmap. Here you can read the newspaper. We need to get through all that feeling that we have unbounded sources of energy.

If you were to implement all the changes you see are needed, what would they be and how would you go about it?

Well, one of the ways, is to create incentives, they are starting those again. Incentives to insulate your home or reduce your demand on energy, get a tax rebate, or small grant or something that helps you improve the efficiency of your home. To whose benefit is that? Well it's the homeowner because you burn less fuel and you pay less money. You also put less CO2 up the flue. So there's a shared benefit. So do the numbers on it, find out what it is and offer it, that helps. And that's exactly the same one that would happen in the electrical business that we say, "Let's make it possible for people to understand the cost of energy and therefore do things to reduce how much they use. Let's send a signal, and that elasticity of price and demand is what drives us all. If we see

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things that we think is costing us too much, that we do less of them. And that's particularly true of things that are habitual.

How do you account for the fact that people didn't change their behaviour when the price of fuel went up? Do you think people are bringing it home and saying, "this is a direct connection"?

I buy fuel wood for cottage. Everyone I know who sells fuel wood, their business has increased twofold in the last couple of years. People are buying fuel, which may not cost them a lot less, they have to split it and handle it, stack it and haul it, clean up after it, pay higher insurance rates, everything else, but they're still looking at wood fuel.

So they are making behaviour changes?

Yes. Because they see the handwriting on the wall. That is a renewable resource and oil ain't. They're looking at ways to reduce fossil fuel. The other one is this...the net energy building thing is happened now that has allowed people in a specific sector of the renewable business with wind energy to be able to produce their own power and connect it to the grid. It's catching on here, its enormous in California, New Mexico and Texas.

So do you see anything specific things about islands, for instance, the islands I'm looking at are not grid-connected so they have to generate their own electricity. Does that lead to islanders having a stronger sense of self-sufficiency or a need to be aware of energy?

It should. I don't know Curaçao at all, I've never been there and what the policies are now. They're in a trade wind situation.

They're down there 40 km off coast of Venezuela. They're right in the middle of all the oil tankers from Venezuela.

They have a prevailing easterly trade wind and I'm not sure how good it is. The problem with trade winds is that they are steady but they're not awfully high. We are in the roaring 40s, temperate wind environment, which means we have days of calm but then we have days of very energetic winds, so we actually have a much better wind regime.

One of the remarkable things about Curaçao is that the wind is so steady, they can use it as a standalone source of power almost, as opposed to having it moderated through a grid.

But that's good and bad, because if you look at the ultimate design of a power system, the load is varying as well. So the load goes up, I'm not sure about Curaçao, but the load goes up in middle of day with the air conditioning level, drops off at night because it's cooler, and the lights go off, not cooking and the tourist industry is not so busy. So how do you make use of that excess wind? You build not more than you need or not much, and how do you handle the short-term fluctuations? The optimum power system uses variety of generation systems. In spite of the ultimate

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depletion of petroleum fuels, there's going to be some form of fossil fuels and there will also be substitutes, from biomass, I'm not sure of Curaçao, as you say it's mostly desert, forest growth in terms of the vegetation.

It's kind of like...I spent quite a bit of time on Grand Turk Island. That's another case in point where they have no renewable energy, they don't even have solar energy on their buildings, they have enormously good trade winds because they're right on the edge of the Atlantic Ocean. They're operated by the Caribbean Electric Organization which is also owned by Fortis. They're paying .39 a kilowatt hour and they are a captive. There's no mechanism then for the local people to do anything. One or two groups that are trying to do something. They've been shut off by the central government in Providenciales saying, "no, you can't do that", because we're friends with Fortis, they look after us"

That is what I'm getting at. I inspected the system in Anguilla, St. Maarten, and I've been looking all over for these issues that have to do with energy policy in small islands and the impact of these utilities versus the government which sort of represents the people.

There's a lot of old relationships that are very convenient. I tried to force a project into St. Lucia, Lucelec is the company. And they're omnipotent, all-powerful. They've got the Minister in their back pocket, everyone else in they're back pocket. And the policy is there, on investment, if you want to bring in a wind plant worth $5 million, you have to pay 100% tax up front with every piece of capital equipment you bring in, unless you are in one or two sectors, in the hotel industry they don't have to, because they know, if you go out and buy a new galley range for $10,000 for a big hotel, they don't charge you a $10,000 tax on it, because they know that if you are going to be consuming goods and foods and things to feed people, therefore you are forgiven the tax on that. But if you bring in some other equipment, you pay for it. It is taxed. That's enough to kill a project just like that. And then Lucille will not buy the power. So it's very pragmatic there. There's no mechanism for appealing the decisions. It's the same in Puerto Rico. You've got to pay a lot of graft and corruption to get anybody to talk to you in Puerto Rico.

That's what I was wondering about in Curaçao, whether I'm even going to be able to talk to the people that can answer these questions. I've talked to the utility chairman, he spent an hour with me answering questions and so on, but I'm wondering what about the government, although the government does have some ownership of the utility in Curaçao, I'm interested in the policy, of the point of view of the people, the island...

It's not a new issue. I've been trying to do projects in NWT for 30 years. You can't get them off dead centre. They just don't want to talk about it. They've got a way of doing things that pays the bills, and they just pass the costs along to tourists, and the consumers are largely large hotels, resorts, the tourism industry, and they're not allowed to make those

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investments themselves or they pay this horrendous tax, so they don't care. I've been on islands, in Belize, a lot of the Caribbean islands, Barbados, Bermuda, the place is saying. "no, we don't want these ugly things up here", "people are coming to play golf, not look at windmills". So getting through the mentality that says there is an issue here is difficult. Grand Turk was one that was particularly interesting because I was working on a project there that looked like it had an enormous potential to create wealth and jobs. Local company. But you just couldn't get through utility allowing the use of their system to deliver the energy.

And what is the rationale for that? What have they got to lose?

It's a cash cow, they're making an absolute fortune.

So another company coming in to generate electricity through wind will just be a competitor that will reduce their customer base.

Because of the trade wind you could produce a lot of kilowatt hours there. You eventually even get down to mundane technical issues. They built a brand new power plant there, one of the most modern ones I've seen in the Caribbean and it's built to the wrong scale. It's built at such a scale that if they're only running one engine, they're not quite producing enough to look after the community, and if they run two, they're producing much to much. They should have put in a power plant that had diversity in the size of their engines and the generators—they should have bought a big one, an intermediate one, and a small one, and size the generation to suit the load. But they didn't. So they went with a cookie cutter design and went with four big engines all the same size.

How do you deal with that? Is that something, are there NGO's or things that can raise the consciousness of people about energy?

I've never seen them in the Caribbean. It's every man for himself. Much more so than here. Here we have a much different dialogue with government and the courts, the utility, regulatory people, media, the press.

I see this at the heart of what I'm trying to do. I'm trying to tease out that issue of, people don't have any involvement because they don't understand the technology. The technology is handled by a remote group of technocrats and government, and there's also the ownership issue, and the legislation. And there's not the legislation in place that allows...

I've never sensed in the Caribbean islands that there is any public dialogue on anything. Absentee ownership to a large extent and a subservient mass population in many cases.

I think that may be a bit different in Curaçao, but the results... I think the utility has a fairly "green" chair person who understands the need for renewables but he is still running a business..

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...and it's privately owned...

It's at arm's length, It's privately owned but with some government ownership.

...So it's a cash cow to them too.

and what is said may not be what actually happens. What is said at an energy conference with the people from different groups and sectors of the society may not be what they turn around and actually do...

That's right. It's like New Brunswick, there hasn't been a wind turbine put up in New Brunswick yet. The attitude still is in the Power Corporation that "all our eggs are all in Point Lepreau and Coulson Cove".

Do you think there's a size component to this? Are the larger jurisdictions making more progress towards diversifying? Are the small jurisdictions going to take longer, or are they going to be quicker to get on the ball?

I don't think it has anything to do with size. There is enormous development of wind energy in Texas because they have wind, and they have oil and gas and other things too, but they realize that they are not sustainable.

Of course they have been focused on the energy business for 100 years.

Is there something about Caribbean that makes the lack of public awareness more permanent? What could change that situation?

I don't know. I don't know the politics of the various islands enough other than the ones I've been on. There are some. The French Antilles have probably a greater interest than some of the other ones because Electricité de France is paying the bill for everybody. EDF is responsible for everyone's electricity in all the French colonies and islands. Pay the same rates in St. Pierre as you do in Paris and French Polynesia, Le Desirade. Everyone has the same rights and the same passport.

Is there anything as a last word you want to say about energy in islands? Energy policy?

I think islands have major, of many sizes too, significant advantage in their ability to affect change and manage change. It should happen. You can qualify that, too, in terms of who the islanders are. When you have islands that are not populated with landowners and developers, then you don't have stakeholders. You only have the owners. I think the success on PEI will be because PEI is owned by 150,000 individuals. There's nobody who owns a big piece of it. And everybody has a great investment in terms of their interest in the island, and the responsibilities they feel for making it and helping it survive. When I go to many Caribbean islands, I pick the

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smaller ones, I sense that there isn't that interest or certainly not the resources, or the capital or the know how to do anything about it. So they are subservient to some large influences, one is the foreign-owned electrical utility. So local ownership and entrepreneurship helps a great deal. That is largely why I'm here, cause I was born here, but largely I see that here and you don't see it on all islands. I think we can teach a lot of other islands a lot of interesting things.

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Interviewer: E. Kathy Stuart

Interviewee: Respondent #3

Contact Information:

Location:

Date:
Time:

Do you see any specific advantages or disadvantages in pursuing an energy policy from/for a small island?

There are always challenges being a small island as far as electricity. We don't produce our own here we don't produce a lot of it, we are moving towards producing more of it but when you are small, it is not uncommon that you wouldn't produce your own electricity so you are reliant on some other jurisdiction to produce your electricity for you and so the supply is not always maybe what you wanted and the price that you are paying for it is not always what you wanted. so you can't control those aspects of it so that presents a bit of a challenge.

Do you see any advantages to having control over energy policy?

Absolutely. It's great as an island to be able to have more control over your environment. Without control over your electricity production, you're at the beck and call of someone else, basically. When you control your own electricity, you also are one step closer to controlling how you use your electricity.

Eg. BC. very large power company BC Hydro they do wonderful things as far as energy conservation, energy efficiency. The reason they are able to do that is because they produce their own electricity and any electricity is saved within their own province. They are able to sell it to someone else for a premium. There is a real push to conserve electricity within the province.
We don't have that here. Without producing your own electricity, you don't have that same driver to conserve because your client is islanders. if your client group expands and it is islanders as well as someone else, then you have the opportunity to say alright, if we make more here on the island, we can sell more somewhere else. you can sell it at a higher cost than you

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can sell it to islanders. So it really pushes the whole idea of energy efficiency and conservation.

Do you have any thoughts on small islands that are more isolated and not connected to a grid as to any advantages or disadvantages for them in terms of energy policy?

The only island I am familiar with is this one in terms of energy policies. I know it is not uncommon in a lot of island nations, that have wind energy in some of them, in Europe a lot of those islands are completely off the grid. and they seem to manage just fine. For us, if we were entirely off the grid as far as New Brunswick and getting our power from them, it also means we would not be exporting power, so once again, it isolates you and it can deter energy conservation efforts, because once again, you only have one client base.

Does the Province use any international benchmarks or indicators to measure progress towards sustainability in the production of electricity? What are they? To what extent has the PEI Energy Framework helped to consolidate progress towards sustainability?

We have as set out in the Framework a sustainability standard, the Renewable Portfolio Standard. there are a number of other jurisdictions that have those as well but no fixed amount that is common among jurisdictions. A lot of jurisdictions that don't have them, so the fact that we have one is quite special. 15% for a province that doesn't have hydro is substantial. Maine, for example, I think theirs is 30% RPS but they have more hydroelectric power. so it is not as much of a challenge. New Brunswick has Mactaquac and for them to set a RPS when a good portion of their electricity is being produced from Mactaquac which is renewable, as well as Point Lepreau, which is renewable, it doesn't mean quite as much as with a jurisdiction like ours where we are going from not producing our own electricity at all to 15% is going to be renewable. I'm assuming that is part of the reason why on the national and international scale, this policy is called one of the most progressive in North America, for taking a big step towards more difficult renewables.

Do you think the Energy Framework has actually helped consolidate the progress?

Absolutely. What is really important as far as progress is setting very measurable targets. And this policy has outlined a very measurable target. Saying what we are going to do 15% by 2010. and that's something that will hold us accountable and will ensure that we meet those targets.

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Do you see that that goes across the board to efficiency as well, in terms of manufacturers, processors, people in the private sector, are they benefiting from having these benchmarks?

Private industry, they would benefit on their own from doing energy conservation. Energy is usually one of the largest costs for people to do business in any particular type of business. For them to use less energy to do the same amount of business reflects their bottom line positively. For those businesses, energy conservation should be something they would be moving towards anyway just to improve their bottom line. As far as the Policy, I don't know that the Policy yet is moving towards getting people engaged in energy conservation. I think getting the ability to export and then the utility will become engaged in energy conservation. In other jurisdictions, the utility has been the main driver for energy conservation programs. BC Hydro does a program called PowerSmart where they reach out to homeowners as well as businesses to improve their energy efficiency. Without that same kind of interest from the utility, it is a hard sell here.

If you were to implement all the changes you see are needed for future sustainability, what would they be and how would you go about it? What are barriers to implementation?

From my perspective, the policy that we have here with the Energy Framework is moving towards a more sustainable energy supply, no question. We are moving towards that fairly quickly and making considerable strides towards that. But the other side of energy, there's supply and then there's demand, on the demand side it is more challenging to change people's behaviours so that they use less energy. We don't just want to be able to produce as much green electricity as we can, because at some point we just can't produce any more. Our resource in that way is tapped, just like it's becoming tapped as far as oil. But our demand is still out of control. We want to produce a good sustainable electricity and we want people to use less of it. So the challenge is in the demand side because government here has really taken steps toward addressing the supply issue. So on the demand side, I'm not sure what needs to take place. There are a lot of businesses and major corporations that have seen the light, so to speak, and they know that their bottom line is going to be bettered by jumping on board with this energy conservation initiative. Companies like Alcan, the major aluminum producers of the world, doing wonderful things as far as energy efficiency and to be quite honest, I don't think that has been driven by how we want to be good stewards of the environment. It's been driven by the bottom line. And so major industries are getting on board now and I'm expecting that that will trickle down eventually to smaller businesses and commercial enterprises once they see the benefits of reducing their energy consumption.

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Do you think people have more motivation to conserve if they have more control over their energy supply or if they understand electricity better?

No, I don't. I think what drives people's consumption is the lifestyle they are accustomed to. People are accustomed to driving by themselves to work; the transit system in the city that may start to change normal behaviours, but people are very accustomed to that, and here in PEI, people want the atmosphere of living outside the city but they work inside the city. People don't want to give that up. They want to go home and in their homes they want to have all kinds of appliances to do everything they imagine possible. All of the new homes that are being built nowadays are being built with about 40 light fixtures in them which is so much greater than were being built 10 or 20 years ago. So I don't know that it's having control over their own resource that drives consumption. I think it's people feeling they are entitled to a certain lifestyle and that lifestyle comes with, "so it costs me $10 more a year to operate this appliance, that's not a big deal. I work hard and I just deserve to have that."

Do you think the improvement in appliances is going to offset that to some degree?

Absolutely. The Energy Star appliances now are phenomenal as far as their energy consumption. One of the guys in the Department just bought a new fridge. He said compared to his old fridge, it saves him about $30 a month in electricity, and he said the whole fridge is going to be paid for in about 3 years just on energy savings. So, yes, they are making huge strides towards more energy efficient appliances and equipment and in a lot of cases, there is no difference in the price. It is just being aware of what's out there, and sometimes, depending upon the appliance and the technology, there may be a difference in the price, the Energy Star may be slightly more expensive and people have a hard time with that, with the sticker price of an item and the understanding of what it actually costs to operate. Taking the two of them into account instead of just looking at the sticker price. Same as with vehicles, they look at the sticker price of the vehicle and don't seem to take into account how much fuel this vehicle is going to burn, and let that have an impact on their purchases.

How is energy policy determined? How are the various interests expressed?

I think energy policy is determined by the desire to have a reliable source of electricity at a reasonable price. That's the bottom line driver. There are other drivers out there right now affecting energy policies. One of those is climate change and the international accords that are being negotiated with respect to climate change. So that's a driver right now. Oil prices are a definite driver as well as the supply of oil, and that's affected by

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everything from politics to the actual supply.. So that affects energy policy. For example, the oil prices in the late '70s, early '80s were a major driver of energy conservation initiatives. It was at that point that we started to see big leaps being made in the energy efficiency of appliances, vehicles, and that was all driven by the price of oil. So we are seeing some of that now as well. It is not just being driven by climate change and concerns over the supply, but it's the price. It's the people going to the pumps to fill up their vehicle and being outraged at the price they have to pay to do that. It's people that are heating their homes here with oil and having a hard time making ends meet because it's so expensive. So public outcry over the cost certainly affects the policy.

So how would these concerns be taken to politicians and the players that are making policy? Do you see this as totally a government responsibility, or have there been other inputs into our energy policy?

Here I see it mainly as government driven. That is one thing that is very different about being in an island jurisdiction. Politics is a very different realm, and having lived in different places, the access that islanders have here to their elected officials is phenomenal. To have lived even in New Brunswick, small population, and in Ontario, there would be no way I could call up the Minister's office and say, can I do an interview and that just wouldn't happen, nor would just the average citizen who had a concern about X run into somebody in the mall or at Tim Horton's and say I have concerns about this, I'd like to talk about this, that doesn't happen in other jurisdictions. The feedback that people here have with respect to government policy is extraordinary. A lot of policies here in government don't proceed without substantial consultation and that doesn't happen in other jurisdictions. Even this Framework policy, substantial consultation, and not just, like a lot of governments do, they put out a discussion paper and they kind of circulate it out there, and "if you want to comment on it, then go ahead, but we are not necessarily going to have a lot of forums where we are going to do that in person." Here that is not the case. I don't know that there is a whole lot of policy that gets developed here without public consultation. In that respect, it is not just government driven. It's definitely driven by concerns of the public, but it has to be pushed forward by government. It has to be led by government. And that is because the people expect it to be led here by government.

What input do communities have into the creation of energy policy? What has been the impact? How might this change?

I think it is huge. Even with private industry, for example, two weeks ago when Ventus had a public meeting to discuss what they were planning to do in West Cape, there was lots of opportunity there for feedback and for

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community consultation, which, like I said, is something I find really unique about this jurisdiction.

What are the contested areas between energy interests affecting Prince Edward Island? Where do you see the areas that are in conflict? How has being an island shielded us or exposed us to these issues?

There's always been some concern with wind energy as far as destroying the aesthetics of the island, the views and the vistas. People being able to drive along a coastal drive and their view not being obscured by a turbine. That has certainly been expressed in a number of locations, Malpeque for example. Major outcry there when the Irvings wanted to put up wind turbines in that area. So much so, it's to the power of the community, that it hasn't happened despite the fact that as a province, and most of the province here, who are very supportive of wind energy, still did not happen due to the outcry of the community. Very powerful movement there, and they were concerned about aesthetics. They were concerned about noise, which I think is a bit of a myth about the turbines themselves, but it was enough of a concern to them that they certainly voiced that. There are some concerns about people being able to put up turbines wherever, and that's not the reality either. With the legislation and the policy, it's designed so that that doesn't happen. So those are ones that I've heard. But for the most part, people here on the island, are very supportive of renewable energy. I sit next to the secretary for the Energy Corporation, and I don't know how many calls in a month she would get from people who wanted either put up their own turbine, or they are willing to offer up their land if the government wants to put a turbine on it. It happens fairly frequently. And in talking to colleagues of mine in the New England states, and their jaw just falls to the floor because they cannot believe it, because they face such opposition from communities there to put up these wind turbines. A lot of areas in the US, where you want to put up these turbines, are coastal, a lot of valuable properties in that area, and people feel that it would devalue their property to be in the vicinity of a wind turbine. Some major opposition there to move forward and that's not what you see here. The farmer see an opportunity to rent out their land and get some additional revenue, which is due to how the policy has been developed. It has been developed in order to elicit cooperation from people like farmers and so now they are all clamoring to say here's my land, put a wind turbine on it, I'll rent it out to you, because they're going to see royalties from it.

People don't distinguish between putting up wind turbines and having utility poles everywhere?

No, that is a norm. We have grown so accustomed to them we don't see them any more. We don't object when a pole goes up in front of our

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cottage and we think, our cottage didn't have electricity and now it will! People don't see it as an obstruction. I think with time, the norm will change here as well. Will not see wind turbines as obstructions to the vistas but maybe as something that adds to them.

Do you see any contested areas between the different suppliers of electricity?

Always issues in a jurisdiction when there has been only one supplier of electricity. When other players start to enter the field, I think there is conflict that arises. It's a competition, they are going to be potentially losing revenue to another company. I think there will be some contentious issues between renewable energy developers here. The policy has made it such that smaller scale suppliers, they have laid out some guidelines as to how things should work with respect to different people who are wanting renewable energy. There will still be some areas of contention.

Do you think the market is large enough for a variety of players?

When you are talking about any kind of commodity, a monopoly is not necessarily in the best interests of the consumer. It tends to inflate the price they are going to pay for the commodity if there is no competition in the market . Here on PEI we pay the highest rates for electricity as anywhere in Canada. So whether that speaks to the fact that we have had a monopoly, I'm not sure, because most jurisdictions don't have a huge variety of players. Ontario does, it has a number of different players, a lot of the power corporations are crown corporations of provincial governments in most of the other provinces. That's not the case here. This is a private utility. but I think it would be to the consumer's best interest to have a greater variety of providers, and I think if energy demand says anything, there is going to be demand for that. It's not as if there is not going to be a buyer here for the electricity here. And even if there is not going to be a buyer here, there is a huge export market for electricity. New Brunswick and Nova Scotia are already exporting power to the New England States, potentially with more electricity being produced here on the island, it stands to reason we would be entering that market as well, and I don't think that market is shrinking. I don't think the energy market is shrinking in a lot of areas.

Is there a role for the federal government in energy policy in Prince Edward Island?

Policy itself is an entirely provincial matter. The federal government has been active in fostering renewable energy in the province. It has been a player at the Atlantic Wind Test Site, they're going to be a player in a lot of energy-related issues here. But as far as the policy itself, it should follow the jurisdiction of the province. And if the federal government sees fit to

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cooperate in the initiatives that are developed within these policies, than that would be their prerogative. If the federal government, for example, is very interested in renewables, and wants to be involved with a province that is like-minded in that respect, then they will find themselves a province that has a progressive renewable energy policy and become engaged in that process. And that is what has happened here. It hasn't been the other way around. It hasn't been the federal government driving our interest in renewable energy. We have driven our interest in renewable energy, and they have come on board with us because they are like-minded in that respect.

How do you account for our independence or autonomy in this sense of our driving it?

I think the Minister has a lot to do with that. Whenever he speaks, he talks about the wind being 'our' oil. He places the entire connotation is this is 'our' resource to harness. This is 'our' electricity demand to meet. This is 'our' problem to address. We have relied on somebody else for so long, we have the opportunity to take hold of our own destiny. And I think that is attractive not just to islands but to any group of people, maybe more so to islands because we are used to living autonomously. Certainly until we had lights, we were not even connected to the other province. Very used to just going about our own business. It's a very different atmosphere, and I think here people strive for independence more than they do in other jurisdictions, just to keep the identity of who they are. The island has always been a place of progressive thinking, it's the cradle of confederation. A lot of progressive ideas have sprung up out of here. so this is really not breaking new ground in terms of doing something that a lot of other jurisdictions would see as risky or not the traditional way to go.

Do you have any comments on the capital costs and preserving our capital, obtaining financing?

If the strategy were to build these capital intensive structures, do you see advantages or disadvantages,

I don't see this as a whole lot different from the existing structure of the electricity industry. To build a generating station, a huge capital cost is associated with doing that. When Maritime Electric two years ago was talking about building a new oil-driven turbine on the waterfront, $50 million, that was a huge capital cost. Always huge capital costs. Only issue is that this is new, this technology is different, that perhaps the financial industry has not caught up with what the renewable industry is and is a little less willing to put financing into some of the steps or programs. And you hear that from private citizens who want to put up smaller versions of these kinds of things. Their banks are saying they don't want to be involved in these risky propositions. It's a bit of a

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stumbling block. But as far as large developments with governments or utilities leading some of these large investments, to me I don't see it as any different from investments in any other generating stations.

Because we have no financial head offices here, is having a financial sector something we need to deal with on an island?

I don't think it will be dealt with on the island. I think it is going to take some time before the industry catches up. In other parts of the world they have caught up, and it's not as much of a stumbling block as here right now. And that's going to have to happen in the financial districts. And that's not here in PEI, that's Bay Street.

A number of islands are financial centres, where we seem to be exporting our capital. How big a problem is that for PEI?

To me its only an issue of getting the financial industry interested in these types of projects. And I think that will come. I don't see that as a major barrier for the future. Right now, when you are the jurisdiction that is leading the charge on this, then it presents some barriers, but I think it would be the same barriers if it was NS that was leading the charge, or if it was Sask. I think they would be experiencing the same issues as we are. It's not unique to being an island, it's unique to being the one who really starts to move forward on this thing.

Do you have any last words on any of these issues?

On the financing side of things, that is where demand comes back into play. The cost to put up this type of infrastructure to get the supply is so much greater than the efforts that would be needed to reduce demand. You see a lot of the huge capital investments in these generating stations, and there are other jurisdictions that are looking at investing in demand side management programs, and they invest millions of $ because they see it as a means to avoid construction of generating facilities. And they are right. They can save enough money and demand to avoid having to build another station. And that takes a different kind of thinking. That's the same kind of thinking when a consumer goes into a shop and looks at buying a slightly more expensive fridge rather than a less expensive fridge, and having to weigh the fact that the more expensive fridge is going to cost a lot less energy. The same kind of thinking, the institution investing an additional amount up front is going to save us money in the long run. And people, whether they are a private citizen or a huge corporation, have a difficult time getting their head around it. I don't know what the answer to that is, but right now, it seems like it's more popular to just say let's build some more renewable supplies and we will address demand later.

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Interviewer: E. Kathy Stuart

Interviewee: Respondent #4

Contact Information:

Location:

Date:
Time:

Do you see any specific advantages or disadvantages in pursuing an energy policy from or for a small island?

In that context, is PEI a small island? **Yes.**

And are you looking for my view on PEI specifically, or small islands generally?

Both, from your perspective, your experience and your knowledge of other islands. Have you seen any specific advantages or disadvantages in terms of what you can accomplish?

Up until just very recently, I can't say that I am aware of any jurisdiction that has focused on anything other than cost as a policy. Lowest possible cost. But then recently I've seen some different things happen in different jurisdictions. In some jurisdictions there's been a move to encourage more local ownership. Many of the small islands in the Caribbean they are all investor-owned by some outsider. In a few of the jurisdictions, the governments have been suggesting, "maybe we ought to have more local ownership". I'm not sure that that's a well thought-out policy. I'm not sure I understand the objective of the policy other than to have some local owners. Typically it would be very difficult to find sufficient capital in that local area to maintain the utility, so it creates a funny challenge. I'm not sure how beneficial it is.

Then you have PEI which has recently taken a different perspective with respect to the renewable, and we're a bit uniquely situated there, even in spite of, what you think the trade winds in the Caribbean, the wind regime is not that great. There are some areas where they may benefit. In PEI here, I would call it slightly differently situated. And I cannot say that I know for certain what government's strategy is. Is it to develop a local resource or is it to develop a sustainable resource. Is it an economic strategy or an environmental strategy? I don't know the answer to that. I think they would like it to be both, and maybe it will be both, but I'm not sure. There are a couple of interesting things that they have done in the recent Renewable Energy Act, the legislation. If you look at it, there are perhaps three components that I think are the major components of it.

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One is that we have to have 15% renewables by 2010. And again, it doesn't say a whole lot about whether this is an economic or an environmental strategy. I think they hope it will be both. And that's not a difficult objective to achieve. Will there be a cost to it? Not significant. Or at least at this point it doesn't appear to be significant. Like I say, it may be both.

Whether or not it is a good environmental policy, from a sustainability perspective, is a bit questionable because of another component of the legislation which says the government gets to keep all the environmental attributes associated with it. So that leaves Maritime Electric, as the buyer of all this energy, not able to claim that it is renewable energy because the government want all the renewable credits, and the legislation assigns them to government. That would suggest it is more economic than environmental.

Does Maritime Electric have any obligation or responsibility in terms of environmental credits, or is that a government responsibility under Kyoto?

Unclear. It is still really unclear. Of course the implementation of Kyoto, the requirements under Kyoto, is very confusing because the federal government has signed a deal but they have to reach agreements with all the provinces to implement it. And at this point, there is no strategy. Really, there is no strategy. We have no idea how the Kyoto Protocol will be implemented and what impact it will have on Prince Edward Island. Assuming that they just say that each province has to reduce its greenhouse gas emissions, and they look to Maritime Electric...I shouldn't say we have no idea, we have very little idea...the federal government has divided up the country's emissions into various categories. For example, industry and large final emitters. Utilities are large final emitters and there are targets that the large final emitter group has to meet, but how that will be distributed we don't know. Coupled with that, now that we have 15% renewable energy, how will we be able to use any credits associated with that, we don't know, because the province by legislation own all of those credits. It is very confusing and Mar Elec is not alone in its confusion. The whole industry across Canada is standing back scratching its heads saying what are they going to do.

Are there any other international benchmarks or indicators that would be followed or useful or used by utilities to measure how well they are doing on the environment?

There are a whole bunch of ways you can do it. If you just said in Canada, and I haven't done this so I'm just guessing, but just take total greenhouse gas emissions and divide it by the amount of electricity produced in Canada, Canada would come out pretty well. Ontario has so

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much nuclear energy, BC, Manitoba and Quebec are essentially 100% hydro, Nfld is part hydro. Sask and the Maritimes are the main thermal producers, Ontario has significant coal generation still, but I suspect that if you just did that calculation, it would be quite low. We would look pretty good on the world stage. If you did another calculation, tons of carbon emitted per $ of GDP, it might be significantly different. It might be significantly higher, simply because as an exporting nation, a lot of the products that we export are very energy intensive, so if aluminum, for example, extremely energy intensive, although a lot of the aluminum smelters actually have hydro, but if you look at aluminum as an example, and Canada exports significant amounts of raw aluminum, and that aluminum is turned into a consumer product in say the US or Japan or somewhere, and the ultimate product is consumed in the US, if you did the calculation I just mentioned, Canada, although the end consumption was in the US, it would be Canada that would be tagged with the emissions associated with that product. Is that right? Should it be where the emissions occur or where product is consumed? In other words, should we assign some of our greenhouse gases to the importing country?

I guess that would depend on the intention of the Protocol to determine where environmental problem is, whether there are actual physical particles in the air more in one place than another, maybe....

The funny thing about the Protocol, the other way you can achieve meeting the requirements would be to ship out the raw bauxite. So what have we done? Bauxite is now going to be refined in the US, Brazil, China...the amount of emissions didn't go down on a global basis but Canada's goes down and somebody else's goes up. Did that achieve anything? Not globally. I can argue that Kyoto is a colossal failure and it's time to move on, for a number of reasons. No. 1, we will never achieve the targets. It is just physically impossible unless we want to drag Canada back into a kind of economy we had back in the early part of the 20th century. It is just physically impossible to do. No. 2, it's going to have negligible impact on the global environment, and No. 3, the big emitters are not in it. India, China, US. Australia is a significant emitter, there is a lot of coal in Australia...not part of it.

On the other hand, I could call Kyoto a success too, because it has raised the issue on a global basis, and I think it is now to the point where people are acknowledging that this is very serious, and I do believe it is a very serious issue, and although Kyoto in itself might not succeed in the sense that it meets its targets, it has been a success in that it has gotten enough global attention focused on the issue that realistic efforts can be made. And there are a lot of people who have some really good ideas about how you can manage the issue on a global basis. It is a big technological challenge but it can be done. I think it's time to move on from Kyoto. And

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I'd call it a success in that sense, that it has given us the focus we needed, but we won't meet the targets.

So in terms of bringing it down to Prince Edward Island, and an island level, what are issues of sustainability that you see around energy in this province, even if it is beyond electricity?

What we have to do as a province is have the kind of public discussion that hasn't occurred. And that is, what commitment should we as a province be prepared to make in terms of environmental sustainability? Because there is always going to be a trade-off. An economic trade-off, a financial trade-off to the extent that we impose on ourselves limitations or targets that are going to have a negative impact, for example, on our economic productivity. To the extent that we do that but our competitors don't do that, we are going to create just one more barrier to our economic viability. A lot of people will say, gee, to get 15% of our energy renewable, if it only costs an extra 5%, I'm all for it. And actually we've done surveys, and people do, it drops off, but at 5%, approximately 80% of people say yes, they will pay an extra 5%. An extra 10%, it starts to drop off. So islanders appear to be prepared to do that. A question that I don't think has been answered though, is that's islanders as individuals, who always think only of their home electricity bill which on average runs around $100 a month. That's $5 a month and I can have a warm, fuzzy feeling because I'm supporting the environment. But they don't think about the impact on the Cavendish Farms, the McCains of the world, the fish packing plants, and the more energy-intensive sectors where it can have an impact. So should we perhaps say, OK, all of the impact, to the extent that there is one, should be borne by residential customers?

How is it distributed now?

Well, we haven't really done it yet, but it will be distributed basically just on a pro rata basis on every kwh we sell. Business, residential will all pay the same premium, to the extent that there is a premium, and there will be some, it is not going to be extraordinary, at 15%. To the extent we go beyond that, it becomes more significant.

What if people paid more the more they use rather than the less they use?

Right now we do have that declining block in our rates. That's not something that was our idea. We would rather have a single flat plan. It has an historical basis. In the '90s, the legislation governing rate-setting on PEI changed so that our rates were modeled off NB Power's rates. NB had that declining block structure. Prior to that, ours was one flat rate. We had to abandon it due to the legislative change. We just haven't changed it back yet. We probably will do that within a year or two. In

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terms of the environmental issue, and an increasing block structure, then you are starting to drift into the question, should rates reflect costs or not? If rates should reflect costs, an increasing block structure does not necessarily do that. And when you find yourself in that situation, eg two different businesses. My business is more energy intensive, you work simply on a computer. I manufacture gadgets, use a lot more electricity. Is it fair that all of your energy is at that low block, because of the nature of my business, even though I am very efficient at what I do, I pay a higher price for it. There are a lot of equity issues that have to be dealt with.

First of all you have to decide, and this is a big issue in terms of deciding how you calculate the costs for serving each type of customer, and then saying what are my arguments for charging him other than cost. If I charge him more than cost, then I have to charge somebody else less than cost, or else I'm going to make a whole bunch of extra money.

There are all these externalities that are not considered in setting costs: environmental, social, equity...

My comment on that is two fold. One is in terms of environmental externalities, again the principle of environmental externalities are that there are real costs out there which the utility is not being charged, and so the utility is not passing on. If those costs can be identified, and the utility is then charged, then they should be charged to customers on the basis that customers incur those costs and not simply saying well, lets put an increasing block structure if that's not how the costs are incurred. So if they are there and they are measurable, then they should be charged on the basis of cost causation. The social types of externalities get even more fuzzy, and I think you are drifting out of the area of the utility's mandate and into the area of government policy. If you want to deal with that, you should deal with it in some sort of a taxation policy.

That's what I'm looking at, a holistic analysis, trying to get the whole picture. Just wondering about who sets policy and who feeds into it. Are there any players or institutions that feed into policy other than the utilities, the regulators and government?

Well, you have pretty well captured everybody there. When you talk about the utility first, you have to recognize that we act within the bounds of legislation. The legislation is pretty explicit and there's no way we can justify acting outside of it. Given the nature of the legislation, if you are talking about social externalities, somebody would just be smacking us on the side of the head saying, where do you guys get the right to make those kinds of decisions if we tried to do anything in that context. An example of a social externality is a lifeline rate. People whose incomes are below a certain level can get their electricity at lower cost. We have no basis to make those kinds of decisions. What is the cut-off level, what

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should the break be, that's the dept of social services. If you can't pay your electricity bill, then they will look at your situation and contribute so much towards it.

How would the utility respond to more of that kind of legislation, would it be a help or hindrance to have things that would affect the rate structure differently? How does that impact the utility?

We would take the same position we took with respect to the Renewable Energy Act. I think there is a significant misunderstanding of Maritime Electric's position with respect to wind energy. People are saying, "You guys wouldn't have anything to do with it, you wouldn't go along with it, government produced some legislation, and now you want to do all this stuff". And that's not correct. We had always taken the position that, the question of whether or not there should be wind generation on PEI, if it's at a premium, is not one that Maritime Electric should make. Maritime Electric's mandate by legislation is to provide electricity at least cost. To go beyond that is social policy and that's the role of government. So we said we were pleased when government introduced the Renewable Energy Act because it clarified for us government's position, and that's their role, to make that public policy kind of decision. Having made that, it paved the way for us now to become more active in it. So people say, "you've changed your tune". We haven't changed our tune. We've always said, somebody's finally listened to us and they've made the kinds of decisions that we said had to be made before we could proceed. And we said, fine, we'll do it.

I think our position would be essentially the same with respect to any kind of a social policy that dealt with any of those other issues. That's public policy and it's government's role to affect public policy. I personally might not agree with all of their public policy decisions but in the context that they make them, that have an influence on electricity, if we knew they were considering it and we had concerns about it, we would probably express those concerns. But if they were ignored, or they explained to us why they were carrying on anyway, and they carry on, we just say fine, we raised the issue, it's government's mandate to make those kinds of decisions, they made them. Our role is to implement them.

Given your role, or Maritime Electric's role, in servicing the province for many years, do you see areas where particular kinds of public policy could address issues that you see are needed, in social areas or conservation or in environmental areas?

In terms of conservation or environmental areas, one of the other things in the Renewable Energy Act is the requirement for Maritime Electric to produce a demand-side management program which is conservation and working with customers to help them improve their efficiency. Again, in

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the absence of government policy, it is tough for us to go to the regulator and explain why we want to spend a whole bunch of money to encourage customers to use less of our product. There's just no economic basis within the existing regulatory framework. This creates that framework so it allows us to go ahead and do it. That's an example of a reasonable policy I can see coming out of it.

Let me come up with an example of one that I think is not reasonable. Let's suppose the province looked at concerns with small family farms and said their electricity bills are the problem. Let's introduce legislation that says that Mar Electric has got to give them a big break. That would concern me a great deal. First of all though, it doesn't concern me with respect to Maritime Electric because we will collect the amount of money it requires to run the company. That's the way the regulatory environment works. We have a rate case, it is really divided up into two stages. First stage is "how much money is it going to cost to run the company next year?" and we just add up all of the costs. Buying energy, maintaining distribution lines, building new equipment, paying taxes, all of that stuff, we say, there's the bill. $132 million the next year. That's not it exactly, I forget what our target is for next year. Go to a hearing and people say, "I have a few questions here and how did you come up with that estimate?" I say we estimated this many hours, "I don't agree with that, last year the cost was only ---, you have doubled the cost from last year"... we say "ya, we wanted to do a little more..." The regulator might say instead of $132 million, it is going to be $127 million" , we agree with some of the interventions. It costs us $127 million to run the company next year. Next question, who is paying? And if government introduces legislation that says the farmers are going to pay this amount instead of the total cost of serving them, then that means everybody else is going to share in it.

And that bothers me for two reasons. The primary reason it bothers me is because the best conservation tool is proper price signalling. So if you artificially subsidize one class, even though it is at the expense of another, you are sending a funny price signal to that person. They are not making the proper decisions. So rates should reflect costs from an energy conservation perspective. So if you were to, say what, and the same thing would apply to social services policy, if you start sending low bills to low income people, the thing they are going to soon learn is, "I guess I don't have to turn off the lights so diligently as I used to". Wrong signal. Wrong signal. So rates really should reflect costs. And I guess the other part of it is, I don't know how you would balance charging this person more so that person could pay less. If you want somebody to pay less, if you want to support the farming community, or whatever particular interest group, do it in an overt manner. That's a government role, do it through government means, not using electricity prices for social purposes. That's a very slippery slope. A lot of jurisdictions haven't been able to resist the urge to do that, and they are all in trouble now.

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That would be an important area in communicating with government on whether to do it through rates or direct government subsidies.

We call it government support.

Getting back to islands, do you think that these kinds of issues are affected by working on an island? Is it easier to do this here than it would be, say, in Ontario or Quebec?

Ontario is one of the areas I referred to when I said areas hadn't been able to resist using electricity as a social policy and have gotten into trouble. People don't know it but rates are higher in Ontario than in Prince Edward Island.

Are you familiar with any similar experience in the Cayman Islands or other islands?

The Cayman Islands have been remarkably stable until recently that dealt with how they are going to recover the costs of the hurricane damage but I think they've gotten past that. Now they are an example of a jurisdiction, I think they are at the other end of the scale. Electricity prices are fairly expensive in the Caymans by our standards, probably 2-2.5 times what they would be here. But they are all so darn wealthy that it doesn't become the same issue.

Do they have a government regulator?

Its not the same. The way it works down there, I say that but I hesitate to say it, because they are in the process of changing it in the Caymans, but the way it really worked was more by formula rather than regulation. Regulation looks at reasonableness of expenses, a formula just is (who cares why they are this), just multiply this by this and you get the rate.

Have we evolved from the formula to this, or have we been pretty much proactive in regulating all along?

We've gone through a bunch of phases. We went through the phase where, "we don't care what the rates are, we know they are going to be 110% of New Brunswick's". From that to, "we don't care what costs are here, here's the formula. Multiply this by this, subtract that out, that's what the rates are". to one where we look at the reasonableness of costs and go through that argument I described. And quite frankly, that is the best model from the consumers' perspective.

Is that the best model from utility's and the government's perspective, do you think? Is it more complicated?

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It is the most complicated. The most costly model, and it has the potential to be extraordinarily complicated. It leaves the regulator an awful lot of authority in how they decide on reasonableness, and I have seen jurisdictions, one in particular, in Belize, where the regulator has just gone way off the deep end. He issued an order that we can't even understand, and you go back and talk to the staff in their department. You ask two people and they give you two different answers, they've gotten so complicated, they've confused even themselves. But those issues always sort themselves out. In the long term, it's probably the best model for everybody concerned. It provides the consumer with the opportunity to intervene, challenge, ask questions, and it provides the utility a lot more certainty in how his rates are being set.

Does it effect how much energy is produced or consumed?

I haven't seen one of those other models that would work by formula that have incorporated any conservation or energy management efforts in them. So in that context, the cost-of-service model, that is what it is mostly described as, is the only one that has the ability to have an impact on that.

You mentioned about consumers being able to give some input on whether their rates are too high or whatever. How do they do that? Is that directly to you as a customer?

Lots of them do that, but it tends to be done through the Public Utilities Commission (IRAC), either through a complaint, "I got my bill last month, and it is too high, there's something wrong, the utility says it's right but I think it's wrong", so there can be that type of complaint. But more so at a rate hearing when we apply for rates. You can have a rate application that can go just through a paper hearing or an oral hearing which can go on for weeks. You will probably see a notice of a rate hearing next week. You can go online and look at our application and all of the evidence, the reasons behind it. You ask questions or write comments. If there is an oral hearing, people show up. Usually large industrial users will show up, they will often hire somebody, an expert, to intervene on their behalf. They'll get and expert who is on the stand, says "no, I know what I'm doing, this cost shouldn't be this, should be that, if you didn't do things this way, you can reduce cost..." so you get that kind of argument.

So are your rates already established from the budget for the upcoming year? How does this affect your revenues?

If you look at the application that we have put in, you'll see that about 80% of it is in explaining how much it is going to cost to run the company for the year 2006. And then the last page, is, within it, we do things like we say here is our forecast for sales, and here's why it is forecast this way, here's the classes, here's what has been going on, and associated with that

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forecast of sales is the cost of buying or purchasing that energy. So we do that, and we go through and here's what it is going to cost to run the company. And then we say, based on that sales forecast and the existing rates, here's what we are going to collect. It is only 98% of what we need. We need a 2% rate increase. That's what we do. So all of our existing rates will go up by, if they agree with us, 2%.

That's not the usual. The usual is to have a more detailed rate design that looks at the costs of serving each customer class. So we would say the total revenue requirement was $130 million. We'd say, and the way we'd calculate it, 68 million of that is residential customers but our existing residential rates are only going to recover 60%, so we need a 12% rate increase in there. There's another class and we look, look at that, the existing rates recover more than we need, so they get a decrease. An average revenue goes up by 2%, and some goes up and some goes down...we aren't doing that in this application because we don't have the data. We are in the process of collecting the data and doing that analysis and any adjustments. By the way those are very big exaggerations—it would be astonishing to see a rate go up by 12%-- and the commission wouldn't agree with it. If you have that kind of a problem, you would deal with it over a number of years. You would say, ok, the average is 2%, we'll increase that by 3% and move into it slowly.

How can we pull this back a little more into the small island issues?

There have been some events in the news about federal assistance for transmission and cabling. How does transmission figure into costs?

That is an issue that is specific to Prince Edward Island. We have a cost that no other province in Canada has, and that is crossing the Strait. It would be the same cost in just about everything we do, and that deal with the federal government. In effect we said that Maritime Electric would build the on-island transmission infrastructure, same as any utility in any other province. In exchange for that commitment, the federal government would pay for another cable. The way I viewed that, and I used the same argument a number of years ago when we were looking at bringing natural gas to the Island, I said that the federal government should pay. There is cost to build a pipeline, under the road from the bridge in New Brunswick to Aulac. The natural gas pipeline from the offshore in Nova Scotia, it crosses the road about halfway between the rotary and Aulac. you don't even see it, it is all buried. There is nothing there. If you look, you will see a little sign with M&NP written on it, and that's the pipeline company. The pipeline is under there. We would have had to pay the cost of bringing the pipeline from that pipeline down to the shore and across the strait.

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I argued that the federal government should pay the portion of the submarine pipeline. The reason I argued it was I said that that is a cost that is unique to Prince Edward Island because it is not a contiguous part of Canada the way all the other provinces are. So it was a unique situation as a result of our being an island, and that should be supported by the federal government. Now we never got to the point where we were really arguing it because it fell apart for other reasons. There was no gas to buy. But the same argument holds true for this project. We shouldn't be penalized as a province just because we are an island. We will pay the costs of transmission on the island the same way NS Power would invest in that, but for investors in building wind turbines in Nova Scotia to export the energy to say the US, compared to investors in PEI, PEI investors have to support the costs of an additional link simply because we are not a contiguous province, we are an island. So that should be eliminated. We came up with, if we agreed to build on-island, they would agree to do that. That was simply because of us being an island.

Re the availability of capital, are we at a disadvantage because there are no financial institutions, head offices, financial policies made here?

No, we are not at a disadvantage because of that. But we are at a disadvantage due to a bunch of other factors. One is the relative size of our economy and the relatively small scale. Let me give you an example. As a utility here, we finance our operations by either equity or debt. Equity is shareholders' ownership. Every few years as the load grows, we have to have another bond issue. This is again another of the things that we can debate *ad nauseum* at a rate case, what should the proportions of equity and debt be in the company—typically a company like us would be 40-45% equity and 55-60% debt. So as the company grows and we make additional investment, we have to go out and finance more debt. Because of the size of the operation, for us a big debt issue would be $30 million. That's about the biggest we have ever done. That is teeny tiny in the bond markets. And as a result, we have to do what are called private placements. You can do a public debt issue, and you see bonds traded the same way you see stocks traded. We just can't afford to do that. But if you look at what they call the spreads, the difference between the interest rate on our bonds and the long term Canadas, we have a much higher spread than a public issue simply because they argue things like liquidity—if you are holding our bond and you need to sell it, you are going to have a rough time selling it just because there is no market for it, not because people are going to say "heck no, I'm not doing that". But if you just need the cash for some reason, the number of people you can go to sell it that will say, "yes, I'll buy that bond", is pretty limited. So we pay for that. That's a size issue. We also pay in terms of the equity returns we are allowed. Typically returns on equity are higher, for example, in Prince Edward Island and Nfld than they are in NS. There aren't so many electric

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utilities in Canada but gas utilities compare pretty directly to them. And our returns are higher. The arguments are the same there--the investor risk is higher there because it's a smaller economy, the risks, with the economy very narrowly based on agriculture and tourism, so investors say, "no, if you're asking me to invest in Maritime Electric vs. investing in Union Gas", which is a big gas company in Ontario, they're going to say "sure, Union Gas I can earn 9.5%, Maritime Electric I want 10.5%". "Cayman Islands, I want 14%". "Belize I want 16%". "Turks & Caicos I want 18%". Turks & Caicos is an interesting example. It is a privately owned one but I know the family that owns it. They've got some real concerns. Although the returns are very good, they are terrified they are going to be wiped out by a hurricane and the whole thing is gone. How would they be compensated for that? The country doesn't have the money to do that so there is a huge risk to operating there, and consequently, if they want to attract an investor in there, they are going to have to pay a huge amount for it. If you look in Belize, for example, government bonds are 12% so the equity return, first of all, the company bonds, would be more risky than government bonds, they are typically 12-14%, the equity investor's got the most risk of all, he's got to be above that. In these smaller economies, it's just more expensive to attract investment. It's not a question of-- in some cases it would become a question of would you be able to attract it at all—typically that would happen if you have a regulatory environment that does something wacky—like says you are an investor in Canada and you only earn 10% there, well you are only getting 10% down here—well that would probably skid an investor to a halt.

It would seem those would be good places to incorporate renewables if they could to reduce their fuel costs over the long term...

The question is, are the renewables cheaper?

Well they would be after the capital costs would be paid.

But you can't ignore the capital costs. That's a little more elegant argument of the wind is free argument for wind turbines. That's true, but the capital cost of a wind turbine is significantly more than the capital cost of say a coal plant. Dollars per kw, you would be paying more for a wind turbine than a coal plant, yet for each kw that you get out of it or you build, you will get 2.5 times the energy out of the coal-fired plant.

But at some point, fossil fuels will...

There is enough coal in the world we can all choke ourselves to death with the CO2.

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Those would be what I call the externalities.

Yes, I know. But can you expect small island economies to be sensitive to those externalities? That's the question.

That is my question. Perhaps they should be more so because...

Let me give you an interesting example. It is not an island economy but it is a small economy, equivalent to an island, and that is Belize. We wanted to build a dam. And we were raked over the coals by the National Resource Defence Council, a US environmental group. And they enlisted all sorts of things. They put out to their membership a petition, if you are opposed to the dam in Belize, sign this. They sent 45,000 of these things to us. We took the position that 1. the dam is the least cost solution to Belize's energy needs. 2. on balance, when comparing the environmental impact of the dam to the environmental impact of the alternative source, which is heavy oil burned in a diesel generator, the dam was the least environmentally damaging, and 3., we'll do what the Belize people want us to do, a dam or a diesel generator, whatever; they decided on a dam. These Americans, and of the 45,000 petitions that came in, about 42,000 were from the US; I looked at it and the vast bulk of the petitions were coming from the southwest of the US; these guys had dammed up every river in that part of the country and they have destroyed their own environment, now they're bleating that "we've destroyed all our own environment, all that's left is yours, so we want to save yours'. I thought, if you want to save the Belize environment, why won't you pay the difference between the economic benefit of the dam and the next least expensive alternative. Why do they have the right to deny Belize its ability to develop its economy just because they don't think it should be developed? And I didn't understand that. If you want to put your money where your mouth is, and subsidize the price of oil to keep electricity prices down to where they would be with the dam, then go ahead, but I don't think one country's got the right to tell another country something like that.

So do you find that NGO's are visible and do they have an impact in some of these countries?

They can have an impact. We were involved with another multi-national in this project initially. They were the ones who were going to build it. As soon as it started, they said "we're out". We said, then get out of the way and we'll build it. And the NGO's influenced them to do that. NGO's didn't have a big influence in the country. That to me was a bit disappointing. It was the sort of, here's a small isolated economy, in effect an island economy, they are in the same situations, all the Caribbean islands, they had an opportunity to develop what was really an environmentally benign

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project and you had these external people trying to stop it. That to me was not right.

What is different about the Caribbean--are there things that are different that affect energy policy there as opposed to energy policy here?

Yes. I think so . One is the price. But then there are reasons behind that. If your electricity price is reasonable-- and who can judge what is reasonable—if you look at prices on Prince Edward Island in comparison to other areas with the same standard of living, we are pretty competitive. Most people don't believe that, but it is a reality—prices of electricity here are about two-thirds of what they are in New York. Prices in the Caribbean would be at least US 20 cents, and our average revenue in cents per kwh is about 11.5. So it's pretty much double.

And ours are the highest in Canada? No, there are areas of Ontario that are higher than us. NB is probably about the same as us now. NS, if they get the rate increase, will be the same as us. Ours are very competitive now.

So if your prices are competitive, it gives you more flexibility, and you can do things like, say the Renewable Energy Act, because 5%, gee whiz, that's not so much, that's $5 a month. But if your prices are already sky high to the breaking point, you don't have much flexibility. That's the case in Belize. Cayman, they do have flexibility because they are a wealthier jurisdiction. Most of the islands in the Caribbean.

What would be the reasons why their prices are higher?

Economies of scale. Relatively smaller diesel engines that are lower efficiency, use a higher priced fuel in terms of $ per million BTU. In most of those countries, I don't have the statistics but just from looking at some of them, I know a little bit more about Belize, In PEI we're about the lowest in energy intensity in Canada. Here the average consumer uses around 600 kwh per month. In an area like Belize, or some of the poorer countries, it would probably be 50-75 . All they've got is a refrigerator, a television and the odd light in many of the places.

Is tourism a big factor in terms of air conditioning? yes it is, but it's very seasonal, I think. That makes it very expensive to serve when you have a seasonal load because you have all the infrastructure for 12 months of the year but you only have the revenue to pay for it for 6-8 months. In the off-season you suffer.

I wanted to ask you about agriculture in PEI. That would be fairly energy intensive?

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It's not particularly for electricity. Depends on the type of operation for electricity. They re energy intensive in terms of all the mechanization in farms. It's like everything else, the energy intensity is growing.

Anything to add?

I think the idea that the flexibility of energy policy, or the ability to introduce different types of energy policies, is very dependent not only upon the wealth of the country but the price of the electricity, and that's the problem that many small islands have. We are fortunate here on PEI although most people don't really see that. We can do things like this Renewable Energy Act. Most of those countries couldn't do something that's not least cost. They have no choice. That's why you see some pretty rough environmental situations. You go down there and see some of these diesel plants. There is just oil oozing out of the ground. They can't afford anything else. If it took 10% of the bills to clean up the environmental messes they've created, and lots of them have them, the country would be in open revolt. Cash just isn't there. These work like lots of people use their family bank accounts. If there's not enough money in the account by the end of the month, they wait until the next cheque comes in. I've seen that. Countries..."sorry, we don't have that". You have to buy fuel in US dollars. You go to the national bank to exchange local currency for US dollars... "we don't have any". We have a bill we have to pay..."can't help you. Come back next week"...the flexibility is all gone. Those are all issues that don't exist here.

How do we stand in negotiating as far as our neighbours go, and are we at an advantage or disadvantage as a small island?

We are at a disadvantage. We are at the end of a string. We do have some flexibility, but the reality is, who can we buy energy from? Directly from New Brunswick, indirectly from NS; Maine, Quebec. Every one of those indirect purchases we make requires us to pay to ship it through New Brunswick. Whereas, if you are situated like New Brunswick, you can buy it directly from NS, Maine and Quebec. NB are ideally situated. We are able to ship it through NB, which is something we were not able to do before, so we were a totally captive customer, but now we can. It puts us at a disadvantage.

Any chance to get cables in any other direction? Virtually none because where would you ship from?

Exporting is not really a problem but exporters have the same issues too. Where are they going to sell it? The US market is the obvious market but they have to ship it through New Brunswick. If you have the same costs as a developer, if the developer says, "where am I going to build, PEI or

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NB?"...he is one wheeling charge cheaper by building it in New Brunswick. Geography again. So it puts us at a disadvantage.

Are there any subsidies or any changes to the market as a result of federal input?

In terms of renewable energy, yes, to encourage wind energy they have done two things: one is Wind Power Production Incentive—they will pay producers for a period of ten years one cent per kwh for every kwh of wind energy produced. And they also have changed the capital cost allowance (CCA) rules for wind turbines so you can write off 50% in the first year. So they have made it more attractive for investment in those renewables. The problem is, the US has also federally offered some significant incentives to the point where demand worldwide now outstrips the supply of windturbines. Manufacturers of turbines have noticed this and prices of turbines have gone up close to 20%. They blame it on steel prices, which is partly true, but I think there is another part too as they saw the market.

Where are the big producers of turbines? GE produces them in the states. Other than that, they are European producers.

Speaking of turbines, has Maritime Electric had occasion to use the new turbine yet?

Yes we flip it on from time to time. It is designed to be backup. In the extreme cold weather, NB has so much electric heat load, 90% of houses are heated with electric, their load just soars through the roof, which works to our benefit. When they get a really bad cold snap, they will call us based on the weather forecast. No energy tomorrow boys, so we have used that turbine.

Is there any plan to put underground transmission lines in PEI?

We'd be happy to do it but it is brutally expensive. There is a difference between transmission and distribution lines. Transmission is the steel towers that cross the fields. You wouldn't even want to think about that. The most effective distribution line we could build is in a subdivision where in a km you might have 20 customers, so your cost per customer is relatively low. We get requests, and some people do it, not very often...there are a few underground subdivisions. The last time we did it, the developer said "that's going to add $5,000 to each of my lots. I just can't do it." I said yes, we know. It costs just about 10 times as much as the overhead. People argue that you won't have the problems with it and the interruptions. And you won't have the number, the frequency, but when you do have a problem, you have a big problem.

So that would be a consideration in somewhere like the Cayman Islands in terms of mitigation of disaster?

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Interestingly enough, they did take that approach there. They put a fairly major circuit through underwater across a shallow bay by cable thinking "hurricane-proof". A ship sank on the cable in the hurricane and crushed it! You have problems: terminations get flooded, water gets inside of a cable, it just explodes, it's very difficult to operate in an environment where you think they may be totally submerged. It's essentially one of aesthetics. We'd be very happy to do it, invest more money, earn more money but I don't think people want to pay.

Is there a solution to the technical problems to hooking wind power to the grid system?

Call back next year. There are varying degrees of technical problems. Hooking small amounts up is not a problem. The load on PEI peaks at a little over 200 MW. The wind farm that government are talking about building up at East Point will be 30 MW. That will have some issues we are starting to discover now that we are getting the details, the technical details of the turbines. There have been a few million $ surprises show up in terms of technical problems but we think we can solve them. But that's just 30 MW. A developer is talking about building a 100 MW farm at Cape Wolfe, West Cape. That might surface a few more extreme problems. We haven't heard yet. Big issues that we don't know the answer to is not technical problems but financial ones. When I said that it won't probably cost us a whole lot extra, government sets the price that we pay for wind energy. Government sets the price at 7.75 cents per kwh. If you look at the energy we are buying this year, it is significantly less expensive but it will probably increase just to reflect world oil prices. The 7.75 will be a little more but not a whole lot more. When you multiply it by the amount of energy and compare, it will be a couple of percent on your bill. The question we don't know the answer to is this: that when we buy energy, here's the load from midnight to noon to midnight. The load is low, it comes up in the morning and peaks and then drops again in the evening. So we decide, how will be supply all the energy? And we say ok we have Dalhousie and Lepreau, and we don't want to shut them back at all because they are really inexpensive. We'd only save about 3 cents a kwh. Lepreau, we'd save a tenth of a cent a kwh, so you keep them going all the time. Then after that we say, how are we going to supply the rest of this. We look at different types of contracts. We will have a contract with New Brunswick where we will say we will take this amount 100% of the time, I guarantee we will take that. Then they say, guaranteed 100% of the time, price is 5 cents per kwh. Then we say we need another block and we will need up to 70 MW, but only for short times. Then we are only going to, on average, take it about 40%. They say, well, ok, that's going to be more expensive. It's going to be 7 cents. Now you introduce wind. You don't have any control over when it blows. We know that it will blow only about 40% of the time, so where it really goes is in here, and it will be up and down, up and down. So this energy will come from wind at 7.75

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cents per kwh, displacing 5 cents, but where are we going to get this energy in here. We're going to have to buy it from New Brunswick. What we're going to have to say to them is, well, we're not quite sure. We might want 50 MW of energy but don't count on it. And I'm quite concerned about what New Brunswick's reaction is going to be. They are going to say, tell us whether you want it or not. Commit to take it, and if you don't take it, we will sell it somewhere else, we will credit you with what we get for it, and you take all the risk. And that could be very expensive. It's not the wind energy, it's the energy to back it up that I'm quite concerned about. We just don't know the answer yet.

But then that's normal for a new technology.

It is. The question is, and this comes back to the discussion we've been having, can a small island economy like ours afford to take that risk. What do you think?

From what I have seen of small islands, they're accustomed to taking risks, they are accustoming to paying more, they are more outward thinking, they have an identity, they have a lot more resources that makes risk-taking less of a risk, and I think people are quite willing to pay more to be more forward thinking, especially if the environment is underneath .

How much in terms of a percentage? I just have no way of knowing.

We spend so much on so many other things that are not necessary, why should we balk at spending a few more cents on something that is necessary and a good bargain?

But 5%, 10%, 15%, where is the cut off? If it doubled your bill you would say whoa. If it went from $100 to $200 a month?

It is quite variable across the board. There are people who are really in trouble if their bill moves even a little bit. And those should be dealt with through an equity component, a subsidy, or some way of helping them manage how they take their electricity. There are others it's not going to make a difference if it's 25cents or 50 cents or 75 cents per kwh, and they probably won't even think about it, because they'll go out and spend a lot of money on something that somebody else wouldn't pay for.

Yep, and they don't even see the bill because it comes into the office and somebody else pays it for them.

Most people are quite apathetic about electricity. So I think there is a huge capacity out there to pay more for electricity, especially if they

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think they are supporting an environmentally friendly action that is long term.

Here is my concern. It is based on an experience that happened in the US. And I know particularly of the situation in New York State because I did a lot of work there for a few years. Back in the mid-'80s, during one of the previous oil crises, the federal government introduced what they called PURPA, the Public Utilities ... Act, that required utilities to buy energy from renewable sources, which were mainly small hydro, at extremely high prices. Back then, some of them were at 15 cents a kwh. The State of NY got on the bandwagon, said they had an even better idea, and they increased it. So the utility was required to go out and sign contracts for incredible amounts of money. The oil crisis disappeared, electricity rates were going through the roof, businesses were leaving the State, and the politicians said, "what is going on here with electricity prices...we are going to have to fix that", and they said to the utilities, "you shouldn't have signed those contracts". "What do you mean, you put it in the legislation, you made it law that we had to". "You should have figured out some way not to..." The utilities took a good part of the bath associated with that, and one of the large NY utilities went bankrupt. So the problem is, that things that everybody thinks are a good idea at the time, people's memories fade, if things go wrong, five, ten years down the road, finger pointing starts. There was only one guy around when it all started, the utility.

By having a private utility you are in a peculiar situation in that you take the risk yet you are providing a public service. Perhaps there needs to be some innovative thinking done around that too. It's about the institution of providing electricity. This gets into unbundling and deregulation.

All you are doing is segregating the risk. You are not changing the risk when you get into that discussion.

So how has the pressure to unbundle played out in PEI.

There has been none.

I guess the development of renewables is going towards more competition.

Not really. If you look back, this generator we built. Part of that, we never built a generator. The last generator prior to this one was built in 1970. Because we have always taken the view that when we make an energy supply decision, we take the least cost. We either build or buy. And we've looked over the years of building options, eg natural gas, we've looked at, in the past, renewables, wood chip things as an option, whether we'd build

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them or whether it would be cheaper to buy them, and invariably, the decision has been made to buy. And this is no different, the wind is no different. Except that government have their mind made up that they want to build a wind farm. If that weren't happening, we would go through that process. We would put out a request for proposals and compare the proposals we got to what it would cost us to build. If it was cheaper for us to buy from independents, we'd buy. If it was cheaper for us to build, we would build. Government's decision that they want to get into the businesses is their decision, so we're not doing that. But that's what we would have done. So it doesn't really change anything. That's what we have always done. We just decide which is the cheapest alternative.

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Interviewer: E. Kathy Stuart

Interviewee: Respondent #5

Contact Information:

Location:

Date:
Time:

Do you see any specific advantages or disadvantages in pursuing an energy policy from or for a small island?

I don't understand the question.

...in terms of anything that would make it easier, because we're an island, to implement, any particular kinds of renewable energy, energy policies, is there anything about being an island that would...

I don't think there's anything about being an island that makes us unique in the sense that every place is an island in this sense, in that every place has its own unique characteristics, its own unique advantages and disadvantages, in terms of energy. We're an island, we're surrounded by water, so that may have an impact, but that's no different than if we were in the prairies surrounded by wheat. Both have energy implications. So I don't think our islandness really has a unique role to play in that.

Of course, PEI being linked to the continental grid, do you see any other technical considerations in terms of an island that would be offshore, or unable to be linked...

Well, certainly that's different. There again, because we are part of the grid, we're not in a different situation than a region of Nova Scotia in the sense of, again, we all have our unique issues, challenges, whatever. If we were disconnected from the North American grid, then certainly we would have the issue that we would only have our own generation capacity to worry about, so a further offshore island would have that issue. Again, these are all part of the whole suite of unique characteristics that every place has, whether it's an island or not. You just have to tick that off as one of the things that would make us unique.

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Besides the 15% of renewables by 2010 benchmark, are you aware of any international benchmarks or indicators that could be used by the Province to measure progress towards sustainability?

No, I'm not.

To what extent has the PEI Energy Framework helped to consolidate progress towards sustainability?

I don't really know if it has or if it hasn't. I'm not in the loop to know that.

As a supplier or consultant and an academic in engineering, if you were to implement all the changes you see are needed for future sustainability, what would they be and how would you go about it?

Well, I would certainly be investing more in local expertise. Right now, what appears to be happening is we're looking for companies from outside to come and set up wind turbines or provide that sort of a solution. We don't have any ability locally to know what level of wind power is appropriate for us. We don't have anybody locally who really has genuine expertise in integrating that wind power with the grid. We don't have anybody locally who has expertise in biofuels, so we are really at the mercy of the rest of the world, and until we get that expertise locally, we have difficulty in really moving forward. The Wind Energy Institute which was announced for PEI is good in a sense, but it's specific to a fairly narrow focus right now, and maybe that will build. It needs time and money to do so.

What barriers to implementation of having more local expertise do you see? How big a problem is that and how easy is it to fix that?

Well, it's a huge problem because we don't have critical mass and we don't have any major resources being steered at it right now. So again we are at the mercy of offshore, off-island companies, individuals and the like who our government is hoping to recruit, to come and be a part of this. We don't have anybody really in the game for us who knows what's going on. For an example, and again I'm out of the loop in terms of licensing royalties for wind power, but it's my understanding, again, I don't know if this is true, that local landowners are being offered a very low percentage of royalty for the use of their land, maybe 1% or less. Whereas, I understand that in other parts of North America, the percentage that landowners are being offered in remote areas even, for the use of their land for wind turbines, is quite a bit more than that. We have nobody here that's able to say, wait a minute, for our citizens, for our population, the payback to landowners isn't fair. We have no experience with it and that's something we desperately need. That and many, many more things.

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What input do communities have into the creation of energy policy.

I couldn't tell you. I don't know. I don't think it's much but I don't know specifically.

What are the contested areas between the energy interests in Prince Edward Island?

I think that Maritime Electric has a mandate to offer power that's reliable at a low cost. They don't have any significant interest in leading the way in terms of renewable energy, and they're mandated that way because of the way that their monopoly in the Island is set up, having to go through IRAC for most everything in terms of decisions. So they haven't an ability to make significant decisions. They don't have an interest in making novel decisions, so they're on one side of the coin, the provincial government is out speaking quite vocally about progressive ideas and renewable energy, but they don't have any significant resources to turn to it, so they are hoping that companies from offshore are coming to invest in wind power parks, for instance here on the island, etc., but they don't have any way really to guide that other than encouraging, saying, "come here, put up turbines for us". And the major energy consumers, both individuals and companies, don't seem to have a whole lot of ability to force the public issues either. So we seem to be spinning our wheels in some ways with a government that wants to be proactive but doesn't have the handles to control it, with an electric company that doesn't want to be proactive and wants to be as stationary as they possibly can because of the structure that they're working in, and a public that is all over the place. So I think we've got some big challenges in getting people together on this.

Do you think the university has a role to play in this overall energy institution?

The way we're set up right now? No. Because we don't have any expertise here. We have no researchers that seem to be interested in the issues, we don't have any either social researchers or researchers in the faculty of science that are doing anything in this area, so we've been really sidelined through it all. Maybe that will change. Holland College has some interests in this and they would like to set up a windsmiths program, so they might be able to make some inroads, but I think we've really been sidelined as being superfluous in this.

How do you see a project like this one that I'm doing fitting into identifying areas that need to be worked on?

Don't know until I see the result.

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Are there any last words you'd like to say about...you seem to have some passionate interest in those areas that seem to be missing and the connection with the expertise. Do you have anything further to say on that? And what kind of a timeline and how big a job is it to fulfil those roles?

It's a huge job because of the lack of resources we're starting with. Twenty and thirty years ago we did have expertise on PEI in energy research, energy technology, but that's all gone now. And so we are starting completely from scratch. Maritime Electric has little to no onsite expertise in anything other than running the plant that they've had for 50 or 60 years and maintaining the electrical grid. The Province has an energy corporation that is three people, with one engineer, one CEO and a secretary, essentially. Maybe there is another person in there too. So their resources are extremely limited. There's a Wind Energy Institute that's just been formed. It will be years before that is up and running, and it's hard to know exactly what it's role will be and how it will fit into the picture. So we are just starting from nothing right now and it's hard to see how we are going to move ahead.

Do you see any federal input to this?

Well, the federal government is providing most of the money to the Wind Energy Institute. If you look at the announcement that was made about a year ago on that, the contribution from the Province was really rolling over the contribution they've already had in the Atlantic Wind Test Site. Their dollar contribution has not gone up. It is just the same, just rolled into the new name. The government's ongoing contribution, from what I can read, has not gone up either. I could be wrong about this. So their operational money they're contributing is the same as what it was for the Atlantic Wind Test Site. What they have done, however, is that they've put in some capital money for building a new building. And hopefully if you are building a structure, that will grow. Now maybe that's changed in the period of time since the original announcement, I'm not aware.

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Interviewer: E. Kathy Stuart

Interviewee: Respondent #6

Contact Information:

Location:

Date:
Time:

Do you see any specific advantages or disadvantages in pursuing an energy policy for or from an small island?

Oh yes, we have to have an energy policy from a small island or a small province, whatever you want to call it. From an energy perspective, we're not technically, we are an island, but we are attached by the cable, so it's not, the analogy to the Cayman Islands is not totally the same.

Do you think that there are any issues in terms of the cable or anything like that that makes us any different say, from Nova Scotia or New Brunswick?

The biggest difference is we are a province and we are very small. We only have 135,000 people, that's the big difference. And we don't have any natural, if we are going to produce here, we really don't have too many natural advantages. We are into wind for a small percentage, but other than that, it has to be combustion of carbon fuels. Or purchase from New Brunswick.

Besides the 15% of renewables by 2010, are you aware of any international benchmarks or indicators that could be used by the Province to measure progress towards sustainability?

No, I'm not aware of any international formula or anything like that that's going on. The only comment I'd make on the whole thing, I've been watching it very carefully and I'm involved a bit, you know, you talk about an energy policy, we're talking wind, and we're talking the second cable to New Brunswick, we're talking about a whole host of other issues, but we talk very little about reducing demand. That to me would be the low-hanging fruit, would be the 20% that we could save by just making a concerted effort to use less electricity. That's where I'd start. No one ever talks about that, that's were I would, from a policy point of view, my first prong in my policy would be let's, says islanders reduce their consumption

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by at least 15-20% which I think is quite attainable without too much difficulty.

To what extent does the PEI Energy Framework help to consolidate progress towards sustainability?

Well, it's difficult to say. They have made a concerted effort towards wind, and they've put a lot of, I guess their efforts into wind. Now I should say most of the wind finance is coming from the federal government through the WPPI Program and technology is advancing considerably that it appears, with the WPPI Program, that, and I don't know the exact details, but wind may be to a certain extent self-sustainable. From what I hear in the media, although I haven't seen any actual windmills on the ground yet by a pure private player, on a pure private play. But there is a lot of talk, and I assume that there is some basis for that talk, and that we're going to see some private players in the market based upon the great costs that they'll get from Maritime Electric plus the WPPI from the federal government, that it is self-financing.

If you were to implement all the changes you see necessary for future sustainability, what would they be and how would you go about it?

The first thing I would attack would be the demand side. You have to get at the demand side and go with the technology, the bulbs, the usage, the whole host of areas that can be used to decrease demand for electricity. I don't know the exact figure—let's us a figure of 15%. I know in our own home, we have taken at least 15% off our consumption in the last couple of years just by doing a few little things. There's tremendous savings to be made by some of the more energy-efficient appliances, dryers, washers, dishwashers, light bulbs, usage, etc., etc., etc. That would be the first thing. The second step would be, I think the wind energy is a correct policy. We have to be realistic on it. It's...I don't think it's...we're never going to reach total wind, but I think it's probably something we can get 15-20% of our thing from, and then we have to examine the options available to us from New Brunswick. And also too, I think we have to keep an eye on future developments too. The Quebec situation vis à vis running a cable maybe down through the Strait of Belle Isle, down along the Atlantic Seacoast here and catching Prince Edward Island. If some of the developments in Labrador or northern Quebec ever develop, that may be a situation we'd look through.

Do you have any thoughts on nuclear energy?

I don't have a major problem with it, it's been with us for a long, long time. I think it's got to be part of our strategy and you know we have Point Lepreau, it's been with us for quite some time, there's hundreds and

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hundreds and hundreds and hundreds of nuclear plants around the world, and that's part of our energy. Now I prefer a natural like a hydro, wind, carbon consumption to a certain extent, but I don't ...(?).. approve nuclear energy.

One of the comments I received was that we don't have the R&D infrastructure here for wind and the implementation of wind policies, social research and so on. Do you have any comments on that?

I just want to talk about my previous answer. Nuclear. We're not big enough for a nuclear plant here. I don't mean nuclear, I don't have a problem in being part of Point Lepreau or getting electricity as part of it, no, for 134,000 to put a nuclear plant here...I wouldn't put a nuclear plant here. Wind power, the social ramifications, I'm going to have to clarify, what do you mean?

For instance, land policy and people who expect to have turbines being put on their land, perhaps having the population informed of what their rights are, what they should be getting for compensation, and so on, compared to other places like in Europe and so on, where they may be receiving more compensation. Issues like that, protection issues for our population.

Well again, I don't think you can make a comparison to Europe and to here. In Prince Edward Island you can't make comparisons, like I know there was a big kafluffle up in Malpeque area. Obviously they were going into what I consider to be a prime tourism area. It's the local people put up in arms. If you had a prime area, you'd want... Rent is a factor of the value of the property. You know, usually you'd want...the experts would use a 10% factor, 11, 12, 13, and those areas of Prince Edward Island, like the area even there of the wind farms of West Cape, it's not what, it's never been considered, a prime tourism potential in the middle of the field there, or in the woods, the rent would be basically, unless there was some kind of a health issue that has never been quantified or qualified, the rent is a factor of the value of the property, nothing else. If you are going into Europe and there's a highly populated area, and they are looking to put up a wind farm in an area where there's people living, the people that own the land want a much higher rent, and of course you're going to meet more of an opposition from the local residents, and that's a factor. Same as a hog farm. Don't know different from a hog farm. If you put in a hog farm in the area that there's nobody living in, probably don't have a problem. Put it in where people living and....

What about research capability in terms of wind? There was a comment that we don't have the constellation of researchers or the

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critical mass that would be able to support a wind energy here. Do you have any comment about that?

No, we don't. The federal government announced that project for the Wind Institute up in North Cape, but again that's a step in the right direction. I think, like a lot of things, we have to be realistic in our expectations. I think a lot of the work has been done for the smaller, like I know some of the work that's been done for smaller wind farms that perhaps aren't even applicable in Prince Edward Island, like they're applicable to Nunavut, areas in northern Labrador and places like that that I know they do some work on. But again, we are ahead of the curve vis a vis you know anyone probably east of, certainly east of Quebec, I'm not sure exactly what's going on there, Alberta's involved in it, Quebec is involved, Prince Edward Island's involved, a lot of provinces aren't involved. But technology is enhancing considerably, and these things that perhaps were 20 years ago were just somebody's pipe dream are now becoming a situation, where with the WPPI incentive, they are, from what I read, they are, can be sustained on a private sector basis.

Can you tell me a bit about the federal structure in the Department of Environment?

Lack of structure! (laugh)

And the kinds of resources that Canada devotes to renewable energy?

Well, they put a, I don't have the exact figure, first of all, the WPPI is a federal initiative, and that's a good initiative of that, is probably, you know a, that really, the North Cape Wind Farm wouldn't be there without WPPI. That pays so much per kWh for wind-based energy, and pays it to the producer. And then that, coupled with what Maritime Electric will pay, and the provincial government, all of them put some money in to finance the operation...I don't think there's any provincial money in those operations.. and then, so that's one program they have. That's been doubled there about a year ago, and it's been increased, and they put more money into that, so there is more money into that. And then it ties into this whole the big Kyoto Accord, and that's how we got money for the cable, the $30 million for that. And that still hooked up to New Brunswick to make us more flexible in future years. And, so that's it. Basically, they don't do any, have any wind farms themselves, the federal government just encourages, it is a provincial jurisdiction. They encourage the provinces to get more involved in wind farms through incentives.

Is that the extent of the federal government's involvement in energy in Prince Edward Island?

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Yes. Energy is a provincial issue. Our involvement basically, I would suggest is quite substantial because of WPPI. There would be no wind without WPPI. Make no mistake about that. And we have the Wind Institute. That's all federal money. We have the cable. That's all federal. So there's a fairly substantial...there really isn't any provincial...You ask them how much money have you put into this, and the answer is none or very insignificant. So ...

What about the issue of credits under Kyoto and so on. That came up in a discussion about who is getting the credit for this and whose responsibility is it to have renewable credits and so on. Do you have any thoughts on that?

Well, the Kyoto...first of all, there's two things about Kyoto—the present administration says they're going to renege on those, that's ...point. Canada has not done well on where they should be right now. This is part of reducing, and wind does reduce our use of carbon consumption and greenhouse gases. The government will spend money to try and get the greenhouse gases down. It's not a matter of credits to, like you know sometimes, under the Kyoto Accord, you can actually purchase credits from Russia or places like that, actually their economy is in such a shape that they are not using the, the greenhouse gases are reducing but for different reasons. No, I don't see the credit being as much on the energy side, maybe on the agricultural side, there might be an issue there. Or the forestry side. But on the energy side, I think it will be done through the incentive program where the federal government will incentivize the increased capacity of production of green energy.

Does that involve a financial value or financial gain for any particular interests?

Yes, but it is being paid for by the federal government.

So whoever is attaching to these credits is going to get some sort of compensation from the federal government?

Well there is a program of the federal government called the, I don't know the name of it, that if you go to them, and say, it's energy reduction, let's call it the greenhouse gas reduction fund, and you go to them and say, "I've got a plan here that can reduce greenhouse gases by let's say 500,000 tons, it's going to cost me a million dollars a year", you go to the federal government with the plan, they would say yes, and we'll pay the first five years of that. But I don't think this would really qualify because the federal government has already been involved from day 1 with WPPI and through the other incentives. But let's assume, we'll have to be

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usually fairly major, but let's say Cavendish Farms had a situation where they went and said, "listen, we are going to do three things here at our own expense. We've got a plan to go to 20% ethanol consumption, we've got a plan to reduce our consumption of electricity by 25%, reduce our consumption of carbon-based fuels by 25%, we're going to a 10% wind factor, the whole thing is going to cost us $5 million." With a plan, that would all go to the federal government under the carbon reduction fund but the federal government would...this is fairly new, it hasn't, that's the principle of it, that they would pay, based upon the document there that we are going to reduce our greenhouse gases by 500,000 tons over the next 5 years, which can be done, and we will pay so much per ton on that.

So that would be an incentive for private industry.

That's right, and governments too. City could do it.

So there could be contested areas over who owns those credits if the province takes those credits or the utility; is there a barrier there if those credits are assumed by one particular party or another?

Well it's the federal government that wants the reduction. They're paying for the reduction. After one party has basically paid through incentives or direct grants for them, I can't see another party coming and wanting more money for the credits that were already paid by somebody else. Like the wind, what are we, 3-4% wind?

Actually the province is thinking they are going to reach their 15% target very soon.

What are we at now?

I believe we are at 5%.

You see that 5% results in energy reduction and reduction of greenhouse gases. For that I don't think Maritime Electric can take credit for that, I don't think the province can. That's done through mainly federal incentives.

So that would explain why, I guess it's, I believe it's a component of one of the pieces of provincial legislation of who gets the credits. I'll have to look into that further.

Yes, I don't know.

Moving now to communities, my question was what input do communities have into the creation of energy policy.

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Well, they would have, I would suggest, a lot. A prime example would be the Charlottetown Transit System that's up and operating. That's going to require a cultural change with the people who live here. It's going to take, I would suggest, 5-10 years, and it's not going to come from the older people, it's going to come from younger people that live here. But it will happen. And that's another thing, that will be developed through federal money...$3 million to develop that. But the City of Charlottetown are very much supportive, they're involved, they're actually putting some of their own money on the table, Stratford, Cornwall, so that's one example. And other than that, just our own usage, trying to encourage our citizens, you know, Charlottetown should have it, they have it in other centres, they should have a car free day, some Wednesday in May, no one brings their car, get everyone used to it.

That would be a good idea.

Oh, it's a good idea.

And do you see any contested areas between energy interests affecting Prince Edward Island?

Yes. There's always been, I think there's a push-pull between Maritime Electric and the Province as to where they're going, do you know. I don't think it's as bad now as it was 8 months ago, but they seem to be in two different wavelengths. The politics versus the reality.

Do you see the need for a public process of discussion and engagement on this that could include demand-side management?

Oh big time. Big time. That's the number one we're on here. Let's attack the problem. The governments should do that rather pick away at, put another windmill up. Let's first of all reduce demand by 20%. Convincing them to do it, that's got to be public education, incentives to, maybe if the government put up an incentive to purchase the high energy dryers, washers, dishwashers, lightbulbs, let's look at your electricity, let's attack it. The federal government did the one-ton challenge, that's an idea, that's not the be-all and end-all, but everyone's got to do it, the city's got to do it, the province's got to do it, the NGO's got to do it, it's got to be a public attack, plus it's got to be a little more than that, there's got to be some teeth in it, you know.

In some other jurisdictions, the utilities take a lead on that and they put a lot of money into it, do you see that being a conflict for Maritime Electric

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..oh big time,...

how would you suggest that that get turned around?

I think it's got to be led by a government agency. Maritime Electric's got to play a major role but I think it's got to be, you really can't rely on Maritime Electric, that's like asking the fox how you are going to stop the chickens from disappearing. It was Christmastime and they were advertising that everyone decorate their homes, put these great big lights up, you know there is a conflicting message, I'm getting a conflicting message anyway..

Do you see legislation as an option for that, or how would you legislate that sort of thing?

I don't think you can legislate before you educate. The first step has to be a very strong 24 month of aggressive public education on this, and the public's willing to buy this now, we're not starting from scratch, reinventing the wheel. People are looking at the one-ton challenge, they are more concerned, people are more environmentally concerned, so if there was a big push from Maritime Electric that involved the Cities, involved Maritime Electric, and we are going to reduce our electrical consumption by 20% period, we've got financial incentives, we've got this, we've got public education, a whole host of things we are going to do, then after two years, then we can step back and say, listen, we've taken it the 15%, the next 15 is going to be legislation, we've done that. But you can't legislate before you have the public. They are not going to buy into legislation until they buy it themselves. But the public has come a long way in the last 10 years here on this issue. People are, I know in our household, just watch it.

How do you deal with the industrial consumers which probably have more impact in terms of their energy impact, agriculture, fisheries, processors, and so on? Do you see them as going beyond the least cost?

Every facility has to be looked at. Technology has made some tremendous strides. Freezers, freezer capacity, lighting, there's a lot of technological change has taken place in the last 5-6 years. And you know, they have incentives themselves. Don't forget the wind farm in Malpeque wasn't the one that was shut down by the public. Wasn't a government initiative. That was an initiative of Irving Oil. So there's where their mind is. So they were looking at it, they would put them up, they would get the WPPI federal incentive, they would get the money, they would probably be feeding their own consumption but they know how much they were paying Maritime Electric and they put two figures together and we're willing to put, so, I don't know the details around that, but that's an example of where their mind is. They're not adverse to decreasing

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electrical, whether the 20% will be able to come from Cavendish Farms will be able to reduce their consumption but I rather doubt it. If they could do it, they probably would have done it already, but there might be incentives. You could say it's not cost effective to go to an new $800,000 freezer, but the government might say we'll pay half.

On the whole, how would you rank PEI in terms of its energy policy?

Let me see now. It's good and bad. I think it's both good and bad. Their emphasis on wind is very positive. I think but there has to be, it has to be much more comprehensive than wind. My very first impression. Attack demand first. I assume our consumption is going up every year. You probably have the figures for your report.

I haven't filled that in yet...

Our population isn't going up, so why is our consumption going up? And then also, you know, I get conflicting signals as to where we are going with some of the bilaterals with New Brunswick.

I don't suppose you have any comments on islands in general in terms of their needs if fossil fuels continue to go up in price and so on, how that will impact on islands in general.

Nothing but negative. Most islands are reliant. Unless wind technology increases. Islands generally speaking are reliant on fossil fuel consumption. They do not have the populations, the cost efficiencies of scale are not there, have to go to a small island like Prince Edward Island, we don't generate a lot of our own electricity, we have some backup, but most of our energy generation is done in the mainlands. We're really not a pure example for an island because we are, from a hydroelectric point of view, we are not an island. We are connected. so we have backup generation in our jurisdiction but our main source of what kind of energy comes from third party sources, is from the mainland, off-island. That wouldn't be the case with other small islands. They would be relying totally on either carbon fuel consumption or wind. Or maybe some cases, hydro or dams, but that would be unlikely too in islands.

How do you see, I guess a comment about the NGO sector, and what impact they've had on moving us towards changes in energy policy.

I think it's relatively weak in Prince Edward Island. They pick around the edges, the Eco-Net and that, they've done some good work with the transit; the transit coalition has been reasonably effective but they have to be much more organized and aggressive to raise the bar on this whole issue.

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Do you have any thoughts on why we more passive, or is it a function of education or awareness, or just the fact that on small islands perhaps the critical thinking is missing?

I wouldn't say that! No, we are only a small island, by virtue of a small island we have a small population, by virtue of a small population you only have some many people that have the energy and capacity to do these things. Some are involved that don't have the energy and capacity, maybe have the energy but don't have the capacity, or the capacity and don't have the energy. So really, it's a dilution of a lot of things. That's one of the problems. But having said that, things are moving. The public attitudes out there are changing, especially with young people.

What do you think about our amount of entrepreneurship and enterprising capacity. Do you see Prince Edward Island as having a higher proportion of entrepreneurs?

No. Less. Much less. And on the electrical side, of course that would be more specialized entrepreneur, that would come from off-island. I think it is or from the larger Irving Oils, capable of handling it, not something that, like you know Superior Sanitation have a small windmill out there, it's a pretty small operation, I doubt that it pays for itself. My understanding it doesn't.

But once the capital cost is absorbed, the fuel would be relatively few

No fuel.

So are there any final words?

No, my thinking is the energy strategy has to be more comprehensive, I think the demand has to be attacked first of all, I like the wind concept because I think a lot of people that talked 3-4 years ago, were saying, you know, that's all crazy talk. But I think the technology increasing, I think it has to, it's becoming more realistic and we still have challenges because we are a small jurisdiction, we have this political reality at play here.

One question I neglected was about finance, the ability to obtain financing, and how difficult is that because we are an island or the fact that we do not have any head offices. Financing for utilities, financing for wind mills...

I don't think it would make any difference. Your utilities come from a large company traded on the Toronto Stock Exchange. If it makes sense they

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will do it. They are looking for return on equity. They can put up a generation capacity, generate this electricity, sell it, they'll do it. If they don't make money they won't do it. It's a simple equation. So financing is not an issue at all. Financing is available for any project that makes sense, and that's why I think 5 years ago, windmills didn't make any sense from a private sector finance angle. Now, by the looks of it, I haven't studied this in detail but, with the increased WPPI, and enhanced technology, that they are at a point now where, and once they reach that point, the finance is no problem. There is all sorts of capital for projects that make sense, but you have to have the wherewithal to do it. Capacity in engineering to deliver contracts with Maritime Electric, to sell it.

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Interviewer: E. Kathy Stuart

Interviewee: Respondent #7

Contact Information:

Location:

Date:
Time:

Do you see any specific advantages or disadvantages in pursuing an energy policy from or for a small island?

An energy policy for a small island is absolutely essential. The problem as I see it is that although we are islands, we really don't think separately from the rest of the world, so we are in a situation where our policies, whether we like it or not, tend to very much mirror what's happening in the surrounding jurisdictions, and the opportunity for truly independent policy, I don't think it ever really emerges. Because we are so tied in, especially in the electricity sector. We are integrated in with other utilities, a lot of the infrastructure, the types of facilities that you have to buy are really geared for other markets, and you're looking almost as following what others are doing, as opposed to being able to really branch out on your own.

Has there been any comparison to other small islands, looking at legislation or policy?

Not that I'm aware of. The tendency for Prince Edward Island has always been from, certainly from the energy sector, to really look at what is happening in other jurisdictions in the Atlantic Region and certainly in North America, as opposed to looking at somewhere else entirely in the world. There have been some linkages, certainly through the university in terms of operations with other small islands around the world, but I'm not aware of any that are doing things dramatically differently from the way that they are happening on Prince Edward Island. I think that may reflect as well the reality that even in those jurisdictions, the opportunity to truly do something completely different doesn't exist because of the integration with the other jurisdictions.

Besides the 15% of renewables by 2010, are you aware of any other international benchmarks or indicators that could be used by the province to measure progress towards sustainability in the production of electricity?

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No, I am not. It's certainly an area that is evolving in a lot of other jurisdictions where they are beginning now to look at renewables. Traditionally what happens, and it seems to be no different in this situation, as the price of traditional fossil fuels starts to rise, people start to look at different opportunities for other ways to generate electrical power, and people tend to go in a variety of different avenues, but they're always driven by the final cost, and it's the final cost that really keeps utilities away from setting significant benchmarks in terms of where they should be going in the longer term, in terms of getting off traditional reliance on fossil fuels, and then of course you have jurisdictions that have a heavy reliance or opportunity, depending on how you look at it, for hydro, and they're often in a situation where they are encouraging the production and export of consumption of electrical power because it is of benefit to them, it's a money maker.

What about any jurisdictions that have gone towards decentralization?

Deregulation?

I'm thinking more of distributed energy, each home for instance is an energy producer. Would that require a different set of, a different paradigm, structure for regulation?

It probably would. I think the...I'm not aware of any jurisdictions that have moved extensively in that direction other than the odd experiment. The challenge you would have in that instance, I think comes back to the ultimate issue, which is that society has to drive the policy process in terms of being interested or willing to pay for it. And invariably, in my experience here, the issue always, sooner or later, quite often sooner, comes down to cost. And that type of system, because of the structure that's evolved over the last 50 years, would be quite expensive to get up and operational because the utility would still have to be in a situation where it could supply power to that individual home, if that home needed it, for example if the wind wasn't blowing, or whatever other type of production system they were using wasn't producing, and at the same time, them being able to buy that power when that particular home is producing too much and distributing that through their system. So you get into the costs of backup power, and the construction of the system, the maintenance of line, all those types of things are still there, someone has to be responsible, so the tendency is that costs rise rather than go down. Largely I think because of the way the system has evolved. We have moved off the old idea, when I was a child, I mean it was really advanced then, it had begun certainly prior to that, that rather than every little farm on Prince Edward Island being a viable self-contained unit, suddenly you were utilizing electric power to run milking machines for cows, and to run

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coolers for the milk, and those types of things. So we really moved away from that self-sufficiency into this collective process of buying power from a central authority and getting back, it's not impossible, but it's going to cost money and someone has to be willing to pay for it.

With all the new technologies and new developments in those technologies, I believe that probably the research could show different ways where those types of systems might be less costly. Do you think that the Province or the federal government would support research and use Prince Edward Island as a possible pilot facility?

Well we've certainly heard discussions and opportunities like that, the hydrogen village, you know, whether anything is really, in reality happened in that regard could be debated, but that's an opportunity where they've certainly expressed an interest in looking at alternatives. I think there are opportunities in that regard. What it takes is a very carefully thought out and well-defined plan of exactly what could be done, what should be done, and what type of technology is available that could support it and what type of resources would be required in that transition phase and the costs associated with getting the transmission from where we are today to where that type of really completely different system in some respects would be able to be effective and operational. And again, you get into the situation of who's going to lead that effort, and invariably the people who participate in it are going to want to see some benefit from it. We've seen already in New Brunswick where major users of electric power over there are saying no, we don't want an increase in power rates because we can't afford it. It's going to hurt our bottom line and we have to compete with the rest of the world, etc., etc., etc. That's a long way from someone saying, "the system we have isn't the best way to go, let's move to some type of more sustainable system, let's invest in technology which isn't perfected yet, and let's work at perfecting that technology, and cover the costs, and basically take the leap of faith to go that way and hopefully 5, 10, 20, 50 years from now, it's going to prove to have been a wonderful move". But it's getting the type of commitment and support for the type of policy decision that will lead you in that direction, and that's not easy.

Do you think Prince Edward Islanders are risk takers? Or what level of risk do you think they would take?

I don't think...Well, we have one example in that Islanders have expressed an interest to pay slightly more for green power coming from wind turbines in western PEI. That contrasts to Nova Scotia for example where that offer was made and there was extremely limited take-up. I think the problem will be one of degree. I think Islanders would be prepared to support some but they wouldn't support an extensive change

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that would cost a lot of money unless they were really be convinced that there is going to be some sort of payback in the very near future, or if there's some partner involved, for example the federal government or businesses that would underwrite some of those costs so they wouldn't be so extreme.

Do you think Islanders In particular have...I notice from a piece of research that over in Greece, the people on the Greek islands were more open to having wind power than the people on the Greek mainland. It seemed to be interesting in terms of island studies that perhaps islanders have a different sensibility in terms of where they fit renewables into their vision.

I don't disagree with the premise that islanders tend to be more interested in the opportunity to protect and preserve the environment because they are closer to it, but I think from my own personal perspective, from what I've seen, I think we're moving in the opposite direction while the others are moving towards more interest in environmental sustainability. I think islanders are almost moving to meet them in the middle. So we're moving from less interest in sustainability to more interest in the provision of the service and the cost.

Do you think that we've already peaked in terms of our interest in renewables?

No, I don't think that we've peaked in terms of our interest in renewables as long as prices remain where they are, and I see it very much unfairly driven by economics. As long as the cost of energy is high, and people see some opportunity to do it on a cost-effective basis, in a more sustainable manner, they will always be interested in that, but I'm not sure that that can be fully sustained if the price isn't there. And you know, we look back on the '70s, there was all kinds of interest. When I bought my first car, the particular vehicle I bought, you couldn't buy anything other than a 4-cylinder. They quickly started making cars in North America, and suddenly they were making V-6s and V-8s because gasoline went down in price. It was cheap, and now, once again you are seeing a swing up at the present time when prices rise, the people are interested in the alternatives. We didn't really learn the lessons of the 70s and say, "we're moving in a different direction". There was a wind turbine at the sewage lagoon in Stratford for a number of years that came about as a result of the energy crisis of the 70s. And then, when that crisis passed, "oh well, it's hard to maintain, it doesn't work that well in high winds, tends to have breaking, take it down and throw it away".

How is energy policy determined here in Prince Edward Island?

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Well the energy policy is really determined by the provincial government. The Commission, as a regulator of Maritime Electric, has some influence over some aspects of policy decision as it would relate to the operations of the utility. In terms of the overall direction of where Prince Edward Island is going in terms of energy, that would be determined by the provincial government, and it would be determined really by the leadership of individuals within government who would be looking at what is the most appropriate mix for Prince Edward Island 10 years from now, as opposed to just today. I think it runs up against the same roadblock that the utility itself and the regulator run up against, and that's the issue of cost. It would be wonderful, and I think you've seen that, the legislation talks about at some point having 100% of Prince Edward Island's electricity provided by renewable resources, but that hasn't been proclaimed yet and I think the issue is, how do you get there and at what cost.

Do you have any comments on demand-side management?

Yes, I think demand-side management is extremely important. I think it's principal value is to educate people about electric consumption, about their use, and the fact that individuals really are the determining factor in terms of overall demand and load growth. Generally, consumers are very poorly informed about electricity. They want it there when they turn the light switch on, and they don't care what time of day or night they turn the light switch on, they want the power there. They are not as open to taking constructive action to truly reduce demand as much as they should be, but we've had considerable success. Many years ago, prior to the deregulation of Maritime Electric, there was fairly significant emphasis on demand-side management and various beat-the-peak campaigns, those types of things, which are really like 15 years ago. And you know, that is returning now. We've seen to get back into that. But in the interim period of time, power consumption on the island has virtually doubled. And we've really moved...Now there are, the other side of that argument, people would say that electrical energy is actually the cheapest way to go, that the creation of electricity should be promoted and fostered because of the fact that it's better than burning dirty fuel oil to run services at a manufacturing plant . And some of the leading economists are saying that really, electrical energy is good energy, even if it is produced by dirty coal because it's offsetting some of the costs associated with the normal type of fuel that would be burned at the actual processing plant itself. But I firmly believe that demand-side management is important from the point of view of educating consumers of their role in the chain. And consumers ultimately lead this process. We get complaints, as you might expect, about the cost of gasoline, for example. Nine times out of ten it's someone else's problem, it's not the person calling. "Well, what have you done to cut back?" "Well, I can't cut back, I have to do this, I have to do that, the price is just too high, bring the price down." When individual

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consumers start to say, "no, I can do something and I'm going to do it, I'm going to leave the car home and take the bus, I'm going to walk, I'm going to get a smaller vehicle, I'm going to drive less", those types of decisions will ultimately have an impact. The very same is true in electricity when people say, "No, I'm not going to have as many outdoor lights, change them to florescent bulbs, I'm going to reduce the amount of motors I have running for everything under the sun and try and cut back and live in a more environmentally or sustainable manner. That will definitely have an impact.

Can you review the history for me of the deregulation of Maritime Electric?

Yes. Essentially what happened is that Maritime Electric was always a fully regulated utility. Cost of service based regulation was active. There has always been the ongoing issue which is at the background of many things, unfortunately of cost. And the cost of electric power on Prince Edward Island was higher than it was in New Brunswick. At one point, the government of the day made a policy decision to acquire the shares of Maritime Electric with the plan that they would sell those shares then to NB Power, and NB Power would own Maritime Electric. And the hope was, obviously, that that would produce a situation where the power rates in Prince Edward Island would be more in line with what they were in New Brunswick. When the shareholders of Maritime Electric were informed of that, when that disclosure was made, they mounted a campaign to maintain Maritime Electric, and that became somewhat of a public campaign as opposed to just a shareholders' campaign, it became a public political policy issue, and the result was that the government ended up reaching an arrangement with Fortis who were the principal shareholder at that time of Maritime Electric. Fortis acquired the, all of, or was in the process of acquiring the outstanding shares of Maritime Electric and the government entered into an agreement with Fortis that power rates in Prince Edward Island would eventually come down and then would be pegged at New Brunswick plus 10%. And there were a number of years when they could work their way down. That is exactly what happened. Fortunately or unfortunately, depending on which way you looked at it, one would say for the first number of years, this was a great success. Power rates are coming down. That was also at a time when there was excess power in the region, it was at a time when energy costs were relatively low in terms of the price of oil. When several things started to change, for example, rising costs for the operation of Point Lepreau and some of the factors associated with it, increased costs for fuel oil, increased demand for electricity, Maritime Electric then found itself in a situation where it wasn't as strong, from an economic point of view, and was really in danger of falling below requiring the funds necessary to operate the utility. That resulted in discussions with the government which

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ultimately led to the re-regulation, I guess is the best way to describe it, of the utility.

So how would you describe it now?

It's now fully regulated. What we are attempting to do from a Commission point of view is to, some would call it light-handed regulation, some would call it less emphasis on somewhat the traditional cost of service aspects in an effort to achieve the desired result but in the most efficient manner possible. But it is fully regulated, their capital budget has to come to the Commission for approval, their rates have to be approved by the Commission, any of those major acquisitions they are making would all be approved by the Commission.

I mentioned in my letter about corporate social responsibility, and I was just wondering about that in terms of what, I suppose there is an attempt to deal with that through the demand-side management provisions in the *Act*, would you say?

Yes to some extent. I think all corporations attempt to be socially responsible. They're also accountable to their shareholders and to their customers, and they have to be able to demonstrate to customers that any initiative they're taking, or measure they're taking, benefits the customers. And sometimes there's a disconnect. And I think this may be especially true on PEI, of a distrust of corporations. People think they're bad. So whatever they're trying to do is not the best way to go. I don't know if that answers your question on corporate responsibility or if there is something else you're trying to...

I'm just trying to pull it out so I can understand it better the different contested areas I see between trying to produce renewables, cut down consumption, but if the goal is to produce more revenue and reduce cost by the company, then they would want to increase consumption, so it's a bit of a conflict between the legislation and the mandate of the utility, and I'm wondering how we get from A to B to make it all work together so that it's improving in terms of sustainability.

And there have been initiatives related to performance-based regulation. That's been used more extensively in the natural gas side than the electricity side, but it's certainly used in the electricity side as well, which is an effort to address exactly what you're saying. You know, the company, by reducing consumption, reduces income which potentially reduces profit, so you build in a process where some of those savings are shared with the company as well as with the customers so that there's an incentive for them to do that, and that certainly is, it appears to be, an effective way to

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address some of those issues. How far it can go in addressing those issues, I'm not sure. The interesting thing is that both publicly owned utilities and private sector owned utilities both appear to be struggling in the same manner. I'm not sure what you read into that, but it's not like the publicly-owned utilities, for example like the Quebec Hydros of the world, are light years ahead of everyone else in terms of demand-side management and changing people's consumption patterns. I think a big aspect of that, because they're corporate, corporations, they'll respond to customers. The key is to change the thinking of the customers and the consumers, as to what they're looking for and what's the right decisions for them to make in the longer term, if you're looking to achieve greater sustainability.

What do you see are the contested areas between the energy interests affecting Prince Edward Island?

The biggest contested issue to me remains cost. People want power at a reasonable price. There are those who certainly believe that we should have more on-island wind generation. There are moves in that area. The question becomes who pays for that generation. Do you allow the private sector in and allow them to develop it and sell it to whomever they can for whatever price they can get for it, do we either make a buck or lose a buck, do you have the public sector develop that and then sell it to the utility, do they compete with the private sector to sell it to the utility, do they have the opportunity to say, "no, we're going to have a higher rate for wind"? We've gone through a process where the government itself is setting the return for wind which is higher than the traditional price that would be paid by the utility for other sources of power. That's only 15% of their requirements, though. If you move to 30, 40, 50, 100 %, then Prince Edward Islanders will be paying significantly more for it, certainly in the short term. No one knows what may happen in terms of oil prices, but in the short term would be paying more for the electricity that they use. The question is, "Will they do that or will they revolt?" If they don't do it, will they cut back, which could be a good thing. So, to me, come back to the central point—the main issue relates to individuals, to the customers, the consumers, to the general public of Prince Edward Island as to what they want for their island. What types of mix of generation they want, and whether or not they are willing to pay to contribute towards achieving the objective of a more sustainable operation. And then the other is we have to see the maturing of the technology. There is no doubt that the wind turbines of today are significantly better than the wind turbines of 20 years ago. Whether in 5 years time they'll be even better than they are today, there's been talk of tidal power, any of those types of things, but the technology again is somewhat untested, I guess is the best way to describe it, and there are certainly costs associated with developing that and getting it up and operational.

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And I guess there's really not much talk out there of solar power and constructing houses differently. Our buildings could be designed more energy efficiently and so on.

There's no question. That again is where you come into policies that go beyond one particular area and really look over all at what we should be doing in terms of the energy we consume, in terms of how we construct our homes, and what's the most energy efficient way to construct those homes, to heat those homes and to cool those homes. And I don't see, and I'm not directly involved, so I can't speak with authority, I don't see anything changing on the construction side from what we would have seen 5 or 10 years ago. The biggest change is people now wrap the house in T-vac and they think that is going to solve all the problems of the world. But we certainly know that there are ways to improve the energy efficiency of homes. We know from the 70s, when there were a lot of experimental activities and various government programs that were offered, that there are ways to do it. I know individuals who essentially added a wall to the outside of their house and doubled the thickness and have achieved great energy savings. But that's never gone anywhere. They've done it because the government gave them money to do it. As I understand it monitored the success, but it's never really been adopted in terms of general building practices. And people will argue, rightly or wrongly, "well people don't want to pay the extra money for a house". What extra money are they paying if they save it all in energy over the next 20 years? That again comes back to the issue of educating the consumer, educating the individual so that they say "no, I don't want that standard type of construction, I want something superior. I'm willing to pay more because I'm going to get it all back in 20-30 years". And you know, one time we had a number of...there's probably no reason, even today from a technology point of view, why every house that's constructed, couldn't include some solar, either for electrical or at least for some hot water. It's not that there isn't , even today, technology to do that in some manner. It's that people don't seem to be moving in that direction.

We've had a solar panel on our roof for the last 25 years. For our hot water, we just don't even think about it...still running, still doing great.

Yes, I had one as well but it broke down. And I can't get it fixed...

What about building codes and so on, have those changed, is that something IRAC gets involved in?

No. We have absolutely nothing to do with building codes. Most of building codes actually are national and tend to be adopted by

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municipalities or provinces. But a lot of those, again, from my limited experience, tend to be driven more by safety than energy considerations. We want doors wider so that they can access wheelchairs, we want buildings with wider corridors, and certain grades of quality in electrical standards and those types of things, because we're using more electricity so they have to be built to higher standards. But in terms of energy efficiency, and there is a prime example just two blocks away. The federal government came out and said we are building a super energy efficient building on Prince Edward Island. Once they got the tenders, they went back and cut a whole lot of stuff because, again, they decided the cost was too high. So it certainly will have a number of energy-efficient features with it, but we're not seeing that. You look around here, every single roof is gravel-covered, or asphalt-covered, there's no green grass, there's nothing, but we know that there are opportunities to do that. We know that companies have made huge savings, of Canada, saved hundreds of thousands of dollars in heating and cooling costs by using a different type of membrane on the roof and planting something green.

Is that a jurisdiction problem, is it because those things are controlled by the federal government as opposed to provincial?

I think it's because it is not really demanded by the end consumer, and it's a sad commentary on our society, but so much is driven by cost.

But if consumers are thinking these things, perhaps they are discouraged by not knowing how to get any action. What about the chain of communication, what kind of input can individuals or communities make that will make a difference?

Again I think individuals can have influence at the community level. There's not a single thing in the world that I'm aware of that would really stop communities from adopting higher standards. I live in the community of Stratford, I'm not aware of any legal issue that would prevent the community of Stratford from saying, you know all new construction has to include some aspect of energy efficiency, that you have to build to higher energy efficiency standards. They don't tend to do that because they expect someone else to do it. And it is true that a lot of individuals aren't aware. They go out into the market to buy a new house, they are buying, this is a nice house, size, it's in a nice neighbourhood, it's close to the schools, it's what we want, looks good, so we'll buy it. They tend not to be asking the questions, you know, how thick are the walls, how much insulation is in them, what type of vapour barrier did you use, what type of alternate energy opportunities have you put in? I mean, you know, houses today aren't even...you've got a solar collector—if it's on your roof, you either had to modify, chop holes in the roof and run down piping, because that's not even thought of when they build a house these days.

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Nobody said well, at some point, these people may want to hook up a solar collector, so we should allow room for piping for that—they don't do that, because you are in the sort of vicious circle where consumers aren't demanding it so builders don't do it, so the people who are interested in it don't see it done, and the people who are consuming don't see it so they can't opt for it, and I'm not sure how you get that changed, but I think it can change by individuals in small groups and organizations starting to make an effort to raise awareness about those types of things.

Do you think as an island that we have a better opportunity to get that kind of interaction and networking happening?

Definitely. Simply because of size, simply because of the fact that there's an opportunity and tends to be more interest in individuals working together in smaller jurisdictions such as, as an island, there's that sense of identity. Part of the challenge then, is the technology and where you get the information and the technology and the expertise and the opportunity to actually do some of the things that demonstrate that.

Do people tend to mistrust experts?

Yes.

Do they trust their own experts, or do they prefer to have people come in and tell them from outside?

Well, there is no question. I think they tend to mistrust experts, or some experts, and they certainly would trust individuals locally more than they would trust expertise coming in from away. In Prince Edward Island that really relates to the Comprehensive Development Plan when there was a huge influx of individuals telling us what to do and what way to go and how to change and improve. And people, the failures tend to be highly emphasized on some sectors. You keep, or at least I keep hearing, "oh yeah, they tried that at the Ark, this sustainable"...well back then it was 30 years ago and things have changed. Maybe it could work today but people tend to, and I'm sure there were 1,000 failures along the way in many of the things we do today that we take for granted, or you know, some of the energy wasters.

Do you have a comment on how islanders are entrepreneurs or do you think they're sense of generating ideas and their autonomy in making some things happen, how do islanders stack up in terms of entrepreneurship?

Well, I think islanders were extremely entrepreneurial-focused. I personally believe we've lost a lot of that, and I think we've lost a lot of that

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because of the notion that, "no, you're way to do it is the wrong way, and the way to do it is the big way". You know, running a farm of 100 acres doesn't work, has to be 1,000 acres. You have to have bigger potatoes, you have to have different methodology, you have to have all the latest technology and equipment, no you can't operate your house that way. I think we've become so sort of inundated with information and expertise from others that in some respects islanders have lost a bit of that entrepreneurial edge. But there are certainly still many individuals who are extremely ingenious and have done extremely well and have adapted and created and generated and invented things on Prince Edward Island that are extremely innovative. But, generally overall, I think there's a lot of people who have sort of backed away from that .

Do you have any final comments on any of the things we have talked about?

Islands are unique and they have some tremendous opportunities. But the challenge, as I see it, is to somehow be able to chart a course that doesn't automatically follow and compare to the rest of the world. Part of the communications system, international travel, all of those things, cause us to tend to look to others to set the standards, as opposed to set them ourselves. Whatever the way of life is in Toronto or Halifax, that's becoming our standard as opposed to "we don't care what they're doing in those jurisdictions, this is the way we want to do it here on Prince Edward Island." We want all of the same things they have as opposed to looking at what we can do on Prince Edward Island that may be different and that, in the longer term, may in fact be the best way to go.

One of the things we probably do enough of is look to other islands which are all over the world, in northern Europe, in the middle of the Atlantic, down in the Caribbean.

I don't think we're...in some respects, I guess when we were building wooden ships, we looked more at the rest of the world than we do today, and we tend not to look at others are doing, in a whole variety of areas. I don't think we look at those, in terms of, are we doing what's the best thing to do from our administrative structure, from a governing point of view, from the way our educational institutions operate, from where they're located and constructed, all those types of things, are those really the best ways for Prince Edward Island, or an island, to go, or have we simply adopted "oh that's what we have everywhere else so we have to have that here". When I say everywhere else, I tend to mean the immediate area around, as opposed to, yes but if you go off to the Greek islands, they're doing this, so we should adopt that. We tend to not look much beyond the other side of the Strait and in North America saying, "OK, that's the way things are there so that's what we should be aspiring to." Maybe we shouldn't.

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Interviewer: E. Kathy Stuart

Interviewee: Respondent #8

Contact Information:

Location:

Date:
Time:

Do you see any specific advantages or disadvantages in pursuing an energy policy from or for a small island?

I see some advantages in terms of ...transmission costs to islands are an issue, so if you can do a self-contained, or largely self-contained energy policy, then there are some advantages to doing that. In the case of islands that are benefiting from a lot of tidal power, or wind power, then obviously there may be export potential. It would depend on the type of island. If we are specifically talking PEI, I suspect that aiming for energy self-sufficiency would probably be a better bet than aiming for export.

Besides the 15% of renewables by 2010, are you aware of any international benchmarks or indicators that could be used by the Province to measure progress towards sustainability, particularly in the production of electricity?

No, I'm not.

To what extent has the PEI Energy Framework helped to consolidate progress towards sustainability?

I'm somewhat familiar with it, but in terms of how it's helped, the only evidence that I've seen is that there seems to be a new willingness in government to look at partnership solutions around renewable energy sources. So in terms of actual changes, I'm not sure how they are going to be able to reverse some of the previous decisions or get out of them. There does seem to be a willingness to look at alternatives now in a more meaningful way than there was before.

Do you think the level of debate has changed any out in the public or in the communities?

Yes, the level of debate has changed significantly in that I think there is a debate in the community and the public. Now if you go back 10 years, there was really no debate other than a few environmental groups but I think the public are becoming more aware of the need to look at alternatives. And obviously there are debates between the pro wind power and the people concerned about migratory birds. In the big picture there, the nuclear industry lobby continues to not so much promote debate as to lobby for increased nuclear. So I'm not seeing a lot of...I'm seeing a

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lot of interest I guess...a lot more interest than debate. I still think because we are not actually doing a lot other than windpower. More public awareness, more public discussion. I think the debate hasn't reached a particularly high level at this point.

How is energy policy determined?

Energy policy seems to be largely determined behind closed doors with major input from the energy companies and the federal government and provincial government. So energy policy is mostly determined by, as far as I can see, by what the energy companies want to do and what government is prepared to pay for.

What input do communities have into the creation of energy policy? What has been the impact and how might this change?

I've attended a lot of community meetings and I have not seen energy policy come onto the agenda very much at all. We still live on PEI in a community where probably 99.9% of people building a house will build it without any regard to its orientation in terms of solar gain, there seems to be people on an individual basis routinely make decisions that will cost them tens of thousands, possibly hundreds of thousands of dollars in unnecessary expense over the lifetime of their house, and on a community level, we seem the same level of, perhaps not disregard, but a lack of awareness of the options that are there. There has been very little public education around energy. Most people's idea of energy is the oil truck or the power that comes through the transmission lines. The windpower, the hoopla around wind power, has really created a lot more awareness but it is still very much a grid-based centralized solution awareness. PEI used to have over 100 dam sites but microhydro has never really been explored since Scale's Pond shut down, and I really don't see that much going on in any other terms with wind power.

Other than I suppose wood heating...

Yes, space heating. When you are saying energy, I'm thinking more electricity, but in terms of space heating, yes, there's obviously a well-evolved system of diverse solutions to people's space heating problems, everything from kerosene stoves and propane to oil and wood and electric.

That's partly the forestry industry and the connection people have still to their rural roots....but my focus is primarily electricity although you can't really talk about electricity in isolation from energy.

No. And I tend to be a demand-reduction kind of guy when looking at solutions. So I'm thinking more in terms of energy retrofits often. But I do think the whole energy sector is tending towards a consolidation and centralization. So in PEI there are many people selling fuelwood on PEI, and my instincts and anecdotal evidence suggests that there will be

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increasing consolidation in the fuel wood business. I wouldn't be surprised to see major players in heating oil marketing fuel wood at the same time. I know it's already going on in New Brunswick to a certain extent.

That would probably be the pellet business and so on?

But beyond that I think Irving have been selling firewood out of their gas stations for quite a long while. They are now getting into the contracting business so that homeowners are finding it harder to get a local guy who will deliver a few cords of wood cause Irving can buy 20,000 cords of wood and give people a price for everything they produce. They don't have the delivery mechanisms in place at this point, but certainly as the price of oil goes up, I think they're looking to diversify in the marketplace as supply gets lower.

Do you have any comments on appliances, stoves, anything to do with, still the demand side?

Well I think the Government of Canada Energuide programs are wonderful programs—I just wish that they did a better job of increasing awareness. Ultimately, I think even though energy costs are a significant portion of most household budgets, a lot of people seem to pay very little attention to the energy consumption. Energy still, electrical energy, is still cheap enough that many people I think just buy what is pretty. I think a lot of people do look at the stickers now and pay attention, but with appliances, I'm more concerned about washing machines and water use. But obviously most households, if they were offered an incentive program, would be more willing to look at more energy efficient and resource efficient appliances. I'm fortunate that our family income over the last five years was good enough that I could replace appliances even though they didn't really need replacing. There's a great market for used stuff so you can sell your existing ones but I wish there was some way, rather than passing that on to somebody else to recycle.

If you were to implement all the changes you see are needed for future sustainability, what would they be and how would you go about it?

I would try and negotiate out of the Lepreau deal so as to get off nuclear. And in terms of how to go about it, it would be, I'm sure that would be difficult. I would encourage, I would give the job to the rural community economic development teams on PEI to begin a process of energy, both conservation and production, education with communities, that might require more staff than they currently have, so I don't just want to dump that on existing cd workers, I would then basically do community consultations after that education process on how people in the community think that they could improve their energy self-sufficiency and conservation.

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I'd like to work with Maritime Electric/ Fortis on a strategy to transition off oil. And I realize I'd like to increase the district heating, make the district heating access easier. I know that it's based on various factors from capacity to hook-up costs, but I think there's a real future for spreading district heating. A lot of the things that I would do would be to do with planning and housing density and energy conservation, heat recovery, so I would like to see more, higher population density in the downtown core and once you do that, you can...

I'm not an engineer and I don't know whether you can do heat recovery from the sewers in a place with as little population density, but there's certainly, we need to begin yesterday in terms of a program of building orientation. I would not issue a building permit to a house that isn't orientated for maximum energy efficiency. It's a no-cost...foundation guys don't care whether they put it in facing south or parallel to the road, so it's a no-cost option and one of the few things that government can easily regulate without incurring any cost. Without the homeowners incurring any cost. In and of itself, that would create more awareness in the community.

Let's talk a minute about the community and individual responsibility. There are some areas that government says, "well it's the responsibility of the community and government can only do so much". You mentioned community councils. How do those work and are they volunteer-based... or staffed..?

Usually the community development teams are provincial government employees on the teams, so they would work a lot with community councils that aren't staffed, mostly volunteer, some might have some part-time administrative help, or some may have full time administrative help.

These would be the municipalities?

Yes and community improvement councils, but there are also watershed groups, community business development councils, there are many community meetings that are looking at broad brush community economic development but really, are they looking specifically at energy?

If you were to implement all the changes you see are needed for future sustainability, what would they be and how would you go about it? What are barriers to implementation?

I would say that I am trying to do that now and have been doing it for years. And the way that I approach it is to partly work from a public education perspective, mostly through non-profit environmental groups and through the media, and more recently through the electoral process, trying to influence that. I also am a great believer in the cooperative economic model as a means of maintaining community empowerment and prosperity, and it is interesting to note that many of the electrical coops across North America were originally cooperatives and there is still a strong electrical energy cooperative movement in the States. But again,

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most cooperatives are set up to fill a need, so once that need is filled, because there isn't a profit motive as such, people tend to move on to the next need and very often the cooperatives get demutualized or taken over by a private operator. So I would encourage government to look first and foremost at cooperative options but to ensure that there is a secretariat that is capable of ensuring that the management of the coops and the training for members and so on, is not fragmented and piecemeal. That's almost a community building initiative, but it's also an initiative that's clearly deviating from the Walmart syndrome in terms of "let the market take care of everything". I look at energy as a public resource. It can be used for the good of the community in terms of creating wealth. Energy conservation strategies can also be financial export conservation strategies in that many of the current big energy solutions tend to export the money that's paid by ratepayers in island jurisdictions off the island to some other place and off into the pockets of shareholders elsewhere. Many jurisdictions have share purchase agreements that energy consumers can buy into, but of course that's a limited option and not something that's aggressively marketed or even promoted in a way that people can understand why it's worthwhile doing that. In terms of the consolidation in the energy supply sector, if you live on a small island, even if 100% of the power users purchase shares in the producing entity, they're still going to be a small player in the consolidated energy empire.

So I'd like to see cooperative solutions, I'd like to see more focus on demand reduction, and I'd like to see diversity in terms of the solutions and a willingness to put a value on energy self-sufficiency that's completely absent now in the same way that it is in food security. There just doesn't seem to be any thought given to how we would deal with supplying the basics of life in an environment where there is some major problem.

One of the people I interviewed said he didn't see the benefit of local ownership. You are saying cooperative ownership where it is owned by the community would be of benefit. Would that just be in terms of the export of capital?

I think it's more than the export of capital, certainly that's a benefit. For me it's more a determinate of health issue. I mean if you want to have a healthy community, it has to have employment, income, and support networks, a feeling of empowerment; so any solution that leaves more money in people's pockets and empowers the community is going to have positive health benefits. So I see it as part of, again this is pretty broad brush...

it's a different paradigm than just the economic paradigm...

if you don't have at least a triple bottom line, then you just get bogged down in the economic bottom line. And the economic bottom line is not about who's getting rich, it's about somebody getting richer. If in fact you apply the economic paradigm solely, then you will do whatever makes

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somebody richest and that may very well be somebody living in Arkansas, and I just fail to see how making somebody rich in Arkansas is of any great benefit to people living in a small island jurisdiction in northeastern Canada.

...You asked about both barriers and competing interests...certainly barriers...it is a bit of a cop out to talk about the prevailing economic paradigm but it's certainly true that in an era when people had less and needed to meet their basic needs, they tended to be more collectivist in approach without regard to generating a lot of profit or surplus. Again, there is nothing wrong with generating wealth--I'm a big fan of it as long as it's not just all going somewhere else—so those other barriers and the interests are connected.

As you build up a type of energy system, the major players seem to acquire more power and influence. Legislation tends to reflect the status quo. It is anecdotal but I had an experience with this when trying to subdivide a lot and being told that the soil wasn't suitable for a septic field when I had no intention of putting a septic field in because there are at least 20 alternatives for sewage disposal and/or treatment but the legislation was such that it was predicated on an antiquated technology. I think now there is such a web of legislation around pricing, you then get bureaucracies with a vested interest in maintaining the status quo, or at least a resistance to shifting to a new system. So it tends to be an anti-innovation environment, I think. Big players, long-established track record, web of regulations. Those are some of the issues. Of course low tech tends to be at its best low capital intensive and local, so it's sometimes hard for big players to see how they are going to maintain control in a highly diverse environment. So on PEI I'd like to see biomass fuels, and windpower and solar, and solar of many kinds, active, passive, photovoltaic. I'd like to go for the home grown solutions if at all possible.

Do you have any comment on education and the lack of expertise that some people say we are suffering from in terms of energy technology?

Again this is not anecdotal but actual. I was recently hiring people and one of the applicants had a business administration degree from UPEI and an MBA from Dalhousie, so had gone through years of business education and knew absolutely nothing about cooperatives and the cooperative movement. In an area of the country where there are billions of dollars in the economy under the cooperatives and financial cooperatives, people can go through an entire educational process without learning anything about that and coming out of the end immersed in a different paradigm. Not surprisingly they tend to look right by locally based cooperative solutions.

In terms of expertise, I think there is a great deal of consumption expertise and very little conservation expertise. If I open the yellow pages I'll find umteen burner technicians and parts suppliers for consumption but PEI is

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still very much taking a back seat when it comes to things like Energuide for houses and retrofits. It's beginning to happen more now but it's been a slow process. Education, we do have very skilled people on the Island who have architectural, planning and design skills that pertain to sustainable housing, sustainable building, and we've had large projects like the Advanced House projects, and you have things like, of course, the ill-fated Ark Project. Many of the people associated with those projects and other energy self-sufficiency and sustainability issues are still around on PEI, and most of them would find it very hard to make a living because of the fact that most buildings on PEI, the system of plunking something down parallel to whatever road you happen to live on, and then throwing in a bit more insulation than you were used to putting in in 1970. There are R-2000 contractors, there are people with experience of passive solar, but there's not...you cannot open the Yellow Pages and look under "energy efficient homes" and instantly find a range of contractors who are going to help you out.

I just wanted to bring this back to islands and look at the how and why we got to where we are. What is it about Prince Edward Island or an island that would make us more or less sensitive to the kinds of things we talked about, efficiency....

As an island, I'm obviously not an "islander", I've lived here for 25 years, a bit more, but I see when I first came here there was a "bigger is better" philosophy that seemed to be dominating the landscape, and I think, the best beer that they brew in Ontario has a slogan that says "a hundred years behind the times", that's their marketing motto and it works for beer. Being 100 years behind the times is not something you can use to market an economic development policy.

But the whole "small is beautiful" networked communities, we focused on networking in terms of technological computer systems, but of course "networking", the word, describes what people do whether they are doing it electronically or not, and PEI tends to be a very networked place. So I think that the potential is there to have networked energy solutions that would be beneficial to the social, environmental and economic situation.

Because we're a separate political jurisdiction, there's a tendency to want to separate solutions. Again I think that's partly because of the financial situations and regulations that prevail. If there's money for one of something in every province, then we'll tend to get one of something here and we might be better off getting 12 different things but they may not qualify for the particular funding envelope.

I don't thing there is any thing about insularity that specifically mitigates against having diverse solutions, but certainly it does tend to mitigate against innovation because people have got into the habit of looking to capital intensive solutions outside, and I think we are still fixated on looking at capital intensive solutions and those tend to happen elsewhere. That's perhaps why we don't adopt them as early as some jurisdictions do.

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Do you think that would be different if we were sovereign?

Yes I do. I think it would be different, I'm not sure whether it would be more successful. Obviously we're a small jurisdiction with a small population. Possibly if we were sovereign we could increase our population. Although I like the smallness of island living, frankly I think you could increase the population tenfold here without reducing the quality of life if it were done with good planning. I think it would benefit everybody.

The piecemeal expansion of communities beyond the boundaries and the lack of any cogent application of planning principles and the constant deviation from whatever planning policies that have been established doesn't create a very viable situation in terms of community energy policy.

Sustainable energy policy has to be part of a sustainable community planning, and sustainable community planning has to address the determinants of health, in terms of support systems, jobs, employment and clearly environment as well. I'd feel a lot happier as a taxpayer in a jurisdiction where over 30% of the tax dollars get spent on healthcare. I'd feel a lot happier if energy policy was evaluated in terms of its impact on the overall health of the community.

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THE INFLUENCE OF ISLANDNESS ON ENERGY POLICY AND ELECTRICITY SUPPLY

APPENDIX D

DATA CODING

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Category	Questions/Topics
Capital	Federal structure, resources for renewables, grants
Capital	Private industry incentives
Capital	Capital equipment, investment in capital
Capital	ability to obtain financing
Comment	final words
Consumption	Energy costs
Efficiency	peak demand
Efficiency	Street lighting
Efficiency	Consumption behaviour
Efficiency	Industrial consumers, cogeneration,
Efficiency	Agriculture
Efficiency	Efficiency
Efficiency	Energy conservation
Efficiency	Appliances
Efficiency	Building, built environment
Island	advantages of pursuing an energy policy from or for a small island?
Island	disadvantages of pursuing an energy policy from/ for small island?
Island	Issues about smallness
Islands	Self-sufficiency
Islands	Caribbean
Islands	Comments on islands in general
Policy	If you could implement changes, what would they be?
Policy	Input of communities, EAC
Policy	IRAC
Policy	Regulation
Policy	Taxation
Policy	Stakeholders
Policy	Deregulation, sell power to customers
Policy	Energy policy, control over energy policy
Policy	Leadership
Policy	Contested areas
Policy	Politics
Policy	Public process of discussion and engagement
Policy	Legislation

Ownership

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Policy	Overall evaluation of PEI's energy policy
Policy	NGO sector
Policy	why happening in PEI
Policy	equity, access
Production	Monopoly, size of market
Production	Nuclear energy?
Production	Research capability, R & D infrastructure
Production	Transmission
Production	Rates, rate structure
Production	Grid connection
Production	Revenue
Production	Maritime Electric
Production	PEI Energy Corporation
Public	Rights of landowners, compensation, NIMBY
Public	Public perception
Public	why is population more passive
Public	level of entrepreneurship
Standards	Reliability guidelines
Sustainability	international benchmarks, indicators for sustainability, ecological footprint
Sustainability	To what extent does PEI Energy Framework consolidate progress towards sustainability
Sustainability	Kyoto and credits
Sustainability	End of fossil fuels
Technology	Technology, net metering
Technology	influence of '70s
Technology	fuel

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Questions/Topics

advantages of pursuing an energy policy from or for a small island?

disadvantages of pursuing an energy policy from/ for small island?

Issues about smallness

international benchmarks, indicators for sustainability, ecological footprint

Reliability guidelines

peak demand

To what extent does PEI Energy Framework consolidate progress towards sustainability

If you could implement changes, what would they be?

Nuclear energy?

Rights of landowners, compensation, NIMBY

Research capability, R & D infrastructure

Federal structure, resources for renewables, grants

Kyoto and credits

Private industry incentives

Input of communities, EAC

IRAC

Regulation,

Transmission

Taxation

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Legislation

Industrial consumers, cogeneration,

Agriculture

Efficiency

Energy conservation

Appliances

Energy costs

Technology, net metering

Building, built environment

Overall evaluation of PEI's energy policy

Comments on islands in general

NGO sector

why is population more passive

why happening in PEI

influence of '70s

equity, access

level of entrepreneurship

ability to obtain financing

fuel

final words

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Rates, rate structure

Street lighting

Consumption behaviour

Grid connection

Self-sufficiency

Caribbean

Revenue

Stakeholders

Maritime Electric

PEI Energy Corporation

Deregulation, sell power to customers

Energy policy, control over energy policy

Leadership

Contested areas

Politics

Public perception

End of fossil fuels

Capital equipment, investment in capital

Monopoly, size of market

Public process of discussion and engagement

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