# Prince Edward Island and Climate Change A Strategy for Reducing the Impacts of Global Warming





### ONE ISLAND COMMUNITY



#### Securing our Future; PEI Environment and Energy Policy Series

- Volume 1: **Prince Edward Island Wind Energy** Securing our Future: The 10 Point Plan
- Volume 2: **Prince Edward Island Energy Strategy** Securing our Future: Energy, Conservation and Renewables
- Volume 3: **Prince Edward Island and Climate Change** A Strategy for Reducing the Impacts of Global Warming

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### Introduction

### Background

"Climate change is the change in the longterm weather patterns experienced in a region. Human activities have resulted in the increased levels of heat-trapping gases which contribute to the warming of the Earth." <sup>1</sup>

In 2007 the Intergovernmental Panel on Climate Change provided the most authoritative scientific information so far on climate change. Key findings from their "Fourth Assessment Report"<sup>2</sup> included the following observations:

- it is highly probable that the observed increase in globally averaged temperatures and increase in greenhouse gas concentrations is largely due to human activity,
- Warming of the climate system is happening,
- Since records began (1850), 11 of the last 12 years (1995-2006) have ranked among the 12 warmest in the record of global surface temperatures,
- Global average sea levels have risen approximately 17 cm during the 20th century, and
- The warming of the world's seas and the rise in sea level has increased rapidly over the last century.



1 : Prince Edward Island Climate Change Consultation Document Draft. June 2003.

### Prince Edward Island's Action Plan for Managing Climate Change

Prince Edward Island must develop resilient responses to the unavoidable effects of climate change on its provincial infrastructure, natural habitats, resources and economy. Reducing vulnerability to climate change through adaptation efforts are essential. Government's role is to promote adaptation through immediate policy guidance, strong support and leadership by example.

Prince Edward Island's climate change strategy builds on its existing efforts to reduce greenhouse gas emissions and adapt to meet the challenges of a world that has a more variable and less predictable climate.

### Climate Change and Prince Edward Island

If the forecast trend in climate disruption continues, we can expect difficult times on Prince Edward Island. This despite the fact that Prince Edward Island is a low emitter of greenhouse gases, producing only 0.3% of the nation's greenhouse gas emissions (CO<sub>2</sub> e<sup>3</sup>).

No substantial growth in greenhouse gas emissions has been experienced or is expected in Prince Edward Island over the next decade. Unfortunately, as an island with a highly erodible sandstone bedrock, an indented sandy shoreline with many estuaries and marshes, and the ongoing submergence of its coast, Prince Edward Island has been identified as one of the areas most vulnerable to sea level rise in Canada.

- 2 : Alley, R, Berntsen, T, Bindoff, NL, Chen, Z, Chidthaisong, A, Friedlingstein, P, Gregory, J, Hegerl, G, Heimann, M, Hewitson, B, Hoskins, B, Joos, F, Jouzel, J, Kattsov, V, Lohmann, U, Manning, M, Matsuno, T, Molina, M,Nicholls, N, Overpeck, J, Qin, D, Raga, G, Ramaswamy, V, Ren, J, Rusticucci, M, Solomon, S, Somerville, R,Stocker, TF, Stott, P, Stouffer, RJ, Whetton, P, Wood, RA & Wratt, D 2007, Climate Change 2007:The Physical Science Basis. Summary for Policymakers, Intergovernmental Panel on Climate Change, Paris, viewed 5 February 2007, http://www.ipcc.ch/SPM2feb07.pdf.
- 3 : CO<sub>2</sub> e = The unit of measurement that defines the global warming potential of the six greenhouse gases. CO<sub>2</sub> e is expressed in terms of the global warming potential of one unit of carbon dioxide. Expressing all greenhouse gases in terms of tonnes of CO<sub>2</sub> e allows the different gases to be grouped together.

The province is at significant risk from the negative effects of climate change, and has a considerable stake in national and international initiatives to limit greenhouse gas emissions.

Global climate warming will not only affect the Island's natural environment, it will also influence Islanders' health and safety, impact their economic prosperity and affect their quality of life.

While Prince Edward Island's climate has been moderated by the influence of the Gulf of St. Lawrence and the Atlantic Ocean's Gulf Stream, in the last 10 years average temperatures in the province have been the warmest on record. Sea level has risen over 30 centimetres since 1911, and the frequency and severity of hurricanes and storm surges have increased noticeably. Health problems associated with air pollution may become more common and we are already dealing with a prevalence of asthma and chronic respiratory diseases higher than the Canadian average.

Natural Resources Canada identifies the following potential impacts in the Atlantic region:

- an increase in storm events, increasing storm intensity, rising sea level, storm surges, coastal erosion, sediment redistribution, coastal sedimentation and flooding
- increased precipitation extremes, shifts in water tables, excessive moisture or drought, and less winter snow cover
- shifts in the winter ranges, distribution and breeding success of birds
- milder winters, early extended thaws, late springs, and early frosts
- higher temperatures and longer growing seasons that may benefit agriculture and forestry, but will also bring water resources under pressure, adversely affecting municipal water supplies, placing stress on forest species that prefer cooler and wetter climates, and impact the management of agricultural production and farm water usage, and

 loss of fish species as fish habitats change and new fish distribution and migration patterns develop.

As temperatures rise, new pest and disease problems are developing, affecting both the productivity of our crops and the health and biodiversity of our rivers and coastal waters. Water-borne contamination has become more prevalent, negatively affecting the value of our food products. Rising sea levels and increased incidence of storm surge activity have affected shoreline stability, damaging property and disrupting sensitive ecosystems. Longer periods without timely rain will increase the susceptibility of forests to fires. Coastal communities, their infrastructure and industries, have become more vulnerable to storm events. Impacts on coastal infrastructure, such as bridges, roads, and waste water systems are predicted to adversely affect trade and tourism. Some communities can expect to experience saltwater intrusion in their groundwater supply.

Responding to the challenge presented by climate change will require significant action. Prince Edward Island's climate change strategy is part of our continuing commitment to contribute to national and global attempts to reduce greenhouse gas emissions, while protecting our Island's resources, promoting sustainable development, and building a strong economy.

In 2001, the Government of Prince Edward Island detailed its commitment to address climate change with the release of 'Curbing Climate Change - Prince Edward Island's Climate Change First Business Plan. This plan, complimented Canada's First National Climate Change Business Plan<sup>4</sup>, and focused on enhancing awareness and understanding, promoting technology development and innovation, investing in the knowledge economy, and encouraging sustainable development in the agricultural, forestry, power, and transportation sectors. Much has changed on the national and international stage, since the release of 'Curbing Climate Change', most notably the ratification of the 'Kyoto Protocol' to the United Nations Framework Convention on Climate Change<sup>5</sup>, an international and legally binding agreement to reduce global greenhouse gas emissions. Canada, as a signatory, has set a series of ambitious global greenhouse gas reduction targets, which will contribute to a reduction in the negative effects of global climate warming.

Prince Edward Island has demonstrated a continued commitment to protecting our environment from the harmful consequences of global warming, while ensuring that natural resources, traditional values and way of life are sustained for generations to come. In 2005, the Special Legislative Committee on Climate Change presented its report 'A Climate Change Strategy for Prince Edward Island', and it forms the basis for a strategy that focuses on a partnership between government and people to ensure a safe, prosperous and sustainable future this province.

### The Framework for Adaptation Policies

In 2001, Prince Edward Island, along with the Eastern Canadian Provinces and the New England States, adopted North America's first multi-jurisdictional Climate Change Action Plan<sup>6</sup> to reverse the trend of rising greenhouse gas emissions and mitigate the harmful consequences of climate change. The Action Plan established a regional reduction target of 10 percent for greenhouse gas emissions below 1990 levels by the year 2020. For Prince Edward Island this will require reducing our current emissions by 500,000 tonnes of  $CO_2$  e per year. Prince Edward Island is also determined to establish sufficient long term reductions to eliminate any dangerous threat to climate,

namely, reduce greenhouse gas emissions to 75-85% below 2001 levels by 2050 (Resolution 31-1, NEG/ECP).

There are significant economic benefits to responding early to climate change. Adaptation is crucial to reducing current vulnerability to climate change, and it is the only way to cope with the inevitable impacts climate change will bring to the province over the next two decades. The Government of Prince Edward Island is committed to dealing with these issues.

Identifying vulnerable infrastructure, incorporating river and coastal flooding in land-use policies, revising emergency response measures, and accounting for sea-level rise when planning and building infrastructure will help reduce damage to infrastructure and the environment, and lessen the risk to human health and wellbeing. Managing development in coastal areas, preventing construction in areas of known vulnerability, and protecting coastlines at critical sites will mitigate the risk to coastal communities.

Adaptation is a long-term process. It will require careful planning to enable Prince Edward Island to thrive in a variable climate, and ensure it is resilient to the impacts of climate change.

The actions in 'Prince Edward Island & Climate Change' will help Islanders:

- capture the benefits from early adaptation planning
- reduce vulnerability and increase resilience in priority sectors
- establish the foundation needed for future adaptation actions, and
- increase knowledge and awareness of personal actions

<sup>5 :</sup> http://unfccc.int/resource/docs/convkp/kpena.html

<sup>6 :</sup> New England Governors/Eastern Canadian Premiers "Climate Action Plan 2001".

### Consultation

There has been a tremendous amount of consultation with Islanders, interest groups and stakeholders regarding climate change.<sup>7</sup> This has led to the identification of a unique set of goals for the province which are presented in this document.

### Goals

Four main goals have been identified<sup>8</sup> namely:

- Reducing greenhouse gas emissions to mitigate the effects of global warming
- Enhancing carbon sinks to reduce the harmful build-up of CO, in our atmosphere
- · Improving our ability to adapt to climate change
- Increase public awareness

### **Principles**

'Prince Edward Island and Climate Change' is built on the following principles:

- Actions will contribute to environmental wellbeing and sustainable economic performance Efforts will be aimed at making decisions that will ensure a sustainable approach to problem solving so that future generations will not bear the burden of adaptation measures.
- Actions will not replace efforts to reduce greenhouse gas emissions

Adapting to climate change does not negate the need to continue to reduce emissions. A continued commitment to do so improves the chances of successful adaptation and reduces the potential for suffering the harmful consequences of climate change. The province will continue to participate in climate change activities to ensure action is taken to reduce greenhouse gas emissions.

• Working in partnership with all stakeholders is considered to be fundamental Partnerships ensure cross-pollination of ideas, reduce duplication, increase the spread of knowledge and skills and ensure that adaptation responses are taken up by all sectors of the community.  Creating a highly informed public who are aware of the consequences of climate change is critical

The actions of individual Canadians account for about 28 percent of the total greenhouse gas emissions in Canada. An informed and engaged public is a key requirement in any successful climate change mitigation or adaptation strategy.

### **Key Desired Outcomes**

Outcomes will be achieved through the action of government in partnership with all stakeholders. The key long term outcomes being sought through 'Prince Edward Island & Climate Change' are to:

- Understand climate change and mitigate the risks and vulnerabilities posed to Prince Edward Island, its natural environment, and the health and economic well being of Islanders.
- Consider climate change impacts in all decisions so as to better identify the potential impacts of decisions and develop appropriate responses.
- Take practical steps to enhance resilience to climate change by improving the ability of communities to withstand a variable and changing climate
- Enhancing the health of vulnerable natural environments
- Exploring alternatives to reduce vulnerability and avoiding decisions that would retard meeting adaptation and resilience based goals.
- Raise awareness and understanding across all sectors of society about the advantages of early action to mitigate, and adapt to, the effects of climate change.

<sup>7 :</sup> Prince Edward Island Climate Change Consultation Document Draft, June 2003. 8 : Prince Edward Island Climate Change Consultation Document Draft, June 2003.

#### Prince Edward Island and Climate Change A Strategy for Reducing the Impacts of Global Warming

### A History of Taking First Action on Climate Change

The Government of Prince Edward Island has been a leader and key proponent in taking steps to reduce greenhouse gas emissions including:

- **1981** Atlantic Wind Test Site, a subsidiary of the PEI Energy Corporation, was established as part of Canada's National Wind Energy Research and Development Program, and the **first** site for wind power development in Canada. Natural Resources Canada has been an important partner in this initiative.
- **1983** The development of a large, biomass/ municipal solid waste-fired district heating system in downtown Charlottetown and at the University of Prince Edward Island began.
- **1994** 'Waste Watch', a waste recycling and composting program began as a pilot project in East Prince. On November 1, 2002, the Waste Watch program of source separation expanded to the entire province and has achieved a 65 percent diversion of waste from landfill. All organic materials are composted aerobically to avoid the generation of methane, a major GHG. Prince Edward Island is the first and only jurisdiction in Canada to institute mandatory province-wide recycling and composting.
- **1997** The Energy-from-Waste plant in Charlottetown underwent a multimillion-dollar upgrade and expansion, including the addition of a new heat recovery boiler, a wood waste combustion system, and installation of air pollution control equipment. The district heating/ co-generation system provides heat to more than 80 buildings.
- **2000** Prince Edward Island together with other provincial governments and the Government of Canada finalized a Climate Change National Implementation Strategy and the First National Business Plan.

**2001** Conference of New England Governors and Eastern Canadian Premiers accepted the Climate Change Action Plan outlining greenhouse gas emission reduction goals for the region and approaches for meeting those goals.

> The Prince Edward Island North Cape Wind Farm officially opened, selling electricity to the Prince Edward Island grid.

> Curbing Climate Change - Prince Edward Island Climate Change Business Plan was released.

**2002** A new hybrid gas/electric car was put into service by the Government of Prince Edward Island.

The Prince Edward Island Climate Change Hub was officially launched.

Government announced investment in additional facilities at the North Cape Wind Farm. An interpretive centre to teach the public about wind energy and its potential as a renewable energy source was also developed.

**2003** Prince Edward Island announced a renewable energy strategy.

Vestas Energy Systems introduced a V-90 prototype wind turbine which was constructed at Norway. This was the largest wind turbine in North America at the time.

2004 Energy Framework & Renewable Energy Strategy was unveiled, and a provincial climate change coordinator hired.

> Prince Edward Island became the first jurisdiction in Canada to introduce a tax incentive on the purchase of a hybrid electric vehicle. This incentive gives a provincial sales tax exemption of up to \$3,000.

2005 Charlottetown Transit system launched.

Fuel Efficiency Standard introduced for all government owned or leased vehicles.

Report of the Special Legislative Committee on Climate Change 'A Climate Change Strategy for Prince Edward Island'.

The PEI Wind Energy Institute was formed and was located on the same site as the Atlantic Wind Test Site at North Cape.

**2006** The Greening Government initiative was announced.

Canada's first safer-living home was built near West Cape, designed and constructed to withstand winds of 200 km/hour.

**2007** A new 30 MW wind farm began operations at North Lake. The wind farm displaces 75,000 tonnes of greenhouse gases per year; the equivalent of taking 16,000 motor vehicles off the road.

Phase 1 of the West Cape Wind Farm was constructed by Ventus in the West Cape Region. This was 20 MW of a planned 100 MW facility. The City of Summerside entered a long term contract to purchase 9 MW of this wind generated electricity.

About fifteen percent of all electricity used in the province is currently generated by renewable energy sources. This was a legislated target for 2010 which has already been met.

School Lightbulb Funding Raising Project helped install 200,000 energy efficient compact fluorescent bulbs in homes across the province, reducing greenhouse gas emissions by 32,000 tonnes over the lifetime of these bulbs; the equivalent of taking 6,000 motor vehicles off the road. Ventus Energy Systems also established a 9 MW wind farm at Norway.

Project Greenlight helped install 12 compact fluorescent light bulbs in 1000 homes across PEI.

2008 The Office of Energy Efficiency opened.

Prince Edward Island underwent LiDAR mapping as a first step in developing a climate mitigation strategy for its coastal communities.

A PEI Energy Strategy and a Wind Energy Strategy were developed.

The capital region urban transit system is expanded to Stratford and Cornwall and a transit service between Charlottetown and Summerside is launched.

### **Setting Priorities**

Much of Prince Edward Island's natural environment and many of its communities and economic activities are climate sensitive. The economic, social and environmental impacts of climate change cannot all be addressed at once. Government has adopted a sectoral approach, and will develop action plans for the following key areas.

- 1. Energy Efficiency and Conservation
- 2. Renewable Energy
- 3. Transportation
- 4. Agriculture
- 5. Adaptation and Resilience
- 6. Public Education and Awareness, and
- 7. Government Leading By Example

### Energy Efficiency and Conservation

#### **Overview**

Energy use in homes, businesses and industries is responsible for almost half of Canada's greenhouse gas emissions. In Prince Edward Island, we have few major industries and 80 percent of our electricity is generated elsewhere, as are the emissions associated with its generation. Consequently, only 30 percent of our emissions are attributable to electricity and space heating (compared to 56 percent nationally). Most of these emissions are from the commercial and residential sectors.

Reducing greenhouse gas emissions in this sector requires initiatives that will address both how we generate and use energy. It is important to expand our efforts to generate electricity and thermal energy using non-carbon or lowcarbon energy sources, and increase efforts to use energy more efficiently.

Since 1990, the replacement of older less efficient furnaces (60 percent efficient) with newer more efficient furnaces (75 - 85 percent efficient) and the increasing popularity of alternative to oil heating systems such as propane, wood and geothermal heating systems has meant that PEI's sources of energy have become more diversified.<sup>9</sup> Even so, electricity demand is expected to increase by 20 - 30 percent in the next 10 years and will contribute to increasing greenhouse gas emissions in the growing residential sector.<sup>10</sup>

Capturing energy efficiencies is considered to be the least costly, most reliable and cheapest way to reduce greenhouse gas emissions. Clearly, energy efficiency will be key to Prince Edward Island's transition to a more sustainable low-carbon energy future.<sup>11</sup>

### The Potential

There is a large potential for energy savings in the following sectors:

- Residential
- Commercial and Institutional (C&I)
- Transportation

Energy efficiency programs can yield large energy savings and greenhouse gas emission reductions. It has been estimated that some households can save as much as \$1,500 a year through energy efficiency measures such as switching to energy efficient lighting and appliances, reducing air leakage around windows and doors, improving insulation in walls and attics, and installing high-efficiency furnaces.

Residential and C&I sectors could reduce forecasted electricity use by 11 percent and nonelectric use by 8 percent. This translates into a cost savings of \$148 million over the ten-year implementation time frame and would reduce greenhouse gas emissions by nearly 132,000 tonnes by 2017. The study also suggests that investing in cost-effective energy efficiency initiatives could offset Prince Edward Island's forecasted electricity load growth for the next decade.

### Office of Energy Efficiency

The Prince Edward Island Office of Energy Efficiency opened in January 2008, and will help homeowners and businesses save energy and money while helping to protect the environment.

<sup>9:</sup> Comprehensive Energy Database - Natural Resources Canada.

<sup>10 :</sup> Maritime Electric Ltd.

<sup>11: 2008</sup> PEI Energy Strategy.



Premier Ghiz and Minister Webster and the Office of Energy Efficiency staff.

### **Government** Action

The Government of Prince Edward Island, through the Office of Energy Efficiency, will develop programs for increasing energy efficiency in Island homes and businesses that include direct incentives, loan programs, grants and rebates.

### Building Code and Energy Standards

Buildings are major energy users and are responsible for over 30 percent of Prince Edward Island's greenhouse gas emissions. It is important to build energy efficient homes, that will reduce our heating and lighting requirements. While our cold climate accounts for much of our energy consumption, a great deal of energy is wasted due to poor building design and outdated construction standards. The implications of poor building design are long lasting, as energy consumption is locked in for the lifetime of the building, typically 50 to 100 years.

Energy efficient or "green" buildings have many benefits; they are less expensive to operate, help reduce energy demands and have the potential for a smaller carbon footprint. Even so, green building design is still the exception rather than the norm in Prince Edward Island. Standards for new construction need to be raised to ensure that long-term reductions in greenhouse gas emissions can be achieved.

### Energy Efficiency Advisory Committee

The Government of Prince Edward Island will develop an Energy Efficiency Advisory Committee composed of stakeholders from the public, private, non-governmental and utility sectors working together to identify potential investments in energy efficiency. This committee will serve to raise awareness of energy efficiency needs and opportunities in Prince Edward Island. The committee will provide information and advice to government departments.

### Government Action

The Government of Prince Edward Island will adopt new energy efficient standards and implement codes and practices in line with providing unified energy efficient building standards across the province that match or better current best standards for energy efficient building construction in Canada.

Building standards and an implementation time line will be set with targets for energy efficiency standards over the next 5 to 10 years.

Administration, inspection, education and compliance will be linked to the new Provincial Building Code and Energy Standards.

The Government of Prince Edward Island will explore the use of financial incentives to promote the 'energy consumption' labeling ("Ener-guide rating") of houses and buildings with special recognition of best practice and best in class.

The Government of Prince Edward Island will develop an Energy Efficiency Advisory Committee composed of stakeholders from the public, private, non-governmental and utility sectors working together to identify potential investments in energy efficiency. This committee will serve to raise awareness of energy efficiency needs and opportunities in Prince Edward Island. The committee will provide information and advice to government departments.

### Renewable Energy

Prince Edward Island has long been a keen proponent of the development and deployment of renewable energy resources. In 2004, Prince Edward Island released the Energy Framework and Renewable Energy Strategy to reduce the province's reliance on imported fossil fuels and achieve a measure of energy self-sufficiency. As part of that effort, Prince Edward Island committed to generating 15 percent of its electricity from renewable sources by 2010. This goal was achieved three years ahead of schedule in 2007.

By 2013, wind energy in Prince Edward Island will generate in the order of 500 MW of clean electricity, reducing by 1,250,000 tonnes the amount of  $CO_2$  e generated each year in Atlantic Canada and the New England States by other sources of energy.

### Wind

As a percentage of domestic use, Prince Edward Island is a North American leader in the development of wind energy. The PEI Energy Corporation, developed Atlantic Canada's first utility-grade wind farm in 2001 at North Cape, well before the

economic feasibility of these projects was proven for this region. Since then, the PEI Energy Corporation has expanded its North Cape facility and developed the East Point Wind Farm resulting in the Province owning and operating 40.56 MW of wind power. Several more private wind farms are in the planning stages. In the April 2008 Speech from the Throne, it was announced that the Province of Prince Edward Island will be developing a further 500 MW of wind generation capacity over the next five years in partnership with Maritime Electric Company and various private developers. In October 2008 the provincial government set out its guiding principles for private sector investment and development of this wind resource. Government has committed itself to encouraging wind energy development that is environmentally sustainable, economically beneficial and community-supported.

### **Government** Action

In line with the New England Governors/ Eastern Canadian Premiers Climate Change Action Plan 2001 the Government of Prince Edward Island will reduce, by 2025, the amount of  $CO_2$  e emitted per megawatt hour of electricity use by 20% of current emissions.

### Role of Government in Future Wind Development

The PEI Energy Corporation's ownership of the North Cape and East Point wind farms is an invaluable asset to the Wind Energy Institute of Canada. Provincial ownership means that data for research and development is accessible to the Wind Energy Institute of Canada, enabling the Corporation to be an active partner in understanding, promoting and developing wind energy in Prince Edward Island. Revenues now being generated by the PEI Energy Corporation are flowing back to the provincial treasury.

### **Government Action**

The Government of Prince Edward Island will commit to the development of 500 MW of wind generated power on Prince Edward Island.

### Solar and Geothermal

There are many modern technologies for harnessing solar energy to produce heat and electricity. Applications span the residential, commercial, industrial, agricultural and transportation sectors. Increased public concern over rising oil prices, have resulted in renewed interest in and installation of solar technologies, primarily systems that use sunlight to heat water. The most common types of solar water heaters are evacuated tube collectors and glazed flat plate collectors generally used for domestic hot water and unglazed plastic collectors used mainly to heat swimming pools. In recent years, geothermal heating and cooling has become popular. This technique is generally for residential use and involves energy transfer of heat - located immediately under the Earth's surface - into a residence or building in winter. In the summer geothermal heat transfer is able to provide cooling functions when the outside temperature is higher than ground temperature (8-12 °C).

Twenty percent of the average energy demand in a residential home is for water heating, and most geothermal units include a component to heat water for domestic use. Geothermal energy systems are ideally suited to meet the heating, ventilation and air conditioning needs of residential, commercial, industrial and institutional (e.g. schools and post-secondary) users. Natural Resources Canada and the US Environmental Protection Agency both state geothermal systems are the most energy-efficient, environmentally clean, and cost-effective space heating/air conditioning systems available in the market today.

### **Government** Action

The Government of Prince Edward Island will support the installation of small-scale renewable heating technologies like solar and geothermal heating systems for residential buildings and businesses through grants, loans, tax breaks and other financial incentives.

#### **Biomass and Biogas**

Ten percent of energy in Prince Edward Island is currently supplied by biomass, which includes wood, sawmill residue and municipal waste. PEI Energy Systems, in Charlottetown, uses municipal waste and wood biomass to supply thermal energy to commercial, residential and institutional buildings in the city. There are many biomass resources in Prince Edward Island that, if developed sustainably, could contribute to additional incorporation of renewable energy into the province's overall energy mix, reducing greenhouse gas emissions.

Biomass from the forest and agricultural sectors are available energy sources for biofuel development in Prince Edward Island. Wood supplies from Island forests (softwood, hardwood, postharvest material, plantation thinnings, roadside material etc.) could represent a fuel source for space and water heating. Reforestation or new forest plantings will add to the carbon-sink potential of the province.

Whether or not the long term harvest of wood is sustainable remains unclear. Sustainable harvest is certainly possible, however, projected wood supply availability under various biomass scenarios remains largely a function of scale. Agricultural by-products such as straw and unused hay could also be developed as fuel sources. Again, it is unclear whether it is economically sustainable to produce these fuels, if the principle markets, namely cereal crops and forages, should disappear. Biogas (e.g. methane) is generated from decomposing manure, compost, and other living things. Several Island food processors, wastewater treatment facilities, and many agricultural producers are currently capturing and using biogas to heat their facilities. Biogas capture and use displaces fossil fuels and prevents the release of methane gas, itself a key greenhouse gas and contributor to global warming. Limited opportunities may exist in Prince Edward Island for methane capture, and the possibility of expanding biogas generation facilities to generate heat for urban and local community district heating systems.

#### **Government** Action

The Government of Prince Edward Island will review and improve codes and regulatory barriers preventing the sustainable development of biomass fuel and biogas facilities in Prince Edward Island.

The Government of Prince Edward Island will lead by example in demonstrating biomass and biogas technologies in public buildings and facilities across the Island.

The Government of Prince Edward Island will promote the use and encourage the installation of biomass heating systems in homes and businesses, through loans, tax breaks and other financial incentives, while seeking to reduce harmful greenhouse gas emissions.

The Government of Prince Edward Island will undertake feasibility studies for the use of biomass and biogas in urban and local community district heating systems and the potential for co-generation facilities with the Island utilities.

### **Liquid Biofuels**

Biofuels represent an opportunity to move to a sustainable biofuel based economy where agricultural and forestry products, co-products and waste materials are used to produce energy. An aggressive biofuels portfolio, incorporating a variety of renewable fuel sources into the current energy mix, could complement Prince Edward Island's efforts to further renewable energy development, reduce greenhouse gas emissions, and provide an additional revenue stream for the agricultural and forestry industries.

Renewable fuels, such as bioethanol and biodiesel (liquid biofuels), are added to gasoline, diesel and light fuel oil and theoretically reduce our dependency on fossil fuels while having a lower carbon-footprint, since their manufacture is supposedly carbon-neutral<sup>12</sup>. Bioethanol and biodiesel are made from natural, renewable sources that are abundant in Canada; namely plants, animal fat, and waste agricultural products. It is possible for most motor vehicles and traditional oil-fired furnaces to run on renewable fuel blends.

Low-level ethanol blends (10 percent or less) can be successfully used in all types of motor vehicles and engines that require gasoline. Motor vehicle manufacturers are also making "flex-fuel" versions of established models that run on blends of up to 85 percent ethanol. Biodiesel blends are currently being used in diesel fleets across Canada, including a B20 blend planned for use by Halifax Metro Transit buses. Beginning in 2010, the Government of Canada will enact federal regulations requiring the blending of fossil fuels with renewable fuels. Fuel producers and importers will be required to have an average annual renewable fuel content of at least 5 percent in gasoline (E5 - 5 percent bioethanol and 95 percent gasoline) by 2010 and 2 percent in diesel fuel and heating oil (B2 - 2 percent biodiesel and 98 percent diesel / light fuel oil) by 2012.



12 : Cautionary studies suggest that biofuels are anything but carbon neutral. Joseph Fargione, Jason Hill, David Tilman, Stephen Polasky, Peter Hawthorne. 2008 Land Clearing and the Biofuel Carbon Debt. Science 29 February 2008: Vol. 319. pp. 1235 - 1238; Science 29 February 2008:Timothy Searchinger, Ralph Heimlich, R. A. Houghton, Fengxia Dong, Amani Elobeid, Jacinto Fabiosa, Simla Tokgoz, 4 Dermot Hayes, 4 Tun-Hsiang Yu 2008. Use of U.S. Croplands for Biofuels Increases Greenhouse Gases Through Emissions from Land-Use Change. Science 29. Vol. 319. pp. 1238 - 1240.

Renewable Fuel Standards will demand that a percentage of transport fuel be acquired from renewable sources such as bioethanol or biodiesel, to augment the make-up of conventional fuels. The introduction of Renewable Fuel Standards in other countries has led to the rapid development of the biofuel market. Despite the Federal Government announcement requiring that renewable content - such as bioethanol and biodiesel - make up a certain percentage of conventional fossil fuels by 2010 and 2012 respectively, there are no assurances that renewable fuels will be available in all Canadian jurisdictions. A federal Renewable Fuel Standards may not result in the sale of renewable fuels in Prince Edward Island. Producers may opt to restrict the sale of renewable fuels to larger markets in Quebec, Ontario and Western Canada where renewable fuel markets are already established. It is therefore important that the Government of Prince Edward Island establish its own Renewable Fuel Standards and a biofuel industry to support it, thereby ensuring that Islanders will have access to renewable fuels and remove the need to pay someone else for our energy needs.

Climate change concerns and the desire to reduce greenhouse gas emissions from motor vehicles has lead to the concept of a Low Carbon Fuel Standard. This was originally introduced in California and subsequently endorsed by the Provinces of Ontario and British Columbia, as well as the State of Massachusetts. A Low Carbon Fuel Standard will require that fuel providers ensure that the mix of fuel they sell into the market meets, on average, a declining standard for greenhouse gas emissions measured in CO e gram per unit of fuel energy sold. The standard will be measured on a lifecycle basis in order to include all emissions from fuel consumption and production, including the "upstream" emissions that are major contributors to the global warming impact of transportation fuels<sup>13</sup>. This focus on greenhouse gas reduction promotes industry innovation to develop alternative clean fuels at the lowest cost.

### The Government of Prince Edward Island

has endorsed the concept of a Low Carbon Fuel Standard, to reduce greenhouse gas emissions, through the increased use of environmentally and economically sustainable alternative biofuels

**Government Action** 

The Government of Prince Edward Island will engage the neighbouring provinces and states in formulating a collaborative regional approach to greenhouse emissions reduction through the adoption of Low Carbon Fuel Standards.

### **Government Action**

The Government of Prince Edward Island will consider the introduction of escalating Renewable Fuel Standards for bioethanol and biodiesel. A Provincial E5 and B10 (or B10 renewable equivalent) mandate could be introduced by 2013 and doubled by 2018.

<sup>13 :</sup> The upstream oil and natural gas emissions include all greenhouse gases that are released during the exploration, drilling, production, gathering, and basic processing of crude oil and natural gas.

### Community-Based Renewable Energy Projects

Strong, diverse, local economies are the backbone of a vibrant Island community. Realizing the advantages that can come from the local ownership of community-based energy projects has resulted in the growth of renewable energy in many jurisdictions around the world. Local control and retention of revenues from the sale of power back to the grid operator (local utilities) brings prosperity to the whole community. Developing long-term fixed price contracts for the supply of renewable energy (wind, solar, biomass & earth energy) benefits local residents, their community and their environment. In this way the twin goals of creating environmental and regional economic sustainability can be achieved.

### **Government** Action

The Government of Prince Edward Island will promote the use and encourage the installation of community based heating projects through loans, tax breaks and other financial incentives.

The Government of Prince Edward Island will evaluate, determine and implement the most appropriate policy mechanism (e.g. net-billing, standard offer contracts) and provide the proper regulatory framework to facilitate the development of community-based renewable energy projects in PEI.

### Transportation

Despite rising prices, the consumption of gasoline and diesel remains high in the province. By 2020, demand for gasoline and diesel is predicted to grow 30 to 50 percent respectively, compared to 1990 figures.

Historically, Prince Edward Island has been more dependent on motor vehicles than any other province. We have the most intensive network of highways, limited urban transit infrastructure, an automobile dependent tourism industry, and a heavy reliance on the trucking industry to move all agriculture and fisheries products in, out and around the province. Islanders live in widely distributed rural communities, with many commuting daily to work in the municipalities of Charlottetown and Summerside.

Reducing greenhouse gas emissions from the transportation sector represents a significant challenge and will involve a number of strategies including; increasing the renewable content or decreasing the carbon-intensity of transportation fuel improving vehicle fuel economy, adopting fuel-efficient driving practices, and reducing vehicle-kilometres traveled.



### **Government** Action

The Government of Prince Edward Island will introduce a variety of transportation initiatives, including a commitment to introducing and increasing the renewable content of fuels, individual tax initiatives for public transport travel, developing co-funding initiatives for the construction of bicycle and walking paths within city limits, and the removal of sales taxes on bicycles, bicycle parts and bicycle related clothing and safety gear.

### Reducing Vehicle Emissions

Over 80 percent of registered vehicles in Prince Edward Island are considered light duty vehicles. Light duty vehicles meet the daily personal transportation needs of Islanders, but they also are integral components of municipal, provincial, and commercial fleets. Light duty passenger vehicles were responsible for 558,000 tonnes of CO<sub>2</sub> e emissions per year. Emissions from light duty gasoline and diesel vehicles have increased by almost 30 percent since 1990, as Islanders are driving more and purchasing less fuel-efficient vehicles.

In 1990, the State of California introduced Low-Emission Vehicle Regulations, aimed at improving local air quality through improved emission reduction standards. As a result, new passenger cars, light duty trucks and medium duty trucks sold in California are required to meet more stringent emissions standards. In 2004, California amended these regulations and added a new greenhouse gas emissions standard. This measure is expected to result in a 30 percent reduction in greenhouse gas emissions by 2016.

California's greenhouse gas emissions standards have been adopted by 11 other states, including all but one of the New England states. Quebec, British Columbia, Nova Scotia, New Brunswick and Manitoba have announced their intention to adopt the California Greenhouse Gas Emissions Standard.

The Government of Prince Edward Island, in cooperation with other provinces, will adopt a greenhouse gas emission standard for new light duty vehicles after 2010. The new standards will cut emissions in Prince Edward Island by 53,000 tonnes  $CO_2$  e a year by 2017 - the equivalent of taking 10,000 cars off the road.

#### **Government Action**

The adoption of California-like vehicle emission standards was announced in 2007. The Government of Prince Edward Island will work on implementation of this standard. This will be done in consultation with neighbouring provinces and states.

Since 2004, the Government of Prince Edward Island has encouraged Islanders to purchase more fuel-efficient vehicles through a provincial tax incentive (up to \$3,000) towards the purchase or lease of a hybrid-electric vehicle. In 2007, over 60 Islanders benefitted from this initiative. A number of hybrid vehicles have entered the marketplace in recent years having only minimal improvements to fuel efficiency (so-called mild hybrids). Some conventional motor vehicles have incorporated technologies that increase their fuel efficiency to rival that of hybrid vehicles. The Government of Prince Edward Island will expand the hybrid tax incentive to all vehicles meeting minimum fuel economy standards. An additional \$2,000 tax incentive will be offered to taxi drivers purchasing hybrid vehicles.

### Government Action

The Provincial Hybrid Tax Incentive will be expanded to become a Fuel Efficient Tax Incentive and include all vehicles that meet the criteria for 'best' fuel economy standards. Tax incentives will be applied to the purchase of new motor vehicles in proportion to their fuel efficiency.

A \$2,000 additional tax incentive will be offered to taxi drivers purchasing hybrid vehicles or their fuel efficient conventional counterparts. This is over and above the existing \$3,000 tax incentive.



### **Driver Education**

Driving practices and vehicle maintenance can affect fuel consumption and, as a result, greenhouse gas emissions. Fuel-efficient driving practices, such as eliminating aggressive driving, reducing idling behaviour, and ensuring regular vehicle maintenance will reduce greenhouse gas emissions.

Educating new drivers will ensure that fuel-efficient driving practices become the "norm" for drivers in Prince Edward Island and contribute to long-term reductions in greenhouse gas emissions.

Natural Resources Canada has developed a driver education program, 'Auto\$mart', to teach students about the linkages between road safety, fuel efficiency, and the environment. Currently, six driver training schools in Prince Edward Island are registered with the 'Auto\$mart' program.

### **Government Action**

The Government of Prince Edward Island will incorporate information on fuel-efficient driving practices into the Driver's Handbook and Driver Examinations.

### **Heavy Duty Vehicles**

Heavy-duty vehicles are a large contributor to Prince Edward Island's greenhouse gas emissions, and these emissions are on the rise, up 94 percent since 1990.

Recent modifications to diesel engines mean that new heavy-duty trucks are significantly more fuelefficient than previous models. However, heavyduty trucks remain in operation for long periods (20 + years). As a result, it will take years for the fuel-efficiency of the on-road fleet to change significantly. In the interim, existing vehicles should be modified to improve fuel efficiency and decrease greenhouse gas emissions. In addition, vehicle operators and fleet managers must increase efforts to maintain the heavy-duty fleet and encourage fuel-efficient driving practices.

According to the Canadian Trucking Alliance, greenhouse gas emissions and smog forming pollutants can be reduced with particulate filters, auxiliary power units and wide-base truck tires. However, retrofits can add additional weight and result in a "payload penalty", meaning drivers have to reduce the amount of freight they can carry because of this equipment.

### **Government** Action

The Government of Prince Edward Island will amend the Vehicle Weights and Dimensions Regulations of the Roads Act to allow wide-based single truck tires, and a payload exemption for trucks equipped with auxiliary power units and particulate filters.

### **Vehicle Maintenance**

Poorly maintained vehicles can increase fuel consumption by up to 50 percent, increasing the emission of smog-causing chemicals, greenhouse gases and other pollutants that damage our health and our environment. In a growing number of provinces and states, proper maintenance of heavy duty vehicles is becoming mandatory through vehicle emissions testing programs. Currently, 36 vehicle emissions testing programs exist in North America; two of them in Canada (Ontario Drive Clean and AirCare in British Columbia).

### **Government Action**

The Government of Prince Edward Island will examine mandatory emissions testing for heavy-duty vehicles beginning in 2010.

The Government of Prince Edward Island will examine mandatory emissions testing for passenger vehicles as part of the annual inspection.

## Agriculture

Agriculture is an important contributor to Prince Edward Island's economy. Six thousand Islanders live on farms that cover over 45 percent of Prince Edward Island's land base (2,615 km<sup>2</sup>). Over 20 percent of PEI's greenhouse gas emissions are from agriculture, and these emissions have increased by 10 percent since 1990. Greenhouse gas emissions, namely methane and nitrous oxides, are associated with livestock, and manure and nutrient management. In Prince Edward Island, emissions from livestock and manure management are on the decline while emissions from agricultural soils have increased by over 35 percent since 1990 because of higher synthetic fertilizer use.<sup>14</sup>

Island plants and trees are dependent on greenhouse gases; namely the carbon dioxide (CO<sub>2</sub>) that drives the process of photosynthesis. Each year, many tonnes of carbon dioxide are removed from the air and trapped in soils and growing vegetation. As a result, soils and growing vegetation are considered carbon "sinks". Intensive cultivation can promote the depletion of soil carbon, and reduce its ability to act as a carbon sink. One of the most effective ways to enhance the ability of soils to absorb carbon dioxide emissions is to remove them from annual cultivation, allowing more permanent vegetation (trees) to be come established.

Currently, greenhouse gases are being sequestered through programs such as forest enhancement, hedgerow and buffer zone planting, and greening spaces. Other opportunities exist; such as re-foresting over 50,000 acres of sloped and marginal land that is unsuitable for agricultural production.

### **Government Action**

The Government of Prince Edward Island will provide incentives to landowners to remove marginal land from agricultural production, if coupled with a program of reforestation with approved Management Plans. Re-forested land will be designated as environmentally sensitive land and removed from land holding limits.



14 : National Inventory Report. Greenhouse Gas Sources and Sinks in Canada 1990-2004. Environment Canada, April 2006.

Many strategies to reduce greenhouse gas emissions in the agriculture sector have been successfully demonstrated in other jurisdictions. These have included efforts to reduce tillage, use cover crops, improve manure storage, and implement nutrient management systems. All the above practices are well-established and widelyaccepted farming practices in their own right. The Government of Prince Edward Island will promote the use of these practices and evaluate their greenhouse gas mitigation benefits.

### **Government Action**

The Government of Prince Edward Island will promote the use of reduced tillage management, cover crops, improved manure storage systems, and nutrient management systems, and evaluate the level of greenhouse gas mitigation that these practices provide the agricultural sector.



### Adaptation & Resilience

For the most part, climate change has been treated like a pollution problem by governments: we are working on reducing our emissions. However, actions to adapt to climate change and take a risk-based approach to adaptation are also important.

A risk-based approach involves:

- *identifying the potential impacts resulting from the decisions being made*
- understanding the probability and potential consequences of those impacts, and
- developing appropriate responses to mitigate any adverse outcomes from those decisions

Risk-based problem solving is the most practical way to ensure that adaptation responses are socially acceptable, cost-effective and consistent with the community's wider social, environmental, and economic goals.



The uncertainties associated with global climate change brings with it a new set of risks, and our emergency planning and response systems need to be reviewed and updated. We need to consider the damage that potential storm surges will mean in our coastal areas. For example:

Extensive erosion along the coastline, higher tides and more frequent storm surge events will require the redesign of coastal highways, bridges, sewer and water infrastructure.

Global warming is altering our coastal habitats making them more vulnerable to invasion by exotic species that threaten our traditional food harvests.

Nitrate contamination combined with warmer waters in our rivers, estuaries and bays is leading to an increase in the number and severity of anoxic events.

Since most of our infrastructure was built before the impacts of climate change were clear, significant investment is now needed to prepare for the changes ahead. Reducing vulnerability and increasing resilience to climate change will require considering options such as:

- improving the ability to withstand future climatic conditions by designing better bridges, roads, dams, water supplies, sewers and buildings
- improving coastal communities' preparedness to cope with severe weather events
- conserving and enhancing the health of vulnerable natural environments by reducing air and water pollution, habitat loss and ecosystem fragmentation
- avoiding decisions that make adaptation harder or that increase vulnerability, by preventing development in areas at risk from increased flooding, storm surges, and catastrophic erosion events.

Islanders are increasingly recognizing the need for government policies to enable them to protect public and private infrastructure. Government is already paying a significant price to support longestablished coastal communities and new ill-sited coastal developments, by repairing the weatherdamage to the infrastructure that sustains them. Risk-based decision making is an effective way to manage the uncertainties of climate change, and assess the relative benefits and costs of action or inaction.

### Climate Change Working Group

Successful adaptation strategies will require the commitment of all parts of society - individuals, communities, professional disciplines, industry and governments - to create and implement actions that contribute to sustainability, that do not replace efforts to reduce greenhouse gas emissions, and that guard against inadvertently increasing greenhouse gas emissions.

The Government of Prince Edward Island will create an interdepartmental working group, cochaired by Environment, Energy & Forestry, and Transportation & Public Works, to identify and manage current and projected climate-related risks. This group will also oversee the development of a broad climate change adaptation strategy that will ensure the health and safety of all Islanders and the sustainability of natural resources. The Climate Change Working Group will work to:

• understand the links between local livelihoods and climate;

- assess the impact of climate change on community-level adaptive capacity, and
- make adjustments to improve a community preparedness.

### **Government** Action

The Government of Prince Edward Island will create an interdepartmental working group to identify and manage current and projected climate-related risks.

### Light Detection and Ranging (LiDAR) Mapping

Prince Edward Island's coast is highly sensitive to sea level rise due to its gradually sinking coastline and the highly erodible nature of its shores.

The extent of Prince Edward Island's vulnerability to sea level rise remains largely unknown. Only limited information exists on the vulnerability of property and infrastructure to a predicted 70 cm rise in sea level or an anticipated 5 m tidal surge.<sup>15</sup> A 2002 study by the Geological Survey of Canada identified the coastal impacts of climate change in Charlottetown and parts of the north shore of Prince Edward Island. Specifically, this report highlighted the need for province-wide hazard mapping and monitoring.

In 2008 the Government of Prince Edward Island (co-funded with the federal government through the National Water Program) completed LiDAR mapping of Prince Edward Island. The data is now in the process of being assembled and analyzed. Complete LiDAR mapping will provide much needed information on the impacts of sealevel rise on coastal stability. LiDAR mapping

<sup>15 :</sup> This would result from a storm surge of similar magnitude to that experienced on January 21, 2000 in addition to a predicted sea level rise of 70 cm - Geological Survey of Canada. 2002. Coastal Impacts of Climate Change and Sea-Level Rise on Prince Edward Island.

will also help improve emergency preparedness, land-use and transportation planning, forest and agricultural management, and maintenance of utility transmission infrastructure.

#### **Government** Action

The data from the LiDAR mapping project are currently being analysed and a new digital elevation model for Prince Edward Island is expected to be available to government in 2009.

### Land Use Planning

The way we plan our communities can have a significant impact on both our greenhouse gas emissions and our vulnerability to climate change. As we continue to build infrastructure around our coast the vulnerability to sea level rise is increasing.

With new developments that are pedestrian-oriented, public transit accessible and designed with active transportation in mind (bicycle lanes and walking paths), residents will be able to make more environmentally responsible decisions about their mode of transportation. Careful urban planning and land use policies will also lead to more energy efficient development practices that better protect our environment.

### Environmental Impact Assessments

Environmental Impact Assessment is an effective planning tool for examining the potential environmental consequences of a proposed development. It is a means to identify unwanted effects before they occur and determine appropriate mitigation measures to reduce and manage the adverse impacts that climate change may have on projects, so ensuring that these impacts will not pose a risk to the public or the environment.<sup>16</sup>

Since climate change will have wide-ranging impacts on the environment of Prince Edward Island, environmental impact assessments must be able to assess the vulnerability of established and new developments to the adverse effects of climate change and likewise the adverse affects of new developments on the climate.

The consideration of climate change impacts on a project is a component of most standard environmental assessments, and might include an examination of the effects of climate upon human social infrastructure such as sewage systems, roads, bridges, causeways, shoreline communities, harbours, and drinking water systems.

### **Government** Action

The Government of Prince Edward Island will support a review of current land use and development policies and encourage sustainable options for future land developments that are tailored to maximize energy efficiency and promote greenhouse gas reductions.

#### Government Action

The Government of Prince Edward Island will incorporate climate change outcomes into the environmental impact assessment process.

<sup>16 :</sup> Incorporating Climate Change Considerations in Environmental Assessment: General Guidance for Practitioners. Canadian Environmental Assessment Agency. http://www.ceaa.gc.ca/012/014/2\_e.htm#0

### Climate Change Adaptation Priorities

In June 2008, Atlantic Ministers of the Environment agreed to collaborate on climate change adaptation issues and to pursue funding from Natural Resources Canada. A joint letter of intent was delivered to the federal minister of Natural resources outlining a commitment by the Atlantic ministers to seek funding that relates to climate change adaptation. In Prince Edward island participation is expected from municipalities, secondary education institutions such as University of Prince Edward Island and Holland College, the insurance industry, engineering associations, land use planners, architects, and environmental groups. The goals of this collaboration will be to:

- Enhance our resilience and adaptive capacity
- Integrate climate change adaption measures into decision making
- Promote meaningful collaboration, co-ordination and sharing of good practices

The initial focus will be on coastal areas, inland waters, and related infrastructure and will identify linkages to other sectors.

Some of the anticipated projects under this regional collaborative effort by Prince Edward Island partners will include:

- Catastrophe planning (storm and tidal surges, severe storms, other extreme weather events)
- Incorporation of climate change measures into land use plans, land use bylaws, road and bridge construction, wharves, marinas and other infrastructure.
- Building for the future a comprehensive development plan for Prince Edward Island incorporating measures to adapt for a changing climate.

- Coastal erosion sensitivity mapping including risk assessment
- Long shore drift coastal erosion and deposition
- Evaluation of forest species' response to a changing climate
- Assessing potential for increased salt water intrusion into aquifers
- Examining the impact of a changing climate on sea ice

The information gathered from this research will assist the province in developing a comprehensive climate change adaptation strategy.



### Public Education and Awareness

The actions of individual Canadians account for about 28 percent of total greenhouse gas emissions in Canada, which translates to almost six tonnes per person per year. Prince Edward Islanders have repeatedly demonstrated their commitment to the environment and continue to be actively involved in protecting and enhancing our natural resources. The Government of Prince Edward Island is confident that Islanders will reduce their greenhouse gas emissions and demonstrate to other Canadians the importance and impact of individual action on climate change. Engaging Islanders in achieving the goals of this plan and changing behaviours to reduce greenhouse gases is essential for success.

Many Islanders want more information on climate change and its implications for Prince Edward Island. The Government of Prince Edward Island will launch a climate change website, providing a means to communicate with the public and provide information on government programs and initiatives. The website will also showcase best practices by Islanders, provide tips on reducing greenhouse gas emissions, list activities of community-based groups, and provide notification of upcoming events.

### **Government** Action

The Government of Prince Edward Island will create and maintain a climate change website, providing information on government programs and initiatives to the public. Prince Edward Island communities have an important role to play in reducing greenhouse gas emissions and adapting to climate change. Many municipalities want to do their part, but they are unsure where to begin and do not have the resources to undertake this research.

The Partners for Climate Protection Program is a group of Canadian municipalities and regional governments working together to reduce the greenhouse gas emissions produced in their communities. The Partners for Climate Protection Program consists of the collection of an emission inventory, development and implementation of a local action plan to reduce emissions and the monitoring and reporting on community progress.

### **Government Action**

The Government of Prince Edward Island will work with Island communities to develop greenhouse gas emission inventories, and develop resources that identify actions communities can take to reduce emissions and prepare for climate change.

# Public School Education (K-12)

To create a sustainable energy future and protect the environment for Prince Edward Island, it is essential that the government be proactive in engaging Islanders on the importance of energy efficiency, conservation and the ethical management of our environmental resources. It has been demonstrated in countries around the world, that some methods of educating the public, requiring very specific behavioural changes, are most successful when efforts and resources are directed into the public school system. The inclusion of energy efficiency, conservation, renewable energy and environmental management into the curricula of the Prince Edward Island public school system will educate the next generation of energy consumers on the Island. Not only will it inform the younger generation of the importance of a sustainable future and environmental responsibility, it will also serve to educate the parents and relatives of these children as this information comes home.

### **Government Action**

The Government of Prince Edward Island will dedicate resources and work cooperatively with other provinces to incorporate climate change into the science curriculum.

### Prince Edward Island Centre for Climate Change Strategies

An integral part of the Government of Prince Edward Island's response to climate change will be the creation of a Centre for Climate Change Strategies. The Centre will help local and regional provincial governments, business leaders, interested stakeholders and community groups develop action plans to best adapt to the environmental and social impacts of climate change. It will help leaders in government and in the community develop effective, consensus-based policy solutions through analysis, planning and collaboration. The Prince Edward Island Centre for Climate Change Strategies will be a non-profit service organization that will work directly with public officials, stakeholders and the people of Prince Edward Island to commission research that will lead to the design and implementation of policies to address climate change mitigation, clean energy, and economic development opportunities.

The Centre will bring scientists, economists, engineers and social scientists together to develop sustainable responses to climate change through trans-disciplinary research. The Centre will promote dialogue between the research community, business leaders, policy advisors, government officials, the media and the people of Prince Edward Island.

### **Government** Action

The Government of Prince Edward Island will create a Centre for Climate Change Strategies, to be aligned with federal and regional initiatives. It will also work collaboratively with Holland College, the University of Prince Edward Island, other educational institutions, municipalities, technical and professional organizations, other jurisdictions, and non-government organizations to develop sustainable, coordinated responses to climate change issues through trans-disciplinary activities.

### Government Leading by Example

The Government of Prince Edward Island will lead by example and serve as a model to business, industry and the public by taking significant action to ensure that our own policies and practices reflect our commitment to address climate change.

Government operations have a considerable impact on our environment - consuming large amounts of energy and water and generating solid and hazardous waste. Heating, cooling and electricity for government offices, hospitals and schools, as well as fueling government vehicles results in the emission of approximately 80,000 tonnes of greenhouse gases each year.<sup>17</sup> These emissions are partially offset by the purchase of wind-generated electricity.

Greenhouse Gas Emissions by Fuel in Provincial Government Operations, 2006



Greening Government, an initiative launched in 2006, endeavours to use processes, practices, materials, products, or energy that avoid or minimize the creation of pollutants (including greenhouse gases) and waste. Under this initiative, Government will reduce greenhouse gas emissions by 25 percent below 2007 levels by 2015.

The Climate Registry is an international collaboration aimed at developing and managing a common greenhouse gas emissions reporting system. It will provide an accurate, complete, consistent, transparent and verifiable set of greenhouse gas emissions data from reporting groups, such as industry, business, and governments.

The Government of Prince Edward Island is a founding member of the Climate Registry.

### Annual Climate Change Report

The Government of Prince Edward Island is committed to taking real action on climate change. As a means to demonstrate our commitment and provide current information on climate change, beginning 2009 we will prepare an annual Climate Change Report, highlighting progress on efforts to reduce greenhouse gas emissions provincially and in our own operations.

### **Government** Action

The Government of Prince Edward Island will prepare an annual Climate Change Report beginning in 2009, highlighting progress on efforts to reduce greenhouse gas emissions provincially and in our own operations.

17 : Emissions from the West Prince Waste Management Facility and the Central Compost Facility have not been included in these estimates.

### Green Building Policy for Government Buildings<sup>18</sup>

Energy efficient or "green" buildings have many benefits. They are less expensive to operate, help mitigate environmental impacts and pollution. Additional capital costs for energy efficient design and construction are low, typically less than 5 percent more than conventional construction. Their lower energy and other operating costs more than offset the additional design and construction costs.

Leadership in this area is essential in order to encourage widespread adoption of energy efficient practices by Islanders. As a result, the Government of Prince Edward Island will require that all new publicly funded, publically owned and leased buildings be built to advanced energy and environmental standards.

### **Government** Action

The Government of Prince Edward Island will adopt advanced energy and environmental standards for all publicly funded, publically owned and leased buildings.

### Energy Audits of Government Facilities

With respect to energy use, poor building design does not have to be a life-long sentence. Facilities can reduce their energy consumption through changes to equipment and operational practices, while at the same time improving the comfort and satisfaction levels of building occupants, reducing maintenance costs and system failures, and increasing equipment life and building value. In recent years, a number of provincial government facilities have completed detailed energy audits and have identified opportunities for improving energy efficiency. The Government of Prince Edward Island will expand these efforts and commence an energy audit program for all government facilities in 2009. In addition, facility managers will participate in energy management training programs that will lower operating costs, reduce greenhouse gas emissions, increase efficiency, and create a better work environment.

### **Government Action**

The Government of Prince Edward Island will commence an energy audit program for all government owned facilities beginning in 2009.

Using the information obtained from these energy audits, government will take action to reduce energy consumption, greenhouse gas emissions and set standards for energy retrofitting of its facilities.

### Energy Technology Investment Fund<sup>19</sup>

Significant energy savings can be achieved through improved energy efficiency and investments in renewable energy. While these technologies offer long-term financial and environmental benefits, facility managers have been reluctant to invest because of higher up-front capital costs.

As a result, the Government of Prince Edward Island will establish the Energy Technology Investment Fund. The Fund will target innovative energy efficient and renewable technologies that conserve energy, reduce greenhouse gas emissions, and provide substantial long-term sav-

<sup>18 :</sup> Recommendation 1.c. from the Recommendations and Outcomes of the Ministerial Forum on Energy and the Environment adopted at the 31st Conference of NEG/ECP.

<sup>19 :</sup> Resolution 7(d) from the Recommendations and Outcomes of the Ministerial Forum on Energy and the Environment recently adopted at the 31st Conference of NEG/ECP.

ings for taxpayers. Government departments or agencies responsible for the operations and maintenance of government facilities can request funding for technologies with pay-back periods of not less than 5 years and not more than 10 years, provided an energy audit has been completed. Cost savings will be returned to the fund annually, creating a self-sustaining revenue stream.

### **Government Action**

The Government of Prince Edward Island will establish an Energy Technology Investment Fund for its departments and agencies.

### Environmental Procurement Policy <sup>20</sup>

Government is a major purchaser of goods and services in Prince Edward Island and our procurement practices influence the profile and market for environmentally preferred products. Government will adopt an environmental procurement policy that gives preference to products that protect and improve public health and safety, reduce pollution, minimize waste, maximize use of bio-based or recycled materials, conserve energy and water, and reduce the consumption or disposal of hazardous materials.

### **Government Action**

The Government of Prince Edward Island will adopt an environmental procurement policy that gives preference to products that protect and improve public health and safety, reduce pollution, minimize waste, maximize use of bio-based or recycled materials, conserve energy and water, and reduce the consumption or disposal of hazardous materials.

### Transportation Efficiency Standard

Purchasing more fuel-efficient vehicles has been part of our strategy to reduce fuel costs and cut greenhouse gas emissions since 2004. Government's Transportation Efficiency Standard requires that fuel efficiency be part of vehicle procurement considerations and specifically that any leased or purchased fleet vehicle, 1 ton or less, be more fuel efficient than at least 80 percent of vehicles in its class. Staff are also encouraged to examine their operational needs and select a vehicle that meets - not exceeds - those needs.

It is proposed that ministerial vehicles must further demonstrate our commitment to greater environmental stewardship and will be restricted to hybrid vehicles, alternatively fueled vehicles (where fueling infrastructure exists), or 4-cylinder conventionally fueled vehicles that emits below 4,300 kg of  $CO_2$  emissions per year (approximately 8.7 L / 100 km) as outlined in the Fuel Consumption Guide published by Natural Resources Canada.

### **Government Action**

Beginning in 2009, the Government of Prince Edward Island will amend the Transportation Efficiency Standard and require that all new government light duty vehicles be 80 percent more fuel efficient than other vehicles in their class. Departments will be required to purchase best in class vehicles.

<sup>20 :</sup> Recommendation 7(d) from the Recommendations and Outcomes of the Ministerial Forum on Energy and the Environment recently adopted at the 31st Conference of NEG ECP.

# Biofuel Procurement for Government Facilities

The Government of Prince Edward Island operates hundreds of vehicles in its fleet and maintains many oil-fired furnaces in facilities throughout the province. In recent years, government has piloted the use of a biodiesel blend (fish oil feedstock) at several facilities and for use in highway equipment.

### **Government** Action

The Government of Prince Edward Island will secure a source of locally available biofuels for use in oil-fired equipment and fleet vehicles, provided there are clear environmental benefits (based on a full life-cycle assessment).

### **Fuel Efficient Driving**

Driving practices and vehicle maintenance can affect fuel consumption and, as a result, greenhouse gas emissions. Fuel-efficient driving practices, such as eliminating aggressive driving, reducing idling behaviour, and ensuring regular vehicle maintenance can reduce greenhouse gas emissions and contribute to a healthier environment.

### **Employee Awareness**

Each individual public service employee can help government reduce our greenhouse gas emissions. In fact, without engaging our staff in efforts to make government greener, we will have limited impact and will not be successful in our efforts to reduce greenhouse gas emissions and promote greater environmental stewardship in the public sector.

### Government Action

Through the Greening Government initiative, campaigns and tools will be developed to create awareness among public service employees on issues relating to our impact on the environment.

### Telecommuting and Compressed Work Week

Government is a major employer in Prince Edward Island. Each work day, employees commute to government offices, generating greenhouse gas emissions. Measures that reduce employeecommuting emissions include telecommuting (telework) or compressed work weeks.

Beginning in 2009 government will implement a reserved parking area for vehicles involving car pools of 3 or more employees at the Shaw, Sullivan, Jones building complex in Charlottetown.

Guidelines concerning telecommuting and flexible hours are already in place for government employees.

#### **Government** Action

Beginning in 2009 government will implement a reserved parking area for vehicles involving carpools of 3 or more employees at the Shaw, Sullivan, Jones building complex in Charlottetown.

### Employee Transit Pass Program

Ride sharing and public transit are effective means to improve air quality, relieve traffic congestion and reduce greenhouse gas emissions. In 2005, Trius Tours, with the support of the City of Charlottetown and the Government of Prince Edward Island, launched a public transit system in Charlottetown. Residents are using this service to commute to and from work, attend educational institutions, and meet other daily transportation needs.

While these efforts will not reduce emissions from government operations, it will encourage employees to embrace their own commitment to improve air quality and reduce greenhouse gas emissions. Our efforts to reduce greenhouse gas emissions from government operations will demonstrate our commitment to address climate change and encourage Islanders to take action.

### Funding Climate Change Initiatives

Failure to reduce our dependence on fossil fuels and prepare for climate change will have a real impact on our future economic prosperity. Reducing our greenhouse gas emissions and preparing for climate change will require significant and long-term investment in climate change mitigation and adaptation. In 2008, the Government of Canada provided \$15 million in funding for Prince Edward Island as part of the Clean Air and Climate Change Fund, a trust fund set up to support provincial and territorial projects to help reduce greenhouse gas emissions and air pollutants. And while this fund will support climate change efforts over the next few years, long-term funding mechanisms must be established.

In 2006, Quebec introduced North America's first carbon levy that will generate revenue of over \$200 million annually, \$120 million of which will be invested in public transit initiatives. The remaining \$80 million will fund action items in their climate change action plan. The impact on consumers will be low (~ 0.8 ¢ per L) but the potential impact of the actions funded through this mechanism will be significant.

British Columbia recently introduced a revenueneutral carbon tax on fossil fuels. The carbon tax will not provide dedicated funding for climate change initiatives, but rather is intended to reduce consumption through an aggressive escalating tax that will initially add 2.4 ¢ per litre to gasoline in 2008 and 7.2 ¢ per litre in 2012. All revenue will be returned through reductions in personal and corporate tax rates. The Government of Prince Edward Island has decided to use revenues from both public and private wind energy facilities to invest in climate change programs and initiatives. The Government will continue to examine new revenue streams to fund climate change initiatives. For example, another potential source of funds is revenue currently collected from beverage containers.

### **Government Action**

The Government of Prince Edward Island will use revenues from wind development initiatives and invest them to fund provincial government climate change activities and associated research initiatives.



### The Path Forward

The Government of Prince Edward Island is committed to demonstrating leadership in mitigating and adapting to climate change. Policies and legislation for the development of renewable energy are in place. The Government of Prince Edward Island is getting "our house in order" by looking at innovative ways to improve energy efficiency in government operations. The province is also working with the Island's resource-based industries to develop more sustainable working practices.



Effectively responding to climate change cannot be achieved by Government alone. There are important roles for all Islanders in responding to climate change. In fact, the challenge of climate change will require careful choices. While large projects, such as wind energy, will be major components in meeting our commitment, the cumulative effort of individual actions must not be underestimated.

Prince Edward Island's response to climate change will continue to evolve as new ideas and opportunities arise, as new technologies are developed and as our knowledge and awareness increase. Climate change considerations will continue to be discussed as part of Government's corporate and strategic planning process for the foreseeable future. Together with the federal government, the municipalities, industry sectors, homeowners and citizens, the Government of Prince Edward Island will cooperate on all efforts that address climate change within the context of a sustainable development framework by:

- Identifying priority areas of cooperation to build partnerships to achieve emission reductions
- Wherever possible adopting a regional approach to addressing climate change
- Ensuring consistency among respective actions and initiatives to avoid duplication
- Coordinating the efforts of all departments involved in addressing climate change, and
- Pursuing cooperation through new initiatives as well as building on existing initiatives.

To meet the above strategic objectives, the Government of Prince Edward Island will do its part to coordinate and harmonize its efforts on policies and measures to:

- Reduce or prevent greenhouse gas emissions
- Promote the development, demonstration and deployment of technologies addressing climate change
- Transfer information, experience and technology
- Enhance carbon sinks, their measurement and monitoring
- Establish effective monitoring, reporting and review mechanisms for emissions reductions and carbon sink enhancement
- Increase public awareness and education to promote actions to reduce greenhouse gas emissions
- Improve knowledge and awareness of the impacts of climate change and approaches to adaptation to climate change; and
- Maximize opportunities for cost-effective economic development and job creation related to climate change.

Prince Edward Island and Climate Change A Strategy for Reducing the Impacts of Global Warming

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