



Curbing Climate Change

Prince Edward Island
Climate Change First Business Plan

Years 2000/01, 2001/02, 2002/03

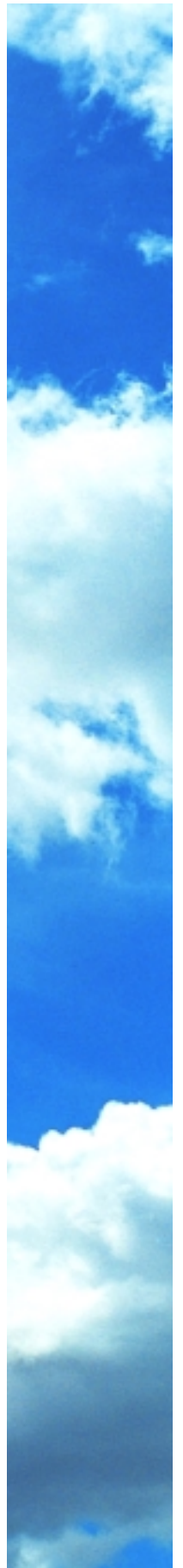


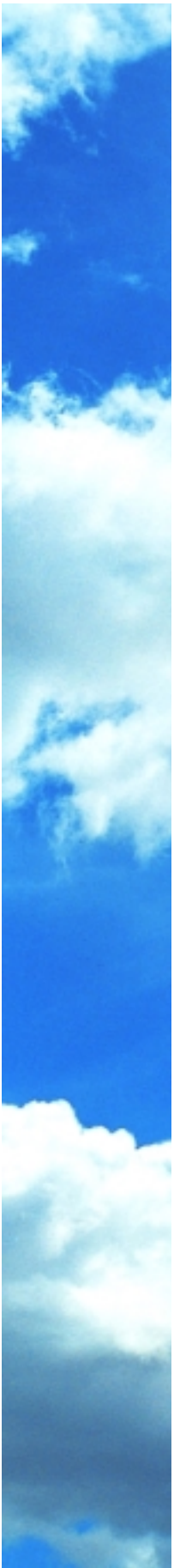
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PEI Department of Fisheries, Aquaculture and Environment
PEI Department of Development and Technology
September 2001





Ministers' Message

Climate change is one of the greatest environmental challenges we face in Canada today. It has the potential to impact on our water supply, sea levels, agriculture, fish habitat, plant and animal life - in short, to bring about significant changes in our daily lives.

This Business Plan outlines Prince Edward Island's commitment to address climate change. We recognize the seriousness of the impacts of climate change and the need for immediate action.

While Prince Edward Island produces only 0.3 percent of the nation's carbon dioxide emissions - a major contributor to global warming, we still have a role to play in curbing climate change. PEI's Business Plan includes a number of

concrete measures related to agriculture, forestry, electricity, transportation and private business.

While climate change presents many challenges, it also presents opportunities. Prince Edward Island has gained years of experience in developing, demonstrating and implementing alternate energy and energy efficiency projects. This current strategy builds on that strong foundation.

This first business plan focuses on actions government will take to address climate change. As the strategy evolves, we will be asking Islanders to join us in taking action. It is our collective actions which impact on our climate. Working together, we can protect our environment for future generations.



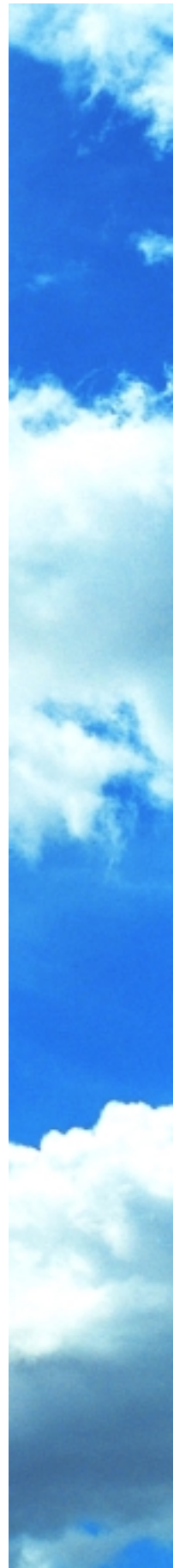
Michael Currie

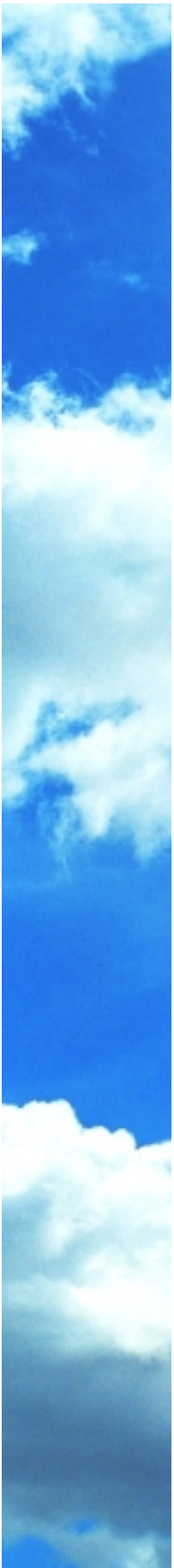
Michael F. Currie, *Minister*
Development and Technology



J. Chester Gillan

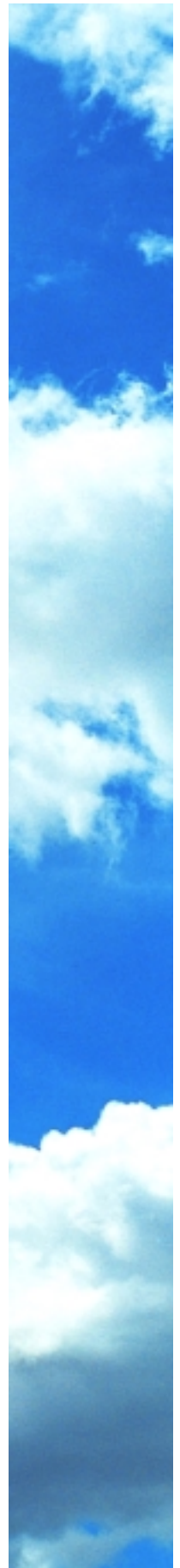
J. Chester Gillan, *Minister*
Fisheries, Aquaculture and Environment

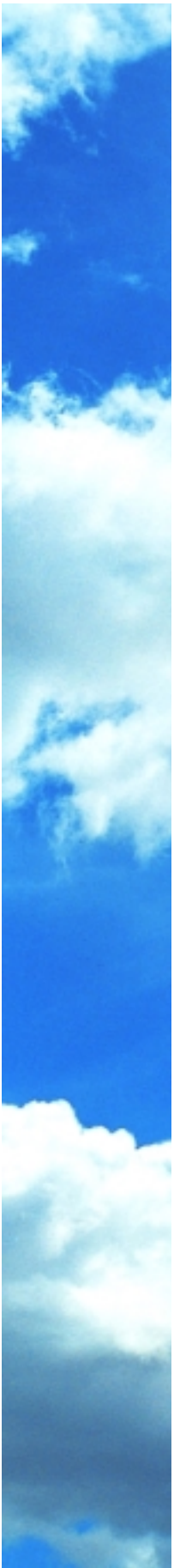




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Preamble

PEI's Plan in the National and International Context

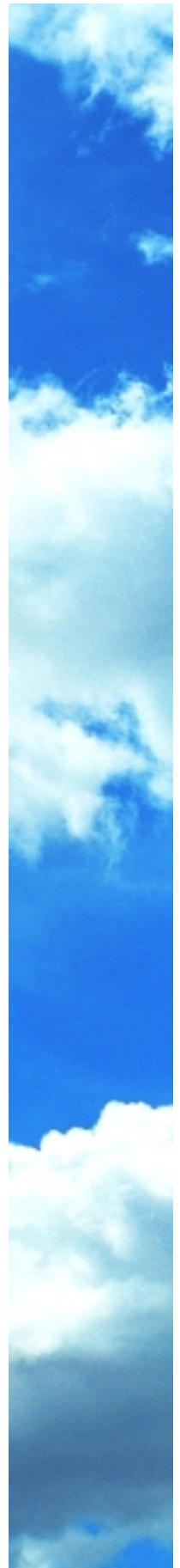
In 1992, Canada was among 154 nations worldwide to sign the United Nations Framework Convention on Climate Change (UNFCCC or the Convention). The objective of the Convention was to stabilize greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic or man-made interference with the climate system.

In 1997, the parties to the Convention judged that initial efforts were not sufficient and they negotiated the Kyoto Protocol which would set binding emission reduction targets for developed countries. Canada's target is to reduce greenhouse gas emissions to six percent below 1990 levels by the period between 2008-2012. Today, the reduction required to meet our Kyoto commitment is approximately 25 per cent.

Through the Joint Ministers of Energy and Environment, Prince Edward Island has been working with the other

provinces and territories and the federal government since 1997 to develop a domestic policy to address the issue of climate change and our Kyoto commitment. In October of 2000, at a Joint Ministers Meeting in Québec City, a National Implementation Strategy and the First National Business Plan were finalized. The National Implementation Strategy is a framework for a coordinated, phased Canadian response to climate change. It focuses on furthering the science of climate change; understanding the impacts, regional variation and the pace of change; and the need for both mitigation and adaptation strategies for addressing those impacts.

The Strategy will be implemented through a series of three-year business plans. The business plans will outline individual and coordinated actions to be taken by federal, provincial and territorial governments to address climate change. The plans will be continually monitored, reviewed and updated to reflect new understandings and opportunities, and will be presented to the Joint Ministers Meeting on an annual basis.



The Concern about Climate Change

Greenhouse gases occur naturally in the atmosphere. They trap the sun's heat near the Earth's surface, keeping the Earth warm enough to support life. This is known as the natural greenhouse effect. However, in recent decades, human activity has been increasing concentrations of greenhouse gases in the atmosphere.

Much of the energy we use to power our cars, heat our houses, produce electricity and manufacture products comes from fossil fuels. When burned, these fossil fuels add large amounts of greenhouse gases to the atmosphere.

As concentrations of the greenhouse gases in the atmosphere increase, they intensify the natural greenhouse effect which, in turn, causes an unnatural increase in global temperatures and changes in climatic patterns.

The Earth's average temperature has increased by about half a degree Celsius over the past 100 years. Climate change projections suggest that over the next century average global temperatures could rise by 1 to 3.5°C. While that may not sound like a great deal, consider that average global temperatures during the last ice age were only about 5°C lower than they are today.

Based on current projections, the
Canada Country Study: A Window on

Climate Change in Canada, predicts the overall impacts of climate change on our forests, fish populations and agriculture could be extreme. They include:

- longer growing seasons and extension of agriculture further north, but also risks to agriculture such as moisture deficits, pests, disease, and fires;
- impacts on fish populations, which could increase in some areas and decrease in others;
- effects on hydroelectric generating potential;
- risks to waterfowl populations due to lower water levels in lakes, rivers and wetlands; and
- changes in the occurrence and severity of extreme events.



The Atlantic Region has not followed the national warming trend of the past century. In fact, a slight cooling trend was experienced during a good part of the past 50 years. Here, the continuing increase in greenhouse gas emissions is expected to result in a changing and/or more varied climate. However, the exact nature of the change in climate is not known at this time. Some experts maintain that climate change is already happening. They see a higher frequency of weather extremes now imposing more stress on our natural ecosystems.

The regional report, Canada Country Study: Responding to Global Climate Change in the Atlantic Region, identifies the following potential impacts:

- accelerated rise in sea levels causing an increased risk of floods, coastal erosion, sediment redistribution and coastal sedimentation;
- increased storm frequency and intensity;
- precipitation extremes, shifts in water tables, excessive moisture or drought, and less winter snow cover;
- milder winters, early extended thaws, more temperature extremes, unusually late springs, and early frosts;
- loss of fish habitat and changes in the distribution of fish species and migration patterns;

- shifts in the winter ranges of terrestrial birds and changes in the range, distribution and breeding success rates of seabirds; and
- changes in ice-free days which could affect marine transportation and the offshore oil and gas industry.



The Atlantic Regional Report points out that economic dependency on natural resources is higher here than any other region of the country. That underscores the importance of understanding climate change in Atlantic Canada. The report suggests knowledge gaps must be filled to learn more about the relationships that link climate with the region and its inhabitants.

The PEI Perspective

Being an island with highly erodible soils, PEI is at risk from the effects of climate change and has a considerable stake in national and international initiatives to limit greenhouse gas emissions.

With limited indigenous sources of energy, Prince Edward Island is highly dependant on imported fuels, mainly petroleum products. Approximately 80 per cent of the energy mix consists of automotive fuels, light oil, heavy oil and propane.

In recent years, virtually all the electricity, that makes up about 12% of the Island's energy supply, has been imported from New Brunswick. Biomass, in the form of municipal garbage, sawmill residue and firewood is accessed locally and makes up the remaining constituent of the energy supply.

Because of the heavy reliance on fossil fuels that are cited as the main precursors to greenhouse gases, Prince Edward Island may be disadvantaged by economic instruments, such as carbon taxes, that penalize their use.

Prince Edward Island is a low emitter of greenhouse gases, producing only 0.3% of the nation's carbon dioxide emissions in 1990, the base year for the Kyoto

Protocol. No substantial growth in greenhouse gas emissions has been experienced or is expected over the next 10 years but the province can still play a significant role in the National Implementation Strategy that was finalized in the fall of 2000.

Prince Edward Island has gained years of experience in developing, demonstrating and implementing alternate energy and

energy efficiency projects due to its historically high energy prices and lack of indigenous energy sources. Environmental protection in PEI has also necessitated the prudent use of resources, including energy and the by-

products of energy consumption.

Past examples of developed alternate energy projects in the province include a district heating system in Charlottetown that sources 90 per cent of its energy from municipal garbage and sawmill residue, the Atlantic Wind Test Site at North Cape and methane capture and utilization equipment at the major agri-food processors.

The province has also initiated a waste recycling and composting program, Waste Watch source separation, that will soon encompass the entire province and achieve a 65 per cent diversion from landfill or burning. As well, plans to



access natural gas that will replace higher greenhouse gas emitting fossil fuels have already been initiated by the province. These initiatives all provide the collateral benefit of reducing greenhouse gases.

The province's engagement in the National Implementation Strategy to address climate change will twin its energy and environmental strategies with measures to mitigate greenhouse gas emissions.

In future business plans, as the rules of engagement become more certain both nationally and internationally, PEI may increasingly focus program resources on specific climate change initiatives. An area worthy of further attention is the province's largest industry, agriculture. Now that

agricultural soils have been recognized as "carbon sinks" - forests and farmlands that absorb carbon dioxide from the air - the province has the opportunity to expand foundation programs to capitalize on this mechanism.





The PEI Strategy

Canada's First National Climate Change Business Plan is structured around five themes that have been adopted in the PEI Climate Change Business Plan.

- **Enhancing Awareness and Understanding:** inform, educate and build Canadians' awareness of climate change, current and future impacts, and opportunities for personal actions.
- **Promoting Technology Development and Innovation:** position firms to become innovators or developers of climate change-friendly technologies.
- **Investing in Knowledge/Building the Foundation:** equip decision-makers with the necessary knowledge, capacity and experience to make informed future decisions and lay the foundation for future action.
- **Governments Leading by Example:** governments lead by getting their own house in order, and sharing "best practices" among governments, with communities and the private sector.
- **Encouraging Action:** catalyze immediate actions to reduce greenhouse gas emissions across sectors and within all key sectors through incentives to appropriate technological choices and behavioural change, and by removing barriers, supporting voluntary action and international activities.

Enhancing Awareness and Understanding

At the year one and year two stages of the National Business Plan, the province has limited input into this theme. Although stakeholder sessions, including one held in June 2000 in Charlottetown, highlighted the need for general public awareness of the climate change issue, the message must be clear and focussed. This may require a national strategy of communication instead of a fragmented approach delivered by each provincial and territorial jurisdiction.

Islanders can take action at home and on the road to reduce greenhouse gas emissions and save money.

- Lower your thermostat at night and when you are not home.
- Keep your furnace properly tuned. A well-maintained unit uses 10-15% less energy.
- Turn off lights, appliances, televisions and computers when they're not needed.
- Recycle! Products made from recycled materials require as much as 40% less energy to manufacture.
- Keep your car well-tuned and tires fully inflated. A properly-maintained vehicle can reduce fuel consumption by up to 10%.
- Slow down! Driving 10 km/hour slower saves 10% on fuel costs and cuts emissions.
- Avoid excessive idling. Ten seconds of idling uses more fuel than restarting the engine.

As mentioned previously, Prince Edward Island is involved in several energy efficiency, alternate energy and environmental programs that have climate change implications.

Consequently, the province may promote the benefits of these initiatives in mitigating greenhouse gas emissions in the final year of the business plan and future business plans.

Promoting Technology Development and Innovation

The actions in this theme cover a range of activities. Research and development in applying new technologies that reduce greenhouse gas emissions is prominent. This includes projects for handling carbon dioxide gas streams, alternative fuels and energy sources, and fuel cell technology. Jurisdictions are also advancing regulatory and environmental tax-shifting actions that will make it easier for the Canadian industrial sector to advance and adjust to changing technologies.

Building collaboration in technology development is another important element of the strategy. It will be fostered through creating new technology networks among stakeholders, planning research and development for specific new and emerging technologies using technology roadmapping, and creating a forum for decision-makers on new developments in technology.

Collaboration among governments and both private and public sector partners in developing applications of climate change technology will make solutions available to the market more quickly.

Objectives

- To develop technologies that reduce greenhouse gases, while reducing dependence on imported energy.

Actions/measures to achieve objectives

- Continue to support the research of wind power technologies at the Atlantic Wind Test Site.
- Investigate intelligent transportation systems (ITS) in road design and incorporate Global Positioning Systems (GPS) in highway maintenance activities (pending funding from Transport Canada).



Atlantic Wind Test Site at North Cape



Next Steps

- Greater role in wind power development as a climate change instrument for the Atlantic Wind Test Site.
- Integrated fleet management of provincial vehicles using intelligent transportation systems and deployment of global positioning systems for the efficient dispatching of maintenance crews.

Reporting Progress

- Advancements in wind power technology.
- Improved traffic flow and resulting reduction in fuel consumption and greenhouse gases.

Investing in Knowledge/ Building the Foundation

Objectives

- To begin the necessary baseline studies to capitalize on greenhouse gas mitigation and sequestration opportunities.
- To develop energy information materials, specifically for the manufacturing and processing sectors, to reduce energy consumption and the emissions of greenhouse gases.
- To provide the general public with information materials to allow for the assessment and reduction of energy consumption in the residential sector.

Actions/measures to achieve objectives

- Complete land use inventory of agriculture and forest plots that will provide baseline data on several soil parameters including organic carbon content.
- Develop and distribute energy information materials through the \$SMART Energy Management Workshops, on-site consultation and an interactive \$SMART Energy Management CD-ROM that will allow manufacturers and processors to begin the analysis and reduction of energy consumption in their facilities.

\$SMART Energy Management

- Respond to telephone inquiries from the general public and distribute Comfort-Plus home energy information materials.

Next Steps

- Continue to monitor inventory plots and continue with the necessary data collection to position the agriculture and forestry sectors for opportunities such as sinks for carbon.
- Continue with the on-site analysis to further identify energy savings opportunities for the manufacturing and processing sectors.
- Continue with assistance to the general public.

Reporting Progress

- Outcomes of systematic testing will be available to policy makers as well as the general public and will provide baseline data on several soil parameters including organic carbon content.
- Staff of the Energy and Minerals Section, Department of Development and Technology, will continuously monitor and update the section's energy consumption database to verify reductions in each of the sectors targeted.

Governments Leading by Example

Objectives

- To lead by example by:
 - promoting transportation measures that reduce greenhouse gases;
 - purchasing Green Power for provincial government facilities;
 - diverting recyclables from landfills; and
 - mitigating greenhouse gases (methane and carbon dioxide).



Actions/measures to achieve objectives

- Continue to promote ride-sharing programs such as PEI Enerpool.
- Develop and promote the \$SMART Energy Management CD-ROM.
- Promote teleworking for provincial employees.
- Install Green Power capacity by establishing a wind energy generation site through the PEI Energy Corporation (provincial crown agency) in cooperation with the Atlantic Wind Test Site).
- Purchase Green Power for some provincial government buildings.
- Pursue the accessibility of natural gas (a lower emitting alternate to other fossil fuels).
- Continue with implementation of the Waste Watch program.

Next Steps

- Promote alternate transportation opportunities for provincial government employees (e.g., infrastructure for bicyclers).
- More widespread promotion of teleworking for provincial employees.
- Fleet management techniques to reduce fuel usage and greenhouse gases.
- Increase the scope of recyclables for areas under Waste Watch and extend the implementation of Waste Watch on a province-wide basis.

Hybrid gas/electric car purchased by Department of Fisheries, Aquaculture and Environment, in cooperation with the PEI Energy Corporation.

Reporting Progress

- Number of employees who participate in ride-sharing and alternate transportation.
- Number of employees engaged in teleworking.
- The reduction of fuel and greenhouse gases through fleet management.
- Energy acquired from Green Power for government buildings.
- Access to natural gas and the resulting reduction of greenhouse gases from displacing other fossil fuels.
- Diversion of organics and recyclables from landfills and greenhouse gases mitigated through this action.

Encouraging Action

The Provincial Government has been instrumental in encouraging action to reduce greenhouse gases in important sectors of the province's economy. Actions may have originally been intended to meet other energy and/or environmental objectives, however, the collateral benefit of greenhouse gas mitigation is being achieved and will be documented.



Agriculture/Forestry

Objectives

- To position the province's agriculture and forestry sectors to seize greenhouse gas sequestration opportunities through collection of baseline soil parameters.
- To reduce methane production from livestock operations.
- To sequester carbon in growing trees.
- To mitigate nitrous oxide release through nutrient management planning.

Actions/measures to achieve objectives

- Land Use Inventory Plots - monitor and provide baseline soil parameters.
Status: Scheduled for Years 1, 2, 3.
- Livestock Management and Grazing Management - provide technical advice to mitigate methane and nitrous oxide.
Status: Scheduled for Years 1, 2, 3.
- Planting Hedgerows, Shelter Belts - sequester carbon in living trees.
Status: Scheduled for Years 1, 2, 3.



- Soil Nutrient Efficiency - mitigate nitrous oxide emissions through best management practices in applying fertilizers.
Status: Year 1 - in development, Year 2 - implement, Year 3 - implement.
- Agriculture and Environment Resource Conservation Program (AERC) - continue this comprehensive program that provides technical and financial assistance for soil conservation, hedgerow planting, manure storage, etc.
Status: Year 1 - implement, Year 2 - implement, Year 3 - dependant on funding.

Next steps

- Highly dependant on the international rules of engagement for agriculture/forestry sinks which, following the outcome of the July 2001 6th Session of the Conference of the Parties (Part 2) in Bonn, has been significantly clarified.

Reporting progress

- Greenhouse gas mitigation and carbon capture in this sector.

Electricity

Objectives

- To increase electrical generation by Green Power.
- To reduce greenhouse gases from electrical generation in the Maritime air shed.



Construction at the new wind farm at North Cape. The facility will supply power to provincial and federal office buildings in PEI.

Actions/asures to achieve objectives

- Expansion of the generation capacity at the Atlantic Wind Test Site and purchase of some of this power for federal and provincial government buildings.
Status: Year 1 - planning stage, Year 2 - construction, Year 3 - operational. (Note - implementation is highly dependant on federal funding.)
- Pursue access to natural gas for the province to enable on-Island electrical generation. This would enable the decommissioning of heavy oil-fired capacity in the province and may also displace other thermal generating capacity in the Maritimes which uses higher greenhouse gas emitting fossil fuels.
Status: Year 1 - selection of proponent for Phase 1 through an expression of interest, Year 2 - proceed through Phase 2 for more in-depth project planning, Year 3 - project fully defined, proceed with regulatory approval and project construction. (Note - project may be contingent on federal funding.)

Next Steps

- Continue to investigate Green Power opportunities.
- Continue to pursue natural gas accessibility for on-Island electrical generation and possibly cogeneration.

Reporting Progress

- Electrical generation with Green Power and greenhouse gas mitigation.
- Net reduction of greenhouse gas from Green Power and gas-fired electrical generation.

Transportation

Objectives

- To reduce greenhouse gases through:
 - more efficient traffic flow management;
 - more efficient fleet management utilizing Graphical Information Systems for Transportation (GPS-T) and Intelligent Transportation Systems (ITS); and
 - sharing of transportation related and regional weather information data.

Actions/measures to achieve objectives

- Synchronized Traffic Signals on entire perimeter highway in Charlottetown.

Status: Refine in Year 1, expand initiative to main routes through Charlottetown in Years 2 and 3. (Pending cooperation from the City of Charlottetown and possible funding from Transport Canada.)

- Adaptive traffic signals for Charlottetown.

Status: Implement in Year 3. (Pending possible funding from Transport Canada.)

- Advanced Traveller Information to alert travelling public to construction zones, detour routes, weather and road conditions. This may include web page

postings, roadside changeable message signs, media announcements, etc.

Status: Implement in Year 2 or Year 3.

(Pending possible funding from Transport Canada.)

- Fleet Management for highway maintenance using Graphical Information Systems and Intelligent Transportation Systems.

Status: Implement in Year 3. (Pending funding from Transport Canada.)

- Road Weather Information Systems

Status: Expand current system (two sites) to include eight to 10 Road Weather Information Systems locations. Improve awareness of current road conditions, leading to more efficient use of road maintenance fleet.



Next steps

- Continue to investigate efficient transportation technologies.

Reporting progress

- Fuel saved.
- Greenhouse gas mitigation through actions and measures.



Industry

Objectives

- To capture and utilize methane while displacing heavy fuel oil.
- To continue the operation and possible expansion of district heating in Charlottetown which mitigates greenhouse gases by displacing fuel oil with biomass, and decreases the total fuel requirements in the City by improving the overall thermal efficiency of space and domestic water heating.

Actions/measures to achieve objectives

- Capture and utilize methane at agri-food facilities. The capture and utilization of methane as a fuel source replacing heavy oil has been implemented at three of the four largest agri-food facilities. The remaining plant is flaring the gas.

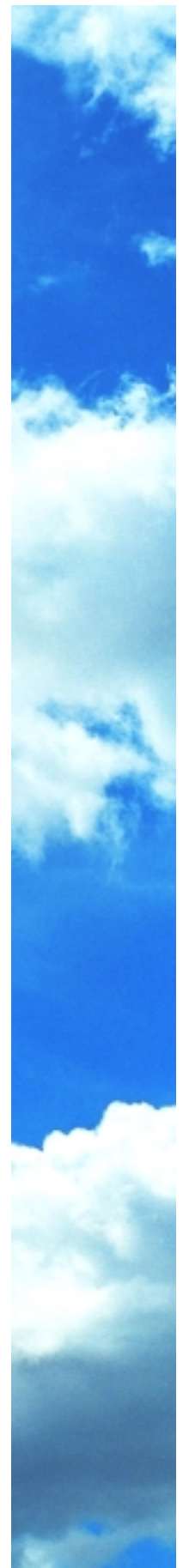
- The district heating system in Charlottetown was developed by the PEI Energy Corporation and was sold to a private company, Trigen Canada Ltd. Since buying the assets of the PEI Energy Corporation, the company has continued to expand and upgrade the system to add more customers.

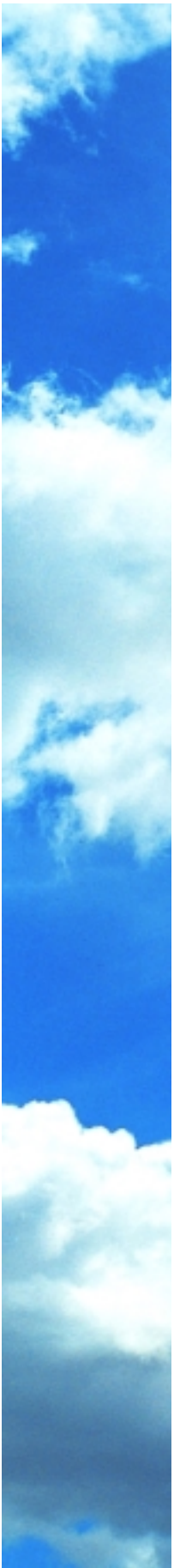
Next Steps

- Investigate methane utilization at the remaining large agri-food facility that is still flaring methane.
- Continue expansion of the Charlottetown district heating system.

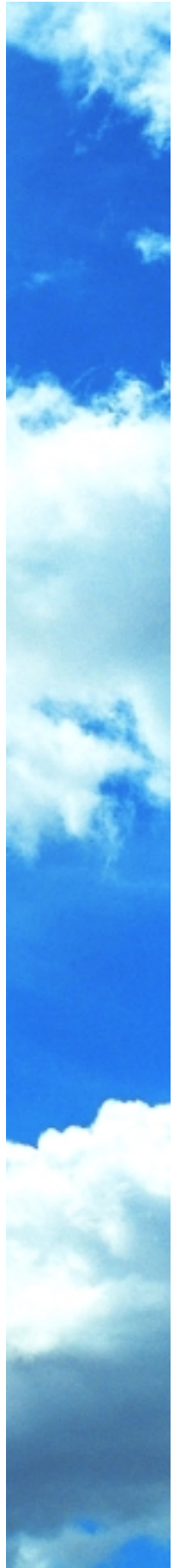
Reporting Progress

- Methane captured and utilized and heavy oil displaced.
- Fuel oil displaced by biomass from continued expansion of district heating system.





Appendix 1
Initiatives Based on
Phase 1 Themes



Theme	Measure Proposed	Implementation Authority	Type of Measure/ Instrument	Impact of Measure	Resource Requirements	Status
Enhancing Awareness and Understanding	---	---	---	---	---	---
Promoting Technology Development and Innovation	Continue support of R&D wind power facilities.	Federal/provincial (PEI Energy Corporation).	Economic.	CO ₂	Contingent on federal funding.	Years 1, 2, 3.
	Expand transportation RWIS to dispatch road maintenance crews.	Provincial government.	Economic.	CO ₂ , nitrous oxide	Contingent on federal funding.	Year 3
Investing in Knowledge/ Building the Foundation	Land use inventory.	Provincial government.	R&D.	CO ₂	---	Years 1, 2, 3
	\$mart Energy Management.	Provincial government.	Information.	CO ₂	---	Years 1, 2, 3
Governments Leading by Example	Ride sharing through PEI Enerpool.	Provincial government.	Economic, information, leadership.	CO ₂ , nitrous oxide	None other than rebate on diesel tax.	Years 1, 2, 3
	Promote teleworking for provincial civil servants.	Provincial government.	Policy, process.	CO ₂ , nitrous oxide	Unknown.	Years 1, 2, 3
	Fleet Management.	Provincial government.	Leadership, policy, process.	CO ₂ , nitrous oxide	Unknown.	Year 3
	Build Green Power capacity and purchase Green Power.	Provincial/federal governments.	Leadership, policy, process, economic.	CO ₂	---	Years 1, 2, 3
	Waste Watch (for landfill diversion).	Provincial government.	Leadership, policy, process, economic.	CH ₄ , CO ₂	---	Years 1, 2, 3

Theme	Measure Proposed	Implementation Authority	Type of Measure/ Instrument	Impact of Measure	Resource Requirements	Status
Encouraging Action <i>Agriculture/Forestry</i>	Plot surveys.	Provincial government.	R&D.	CO ₂	---	Years 1,2, 3
	Livestock management and grazing management.	Provincial government.	Information.	CH ₄ , nitrous oxide	---	Years 1,2, 3
	Planting hedgerows and shelterbelts.	Provincial government.	Economic.	CO ₂	---	Years 1,2, 3
	Soil nutrient efficiency. AERC.	Provincial government.	Information.	Nitrous oxide	---	Years 2, 3
		Provincial government.	Economic, information.	CH ₄ , CO ₂ , nitrous oxide	---	Years 1,2, 3
<i>Electricity</i>	Expansion of generation capacity at AWTS.	Provincial/federal governments.	Economic.	CO ₂	---	Years 1,2, 3
	Access natural gas for electrical generation.	Joint public/private.	Economic.	CO ₂	---	Years 1,2, 3
<i>Transportation</i>	Synchronized traffic signals.	Provincial government.	Economic.	CO ₂ , nitrous oxide	All measures are contingent on Transport Canada funding.	Years 1,2, 3
	Adaptive traffic signals for main routes through Charlottetown.	Provincial government.	Economic.	CO ₂ , nitrous oxide		Year 3
	Advanced traveller information program.	Provincial government.	Economic.	CO ₂ , nitrous oxide		Years 2, 3
	Fleet management for road maintenance.	Provincial government.	Economic.	CO ₂ , nitrous oxide		Year 3
	RWIS	Provincial government.	Economic	CO ₂ , nitrous oxide		Years 2, 3
<i>Industry</i>	Increase methane recovery.	Joint public/private.	Economic.	CO ₂ , nitrous oxide	---	Years 1,2, 3