Building On Our Strengths

An Inventory of Current Federal, Provincial, and Territorial Climate Change Policies

Jillian Bollinger,
Intern
Kari Roberts, Ph.D.
Senior Policy Analyst

February 2008
updated February 22, 2008

CanadaWest FOUNDATION

This report is part of the Canada West Foundation's *Getting it Right Project.* Funding for the *Getting it Right Project* has been provided by the Max Bell Foundation. This report was prepared by Jillian Bollinger and Kari Roberts. The opinions expressed in this document are those of the author and not necessarily those of the Canada West Foundation's Board of Directors, advisors, or funders.

ISBN 1-897423-14-1

Graphic Design and Layout by Jason Azmier

1. Introduction

Building On Our Strengths presents a basic inventory of current federal, provincial, and territorial climate change policies aimed at reducing greenhouse gas (GHG) emissions by changing how we produce and consume energy. The report does not address policies aimed at adapting to the effects of climate change.

The rapidly changing policy environment surrounding climate change initiatives poses a challenge to an up-to-date inventory of climate change efforts. The authors have done their best to include policy developments to the end of 2007 with updates provided where possible. It should also be noted that many government initiatives overlap, both across programs and across jurisdictions. For example, some initiatives that may have an impact upon GHG emissions may be presented in other sections of the report, as they are lodged in other policy areas.

Building On Our Strengths is the first of two reports that will provide important background information about what is currently being done in Canada and the US to address climate change. The second report will examine current climate change policy in Canadian cities and in select US jurisdictions.

The report provides context for a discussion of what else can and should be done by governments to address the climate change challenge. Charting the path forward will be easier once we gain a sense of where we are right now.

Although the provinces, territories and the federal government are addressing the same challenges, the inventory reveals significant differences in approach and timelines. Given this, Canada's provinces and territories, in concert with the federal government, should consider a more coordinated approach. At the same time, the policy experimentation that is taking place provides an opportunity for jurisdictions to learn from one another.

2. Provincial and Territorial Climate Change Policies

2.1 GHG emission reduction targets

Four jurisdictions—PEI, Newfoundland and Labrador, the Yukon, and Nunavut—have not set specific GHG emission reduction targets and timelines. (Newfoundland and Labrador and PEI have committed to the New England Governors/Eastern Canadian Premiers Climate Change Action Plan's call to reduce emissions—see below.)

While the Northwest Territories has set an emission reduction target for its own operations (emissions are to be reduced to 10% below the 2001 level by 2011) rather than an all-encompassing target, it encourages the adoption of voluntary emission reduction targets in the private sector.

BC's *Greenhouse Gas Reduction Targets Act* sets a GHG emission reduction target of 33% below the 2007 level by 2020 and 80% below the 2007 level by 2050. The province's Climate Action Team is responsible for advising the Committee on Climate Action on viable interim targets for 2012 and 2016, which must be set by the end of 2008. Manitoba and Ontario decided to reduce GHG emissions to 6% below the 1990 level by 2012 and 2014, respectively. Quebec has promised to reduce GHG emissions to 1.5% below the 1990 level by 2012. Nova Scotia and New Brunswick each declared short-term goals of reducing GHG emissions to 10% below the 1990 level by 2020. Saskatchewan's goal is to reduce emissions by 22 tonnes per person compared to the 2004 level by 2020 and to reduce emissions by 80% from current levels by 2050.

Until January 2008, Alberta's target was linked to intensity rather than an absolute reduction (emission intensity is a ratio of emissions per unit of economic activity such as GDP or per person), with a target of emissions 50% below its 1990 level by 2020 relative to provincial GDP. But in a January 2008 announcement, the Alberta government has changed its targets, with a promise now of absolute emissions reductions of 14% by 2050 (compared to 2005 levels). The government also announced the creation of a government-industry council to study technologies needed to meet emission targets.

Some provinces are members of partnerships that create region-specific reduction targets. For example, the Conference of New England Governors and Eastern Canadian Premiers

Provincial and Territorial GHG Emission Reduction Targets

	Type of Target	Target Level	Timeline
BC	Absolute	33% below 2007 level	by 2020
		80% below 2007 level	by 2050
Alberta	Absolute	14% below 2005 level	by 2050
		emisions frozen	by 2020
Saskatchewan	Per person	22 tonnes per person lower than the 2004 level (32% lower than current level)	by 2020
		80% lower than current level	by 2050
Manitoba	Absolute	6% below the 1990 level by 2012 and 2014	by 2012
Ontario	Absolute	6% below the 1990 level	by 2014
		15% below the 1990 level	by 2020
Quebec	Absolute	1.5% below the 1990 level	by 2012
New Brunswick	Absolute	10% below the 1990 level	by 2020
Nova Scotia	Absolute	10% below the 1990 level	by 2020
PEI	Regional/absolute (New England Governors/Eastern Canadian Premiers Climate Change Action Plan)	10% below the 1990 level in the region	by 2020
Newfoundland and Labrador	Regional/absolute (New England Governors/Eastern Canadian Premiers Climate Change Action Plan)	10% below the 1990 level in the region	by 2020
Yukon	No target	n/a	n/a
Northwest Territories	Public Sector	10% below the 2001 level	by 2011
Nunavut	No target	n/a	n/a
Government of Canada	Absolute	20% below the 2006 level	by 2020
Kyoto Targets	Absolute	6% below the 1990 level	by 2012

(NEG/ECP), whose Canadian membership includes Quebec, PEI, Newfoundland and Labrador, Nova Scotia and New Brunswick, set regional GHG emissions reduction goals. The NEG/ECP's Climate Change Action Plan 2001 sets out a plan to reduce GHG emissions to the 1990 level by 2010 and 10% below the 1990 level by 2020. In the West, BC and Manitoba are members of the Western Climate Initiative, which recently announced an aggregate emission reduction goal of 15% below 2005 levels by 2020.

2.2 Emissions trading

Emissions trading (a.k.a. cap-and-trade) is often suggested as a means of reducing GHG emissions. While there are many ways to design a cap-and-trade system for GHG emissions, a typical version would see a government set a limit on GHG emissions, issue credits to emitters that total the maximum level of emissions, and then allow for the sale of unused credits to those who need them. Despite the theoretical popularity of emissions trading, policy development in this area in Canada remains rudimentary.

The NEG/ECP Climate Change Action Plan commits its members to creating a "uniform, coordinated basis for emissions banking and trading" by establishing a regional emissions registry and gaining experience in certifying credits and trade within the geographic region.

BC plans to introduce legislation in 2008 that will create a cap-and-trade system for large emitters and place firm caps on the allowable quantity of emissions from large sources.

Manitoba's Task Force on Emissions Trading and the Manitoba Economy released a report in 2004 advocating the implementation of a national emissions trading system.

Under the *Climate Change and Emissions Management Act,* Alberta facilities that emit more than 100,000 tonnes of GHGs a year must reduce their emissions intensity by 12%. The facilities can reduce emissions by way of operating improvements or they can continue to emit by purchasing Alberta-based credits or by paying $15 for every tonne that they are over their reduction target into the Climate Change and Emissions Management Fund.

The Ontario Emissions Trading Registry "provides a transparent mechanism for owners and traders of Emission Allowances and Emission Reduction Credits to register, track, trade and document their transactions." Although aimed at reducing smog and acid rain, Ontario's Emissions Trading Regulations cap the emission of the greenhouse gas nitrous oxide and enables the trade of emission credits.

2.3 Carbon sinks and capture

2.3.1 Natural carbon sinks

Carbon capture and storage—by way of natural carbon sinks such as forests or injecting GHGs into geological formations—is seen by many to be a potentially effective means of reducing the emission of GHGs into the atmosphere. Canadian jurisdictions have responded to this potential in various ways.

Weather, Climate and the Future: BC's Plan articulates the province's commitment to promoting, developing, and protecting carbon sinks. Some of the action points include implementing sustainable forest management and incorporating carbon management objectives where appropriate; asserting ownership of any forest sink and its associated benefits and costs; developing a policy framework that provides business certainty and supports the creation of incremental carbon sinks; continuing to improve the understanding and protection of forest carbon sinks; and, supporting the BC Agriculture Council during the implementation of best management practices to protect agriculture sinks on farms and ranches.

In *Albertans and Climate Change: Taking Action,* the province outlines the following vision: "To develop, enhance and promote environmentally sustainable agriculture and forestry practices across Alberta that make meaningful, long-term contributions to reducing atmospheric greenhouse gas concentrations and maintain or enhance ecosystem health and integrity."

Saskatchewan's *Energy and Climate Change Plan 2007* encourages the development of agricultural soil sinks to remove over 25 million tonnes of CO_2 equivalent annually by 2012 and over 37 million tonnes of CO_2 equivalent per year by 2050. Saskatchewan plans to reforest 20,000 hectares of insufficiently regenerated land by 2017; these regenerated forests are expected to store 4.9 million tonnes of CO_2.

Similarly, Manitoba's *2007 Speech from the Throne* acknowledged that forests are valuable carbon "stabilizers" and included a pledge to plant 5 million trees over 5 years.

The Northwest Territories' *2007-2011 Greenhouse Gas Strategy* affirms a commitment to forest management and carbon sink assessment.

Similar to Saskatchewan and Manitoba, *Go Green: Ontario's Action Plan on Climate Change* includes a plan to create a new carbon sink by planting 50 million trees throughout the province between 2007 and 2020.

Quebec's climate change action plan supports the role of carbon sinks in GHG sequestration. To this end, Quebec is dedicated to studying the vulnerability of its forests to climate change, and to integrating climate change simulations into forest practice planning.

Nova Scotia is committed to preventing a net loss of wetlands by 2009 and to adopting strategies that ensure the sustainability of natural capital, including forests.

New Brunswick's *2007-2012 Climate Change Action Plan* commits the government to addressing climate change in its forest management plan, ensuring the appropriate regulatory framework is in place for environmental protection, and examining options for turning abandoned farmland into agriculture and forestry spaces. New Brunswick is also committed to working with the federal government and NGOs to assess opportunities for forest and agricultural sequestration as part of the development of sustainable forest programs and best-practice management in agriculture.

Newfoundland and Labrador committed to revising its forest management planning process as climate change science develops and decisions on carbon accounting are finalized.

2.3.2 Carbon capture

BC will encourage opportunities to explore new technology for the safe, underground sequestration of CO_2. In support of this goal, the province is a member of the Plains CO_2 Reduction (PCOR) Partnership that assesses the technical and economic feasibility of capturing and storing emissions. Furthermore, BC is a member of the West Coast Regional Carbon Sequestration Partnership, which also pursues carbon sequestration opportunities and technologies. BC intends to foster innovation in sequestration by developing market-oriented requirements in consultation with industry stakeholders.

The *BC Energy Plan* outlines carbon-restricted expectations for the province and for oil and gas industry operators. The policy actions introduced by BC include eliminating all routine flaring at oil and gas producing wells and production facilities by 2016, with 2011 as an interim date for a 50% reduction. The *BC Energy Plan* also states that the government will adopt policies to reduce natural gas flaring and venting at test sites and pipelines and will encourage compressor station efficiency to reduce emissions.

Alberta has remained committed to promoting carbon capture and storage, a commitment underscored in its January 2008 climate change announcement. Alberta's strategy for CO_2 capture and storage includes the following funding initiatives: $25 million to Alberta Environment and the Alberta Energy Research Institute (AERI) for projects on the long-term reliability of underground CO_2 storage; $100,000 to I-CAN for research on carbon-sequestering algae; and $155.9 million for the Canada-Alberta ecoENERGY Carbon Capture and Storage Task Force. The provincial government and Alberta industries contribute to pilot projects focused on identifying the environmental and economic benefits of using captured CO_2 for enhanced resource recovery. The province allocated $100 million for the Energy Innovation Fund initiative, which demonstrates next generation clean carbon and hydrocarbon upgrade technology through carbon capture. The Alberta government committed $260 million to the facility requirements of the University of Calgary's Institute for Sustainable Energy, Environment and Economy (ISEEE) project.

Alberta's *Taking Action* report includes plans for monitoring programs that use CO_2 for enhanced oil recovery and also the creation of a royalty credit for demonstration projects. The report promises to encourage a pilot project for CO_2 Enhanced Coal Bed Methane recovery and to work with other governments to develop protocols for the monitoring of CO_2 stored in geologic formations. The Alberta Energy Innovation Fund contributed $11 million to a research project on generating clean electricity from coal.

Saskatchewan also has a robust carbon management technology strategy. In the *Energy and Climate Change Plan,* Saskatchewan commits to providing financial support to the Petroleum Technology Research Centre and the International Test Centre for Carbon Dioxide Capture. The government is also partnering with industry to finance the Weyburn-Midale CO_2 monitoring and storage project, which assesses the viability of enhanced oil recovery through the use of captured CO_2. In 2005, SaskPower devoted $20 million for studies on a near-zero emissions clean coal power facility.

Saskatchewan's Energy and Climate Change Plan and Green Strategy support research and development of oil and gas technology for carbon capture and storage, poly-generation and flaring, venting, and fugitive emissions. This includes supporting the Petroleum Technology Research Centre, the International Test Centre for CO_2 Capture and the JIVE (Joint Implementation of Vapour Extraction) project. (JIVE is a 3-year, $40 million project to develop, demonstrate and evaluate solvent vapour extraction processes for enhanced oil recovery from heavy oil resources.) Furthermore, the Saskatchewan government is working with the oil and gas industry to make recommendations, by 2008, for initiatives and policies to improve the industry's efficiency and competitiveness and to reduce emissions from flaring, venting, and fugitive emissions.

In addition to a commitment to minimize natural and fugitive gas flaring and venting, the government of Manitoba's *Kyoto and Beyond* climate change action plan integrates amendments to provincial drilling and production regulations under the *Oil and Gas Act* to ensure that emissions from oil and gas facilities comply with Manitoba air quality objectives.

The development of Canada's only circulating fluidized bed coal-fired power station at Point Aconi in Nova Scotia demonstrates the province's commitment to reducing emissions from coal-fired facilities and seizing clean-coal opportunities.

The Northwest Territories' *Energy for the Future* document outlines the goal of developing the region's petroleum and energy resources and includes the creation of an Air Quality and Emissions Management Code of Practices for the upstream oil and gas industry. The Northwest Territories' energy plan supports the Northwest Territories Power Corporation (NTPC) Emissions Reduction Initiative. As per the NTPC website, the NTPC has reduced its GHG emissions levels to 6% below 1990 levels by decreasing its consumption of diesel for generation purposes and increasing its hydroelectric capacity.

2.4 Carbon tax

Widely discussed, but not widely used in Canada, a carbon tax is a tax on energy sources which emit carbon dioxide. Although not intended to curb GHG emissions, current federal, provincial and territorial taxes on gasoline and other fuels such as diesel and jet fuel set a baseline against which carbon taxes on fuel use would be measured. The federal government charges a 10 cent per litre excise tax on gasoline. Provincial taxes on gasoline range from 6.2 cents per litre in the Yukon to 16.5 cents per litre in Newfoundland and Labrador.

Quebec was the first province to introduce a carbon tax. In Quebec, petroleum companies are charged just under one cent for each litre of gas sold in the province. While Alberta has not gone so far as to implement a tax on carbon, it does require that facilities that emit more than 100,000 tonnes of GHGs a year must reduce their emissions intensity by 12% or pay $15 for every tonne that they are over their reduction target. In both provinces, the revenue is used to fund green initiatives.

In its 2008 budget, the BC government introduced a comprehensive carbon tax to be applied to gasoline, diesel, natural gas, propane and home heating fuel. The tax takes effect in July and prices carbon emissions at a rate of $10per tonne and will rise by $5 per year for four years, reaching $30 pertonne by 2012. The tax will be revenue neutral, meaning that generatedrevenue will be returned to British Columbians through the reduction ofother provincial taxes. The BC carbon tax is expected to generate $1.8billion over three years.

2.5 General energy targets

In addition to the source-specific plans for energy discussed below, many provinces have set general targets for energy production and consumption.

BC's plan focuses on maintaining the 90% (of total generation) renewable electricity generation capacity currently in place in the province.

The 2008 budget offers $25 million for a new bio-energy network to createnew opportunities for forestry and agriculture, to encourage innovation, and to expand the range of cleaner energy options available to British Columbians.

Alberta is focused on deriving 12.5% of its electricity needs from renewable energy sources by 2008 and 20% of its energy needs from renewable or alternate sources by 2020.

Saskatchewan's energy plan endorses conservation methods to decrease the provincial electricity load by 300 MW annually by 2017.

Manitoba's *Green and Growing* report includes a goal to save 842 megawatts (MW) of electricity by 2017.

Ontario set goals for the province to obtain 5% (1,350 MW) of its electricity needs from renewable sources in 2007, 10% (2,700 MW) of its electricity from renewable energy by 2010 and 15,700 MW of electricity from renewable energy by 2025. By 2015, Ontario wants to achieve a 50% increase in its clean, renewable energy capacity. Ontario's plan calls for 2,520 MW of electricity to be conserved annually by 2010 and for 6,300 MW to be saved by 2025. The plan also calls for a peak electricity demand reduction of 5% in 2007.

Quebec's renewable energy targets are wind specific; by 2015, 10% of Quebec's installed capacity will be from wind energy and from 2015 onward, for every new segment of hydroelectric power installed, wind energy equal to 10% of the hydroelectric power will be developed. *Quebec and Climate Change,* the province's 2006-2012 plan, requires the conservation of 2 million tonnes of petroleum product by 2015, 96.9 million cubic

metres of natural gas by 2008 (and 350 million cubic metres of natural gas by 2015), and expects Hydro-Quebec to save 4.1 TWh in 2010 and 8.0 TWh by 2015.

PEI plans to obtain 15% of its electricity needs from renewable energy by 2010 and, depending upon the province's wind power capability, 100% of its energy needs from renewable sources by 2015.

Nova Scotia's target is to obtain 18.5% of its total electricity needs through renewable sources by 2013.

New Brunswick plans for 10% of its electricity needs to be serviced by renewable sources by 2016.

Newfoundland and Labrador's energy plan states that 98% of the province's electricity needs will be derived from renewable energy sources by 2015.

Coal and natural gas facility emissions are another issue that a majority of provinces address in their action plans. In terms of targets for such facilities, BC's plans are perhaps the most ambitious of all of the provinces: beginning in 2007, BC requires all new electricity generation projects to have zero net GHG emissions, existing thermal generation power plants to have zero net GHG emissions by 2016, and coal generation facilities to eliminate all GHG emissions.

Alberta requires new coal-fired facilities to have GHG emission levels equal to those of a combined cycle natural gas turbine.

Saskatchewan requires coal facility emissions to be eliminated or offset by emission credits.

Ontario's plan commits the government to shutting down all of the province's coal plants by 2014.

2.6 Alternative energy

Moving to alternative energy sources such as wind power and solar power are also means by which provinces are seeking to reduce GHG emissions. Alternative energy options are pursued through general programs offering development incentives and sector-specific programs designed to increase the installed capacity of nuclear, hydroelectric, wind, solar, geothermal, biomass and hydrogen energy, and biofuels.

2.6.1 General programs

The BC Energy Plan compels the government to ensure that alternative electricity sources are included in its plans for remote communities.

Alberta stipulates that 13-23% of the funding for the Alberta Energy Research Strategy is allocated to renewable energy projects. A January 2008 announcement committed the government to further invest in renewables such as bioenergy, wind and solar power.

The Northwest Territories is committed to an Alternative Energy Technologies Program for testing the applicability of renewable energy systems in the North.

Nunavut's energy strategy includes plans to conduct an alternative energy research study with an eye to developing a renewable energy plan, and an independent power purchase policy to encourage private development of clean, alternative energy.

Ontario directed the Ontario Power Authority to add 2,000 MW of renewable power to its supply grid and is developing programs with green energy retailers to help Ontarians purchase green power. Ontario joined the Renewable Energy and Energy Efficiency Partnership, which provides funding, private and public, for clean energy initiatives. The province extended its retail sales tax rebate on solar, wind, micro-hydro and geothermal equipment until the end of 2009 and is piloting a project to provide 0% interest loans for the installation of renewable energy systems in homes and small businesses.

New Brunswick fosters a range of renewable energy generation opportunities.

Newfoundland and Labrador is planning to adopt GHG emissions regulations that promote renewable energy development. The province committed to capturing the full value of renewable energy and is studying its long-term energy supply options in the event that the Lower Churchill hydroelectric project is not viable. Newfoundland and Labrador committed to investing profits from non-renewable resources in renewable energy infrastructure, supporting investment in renewable energy

projects and ensuring that technology fund investments are directed toward regional and national initiatives that have the ability to reduce GHG emissions.

The Northwest Territories is contributing $250,000 to a central source of expertise on alternative energy and is providing $200,000 per annum for the Alternative Energy and Emerging Technologies Development Fund, which will support feasibility and demonstration projects.

In addition, some governments include programs to encourage small power producers. BC, Saskatchewan, Manitoba, Ontario, and Quebec each have their own "standard offer" programs that encourage small-scale power generation by offering producers access to the provincial electricity grids. Provincial and territorial action plans also include infrastructure development strategies with the purpose of meeting future demand and renewable energy production. Finally, some government policy plans contain action points for implementing "net" meters that allow electricity to flow in two directions, effectively enabling homes equipped with alternative energy supplies to sell their electricity surplus to their electricity distributor.

2.6.2 Sector-specific programs

Nuclear

Currently, there are only three provinces with nuclear energy production: Ontario, Quebec, and New Brunswick. Both Ontario and Quebec's action plans indicate that they will limit their reliance on nuclear energy. Ontario's plan identifies a 14,000 MW capacity cap through 2025 and the Quebec's plan suggests that, while the province's nuclear power reactor will be maintained, it will be the only source of nuclear energy in the province. New Brunswick's Climate Change Action Plan asserts an interest in increasing the efficiency of the Point Lepreau nuclear plant and studying the feasibility of building a second reactor on the site. Of the other provinces, BC, Saskatchewan and Newfoundland and Labrador reject the introduction of nuclear energy to their energy mixes.

Hydroelectric

Hydroelectric generation is the predominant renewable electricity source in Canada. Currently, over 90% of electricity production in BC is generated by hydroelectric systems. BC is committed to ensuring the sustainability of this high rate of renewable generation by upgrading and maintaining its heritage asset power plants and transmission infrastructure.

SaskPower's "vision for the future" includes a discussion about the possibility of large-scale hydroelectric power on the Saskatchewan and Churchill rivers.

While 97% of Manitoba's electricity supply is generated from hydroelectric power, the province is evaluating its options to develop another 5,000 MW of hydroelectric power. Such plans include an examination of the opportunities associated with developing hydroelectric power in conjunction with First Nations and providing electricity to neighbouring jurisdictions.

Nunavut's energy strategy commits the territory to pre-feasibility studies for hydroelectric power and, depending upon the results, could have an operational hydroelectric facility by 2012.

Ontario's Energy and Natural Resources ministries are removing renewable energy barriers and generating new opportunities for hydroelectric development by providing opportunities to develop hydroelectric power on Crown land.

Quebec plans to bring the 1,000 MW of hydroelectric power currently under development on line by 2012 and has set ambitious targets to have a 4,500 MW portfolio of new hydroelectricity projects compiled by 2010.

In mid-2007, Nova Scotia and New Brunswick entered into a Strategic Environmental Assessment agreement to gauge opportunities for harnessing tidal power in the Bay of Fundy.

Newfoundland and Labrador's hydroelectric strategy focuses primarily on the development of the Lower Churchill Hydroelectric project and takeover of the Upper Churchill Hydroelectric Project in 2041. To maintain this focus, Newfoundland and Labrador encourages the investigation of potential hydroelectric sites but continues its freeze on the implementation of small hydro projects until 2009, when final decisions are made regarding the development of the Lower Churchill project.

Wind

As of Autumn 2007, Canada's installed wind capacity was approximately 1,700 MW and accounts for 0.6% of the country's electricity demands. Across the country, provincial

and territorial action plans are ramping up the development of wind energy. In September 2007, Alberta lifted a 900 MW wind development threshold, and with 500 MW scheduled for integration into the provincial grid by the end of 2007, Alberta has the largest installed wind energy capacity in the country.

BC has contracts for the development of over 300 MW of wind energy, the first of which is scheduled for completion in 2008.

The Centennial Wind Power Project in Saskatchewan was completed in 2007 and created 150 MW of electricity for the provincial electricity grid.

Manitoba is focused on developing 1,000 MW of wind power by 2015.

Ontario has over 1,000 MW of wind energy under development, with the majority of projects set for completion by 2008.

In the North, the Yukon has an installed wind energy capacity of 0.81 MW and the Yukon Energy Corporation, private industry, and individuals continue to monitor and evaluate potential wind turbine sites in the region. The Northwest Territories' wind development strategy provides for three new monitoring stations in 2008 and for the installation of an operational wind turbine by 2009. Nunavut's energy strategy acknowledges the potential of small wind turbines as an alternative energy option.

The Quebec strategy calls for 4,000 MW of wind energy to be added to the electricity grid by 2015. Beyond 2015, the development of wind energy will be dependent upon the development of hydroelectric power: for every segment of hydroelectric power developed, a wind energy project of 10% of the hydroelectric project value must also be developed.

PEI has an installed wind energy capacity of approximately 60 MW and is focused on developing wind energy as a provincially owned resource, in a fashion similar to the oil and gas industry. In order to achieve its 2010, 15% renewable energy target solely through wind energy, the province would need to develop another 40 MW of energy. PEI is further promoting wind energy development by exploring the removal of the sales tax on all components of wind turbines, incorporating net metering for small wind power generators, monitoring the wind profile on the island and creating a means for residents to invest in local wind energy projects. The province is also supporting a pilot wind-hydrogen village to demonstrate the compatibility of wind energy and hydrogen technology in small, remote communities.

New Brunswick is scheduled to add approximately 100 MW of wind energy to the provincial grid in 2008, Newfoundland and Labrador is developing approximately 50 MW between two projects, and Nova Scotia's 1.2 MW wind project will be complete in 2007. Additionally, Newfoundland and Labrador's energy and climate change plans support research and development of wind-hydrogen energy for the province's isolated communities.

Solar

Provincial and territorial governments are also promoting the development of solar energy. While the majority of provinces and territories are committed to fostering the popularity of solar water heating appliances and support the integration of passive solar energy techniques, Ontario's strategy includes several action points that specifically target photovoltaic energy development. For example, Ontario's plan offers a provincial sales tax rebate for solar equipment purchased in the province, an energy retrofit program for solar water heaters, a commitment to add solar power capabilities to 100,000 homes, and a program for industrial, commercial and institutional sectors to increase their use of solar thermal equipment. In addition, the government of Ontario contracted a solar farm project near Sarnia to install more than one million solar panels that will produce 40 MW of power by 2010.

Although its strategy is not as robust, Nunavut's commitment to solar wall projects and photovoltaic energy is a promising start to the territory's renewable energy portfolio.

Geothermal, biomass and hydrogen

The general programs for clean energy, as discussed above, are the primary outlets for government promotion of the exploitation of geothermal energy. However, some government action strategies specifically acknowledge the need for a commitment to the development of geothermal energy resources. Alberta's Integrated Energy Vision discusses the importance of developing geothermal energy and the Alberta Energy Research Institute (AERI) is testing the viability of using geothermal heat sources for oil recovery from the oil sands.

Manitoba is home to 25-30% of the country's installed geothermal capacity and the province continues to support geothermal

energy by committing to its widespread implementation in new neighbourhoods. In addition, Manitoba Hydro's Residential and Commercial Earth Power Loan Program makes geothermal heat pumps more accessible to homeowners and businesses.

The Yukon is experimenting with low-grade ground source heat pumps and geologists are identifying areas in which heat energy can be produced from hot rocks.

The Northwest Territories is evaluating ground source heat pumps with a project at Aurora College scheduled for completion in 2008/2009.

Quebec's strategy instructs the *Agence de l'efficacité energetique* to develop an incentive program for geothermal energy in the residential and commercial sectors and requires that the economic potential of geothermal energy be assessed for every new government building construction project and heating system renovation project.

Bio-energy and hydrogen energy exploitation are addressed in varying degrees by provincial and territorial governments. BC is committed to implementing a bio-energy strategy to build upon its natural bio-energy resource advantages, this includes issuing an expression of interest and call for proposals for electricity production from sawmill residue, logging debris and beetle-killed timber. BC is developing its hydrogen economy by establishing a hydrogen and fuel cell strategy, a harmonized regulatory framework for hydrogen and creating technology roadmaps in the areas of fuel cells, hydrogen and bio-energy.

Alberta's commitment to biomass and hydrogen energy involves a Nine-Point Bio-Energy Strategy. The Alberta Energy Research Institute is focused on meeting 3% of Alberta's energy demand through bio-energy and 2% of the province's energy needs from hydrogen by 2015. Additionally, Alberta is contributing $85 million toward a pilot plant that will produce synthetic gas and electricity from municipal solid waste.

Saskatchewan's action plan calls for the establishment of a BioProducts Centre of Excellence and the development of hydrogen production and utilization pilot projects.

Manitoba has partnered with the City of Winnipeg and Manitoba Hydro to develop methods of utilizing methane gas released from landfills and is committed to working with public and private sectors to develop a framework that will ensure that Manitoba captures the opportunities associated with the new bio-energy economy. Manitoba also released a Hydrogen Development Strategy in 2003 and created a Hydrogen Centre of Expertise to study long-term approaches for hydrogen sustainability and the resulting greenhouse gas emissions reductions.

The Northwest Territories is monitoring private-sector tests on the efficiency and effectiveness of wood pellet boilers.

Nunavut's energy strategy includes a commitment to study small-scale energy production from municipal waste.

Regulations under Ontario's Environmental Protection Act require the collection of landfill gas for new or expanding landfill sites larger than 3 million cubic metres or 2.5 million tonnes. Facilities currently generating electricity from the capture of landfill methane are eligible for 20-year power purchase agreements through Ontario's Renewable Energy Standard Offer Program. The Ontario government also provided $9 million to the Ontario Biogas Systems Financial Assistance Program to design and construct biogas digesters to convert methane from manure and food processing by-products into electricity. In September 2007, Ontario announced a $4 million investment in the Atikokan Bio-Energy Research Centre. Like many provinces, Ontario is committed to fostering a hydrogen fuel cell innovation program that will advance the commercialization of fuel cells and related technologies.

Quebec plans to implement regulations for new and large landfills, and the incineration of residual materials, and to provide financial support for the capture of biogas from landfills that are exempt from such regulations. Quebec promotes private initiative through the deregulation of the distribution of biogas from sanitary landfill sites and will aid programs for waste treatment and energy recovery from agricultural biomass. Quebec's energy plan encourages the production of hydrogen through water electrolysis.

PEI's plans include an evaluation of the economic feasibility of collecting biogas from meat packaging waste and encourages the in-house advancement of wind-hydrogen technology.

Nova Scotia is exploring a 20 MW biomass cogeneration/ district heating project in its northern region (scheduled for completion in 2009).

New Brunswick encourages energy production through landfill methane gas capture and is working on a forest biomass policy, in addition to exploring hydrogen and fuel cell opportunities.

Biofuels

Biofuels are solids, liquids or gases derived from biomass (such as animal waste, agricultural crops, landfill gases, trees and organic waste). Ethanol and biodiesel are two common types of renewable biofuels used to generate electricity or heat, and also to power vehicles. It is considered to be a sustainable source of energy, provided it is used at the same rate that it is produced.

The majority of provincial governments have a target for renewable fuel integration. BC, Alberta, Ontario, Quebec, and New Brunswick each committed to a 5% average for ethanol content; however, the time frames for implementation vary between provinces. BC, Alberta, and New Brunswick are committed to supporting a 5% ethanol content standard for gasoline and diesel by 2010 whereas Ontario is implementing a 5% ethanol standard in 2007 and Quebec's 5% ethanol content deadline is 2012. Ontario also advocates reducing the carbon content of transport fuels by 10% by 2020. Saskatchewan jumped from a mandatory content of 1% ethanol gasoline in 2005 to a 7.5% mandatory ethanol content in 2007, and Manitoba advocates 10% ethanol content in fuel, provided local ethanol production can meet the demand.

Several provinces discuss the need for quality parameters for renewable fuel and fuel blends. BC, Alberta, Saskatchewan, and Quebec are among the provinces that want to standardize biofuel and additive production.

Financial incentives for biofuel production are also a major component of several provincial bio-energy action plans. Of the three new programs initiated under *Alberta's Nine-Point Bio-Energy Plan,* all provide financial incentives to encourage biofuel production, refining, and infrastructure. The three initiatives currently in operation are the Bio-Energy Producer Credit Program, Bio-refining Commercialization and Market Development Program, and the Bio-Energy Infrastructure Development Program.

Provincial and Territorial Biofuels Targets: Ethanol Content

	Type of Target	Target Level	Timeline
BC	Ethanol content for gas/diesel	5%	by 2010
Alberta	Ethanol content for gas/diesel	5%	by 2010
Saskatchewan	Ethanol content for gas	7.5%	in 2007
Manitoba	Ethanol content in fuel	10%	Dependent upon ability to meet local demand
Ontario	Ethanol content for gas/diesel	5%	in 2007
	Reduced carbon content in transport fuels	10%	by 2020
Quebec	Ethanol content for gas/diesel	5%	by 2012
New Brunswick	Ethanol content for gas/diesel	5%	by 2010
Nova Scotia	No specific target	n/a	n/a
PEI	No specific target	n/a	n/a
Newfoundland and Labrador	No specific target	n/a	n/a
Yukon	No specific target	n/a	n/a
Northwest Territories	No specific target	n/a	n/a
Nunavut	No specific target	n/a	n/a
Government of Canada	Ethanol content in gas	5%	by 2010
	Renewable content in diesel and heating oil	2%	by 2012

Saskatchewan introduced a $0.15/L grant for fuel distributors that obtain at least 30% of the ethanol that they purchase from small production facilities. Manitoba's ethanol-blended fuel program includes a tax reduction of $0.025/L for 10% ethanol blends. Quebec provides a refund of fuel tax paid on the purchase of biodiesel for transportation as well as a refundable tax credit for ethanol production and distribution in Quebec.

Provincial and territorial action plans support numerous avenues for research and development of biofuels. Alberta's Nine-Point Bio-Energy Plan includes a broad commitment to provide investment support for bio-energy development. Saskatchewan is committed to developing both inter- and intra-provincial E-85 corridors (transportation corridors in which a blend of gasoline comprised of 85% ethanol and 15% gasoline is available), in cooperation with other governments and industry as well as developing a 1.4 billion litre biofuel production industry. The Northwest Territories is monitoring research regarding the viability of biofuels in cold, northern climates and, in lieu of an agriculture base with the ability to support mainstream biofuel production, is investigating the production of synthetic gas from trees.

Quebec is interested in developing a renewable fuels industry and is working with BC and New York State to develop ethanol production techniques from forest biomass, agricultural residue and urban waste. In support of this goal, Quebec began construction on a biomass-ethanol production plant, which is scheduled for completion in 2012. Quebec is also exploring "bio-refineries," to utilize waste products from pulp and paper mills. PEI continues to evaluate the economic viability of an ethanol and biodiesel industry in the province. Nova Scotia supports an increase in the production and consumption of locally produced biofuels in transit buses and government buildings. New Brunswick encourages research and development of biofuels from corn, barley, wheat or wood waste.

2.7 Transportation

2.7.1 Public transportation, infrastructure and alternative methods

BC acknowledges the need to incorporate adaptations for climate change into the province's strategies for integration of transportation modes, reduced congestion, and transportation information technology. BC's transportation demand management initiative will address the need for GHG reduction by enhancing public transit to reduce congestion and creating infrastructure for public and active transportation. (Active transportation is defined as transportation that relies upon movement of the body such as walking, cycling, and running.)

In November 2007, the governments of BC and Canada announced the first deal of the Build Canada Fund, a seven-year, $2.2 billion deal to build the province's transportation infrastructure with financial aid from the federal government. This partnership provides investment for international border crossings and other infrastructure to reduce congestion in the Lower Mainland, which will in turn reduce GHG emissions.

The BC government's 2008 budget promises money to help double transit ridership by 2020.

The Alberta government recently reached a deal with its largest municipalities to fund future public transportation initiatives.

In Saskatchewan, the Energy and Climate Change Plan commits the province to provide funding for public transit initiatives.

The Manitoba Green and Growing Plan promotes the use of commuter challenges to raise awareness and motivate citizens to engage in active transportation.

Ontario recently announced the MoveOntario 2020 initiative. Beginning in 2008, the MoveOntario plan, valued at $17.5 billion, will create 900 kilometers of rapid transit within the Greater Toronto Area and Hamilton.

The Quebec energy plan includes improvements to infrastructure, incentives for car-pooling, alternatives to one-person car use, and a tax deduction for employers who purchase public transit passes on behalf of their employees. Quebec's energy plan also provides for reimbursement of fuel taxes to public transit authorities. Quebec's *Climate Change Action Plan* encourages the development of public transit and transportation alternatives.

PEI's *Energy Framework and Renewable Energy Strategy* promises to explore options for the development of public

transportation systems in the municipalities of Charlottetown and Summerside.

Nova Scotia's *Smarter Choices for Cleaner Energy Strategy* includes developing quality transportation options to increase ridership and public acceptance, establishing better links between existing urban transit systems and outlying communities and examining the potential of a rail system as part of new industrial development opportunities.

New Brunswick is examining opportunities to develop partnerships with communities and stakeholders and to create a public transportation strategy that provides residents with convenient alternatives to private vehicles. New Brunswick's *Climate Change Action Plan* commits the province to developing a new Intelligent Transportation Strategy to position New Brunswick as a national leader in transportation technology and to reduce emissions from the transportation sector.

Newfoundland and Labrador's Climate Change Action Plan involves conducting a feasibility study on the development of commuter parking areas at key junctions and monitoring the energy efficiency of the provincial ferry fleet to reduce fuel consumption and GHG emissions.

The Northwest Territories is considering incentives for active transportation and methods of discouraging vehicle use, such as increasing the cost of downtown parking and closing streets to vehicular traffic.

Nunavut's energy strategy includes an initiative to develop a transportation energy strategy that includes research into the applicability of a public transit system in Iqaluit.

2.7.2 Hybrid vehicles, vehicle standards and promoting alternative fuels

Government action plans include policy actions to promote hybrid vehicles and create vehicle standards. In November 2007, BC introduced a pilot project to encourage the use of zero emission vehicles by allowing electric vehicles on public roads. The 2008 budget reduces the provincial sales tax for vehicles that qualify for Transport Canada's Eco-Auto Rebate Program. PST relief will also be introduced for electric bicycles, scooters and motorcycles.

The government of Alberta, through Climate Change Central, created "Hail-a-Hybrid," which provides incentive for taxi owners to purchase hybrid vehicles, and "Car Heaven," a donation program for old, high-emitting vehicles.

Manitoba offers a $2,000 sales tax rebate on the purchase of a hybrid vehicle.

Ontario's Go Green plan includes a policy action to consult with manufacturers to identify the most efficient and least polluting vehicles and to issue eco-license plates for these vehicles. The Ontario government is also calling for the federal government to implement a national standard of efficiency for all new vehicles sold. Ontario's Drive Clean program identifies vehicles with emissions problems in the southern Ontario "smog zone" and requires them to be repaired. The Ontario government also offers a sales tax rebate up to $2,000 on the purchase of a hybrid vehicle. Ontario's Next Generation Jobs Fund is a $650 million investment to encourage the development and commercial sale of clean cars, fuels, and technologies. Companies that receive support from the Next Generation Jobs Fund must prove that they will provide good, secure jobs for Ontarians and reduce GHG emissions. Ontario invested $235 million in General Motors for the development of fuel-efficient cylinder de-activation engine technology and the production of 100 prototype fuel cell equipped vehicles.

As part of Quebec's policy to reduce petroleum product consumption, the government implemented several initiatives that affect Quebec's transportation sector. Quebec now offers tax refunds up to $1,000 on the purchase of hybrid vehicles and financial incentives for new diesel vehicles and low fuel consumption vehicles. Furthermore, the Quebec energy plan calls for fuel consumption standards for motor vehicles that approach California standards and, as of 2005, additional registration fees are charged for high-cylinder vehicles (4 liters or more). Beginning in 2010, Quebec's energy strategy requires light-duty vehicles sold in Quebec to meet certain GHG emission standards.

PEI's *Energy Framework and Renewable Energy Strategy* utilizes sales tax rebates to encourage the purchase of hybrid fuel vehicles.

Nova Scotia's *Smart Choices for Cleaner Energy* helps Nova Scotians make educated transportation choices through policies that encourage the purchase or use of fuel-efficient vehicles and encourages participation in environmentally responsible transportation options.

Public Awareness

Many provincial and territorial climate change strategies focus on public education. While this list is not exhaustive, it gives a sense of some of the provincial and territorial efforts to increase public awareness about addressing climate change.

British Columbia
The province sponsors a program called Wild BC, which provides quality education programs and resources to British Columbians. In addition, BC Climate Exchange, funded by the BC Ministry of Environment, the Fraser Basin Council, and the Canadian Institute for Climate Studies is mandated to facilitate interaction between the various government, civil society, and private sector organizations in BC engaged in public education and outreach on climate change impacts and solutions.

Alberta
Climate Change Central is a public-private partnership for action on climate change that provides information and options to help Albertans reduce their energy use. Energy Solutions Alberta, an offshoot of Climate Change Central, is a federally and provincially sponsored program to provide information and action on energy efficiency and conservation.

Saskatchewan
Saskatchewan's Green Initiatives Fund fosters community development, education and demonstration projects to encourage sustainable development and public awareness programs. Climate Change Saskatchewan informs residents about reducing GHG emissions. Youth Forums on Sustainability emphasize youth leadership for environmental sustainability.

Manitoba
Green Manitoba, an agency of the provincial government, provides energy efficiency tips for students, teachers, individuals and businesses. Manitoba Hydro's Power Smart provides helpful hints to help create customer awareness about how to maximize their energy dollars.

Ontario
E-Zone is a website that provides information about the environment and climate change for youth. The website, Obviously.ca, encourages environmentally conscious decisions and environmental awareness. Go Green Ontario provides information and links for energy efficiency, alternative energy and transportation.

Quebec
L'Agence de l'efficacité énergétique is an agency created to promote energy efficiency by developing partnerships with various organizations throughout Québec. The agency targets industrial and institutional sectors, small and medium-sized firms, and homeowners.

PEI
The Department of Environment, Energy and Forestry's website provides information on energy efficiency.

Nova Scotia
Conserve Nova Scotia is an agency responsible for providing residents and businesses with energy efficiency and conservation programs and information. The Climate-Smart Program is a public-private partnership to help municipalities integrate GHG reduction and climate change adaptation into the decision-making process.

New Brunswick
Efficiency NB is a website that offers advice for how to use energy efficiently, make informed decisions, and reduce the impact of energy use on the environment.

Newfoundland and Labrador
The Newfoundland and Labrador Climate Change Education Centre is a project of Conservation Corps Newfoundland and Labrador, which is sponsored by the federal and provincial governments and seeks to educate citizens about climate change.

Yukon
The Energy Solutions Centre is a service and program delivery agency for the federal and Yukon governments, which focuses on energy efficiency and renewable energy. The Northern Climate ExChange, funded by the Governments of Canada and the Yukon, and Yukon College, provides credible, independent information toward developing a shared understanding of action on climate change in northern Canada.

Northwest Territories
The Arctic Energy Alliance is a nonprofit group funded by the territory's Departments of Environment and Natural Resources. It promotes energy awareness and delivers programs to increase sustainability.

Nunavut
Inuit Qaujimajatuqangit of Climate Change in Nunavut is a collection of memories and experiences from individuals in different regions regarding climate change. The Nunavut Energy Centre, operated by Qulliq Energy Corporation, provides energy efficiency and alternative energy advice to residents.

Government of Canada
EcoACTION is the federal government's website dedicated to creating awareness about conservation and climate change. It provides links to relevant legislation, and provides information about government programs such as ecoENERGY Retrofit-Homes and the ecoAUTO Rebate Program.

New Brunswick plans to offer incentives for residents to switch to alternative fuel and fuel-efficient vehicles, create minimum emissions standards as part of the criteria for vehicle registration, and require older vehicles to undergo emissions testing. Both New Brunswick and Newfoundland and Labrador advocate implementing advanced vehicle energy efficiency standards through the NEG/ECP forum.

Newfoundland and Labrador's energy plan discusses the implementation of a rebate program to encourage the purchase of hybrid and other fuel-efficient vehicles and calls for an investigation into ways of influencing consumer choice toward more efficient vehicles.

The Northwest Territories is monitoring cold-weather hybrid testing performed in other jurisdictions and will encourage the hybrid integration when it is clear that the technology can meet the demands of the northern climate.

Nunavut's proposed transportation energy strategy includes plans to test hybrid vehicles and introduce graduated registration fees based on vehicle engine size.

Several climate change plans include provisions to increase driver education and awareness of techniques to limit carbon emissions. For example, climate change plans of BC, the Northwest Territories, Quebec, and Newfoundland and Labrador include information campaigns to foster energy efficient driving techniques.

2.7.3 Commercial transportation

BC is working to improve its vehicle inspection process by providing plug-ins at key truck stops to reduce vehicle idling. The 2008 budget promises a PST exemption for aerodynamic devices that improve the fuel efficiency of commercial trucks.

Manitoba has committed to creating a truck stop electrification demonstration project that enables trucks to use electric power as a means of reducing unnecessary idling.

Ontario is prepared to consult with the commercial transportation industry to identify and develop promising green vehicle technologies and applications and the programs and incentives necessary to ensure their adoption by private industry. Ontario is mandating the use of speed limiters and will work with its counterparts to have similar regulations adopted in other states and provinces. Ontario is also devoting $15 million to convert 1,000 medium-duty commercial vehicles to hybrid electric and other fuel-efficient technologies.

Quebec's plan targets freight transportation and includes plans to install an energy efficiency component in compulsory heavy vehicle inspections, promotes coastal shipping and rail transportation alternatives, and supports marketing technology to improve energy performance.

Quebec's Climate Change plan highlights the creation of PIEVAL, a program that requires road transporters to improve maintenance on vehicles and outlines plans for legislation to make speed limiting devices mandatory on all trucks and set the maximum speed at 105 km/h.

New Brunswick advocates working with the trucking industry to examine opportunities for engine efficiency and aerodynamic technology to reduce pollutants and GHG emissions. New Brunswick also supports a truck speed limit of 105km/h and is committed to working with Quebec and the trucking industry to implement and enforce the limit.

Newfoundland and Labrador has policies for improving fleet management and professional driver training for operators of public and private diesel equipment.

2.7.4 Idling reduction

Through Climate Change Central, Alberta introduced a reduce idling campaign, which encourages drivers to turn off their vehicles when idling for more than 10 seconds (excluding traffic situations).

Quebec encourages municipalities to adopt legislation between now and 2010 to offset the effects of idling motors.

New Brunswick's *Climate Change Action Plan* commits the province to working with municipal associations and communities to develop model anti-idling policies for use by local jurisdictions.

Newfoundland and Labrador advocates the creation of idle free zones around public buildings to reduce emissions of GHGs and other contaminants.

The Northwest Territories is installing and testing the applicability of auxiliary heaters as a means of warming the interior of vehicles and eliminating unnecessary idling.

2.8 Demand management

Demand management requires utility and consumer participation. In most provinces and territories, the energy utilities themselves are the conduits for government energy conservation and efficiency programs. For example, BC Hydro, SaskPower and Manitoba Hydro all have "power smart" or "power savings" programs to provide energy conservation tips and to organize provincial rebate programs for energy efficient upgrades.

In addition to these financial incentives, provincial and territorial governments offer sales tax exemptions, tax credits, and other rebate programs. BC provides a sales tax exemption on energy conservation products and announced a one-time Climate Action Dividend of $100 to every BC resident to encourage citizens to reduce their carbon footprint.

Many provinces, including Saskatchewan and Nova Scotia, offer an EnerGuide for Houses program that tops-up federal government grants for energy efficiency improvements. Manitoba's Manufacturing Investment Tax Credit allows energy conservation equipment to be classified as an eligible asset for the credit, provided the energy conserved is used internally. The Energy Efficiency Incentive Program in the Northwest Territories offers rebates and funding incentives for homeowners to purchase energy efficient products. Nunavut's energy strategy discusses the possibility of transforming consumption-based energy subsidies into incentives in order to encourage energy conservation and efficiency.

Smart meters are another tool used to increase consumer awareness and change energy consumption habits. While several utility companies are independently researching the use and implementation of smart meters, some provincial governments' climate change action plans make specific mention of smart meters. BC's 2005 *Energy Efficient Buildings: A Plan for BC* supported pilot projects involving smart meters. To this end, BC Hydro recently completed its first year of testing time-of-use rates and smart meters, and Saskatchewan's *Energy and Climate Change Action Plan* commits the province to transitioning to smart meters. Ontario's *Energy Conservation Responsibility Act* of 2006 legislated the introduction of 800,000 smart meters by 2007 and requires all homes and businesses to have smart meters and time-of-use rates by 2010.

Government energy and climate change plans supplement the aforementioned demand management initiatives with energy efficiency requirements for new buildings. The BC Energy Plan builds on the province's 2005 *Energy Efficient Buildings* report and includes an action point to implement building energy efficiency standards by 2010. Saskatchewan's energy plan includes an Energy Code for Commercial Buildings, to be implemented by 2009, which will achieve energy efficiency standards that are 25% better than current national standards (report released in 2007). As of April 2007, all new buildings in Manitoba that receive provincial funding must at least meet silver Leadership in Energy and Environmental Design (LEED) standards. Manitoba is also consulting with the business community to adopt new commercial building codes that promote green development. Nunavut is committed to updating the existing Nunavut Energy Code for Buildings to include energy efficiency requirements.

According to the provincial government, Ontario's building code is the most conservation-minded building code in Canada. Quebec's climate change plan includes a directive to amend the building code by 2008 with a focus on energy efficiency and performance. PEI's energy framework states that the province encourages adoption of the National Building Code and Model National Energy Code for Houses. Finally, by 2009, New Brunswick wants to adopt an energy performance standard that surpasses the federal building code.

Provincial and territorial climate change plans also include funding for municipal and community conservation efforts. BC's Green Cities project introduced a $40 million LocalMotion Fund to cost-share capital projects with municipal governments. Until September 2007, Alberta's Climate Change Central operated a four year program called ME First!, which helped municipalities achieve energy savings and reduce GHG emissions. Similarly, Saskatchewan's Municipal Energy Efficiency Program and the Northwest Territories' Energy Conservation Programs fund energy efficient facility upgrades.

Manitoba's Centennial Project, which provided energy efficient retrofits to low-income neighbourhoods in Winnipeg, was expanded in the 2007 provincial throne speech to include low-income households throughout the province. Similarly,

Provincial ecoTrust Funding

	Federal Grants
BC	$199.3 million
Alberta	$159.9 million
Saskatchewan	$44.4 million
Manitoba	$53.8 million
Ontario	$586.2 million
Quebec	$349.9 million
New Brunswick	$34 million
Nova Scotia	$42.5 million
PEI	$15 million
Newfoundland and Labrador	$23 million
Yukon	$5 million
Northwest Territories	$5 million
Nunavut	$5 million

Nova Scotia's Residential Energy Affordability Program (REAP) targets low-income households and helps them to manage their energy costs.

Ontario's Community Conservation Initiatives Program raises awareness about electricity conservation and fosters long-term changes to energy consumption habits; it places priority on projects that enhance the capacity of individuals and communities to conserve energy. The Energy Efficiency Community Campaign in New Brunswick also funds community conservation. The *Agence de l'efficacité énergétique* of Quebec helps municipalities draft and implement energy efficiency plans.

3. Federal Government Climate Change Initiatives

3.1 GHG emission reduction targets

In April 2007, the Government of Canada released *Turning the Corner: An Action Plan to Reduce Greenhouse Gases and Air Pollution*. The regulatory plan is independent from the *Clean Air Act* (Bill C-30), which has been delayed in Parliament. It calls for many of the same reductions in GHGs and other pollutants, but steps away from voluntary compliance and moves toward the language of mandatory enforcement of GHG reduction targets for all major industries that emit them. The government's action plan includes a mandate to cut industry air pollution in half by 2015 and promises a 20% reduction in GHG emissions by 2020 (from 2006 levels).

Among the tools available to help industry reach these targets are: the ability to make in-house reductions (operational improvements); the ability to purchase offsets; the ability to invest in a technology fund; the ability to purchase emissions credits from other Canadian facilities; and the ability to utilize the Clean Development Mechanism under the Kyoto Protocol (which enables the purchase of certified emissions reductions from projects in developing countries). Additionally, there is talk of the potential for exploring domestic emissions trading (as well as the possibility of participating in a wider emissions trading regime with the US and Mexico). The Government of Canada acknowledges that several companies seized upon early opportunities for emission reductions and is offering a one-time credit of up to 15 mega tonnes for early action.

As stated above, the Government of Canada has also taken action toward reducing air pollution in addition to its plan for GHG reduction. The *Turning the Corner* plan sets national fixed emissions caps for industrial pollutants such as nitrogen and sulfur oxides as well as volatile organic compounds and particulate matter.

In February 2007, the federal government announced the creation of the Canada ecoTrust for Clean Air and Climate Change, charged with distributing $1.5 billion to the provinces and territories for efforts against pollution and climate change. The provincial funding grants are shown on left.

3.2 Carbon capture

Although the following programs are included in the provincial initiatives discussion, federal participation in these initiatives should be noted. The first is the Canada-Alberta ecoENERGY Carbon Capture and Storage Task Force, created to capitalize on the potential of underground carbon storage and build support for a comprehensive blueprint to implement a large-scale carbon capture and storage system in Canada. In addition, Natural Resources Canada contributed $100,000 to the I-CAN Centre for the Conversion of Carbon Dioxide, which

is committed to developing the potential of microalgae systems that capture millions of tonnes of CO_2. Finally, the federal government, through the ecoENERGY Technology Initiative, contributed $11 million to a clean coal technology research project that is scheduled for completion in 2009 and could produce a 500 MW clean coal-powered generating station by 2015.

3.3 Renewable energy

3.3.1 General programs

The Government of Canada's environment action centers on the ecoENERGY Renewable Initiative. The government has allocated $1.48 billion for the ecoENERGY for Renewable Power program, a 10-year incentive program that boosts the supply of clean electricity. And an additional $36 million has been earmarked for the ecoENERGY for Renewable Heat Initiative, which encourages the integration of clean, renewable technologies for water and space heating in buildings. In October 2007, the SD Tech Fund investment portfolio, managed by Sustainable Development Technology Canada, surpassed $1 billion. This Fund provides financial assistance to projects that benefit both the environment and the economy. Projects to be funded include CO_2 capture from compressor stations, investment in a new polymer derivative that could lead to cheaper solar photo-voltaic cells, and the exploration of agricultural biomass feedstocks as a rural alternative to burning coal.

As part of the $300 million ecoENERGY Efficiency Initiative, the Government of Canada is providing $20 million for an ecoENERGY for Industry program. The ecoENERGY for Industry program accelerates energy-saving investments and the exchange of best practices information within Canada's industrial sector.

At the 2007 Energy Ministers' Conference, the federal and provincial governments agreed to collaborate on the development of cleaner fossil fuels, advanced energy end-use, alternative and renewable energy sources, bioenergy and hydrogen production, storage and conversion. The document *Moving Forward on Energy Efficiency: A Foundation for Action* summarizes actions taken and potential avenues for provincial, territorial and the federal government to pursue the enhancement of energy efficiency. In addition to the Energy Ministers' Conference and other nation-wide conferences, the federal and provincial governments are engaged in numerous inter-governmental funding initiatives.

For example, the Community Action on Energy and Emissions (CAEE) in BC provides funding to communities for increasing their energy efficiency and conservation. The CAEE program is a collaboration of numerous provincial ministries, Natural Resources Canada, the Fraser Basin Council, Community Energy Association, BC Hydro, FortisBC, Terasen Gas and the Union of BC Municipalities. In addition to building efficiency initiatives, CAEE addresses clean and renewable energy supplies, transportation energy use and the range of related GHG and local air quality emissions. Other funding initiatives include the Canada ecoTrust for Clean Air and Climate Change's $199.3 million contribution to BC's efforts against pollution and climate change.

At the announcement of the ecoTrust funding, Saskatchewan indicated that its dollars would be directed toward projects such as: the development of near zero CO_2 emission electrical generation projects; implementing energy efficiency and conservation measures; developing and utilizing renewable and alternative energy sources; and continuing the efforts of the International Test Center for Carbon Dioxide Capture. The Canada-Saskatchewan Municipal Rural Infrastructure Fund was created to allocate funding to green projects that work toward cleaner air, cleaner water, and solid waste reduction.

In 2007 the federal government allocated $586.2 million to Ontario from the $1.5 billion Canada ecoTrust for Clean Air and Climate Change. The provincial government indicated that it would use the funding for clean-energy related projects such as the construction of an east-west electrical transmission interconnect with Manitoba and the province's plan to phase out coal-fired electricity generating plants.

New Brunswick is directing a portion of its funds from the Canada ecoTrust toward developing renewable fuels and projects that capture methane gases, and examining the use of zero emissions technology for clean coal generation.

Newfoundland and Labrador is focusing its ecoTrust dollars on clean-energy projects that include improving the energy efficiency of public buildings, reducing GHGs through enhanced

waste management techniques, methane gas recovery and utilization, and expanded composting under the Provincial Waste Management Strategy.

3.3.2 Sector-specific programs

Wind

The first company to receive funding under the ecoENERGY for Renewable Power Initiative was Kettles Hill Wind Energy Inc. In July 2007, the federal government granted the company $16.5 million for the construction of a 63 MW wind power facility in Pincher Creek, Alberta. Later in the year, the federal government announced funding for the Baie-des-Sables Wind Energy Project in Quebec that will harness 109.5 MW of wind power. Over a 10-year period, the federal government will provide $31 million in financial assistance to the Quebec wind project as part of the ecoENERGY for Renewable Power Initiative.

Biofuels

The federal government provides assistance, both financial and regulatory, to the biofuels sector. First, the federal government plans to introduce a 5% minimum average ethanol content for gasoline by 2010 and a 2% minimum average renewable fuel content in diesel fuel and heating oil by 2012. At the end of 2006, the federal government announced a $200 million funding initiative for the Capital Formation Assistance Program for Renewable Fuels Production that provides incentives for producers that participate in new renewable fuels production capacity. The government also introduced a $145 million investment in the Agricultural BioProducts Innovation Program to support cross-sector networks for scientific research and to develop a Canadian bio-based economy. The federal government announced an additional $10 million in funding for the Biofuels Opportunities for Producers Initiative (BOPI), a project that aims to help agriculture producers develop sound business proposals. This investment brings the total funding for BOPI to $20 million.

In April 2007, the federal government announced a $200 million initial investment for the creation of the ecoAgriculture Biofuels Capital Initiative (ecoABC). The ecoABC's primary goal is to increase renewable fuel capacity by providing repayable contributions of up to $25 million per project to help farmers construct and expand bio-fuel production facilities. In October, the government announced that the ecoABC Initiative would provide $5 million for the construction of an ethanol production plant in Saskatchewan due to begin production in 2008. In addition, through the ecoENERGY for Biofuels Initiative, the federal government will provide $1.5 billion over nine years to producers of renewable fuel alternatives. The purpose of this incentive program is to help meet the expected annual demand for 3 billion litres of renewable fuels when the average renewable fuel regulations come into effect in 2010. The NextGen Biofuels Fund, with a $500 million government investment, supports up to 40% of operation costs for eligible projects that are engaged in first-of-its-kind large demonstration-scale facilities for the production of next-generation renewable fuels.

The Canada-Manitoba Environmental Farm Program was designed to encourage Manitoba agricultural producers to evaluate operations, develop environmental action plans, and adopt practices that contribute to a clean and healthy environment. The federal government allocated $53.8 million of the Canada ecoTrust fund to advance Manitoba's efforts such as expanding the province's low-income energy efficiency program, creating new biodiesel plants in rural Manitoba, increasing the province's portfolio of renewable energy to include solar power and biogas, and helping to fund the Manitoba portion of the east-west power grid.

Hydro

The Yukon indicated that its $5 million from the Canada ecoTrust for Clean Air and Climate Change would be directed toward the installation of a third hydro turbine at the Aishihik hydroelectric plant. This action contributes to the Yukon's Climate Change Strategy goal of improving short-term energy efficiency through infrastructure improvements.

The Governments of Canada and the Northwest Territories each provide funding for the territory's Energy Solutions Centre and Northern Climate ExChange. The NWT indicated that it would use its ecoTrust funding to develop mini-hydroelectric plants, encourage energy conservation, create an Energy Efficiency Financing Program, establish alternative energy projects using wind and heat pumps, and utilize residual heating systems and surplus hydro capacity to heat buildings.

Solar

Recently, the Government of Canada announced $1.1 million for a photovoltaic and solar thermal power technology project for commercial and residential use. The project will develop four demonstration projects in Ontario and Quebec and is funded

by the Government of Canada and the Solar Buildings Research Network (SBRN).

Tidal

Nova Scotia has directed a portion of its funds from the Canada ecoTrust fund to expand Nova Scotia's portfolio of renewable energy to include funding for one or more tidal power pilot projects.

3.4 Transportation

The *Action on Climate Change and Air Pollution* document highlights the federal government's intention to regulate fuel efficiency standards for cars and light trucks. As part of this initiative, the federal government's goal is to decrease GHG emissions from light duty vehicles by 5.3 megatons (MT) by 2010 and for the 2011 vehicle model year to be subject to new, stringent fuel consumption regulations defined by the Clean Air Regulatory Agenda. The action plan also commits the government to pursuing a Clean Auto Pact with the US to create an "environmentally ambitious North American standard for cars and light duty trucks."

As part of the ecoTransport strategy, the federal government announced two new programs in February 2007: the $15 million ecoTechnology for Vehicles program; and the $21 million ecoENERGY for Personal Vehicles program. Both programs are designed to encourage informed decisions and increase public awareness and availability of environmentally-friendly vehicles.

The ecoFreight program, created in February 2007, provides $61 million for six initiatives to reduce the environmental and health effects of freight transportation. In addition to air, rail, road and marine initiatives, ecoFREIGHT includes two trucking-specific programs that focus on the removal of regulatory barriers and the reduction of fuel use and emissions. The initiatives also target users of the freight system by establishing a Freight Technology Demonstration Fund, providing cost-shared funding, building partnerships, and demonstrating the potential of shore-based power for marine vessels.

The goal of the ecoMobility program is to cut urban-passenger transportation emissions by encouraging the use of public-transit systems or carpooling. The program works with municipalities to improve options for sustainable transportation.

The ecoAUTO Rebate Program provides a rebate, up to $2,000, for the purchase of a new fuel-efficient vehicle. The Government of Canada also introduced a Green Levy (or vehicle efficiency incentive [VEI]) for fuel-guzzling vehicles. The VEI targets vehicles with a weighted average fuel consumption of 13 or more litres per 100 km and increases as fuel consumption increases. The 2007 federal budget also allocated $6 million over two years for a seven-fold increase in support for vehicle scrap programs and $30 million over two years for Environment Canada and Transport Canada to design incentives to remove older vehicles from the road.

Quebec was the first province to receive funding from the Government of Canada's ecoTrust. The province directed its funds toward a number of projects, including the improvement of trucking technology.

3.5 Conservation initiatives

The Government of Canada contributes to provincial and territorial initiatives directed at demand reduction and increasing energy efficiency. As part of the ecoENERGY Efficiency Initiative, the federal government allocated $220 million to an ecoENERGY Retrofit Program that offers homeowners, small businesses and organizations information about, and financial support to, retrofit their homes, buildings, and processes. In addition, the ecoENERGY for Buildings and Houses is a $60 million project that encourages the construction and retrofit of buildings and houses. The federal government is also updating the Model National Energy Code. The federal government introduced the "1-Watt Initiative" to reduce power consumed in the "stand-by" mode. The Government of Canada also contributed $2 million to the Drake Landing Solar Community in Okotoks, Alberta. Finally, the federal action plan commits the government to phasing out incandescent light bulbs by 2012 and regulating household appliances and other goods.

In 2003, PEI signed a Memorandum of Understanding with the Government of Canada for Cooperation on Addressing Climate Change. It has directed its funds from the ecoTrust toward encouraging homeowners to install renewable energy technology, and investing in renewable energy and energy saving measures in government buildings.

The $5 million dedicated to Nunavut by the federal government through the Canada ecoTrust will be used to promote the

adoption of energy efficient lighting in public and private housing, businesses and government offices, create a homeowner incentive program to encourage energy efficiency and conservation and to fund the new construction, expansion or rebuilding of residual heating systems in eight communities that will recover heat from diesel powered electricity generating plants and heat nearby buildings.

3.6 International efforts

As provincial and territorial governments enter into regional climate change coalitions, the federal government is exploring international avenues for energy and climate cooperation. For example, Canada and the US are working on an annex to the US-Canada Air Quality Agreement to decrease continental particulate matter emissions. This agreement focuses on air pollution, but the Government of Canada has tackled both GHG emissions and air pollution together, as evidenced by its Clean Air Act and its more recent *Turning the Corner* plan. Canada is also promoting co-operative action on air pollution with the US and Mexico through the Commission for Environmental Cooperation. These actions include harmonizing air quality data and setting the stage for a North American emissions trading regime.

At the 2007 European Union-Canada Summit, Canadian and EU leaders announced their joint commitment to reduce global GHG emissions by at least half by 2050 and to negotiate a comprehensive post-2012 agreement at the UN Climate Change Conference in Indonesia. Canada and the EU reinforced their "commitment to tackle the interlinked challenges of climate change, energy security, and sustainable development" and, to this end, agreed to establish a Canada-EU High-Level Dialogue on Energy and to strengthen the Canada-EU High-Level Dialogue on Environment. The leaders also agreed to promote clean, secure and affordable energy technology and to ensure energy efficiency best practices for buildings, vehicles and appliances. At the Montreal Protocol conference in September 2007, Canada and 190 other countries committed to accelerate the elimination of hydrochlorofluorocarbons (HCFCs).

4. Conclusion

This inventory of current federal, provincial and territorial climate change policies reveals a complex array of initiatives and significant variation across jurisdictions. While the policy experimentation that this variation affords is valuable, there is a pressing need for greater coordination and a more systematic process for inter-jurisdictional learning.

With so much being done by various jurisdictions to introduce new and better technologies and programs to address the effects of climate change, it is little wonder that programs and timelines vary. But if Canada is going to make a national contribution to a global challenge, it will have to be a measured, targeted, and more coordinated approach—the patchwork nature of multi-jurisdictional efforts will likely not suffice.

With the provinces, territories, and the federal government talking about many of the same things and working toward similar goals, the coordination of timelines should be within the realm of the possible. What this report reveals is that there is a need for a tighter link between targets, program announcements and public spending to ensure that the country's overall goals are achieved.

About the Canada West Foundation

Our Vision

A dynamic and prosperous West in a strong Canada.

Our Mission

A leading source of strategic insight, conducting and communicating non-partisan economic and public policy research of importance to the four western provinces and all Canadians.

Canada West Foundation is a registered Canadian charitable organization incorporated under federal charter (#11882 8698 RR 0001).

In 1970, the One Prairie Province Conference was held in Lethbridge, Alberta. Sponsored by the University of Lethbridge and the Lethbridge Herald, the conference received considerable attention from concerned citizens and community leaders. The consensus at the time was that research on the West (including BC and the Canadian North) should be expanded by a new organization. To fill this need, the Canada West Foundation was created under letters patent on December 31, 1970. Since that time, the Canada West Foundation has established itself as one of Canada's premier research institutes. Non-partisan, accessible research and active citizen engagement are hallmarks of the Foundation's past, present and future endeavours. These efforts are rooted in the belief that a strong West makes for a strong Canada.

More information can be found at www.cwf.ca.

Canada West FOUNDATION

Manitoba Office:
#400, 161 Portage Avenue East
Winnipeg, Manitoba, Canada R3B 0Y4
Telephone: 204.947.3958

British Columbia Office:
#810, 1050 W. Pender Street
Vancouver, BC, Canada V6E 3S7
Telephone: 604.646.4625

Head Office:
#900, 1202 Centre Street SE
Calgary, Alberta, Canada T2G 5A5
Telephone: 403.264.9535

www.cwf.ca