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Information briefs on strategies and research towards LCS in Canada

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Table of Contents

Existing Low-Carbon Society Strategies in Canada	2
Commitments & Trends.....	2
Federal Government.....	4
Key Challenges to Moving Towards a Low-carbon Society: Federal Level.....	5
Existing Low-Carbon Society Strategies in Canadian Provinces and Municipal Governments	7
Examples of Provincial Approaches.....	8
British Columbia – key initiatives	8
Québec – key initiatives.....	9
Ontario – key initiatives.....	9
Municipal Governments.....	10
Toronto – key initiatives	10
Vancouver – key initiatives	11
Calgary – key initiatives	12
Key Challenges to Moving Towards a Low-carbon Society: Provincial and Municipal Levels.....	13
Institutions pursuing research and elaborating strategies on Low-Carbon Society	14
References & Bibliography.....	15

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Existing Low-Carbon Society Strategies in Canada

Commitments & Trends

The Government of Canada ratified the Kyoto Protocol in 2002 and subsequently adopted, the 2002 “Climate Change Plan for Canada”, the 2005 “Moving Forward on Climate Change: A Plan for Honouring Our Kyoto Commitment”, and in 2007, a plan named “Turning the Corner”.¹

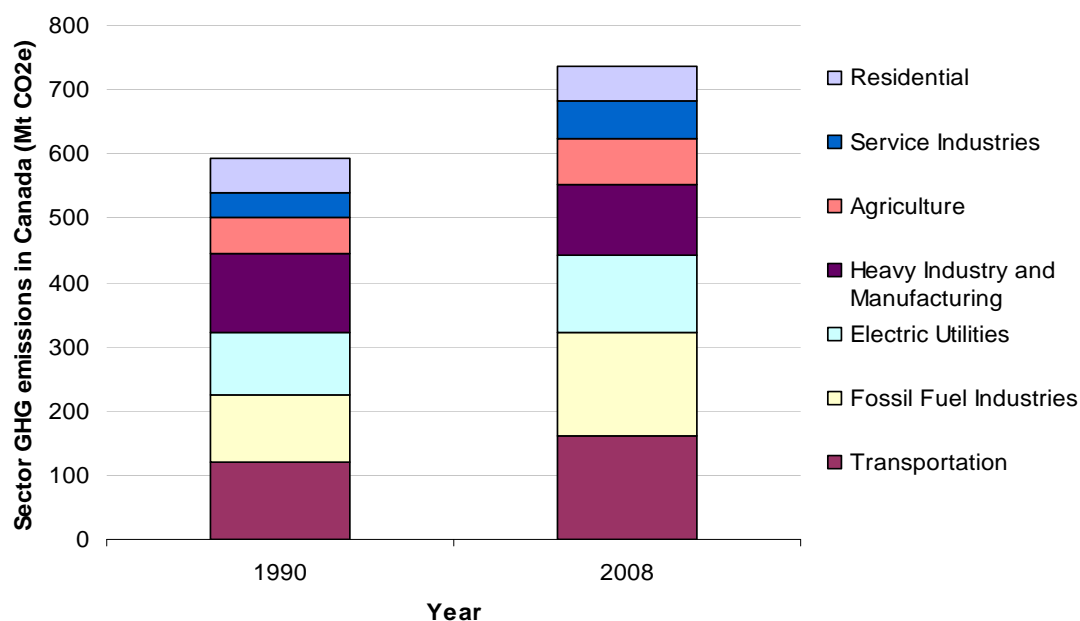
The first two plans were adopted by the Liberal majority government while “Turning the Corner” was adopted by the Conservative minority government (elected in 2006). In 2007, the Conservative government announced that it would not attempt to comply with the Kyoto Protocol, and that instead it would commit to reduce its total GHG emissions by 20% below 2006 level by 2020 and by 60 to 70% by 2050.² On January 30, 2010, Minister of Environment Jim Prentice announced Canada’s intention to reduce its GHG emissions by 17% below 2005 by 2020 and its desire to align its climate change approach with the U.S.³ Moreover, Canada has committed to increase its electricity from non-emitting sources, such as hydroelectricity, clean coal, nuclear and wind power, to 90% of Canada’s total electricity production by 2020.⁴

Canada’s share is approximately 1.94% of global GHG emissions (2005).⁵ In fact, in 2008, Canada’s total GHG emissions were 31% above its Kyoto target (24% over 1990 levels). Energy industries (Fossil Fuel Industries plus Electricity & Heat Generation), Road Transportation, Commercial & Institutional, and Mining subsector were responsible for the largest portion of the GHG emissions growth between 1990-2008.

However, since 2004, GHG emissions in Canada have decreased by 0.9%.⁶ As reflected in figure 1, the most important share of GHG emissions comes from fossil fuels industries, the transportation sector, heavy industries and the manufacturing sector and from electric utilities. As reported in table 1, Alberta, which economic growth relies mostly on oil & gas exploitation, is responsible for 42% of GHG emissions in Canada. In Ontario, Canada’s most populous province, GHG emissions accounts for 26% of total emissions in the country.⁷

Canada being a federation, the constitutional authority over environmental issues including climate change, is divided between the federal government and provincial governments. Municipal governments do not have a legislative authority but are allowed to design and implement climate change and low-carbon transition plans. Therefore, initiatives and strategies related to a low-carbon society are undertaken by three different levels of government: the federal government, provincial and territorial governments, and several municipal governments. Although not necessarily characterized as low-carbon society plans, many initiatives refer to concepts such as a green economy, a low-carbon economy or a more sustainable economy. Most of these initiatives are part of broader climate change plans or complement such plans.

Figure 1: Share of GHG Emissions by Sector in Canada



Source: Environment Canada

Table 1: Reported 2008 GHG emissions by province

Province	Number of Facilities	Total Emissions (kt CO ₂ eq)	% of Total Emissions
Newfoundland and Labrador	7	5 273	2%
Prince Edward Island	1	99	0%
Nova Scotia	9	11 104	4%
New Brunswick	12	10 284	3%
Quebec	46	20 002	8%
Ontario	87	66 911	26%
Manitoba	9	2 367	1%
Saskatchewan	24	21 885	8%
Alberta	109	110 921	42%
British Columbia	43	13 186	5%
Northwest Territories	3	534	0%
Totals	350	262 565	100%

Source: Environment Canada

Federal Government

The federal government has not yet formally defined a low-carbon future as a policy goal or adopted a comprehensive national low-carbon transition plan. However, according to the federal government, a key component in building a low-carbon economy is the Canada-U.S. Clean Energy Dialogue (CED) which was created in 2009 to enhance collaboration on the research, development and demonstration of clean energy technologies to address climate change. In February 2009, the Government stated that transitioning to a low-carbon economy would require the advancement of clean technologies which will in turn enhance energy security and the revitalization of the economy through the creation of clean energy jobs.

The federal government's overall strategy focuses on the funding of renewable energy projects and the development of clean technologies, with a special emphasis on the development of biofuels and carbon capture and storage (CCS) technology. Indeed, the Clean Energy Fund (nearly \$795 million, 2009-2015) is investing in large-scale CCS demonstration projects, including \$466 million for 3 projects in Alberta as well as smaller-scale demonstration projects of renewable and alternative energy technologies. The Office of Energy Efficiency (Natural Resources Canada) manages several programs aimed to improve energy efficiency and to promote renewable energy, including the ecoENERGY for Biofuels program (\$1.5 billion, 2008-2017); ecoENERGY for Renewable Power (\$1.48 billion, 2007-2011), ecoENERGY Home Retrofit (\$801 million, 2007-2011); ecoENERGY Industry (\$18 million, 2007-2011); and ecoENERGY for Renewable Heat (\$36 million, 2007-2011).

Environment Canada has the lead for designing and implementing climate change policies and regulations, and is in charge of coordinating the Clean Air Agenda initiatives (45 programs) with other federal departments through its horizontal management, accountability and reporting framework. The Clean Air and Climate Change Trust Fund (\$1.5 billion), which supports provincial and territorial projects, also falls under the responsibility of Environment Canada. Moreover, new mandatory emissions standards for vehicles will be implemented by Environment Canada (starting with 2011 models).

Several other information and awareness programs aimed at improving energy efficiency and reducing GHG emissions have also been implemented, such as Transport Canada's eco TRANSPORT strategy which specifically targets the transportation sector.

It is also worth mentioning Sustainable Development Technology Canada (SDTC). SDTC is a not-for-profit foundation established by the Government of Canada in 2001 whose purpose is to finance and support the development and demonstration of clean technologies. The SD Tech Fund (\$550 million, until 2012) supports clean-technology projects by financing the critical stages of development and demonstration (between research and commercialization), while the NextGen Biofuels Fund (\$500 million, 2007-2015) supports the establishment of first-of-kind large demonstration-scale facilities for the production of next-generation renewable fuels.

In terms of international collaboration, beyond the Canada-U.S. Clean Energy Dialogue, Canada is part of the Asia-Pacific Partnership on Clean Development and Climate (APP) which seeks to advance the development, deployment and diffusion of clean energy technologies. Since Canada joined the APP in 2007, the federal government has invested a total of \$11.75 million in 28 projects deployed in Canada and in other APP partner countries. In 2009, the government announced 19 new clean technology projects, including 14 projects in China (\$8.4 million over two years, included in the \$11.75 million).

Key Challenges to Moving Towards a Low-carbon Society: Federal Level

Key challenges with regards to the transformation towards a low-carbon society include:

- First, the federal government has not adopted a national low-carbon economy long-term plan yet or GHG emissions targets for beyond 2020. Moreover, most federal government initiatives related to achieving current targets have short-term timeframes (from 2007-2012 on average).
- Secondly, Canada's decision to harmonize its climate change strategy with the U.S. might delay the adoption and implementation of a comprehensive long-term low-carbon economy plan until clarity about the U.S. intentions emerges. Although some measures will proceed including additional non-aligned measures such as restrictions on new coal-fired generation plants. Beyond aligning its 2020 GHG emissions reduction target with the U.S. (17% below 2005 levels), Canada has also harmonized with the U.S. on vehicle emissions standards. In its Climate Change Plan for the Purposes of the *Kyoto Protocol Implementation Act* 2010, the Government states that it is "prepared to adopt a cap-and-trade regime if the United States signals that they are prepared to do the same."⁸ However, the U.S. has not adopted a clear climate change/low-carbon plan yet.
- Thirdly, Canada does not have an economy-wide carbon pricing policy at the federal level. In many countries (mostly European), carbon pricing policies have been implemented as a mean to accelerate the transition toward a low-carbon economy. Several provincial governments are pursuing independent climate action plans, such as through the Western Climate Initiative.
- Fourthly, Canada is the third-largest producer of natural gas and the seventh largest crude oil producer in the world. It is unique in this respect as an industrialized democracy. The entire oil and gas sector made \$110 billion in sales in 2007 and the value of exports reached \$70 billion for the same year (99% of production was exported to the U.S.).⁹ Moreover, this sector made direct contributions to government revenues of \$24 billion in 2007. The oil sands industry is responsible for approximately 5% of Canada's total GHG emissions which represents 0.1% of global GHG emissions.¹⁰ However, the entire oil and gas sector accounts for 23% of Canada's total GHG emissions. Canadian production of crude oil has grown

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significantly during the last decade and oil sands production is expected to continue to grow strongly over the next years.

Existing Low-Carbon Society Strategies in Canadian Provinces and Municipal Governments

Most provinces have adopted and implemented a climate change plan and initiatives related to a low-carbon transition. Some provinces have also complemented their climate change plan with energy plans (British Columbia, Québec, Ontario, Nova Scotia), and plans to foster the green technology industry (Québec, Ontario) and strategies to develop green jobs and skills (Ontario, British Columbia, Nova Scotia). The most comprehensive provincial plans present a sectoral and integrative approach which focus on the following key areas:

- Energy efficiency and renewable energy
- Transportation
- Buildings (building codes, energy efficiency)
- Waste management
- Agriculture (local production, biomass production, methane digester)
- Government leadership
- Citizen engagement/public awareness
- Industry (industrial GHG emission, green industries)
- Forestry (forest management, biomass production)

In addition, most provinces provide funding to foster clean technology development and deployment. Some of them are also undertaking initiatives to create green jobs or to develop green skills (Ontario, British Columbia, Manitoba and Nova Scotia). Few provincial plans are complemented by a carbon pricing element:

- British Columbia has a carbon tax applied on all fossil fuels. The tax rate will vary from \$15 to \$30 between 2009 and 2012.
- Québec has an annual Green Fund duty collected from distributors of targeted fuels.
- Alberta requires 12% reduction (GHG emission intensity) from large-emitters which can buy carbon credits, pay \$15 for every tonne over their reduction target into the Climate Change and Emission Management Fund or submit Emission Performance Credits.
- Nova Scotia imposes absolute caps on Nova Scotia Power Incorporated's GHG emissions for 2010, 2015, and 2020. The cost per tonne of GHG emission is expected to vary between \$15 to \$60 over the 2010-2019 period.

Most provincial climate change plans indicate short-term and long-term emission reduction and energy efficiency targets. However, most provincial low-carbon initiatives have short timeframes. Nonetheless, several initiatives have long-term consequences, such as new building codes initiatives, clean technology development, and transportation strategies. Despite their different financial capacity, most provinces have adopted a sectoral and

integrative approach to transition towards a low-carbon society. Only Alberta and Saskatchewan have not adopted a low-carbon transition approach (or climate change plan) that integrates different sectors such as transportation, buildings, government, and energy. On a per capita basis, Alberta and Saskatchewan are also the most GHG emissions-intensive provinces.

Examples of Provincial Approaches

British Columbia – key initiatives

- B.C. Carbon tax
- Carbon-neutral public sector (beginning 2010)
- B.C. Energy Plan
- B.C. Green Building Code
- Provincial Transit Plan
- Innovative Clean Energy Fund
- The Greenhouse Gas Reduction (Cap and Trade) Act and part of Western Climate Initiative
- LiveSmart BC (energy efficiency incentives for home, work, road, communities)

British Columbia has committed to reduce its GHG emission by 33% below 2007 levels by 2020, and by 80% below 2007 levels by 2050.¹¹ To achieve this goal British Columbia adopted a wide-range of measures to address air quality and climate change. On July 1, 2008, the British Columbia government implemented a revenue-neutral carbon tax applied on “all fossil fuels, including gasoline, diesel, natural gas, coal, propane, and home heating fuel.”¹² The revenue generated by the tax is then redistributed to individuals and small businesses through tax reductions.

This province has also implemented an Energy Plan which is designed to make the province energy self-sufficient by 2016 with at least 90% of the province’s energy coming from renewable sources. The plan set targets around the development of clean energy, conservation and efficiency, and outlines initiatives to invest in advanced energy innovation.

British Columbia is also taking further steps by implementing several energy standards for buildings, by promoting public transports, and by joining the Western Climate Initiative, a regional North American effort to address the climate change, mainly through a cap-and-trade system that aims to be fully implemented in 2015. Indeed, B.C. was the first province to introduce its *Greenhouse Gas (Cap-and-trade) Act* on May 29, 2008, which gives the province the right to implement its own GHG emission cap-and-trade system. As part of its low-carbon strategy, British Columbia appointed seven regional Citizens' Conservation Councils on Climate Action which advised the provincial government on the best ways to encourage individuals and communities in their regions to learn more about climate change and participate in climate action initiatives.

Québec – key initiatives

- Québec's energy strategy
- Public Transit Policy
- Annual Green Fund Duty
- Development Strategy for Québec's Environmental and Green Technology Industry
- Québec's building code (new standards)
- Agriculture and biomass valorization

Québec has set a target of reducing by 20% its GHG emission below 1990 by 2020.¹³ Its climate change Action Plan is composed of 26 measures that revolve around two main objectives: reducing or avoiding GHG emissions and adapting to climate change. Actions intended to reduce GHG emissions concern the energy, transportation, municipal, industrial, residual materials, agriculture and government activity sectors. This plan also has awareness components and initiatives supporting technological innovation. A carbon tax has been introduced in 2007, in addition to building efficiency programs for public buildings, and voluntary agreements with industrial sectors. Recently, on December 29, 2009, Québec announced a new regulation to adopt car emissions standards comparable to California's legislation. Starting in January 2010, the program is applied to 2010-2016 models cars. On June 18, 2009, Québec also enacted a law enabling it to implement a carbon trading system. Finally, along with British Columbia, Manitoba and Ontario, Québec is a part of the Western Climate Initiative.

Ontario – key initiatives

- Green Energy and Green Economy Act (2009)
- MoveOntario 2020 (\$11.5 billion, rapid transit action plan)
- Phasing out Ontario's coal-fired generating plants by 2014
- Agreement with Samsung C&T Corporation and the Korea Power Electric Corporation (\$7 billion)
- Next Generation Jobs Fund (\$1.15 billion)

Ontario has set a target of reducing its GHG emission by 15% below 1990 by 2020, and of 80% by 2050. Its most important policy is probably its program to phase-out coal-fired power stations by 2014 which is expected to reduced GHG emission from electricity by 75%. In 2009, Ontario adopted the Green Energy and Green Economy Act which is a key component of their low-carbon transition strategy. In order to accelerate the research and development of clean technologies, Ontario can count on three main technology-funds: the Ontario Research Fund (\$730 million), the Innovation Demonstration Fund (\$715 million from budget 2009), the New Emerging Technology Fund (\$250 million, 2009-2014). Recently, the Ontario government has signed a \$7 billion (2010-2017) agreement with Samsung C&T Corporation and the Korea Power Electric Corporation for the implementation of renewable wind and solar energy projects, which are expected to create more than 16,00 green energy jobs. With respect to green jobs, Ontario has implemented the Next Generation Jobs Fund (\$1.15 billion) which helps companies invest in the development and commercial sale of clean cars, clean fuels, and clean technologies (companies have to

demonstrate that they can create jobs and reduce GHG emissions). The province is also investing \$5 million (2009-2011) to develop a Green Job Skills Strategy.

Municipal Governments

The Federation of Canadian Municipalities (FCM) which has more than 1,900 members, provides support for municipal initiatives that mitigate climate change and help sustainable development. FCM provides funding through the Green Municipal Fund (\$550 million from federal government) for elaboration and implementation of low-carbon initiatives. It also offers technical assistance (information, guidance and toolkits to elaborate a climate change plan) through the Partners for Climate Protection (PCP) program, which is the Canadian component of ICLEI's Cities for Climate Protection (CCP) network. There are currently 207 municipal governments participating in the PCP national network that encourages municipalities to reduce their GHG emissions. However, although most of participating municipalities have adopted low-carbon initiatives, not all of them have developed a local action plan.

Among the best low-carbon strategies, Toronto, Vancouver and Calgary are good examples since they have set long-term targets and implemented sectoral and integrative approaches.

Toronto – key initiatives

- Toronto Sustainable Energy Plan: to maximize energy efficiency in buildings and infrastructure and to develop local sources of energy generation and distribution in order to reduce Toronto's energy consumption by 21% by 2030, and have local renewable energy sources to contribute more to Toronto's energy supply.
- Live Green Toronto initiative: several programs to engage citizens into low-carbon initiatives.
- Eco-Roof Incentive Program: to promote the use of green and cool roofs on Toronto's commercial, industrial and institutional buildings
- Enviro-Business Working Group: to create a comprehensive environmental efficiency and improvement program
- Sustainable Transportation Implementation Strategy
- Green Fleet Plan: replacing Toronto fleet by clean vehicles (minimum 520 vehicles over 2008-2011)
- Green economic sector development strategy: to support the growth of new and existing environmental businesses
- Public awareness programs
- Partnerships: with businesses, industries, research institutions, community groups, resident associations, neighbouring municipalities, other orders of government and international organizations
- Toronto Atmospheric Fund

In 2007, Toronto adopted its *Climate Change, Clean Air and Sustainable Energy Action Plan: Phase 1*. Other initiatives complement this plan: Sustainable Transportation Implementation Strategy, the proposed Green Economic Sector Development Strategy, the Water Efficiency Plan and the 70% Solid Waste Diversion plan. Toronto has the ambition to reduce its GHG emission by 6% below 1990 targets by 2012 (Kyoto target), 30% by 2020, 80% by 2050.

Vancouver – key initiatives

- Community Climate Change Action Plan (2005): to reduce GHG emissions by 6% below 1990 levels by 2012.
- Corporate Climate Change Action Plan (municipal operations) (2003): to reduce GHG emissions by 20% below 1990 levels by 2010.
- the Greenest City initiative (2009): a report recommends key actions:
 - Jobs and the Economy – includes actions that create green jobs and build Vancouver’s economic strength. These range from finance and smart regulation to energy efficiency and producing clean energy.
 - Greener Communities – identifies actions to improve our green transportation options and that support and enhance clean, green neighbourhoods, the natural environment and greenspaces.
 - Human Health – focuses on protecting and improving health in Vancouver (water, food, pollutants).
- Green Building Strategy (GBS): for all commercial, institutional, mixed-use, and high density residential buildings (energy, water and waste).
- Transportation plan: focus on public awareness, investments in bike lane projects, electric vehicles and car-sharing.
- Energy-saving retrofits of City owned facilities: \$15.4 million

In 2003, Vancouver adopted its Corporate Climate Change Action Plan which aims to reduce GHG emission from municipal operation by 20% below 1990 levels by 2010. Emissions from municipal operations are now 33% below 1990 levels. In 2005, Vancouver implemented its Community Climate Change Action Plan which aims to reduce Vancouver’s GHG emissions by 6% below 1990 levels by 2012. The city has also long-terms goals, including reducing community emissions by 33% by 2020, having all new buildings carbon neutral by 2030, and reducing community emissions by 80% by 2050. The Community Climate Change Action Plan focuses on community engagement, housing and building energy efficiency, transportation alternatives and fuel efficiency. Vancouver has also the objective to be the greenest city in the world by 2020.

Calgary – key initiatives

- imagineCALGARY: public engagement project to produce a 100-year vision for Calgary. A plan focused on a sustainable future was design accordingly.
- The World Energy Cities Partnership (WECP) Calgary Climate Change Accord: WECP is a collaboration framework of 15 "energy cities" around the world which encourages the exchange of energy industry knowledge and economic and infrastructure development strategies.
- Sustainable Building Policy: Leadership in Energy and Environmental Design (LEED) standard applied to all City buildings
- Vehicle Idling Reduction Policy
- EcoFuel Biodiesel Project:
- Low Carbon Future Community Action Plan: this plan is still in its early stages and is based on a series of community roundtable discussions (2009) to define actions to ensure a transition toward a low-carbon economy.
- Downtown district energy: a new heating plant to provide space heating and hot water through an underground thermal distribution system

Calgary's new goal is to reduce its corporate GHG emissions by 20% by 2020 and 80% by 2050, based on 2005 levels, and to pursue parallel strategies within the community. Calgary's Climate Change plan also proposes community emission reductions targets (20% by 2020, and 50% by 2050, below 2005 levels). The community action plan focuses on the following sectors: transportation, residential and commercial energy use, renewable energy, water and waste. Calgary has also the objective of using 100% of green electricity for municipal operation by 2012.

Key Challenges to Moving Towards a Low-carbon Society: Provincial and Municipal Levels

- Although most provinces have adopted climate change or low-carbon strategies, these are often in isolation of one another and of the federal government. For instance, some provinces have implemented a carbon pricing policy and/or joined regional cap-and-trade regimes with U.S. states (the Western Climate Initiative and the Regional Greenhouse Gas Initiative), but not all. However, the implementation of the WCI in Canadian provinces is contingent on U.S. State commitment to participate in WCI.^a
- Provinces and territories have jurisdiction over generation, transmission and distribution of electricity within their boundaries, including electricity prices which vary by province according to the volume and source of electricity and whether prices are set by a competitive market or regulated. Alberta has the most competitive electricity market with its electricity industry mostly privately owned and deregulated prices. Ontario has a mix of privately and publicly owned electricity utilities with a combination of regulated and competitive prices. Crown corporations have an electricity monopoly in Quebec, Saskatchewan and Manitoba and offer regulated prices. In British Columbia, Newfoundland, Prince Edward Island, and Nova Scotia's electricity generation utilities are held by a mix of private and Crown corporations and provide regulated electricity prices¹⁴. The extent to which electricity markets and prices are regulated might affect the outcome of a cap-and-trade system.
- At the municipal level, the main challenge remains the lack of resources and fiscal tools. According to the Federation of Canadian Municipalities, municipalities are largely dependent on the property tax and user fees, since 92 % of every tax dollar collected in Canada goes to the federal or the provincial government¹⁵. Major cities such as Toronto, Vancouver, Calgary and Montreal have thus greater ability to implement low-carbon society plans than smaller municipalities.

^a British Columbia, Manitoba, Ontario and Québec are part of the WCI while Saskatchewan and Nova Scotia have the observer status. Ontario, New Brunswick and Québec have the observer status in the REGGI.

Institutions pursuing research and elaborating strategies on Low-Carbon Society

- The National Round Table on the Environment and the Economy: within the framework of its “Climate Prosperity” initiative, the NRTEE is working on a series of reports aiming to inform Canadian leaders on both the economic risks and the economic opportunities associated with climate change. The NRTEE recently released its report “Benchmarking Canada’s Competitiveness in a Low-Carbon World” which assesses Canada’s capacity to be competitive in a new global low-carbon economy, by comparing Canada to other G8 nations in areas such as emissions and energy, skills, investment, innovation and governance. In 2011, the NRTEE will publish the report “Policy Pathway for Global Low-Carbon Transition” which will provide policy recommendations necessary for Canada to thrive in a global low-carbon economy.¹⁶
- Sustainable Prosperity: a national research and policy network working on market-based approaches to build a stronger, greener economy. In June 2010, this group released a discussion paper entitled “Carbon Pricing, Investment, and the Low Carbon Economy”.
- The Pembina Institute produces research and recommendations with respect to different aspects of climate change, including sustainable energy solutions. In 2009, this group published a report entitled “Climate Leadership, Economic Prosperity” which demonstrates possible actions that Canada can implement to reach its 2020 target.
- The International Institute for Sustainable Development (IISD) is policy research institute specialized in sustainable development issues. They have published several reports on clean energy and climate changes issues, including “Climate Change and International Investment Agreements: Obstacles or opportunities?” (2010); “Clean Energy and Climate Action in North America: A North American Collaboration. Expert Dialogue Synthesis Report” (2010); and “North American Energy Relationships” (2009).
- Policy Research Initiative is a federal policy research organization specialized in emerging issues. In December 2009, this research group released a briefing note entitled “Transitions to a Sustainable Future: Opportunities for Transformational Change in Canada”. This group is currently working on the project “Pathways to a Low-Carbon Society” which seeks “to advance understanding of governance and institutional innovations which could best support Canada’s transition to a low carbon society that is sustainable, competitive and secure.”¹⁷
- The Winnipeg Consensus is a group of leaders from key think tanks that initiated in 2009 a national dialogue on the role of a clean energy policy in Canada and

opportunities emerging from a green economy. In April 2010, the group released the report “Towards a Canadian Clean Energy Strategy”.

- The Conference Board of Canada recently published “The Economic and Employment Impacts of Climate-Related Technology Investments”. This research organization has also created his Clean Energy Centre which aims to develop transition pathways toward a sustainable energy future.
- The EC3 Initiative is an organization that engages industry leaders in efforts to develop new project opportunities in Canada’s new green economy. This group published the report “Supporting Leadership Towards a Low Carbon Economy”.

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