

# Partners for Climate Protection

## Demonstrating Results: Municipal Initiatives for Reducing GHGs

National Measures Report 2009



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Cette publication est aussi disponible en français sous le titre *Des résultats tangibles : Initiatives municipales visant à réduire les gaz à effet de serre Rapport national sur les mesures 2009.*



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## Municipal action to reduce GHGs

Climate change touches every sector of the Canadian economy, and municipal governments are no exception. Municipal governments are in direct or indirect control of almost half of Canada's greenhouse gas (GHG) emissions, and their decisions on public transit, waste management, building energy performance, and land use planning greatly influence the amount of emissions produced in Canada.

In 2009, the FCM–ICLEI (Local Governments for Sustainability) Partners for Climate Protection (PCP) program gathered and analyzed data on initiatives implemented by municipal governments in Canada to reduce GHG emissions at the corporate and community levels and compiled them in a National Measures Database. The initiatives range from education campaigns to complete building retrofits for energy efficiency.

PCP collected data from 16 communities, including Canada's largest cities, represented by the Big City Mayors Caucus (BCMC), and a select group of PCP members. ICLEI also gathered data from various sources on 26 other municipal governments' activities and added this information to the database for analysis. The 42 municipalities that contributed to the database represent 38 per cent of the Canadian population. The database now includes more than 350 initiatives.

Energy and GHG emission reductions, direct costs, and cost savings were included in the analysis.

### About PCP

The PCP program is a partnership between the Federation of Canadian Municipalities and ICLEI — Local Governments for Sustainability. PCP is the Canadian component of ICLEI's Cities for Climate Protection (CPP) Campaign, which involves more than 900 communities internationally. In Canada, over 190 municipal governments are involved in the PCP program, which uses a five-milestone framework to guide communities in assessing and reducing greenhouse gas emissions.

## The results are in

The results of the analysis are clear: **municipalities are significantly reducing GHG emissions in Canada**, providing real solutions and leading the fight against climate change.

The cumulative annual GHG reductions reported by municipal governments is **1.4 million tonnes** — the equivalent of removing about **325,600 light vehicles** from the road. Municipalities are also proving that their influence goes far beyond their own operations: they have reported reducing GHGs by 308,100 tonnes within the industrial, commercial, institutional (ICI), residential and transportation sectors in their communities.

The initiatives implemented vary from million-dollar projects to low or no-cost initiatives. These municipal investments are already generating significant savings of tax-payers' dollars — over **\$56 million in savings** to date.

**Municipal governments are taking action to improve quality of life and air quality in their communities, and to reduce operating costs.**

## Participating municipalities

The following municipal governments submitted data to the database.

Municipality	PCP Member	BCMC	Municipality	PCP Member	BCMC
City of Dawson Creek, B.C.	×		Town of Markham, Ont.	×	
Township of Langley, B.C.	×		City of Mississauga, Ont.	×	×
City of Surrey, B.C.	×		Town of Newmarket, Ont.	×	
City of North Vancouver, B.C.	×		Town of Oakville, Ont.	×	
City of Vancouver, B.C.	×	×	City of Ottawa, Ont.	×	×
City of Victoria, B.C.	×		Town of Perth, Ont.	×	
Town of Banff, Alta.	×		City of Peterborough, Ont.	×	
City of Calgary, Alta.	×	×	City of Pickering, Ont.	×	
Town of Canmore, Alta.	×		City of Stratford, Ont.	×	
City of Edmonton, Alta.	×	×	City of Greater Sudbury, Ont.	×	
City of Grand Prairie, Alta.	×		Town of Richmond Hill, Ont.	×	
Town of Okotoks, Alta.	×		City of Toronto, Ont.	×	×
Town of Stony Plain, Alta.	×		Regional Municipality of Waterloo, Ont.	×	
City of Regina, Sask.	×		City of Windsor, Ont.	×	
City of Saskatoon, Sask.	×	×	City of Laval, Que.	×	×
City of Burlington, Ont.	×		City of Montréal, Que.	×	×
Town of Caledon, Ont.	×		City of Fredericton, N.B.	×	
Town of Collingwood, Ont.	×		City of Saint John, N.B.	×	
City of Guelph, Ont.	×		Municipal District of Clare, N.S.	×	
City of Hamilton, Ont.	×	×	Halifax Regional Municipality, N.S.	×	×
City of London, Ont.	×	×	City of Yellowknife, N.T.		

## Influencing factors

Municipal governments pursue GHG reduction initiatives based on their needs and preferences, and their commitment and capacity to invest in and to implement various programs. For example, the City of Ottawa has demonstrated a strong commitment to reducing emissions from its fleet operations by purchasing hybrid transit vehicles, while other municipalities have capitalized on smaller projects requiring less economic commitment. Ideally, money spent on mitigation initiatives should not only reduce emissions, but also benefit the community by improving infrastructure, increasing local job opportunities, supporting local businesses, and improving air quality and quality of life.



Photo: City of Ottawa

The City of Ottawa began purchasing hybrid-electric transit buses in 2008. In all, more than 175 such buses will be on Ottawa's roads by the end of 2010. An analysis by the National Research Council showed that the buses should reduce CO<sub>2</sub> emissions by about 30 per cent with a payback period of about six years.

## Reductions across Canada

Municipal governments in Ontario contributed the greatest number of initiatives to the database and reported the highest cost savings. Alberta and British Columbia followed Ontario in terms of the total number of initiatives reported. The highest reported total GHG reductions were from Nova Scotia, at 526,700 tonnes. This achievement was due, in part, to the implementation of several significant community waste reduction initiatives, such as a 50 per cent waste diversion program in one community and a citywide residential composting program in another.

### Reported GHG Reductions by Province and Territory

Province/Territory*	Number of measures	Investment (\$)	Savings (\$)	GHG reduction in tonnes (% of total)
British Columbia	38	\$2,045,400	\$3,917,500	5,200 (0%)
Alberta	104	\$20,888,900	\$6,909,600	510,700 (37%)
Saskatchewan	29	\$4,460,200	\$869,400	45,700 (3%)
Ontario	129	\$209,301,800	\$38,507,400	305,100 (22%)
Québec	9	\$3,520,000	\$2,858,600	500 (0%)
New Brunswick	8	\$230,700	\$1,064,700	4,700 (0%)
Nova Scotia	30	\$3,422,000	\$2,354,800	526,700 (38%)
Northwest Territories	1			0 (0%)
<b>Total</b>	<b>(+/- 350)</b>	<b>\$243,869,000</b>	<b>\$56,482,000</b>	<b>1,398,600</b>

\*No data were submitted for Manitoba, Prince Edward Island, Newfoundland and Labrador, Yukon or Nunavut.

## Top 10 initiatives to reduce GHGs

The top 10 GHG reduction initiatives submitted are highlighted below. These initiatives were selected based on the amount of GHGs reduced, and the completeness and verifiability of the data submitted. Investment costs and simple payback vary depending on the size and scale of the initiative.

Initiative	Municipality	Scope – sector*	Annual GHG reduction (t)	Annual cost savings (\$)	Investment (\$)	Simple payback (yrs)	Net present value (\$)	Internal rate of return (%)
Converting to Fine Bubble System (wastewater filtration technology)	City of Edmonton, Alta.	Corporate - Wastewater	6,000	300,000	2,500,000	8.3	5.5 million	11
Purchase of 202 hybrid transit buses	City of Ottawa, Ont.	Community - Transportation	5,000	2,109,000	197,648,000	16.8	18.4 million	4
Retrofits of six major facilities	City of Regina, Sask.	Corporate - Buildings	2,500	210,000	2,200,000	10.5	3.4 million	9
Energy-efficient school upgrades	City of Greater Sudbury, Ont.	Community - Institutional	1,300	469,000	250,000	0.5	12.3 million	180
Green Loan Program - A.C.T. Arena	City of Saskatoon, Sask.	Corporate - Buildings	1,280	33,000	250,000	7.6	630,347	13
Sportsplex refrigeration heat recovery	Halifax Regional Municipality, N.S.	Corporate - Buildings	270	15,000	18,000	1.2	382,158	80
Replacement of domestic hot water boilers and tanks	NorQuest College – Calgary, Alta.	Community – Institutional	194	23,400	33,000	1.4	591,246	68
Energy audits and retrofits	City of Mississauga, Ont.	Corporate - Buildings	167	50,000	300,000	6	38,722	16
Queen Street natural gas conversion	City of Fredericton, N.B.	Corporate - Buildings	55	2,070	16,500	7.9	93,945	12
Solar heating	City of Windsor, Ont.	Corporate - Buildings	40	5,900	63,450	10.7		8

\*The municipal **corporate** sector includes municipal buildings, streetlights, fleet vehicles, wastewater and government waste. Emissions reduction initiatives in this sector range from alternative fuels, to LED streetlights and LEED® building retrofits or new construction. The **community** sector includes the industrial, commercial and institutional (ICI) sector, the residential sector, the transportation sector and community waste. Emissions reduction initiatives in this sector range from landfill gas capture, district energy, hybrid buses, renewable energy and appliance replacement programs.

## Corporate emission reductions

Local governments operate many municipal facilities and large vehicle fleets, control waste removal services and provide street lighting to their communities. These activities use a significant amount of energy and generate a large amount of GHG emissions. To date, municipalities have reduced their corporate GHGs by 308,100 tonnes, with a cumulative savings of over \$17 million and related investment costs of roughly \$22 million.

### Corporate GHG Reduction Initiatives by Sector

Sector	Number of measures	Total investment (\$)	Annual cost savings (\$)	Annual GHG reduction in tonnes (% of total)
<b>Buildings</b>	96	15,192,200	8,234,000	215,300 (70%)
<b>Streetlights</b>	27	3,041,900	4,877,000	65,400 (21%)
<b>Fleet</b>	40	1,125,200	1,843,900	11,900 (4%)
<b>Water</b>	7	2,500,000	2,521,600	15,500 (5%)
<b>TOTAL</b>	<b>170</b>	<b>21,859,300</b>	<b>17,476,500</b>	<b>308,100</b>



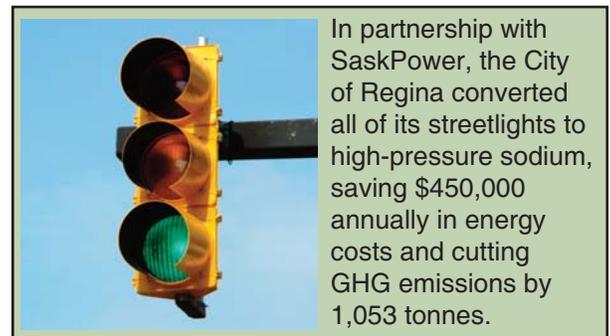
Photo: Township of Uxbridge

The City of Toronto retrofitted 89 of its indoor and outdoor arenas for energy and water efficiency. The retrofits save the city \$50,000 in annual costs and reduce annual GHG emissions by 3,680 tonnes.

Emission reduction initiatives in the **fleet** sector included switching from regular vehicles to alternative vehicles or fuels, purchasing bio-blended fuels or natural gas, purchasing hybrid vehicles<sup>1</sup>, encouraging alternative and active forms of transportation, and reducing fuel consumption by decreasing fleet sizes. The **water** and sewage sector initiatives focused on improving equipment and reducing demand for water, such as the installation of low-flow shower heads and toilets, as well as upgrading the equipment that pumps water to customers.

Municipal buildings often generate the largest amount of emissions for a local government, and offer great potential for emissions reductions. The initiatives within the **buildings** sector focused on increasing energy efficiency through energy retrofits and upgrades to lighting and equipment.

Emissions from street and public lighting are often high depending on the size of a population and geographic boundaries. The majority of the reported **streetlights** initiatives involved upgrading lighting technology, either by selecting LED or high-pressure sodium lamps or by altering ballasts, to reduce energy consumption.



In partnership with SaskPower, the City of Regina converted all of its streetlights to high-pressure sodium, saving \$450,000 annually in energy costs and cutting GHG emissions by 1,053 tonnes.

<sup>1</sup> Bio-blended fuels are derived from renewable plant or animal sources (as opposed to fossil fuels). The International Emissions Analysis Protocol (IEAP) considers this type of combustion carbon-neutral, based on the complete life cycle of the renewable source used for the fuel. For example, a B20 diesel would only account for the 80 per cent of petrol diesel used, not the 20 per cent bio portion.

## Community emission reductions

Community initiatives to reduce emissions include those related to residential waste, energy consumption, personal transportation and others throughout the industrial, commercial and institutional (ICI) sectors.

Canadian municipal governments and their partners reported a cumulative reduction within the community sector of over one million tonnes of GHG emissions. Over 180 community initiatives were reported, with over \$221 million invested in their implementation. This includes money from all sectors, as well as external funding sources.

### Community GHG Emission Reduction Initiatives by Sector

Sector	Number of initiatives	Investment (\$)	Annual savings (\$)	Annual GHG reduction tonnes (% of total)
Residential	22	749,000	2,752,100	12,700 (1%)
Transportation	66	198,970,200	2,186,700	69,100 (6%)
Commercial	15	2,218,000	25,679,800	214,700 (20%)
Industrial	18	0	1,747,700	17,400 (2%)
Institutional	10	10,433,500	628,000	2,200 (0%)
Waste	31	9,364,700	5,419,300	735,300 (67%)
Other	19	200,000	622,700	39,300 (4%)
<b>Total</b>	<b>181</b>	<b>221,935,400</b>	<b>39,036,300</b>	<b>1,090,700</b>

The **residential** sector includes initiatives undertaken by homeowners and renters to reduce emissions. Reported initiatives include reducing dependence on electricity and natural gas used to cool and heat homes, to run appliances or equipment, and to generate hot water. The annual cost savings reported in the residential sector was \$280 per tonne of GHG emissions.

Municipal governments reported the greatest number of their emission reduction initiatives in the **transportation** sector. These initiatives include education campaigns, such as active transportation and work-based challenges, anti-idling programs and encouraging citizens to use more active modes of transportation and public transit.

**Commercial** measures focused on improving the energy efficiency of commercial buildings through equipment and lighting retrofits. The **industrial** sector's initiatives demonstrated various types of cogeneration, using alternative energy to heat and cool buildings, and purchasing renewable energy.

Initiatives in the **institutional** sector aimed to decrease energy consumption and improve energy efficiency through school retrofits, replacement and improvement of lighting for increased efficiency, replacement of chillers, and other initiatives.



The Greater Sudbury Housing Corporation installed a Solar Wall™ at a 250-unit high-rise. Perforated panels were added to one wall of the building. When sunlight hits the cladding, ventilation fans draw solar-heated air through the perforations to heat the building. The project saves more than \$23,000 annually in energy costs and cuts GHG emissions by 108 tonnes.

Many municipal governments are also responsible for waste collection, disposal and landfill operations. By implementing measures that reduce the volume of waste going to landfills, municipalities have the opportunity to significantly reduce GHG emissions. The majority of the initiatives in the **waste** sector were diversion initiatives involving recycling programs and curbside composting.

## Other measures

Several municipal governments purchased or generated their own renewable energy, including wind, solar and photovoltaic power. These types of measures feed clean power back into the provincial grids, generating a cleaner energy mix for all customers using power from the grid.

A number of municipalities also reported tree-planting initiatives. Trees improve air quality as they grow by sequestering carbon dioxide from the atmosphere.

Municipal governments developed official and master plans to influence the design and use of land across the geopolitical boundaries of the municipality. Many PCP members also participated in Earth Hour.



Grande Prairie, Alberta, piloted a four-kilowatt wind turbine project, while the Town of Caledon, Ontario, purchased 650,000 kWh of renewable energy between 2006 and 2009, reducing GHGs by approximately 200 tonnes.

## Next steps

FCM and ICLEI – Local Governments for Sustainability will continue to collect and report on GHG reduction initiatives to assess the impact PCP members are having in reducing GHG emissions and combating climate change. This, in turn, will help municipal governments and communities across the country to share their ideas and solutions, and build their capacity to track, measure and report on their achievements.