FCM

Federation of Canadian Municipalities

Fédération canadienne des municipalités

Act Locally

The Municipal Role in Fighting Climate Change

Prepared for the
Federation of Canadian Municipalities
by
EnviroEconomics

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Since 1901
Depuis 1901

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1. Executive Summary

Municipalities can play a key role in helping Canada meet commitments for both significant and long-term greenhouse gas (GHG) emission reductions. Municipal leadership in this area is already contributing substantial and cost-effective GHG emission reductions in every region of the country. The Federation of Canadian Municipalities (FCM) asked EnviroEconomics to summarize what municipalities have accomplished in terms of reducing GHG emissions and to estimate the potential for municipalities to achieve future emission reductions.

Municipal governments currently have direct or indirect control over approximately 44 per cent of GHG emissions in Canada. In 2006, this represented control over 315 megatonnes (Mt) of carbon dioxide equivalent (CO_2e), of a national total of 718 Mt.

The government of Canada has set a target to reduce emissions to 20 per cent below 2006 levels by 2020. However, if projects are to continue business as usual, municipal emissions are projected to rise to 388 Mt in 2020, an increase of 23 per cent, that is, if no new policies are put in place to address these emissions. Fortunately, there is a significant stock of untapped local, community-based emission reduction opportunities that are ready to be implemented using proven, cost-effective technologies. It is estimated that municipalities have the potential to supply between 20 and 55 Mt of emission reductions, equivalent to 15 to 40 per cent of Canada's 2020 emission reduction target.

A major advantage of investing in local, community-based emission reductions is that they can be achieved at a low cost. Over one quarter of these emission reductions can provide a neutral or even positive return on investment (i.e., less than $0/tonne reduced), even without the implementation of a carbon price. More than two thirds of emission reductions can be achieved at a cost of less than $25/tonne reduced (which is at the low range of projected carbon prices, bringing these types of reduction projects to a neutral or positive return on investment). All of the emission reductions are projected to cost less than $75/tonne reduced, which is still significantly less than the projected cost of competing options such as carbon capture and storage. Lastly, local, community-based emission reduction projects not only improve the environment, but also have significant health, social and economic co-benefits that would be felt across the country.

Municipal governments are fundamental to achieving local, community-based emission reductions since they have significant influence on development and land-use decisions that shape the pattern of energy use within communities. Municipal governments are also the order of government that is the closest to citizens and can most easily engage households and businesses to implement local projects to reduce GHG emissions. Municipal governments can affect GHG emissions as a regulator, facilitator, partner, program deliverer and educator.

Municipal contributions to Canada's GHG reduction objectives must be considered an essential element to achieving long-term and cost-effective emission reductions. A strategic approach, led and in part funded by the Government of Canada, is required in order to maximize this potential and ensure that more progress is made in achieving emission reductions in the next decade.

2. Introduction

Municipalities play a key role in helping Canada meet commitments for both significant and long-term greenhouse gas (GHG) emission reductions. Actions taken by municipalities are already contributing substantial and cost-effective GHG emission reductions. The Federation of Canadian Municipalities (FCM) asked EnviroEconomics to summarize what municipalities have accomplished in terms of reducing GHG emissions and to estimate the potential for municipalities to achieve future emission reductions.

This report attempts to address the following four key questions:

1. ***What impact do municipalities have on GHG emissions?*** That is, how extensive are municipal GHG emissions compared to total national emissions? To answer this question, we reviewed the *Municipalities Table*, the most recent Environment Canada national GHG emission inventory and the energy outlook database available from Natural Resources Canada. We excluded specific sectors, such as the agricultural and primary industrial sectors, where municipalities exert little influence on GHG emissions.
2. ***What have municipalities done to date?*** A summary of GHG emission reductions undertaken by municipalities in recent years was prepared using the Partners for Climate Protection (PCP) *Measures Report 2009* and GHG emission reduction database.
3. ***How much more can municipalities do to reduce GHG emissions and at what cost?*** Based on the data available from the PCP database, the *Municipalities Table* and additional cost data from published literature, we determined the potential magnitude of different options for municipal GHG emission reductions and their relative cost.
4. ***Why should we invest in local, community-based GHG emission reduction initiatives?*** In this section, we summarize results of our study and identify advantages of investing in municipal GHG emission reduction initiatives and potential barriers.

3. What impact do municipalities have on GHG emissions?

Municipal governments currently have direct or indirect control over approximately 44 per cent of national greenhouse gas (GHG) emissions in Canada. In 2006, this represented control over 315 megatonnes (Mt) of carbon dioxide equivalent (CO_2e), of a total of 718 Mt.

Municipal governments, through their own operations and decision-making powers, have a major impact on the pattern of urban and rural development, transportation, economic activity and consumption of energy resources. As a result, municipalities have both *direct* control and *indirect* control over how, where and to what extent GHG emissions are produced:

- GHG emissions under the *direct* control of municipalities include those that arise directly from providing municipal services and operating municipal buildings, fleets and facilities.
- GHG emissions under *indirect* control include those emissions where municipalities play a significant role in determining the level of emissions through municipal planning, public transit access and policy mechanisms, such as building codes and land use regulations, for example, development charges and zoning requirements.

In this respect, municipalities shape how GHG emissions are generated through land-use practices, spatial distribution of the economy, transportation systems and the energy efficiency of the community building stock.

3.1 Estimating the current local, community-based GHG emissions footprint

In the *Municipalities Table* prepared by federal, provincial and territorial stakeholders in 1999,[1] it was estimated that municipalities maintained direct and indirect control over approximately 60 per cent of total national emissions or 360 Mt in 1990. Table 1 provides a breakdown of Canada's GHG emissions that were estimated to be under the direct or indirect control of municipal governments in 1990.

1 Canada's National Climate Change Implementation Process. Municipalities Table Options Paper Final Report. December 1999.

Table 1: Community Greenhouse Gas Emissions in Canada under the Direct Control, Indirect Control or Influence of Municipal Governments, 1990

GHG Emission Type	End Use Sector	Megatonnes (Mt) of CO_2e in 1990
Direct Control	Municipal Operations	4
	Landfill Gas[2]	18
	The Management of Residential Waste[2]	16
	Sub-Total	**38**
Indirect Control and Influence	The Management or Influence over Industrial, Commercial and Institutional Waste[2]	48
	Residential Buildings	84
	Commercial and Institutional Buildings (excluding municipal)	49
	Industry (excluding primary industries)	31
	Personal and Freight Transportation (excluding, rail, marine and off-road)	110
	Sub-Total	**322**
Total Municipal Government Direct Control, Indirect Control and Influence		**360**

Reproduced from Canada's National Climate Change Implementation Process. Municipalities Table Options Paper Final Report. December 1999.

Taking into account the adjustments made in Table 2 in order to ensure no double-counting,[2] we estimate that approximately 45 per cent of national GHG emissions in Canada or 266 Mt were under the direct or indirect control of Municipal Governments in 1990. In 2006, which is the most recent year for which full data is available, we estimate that 44 per cent or 315 Mt of national GHG emissions in Canada were under the direct or indirect control of municipal governments.

3.2 Looking to the future: Municipal GHG emissions footprint in 2020

We used Canada's energy and GHG emissions projections to estimate business-as-usual (BAU) municipal emissions in 2020. The BAU emissions are estimated to be 388 Mt in 2020, an increase of 23 per cent from 2006. Table 2 summarizes emissions by the municipal end-use sectors included in the analysis from 1990 to 2020. Figure 1 illustrates these municipal emissions relative to total national GHG emissions.

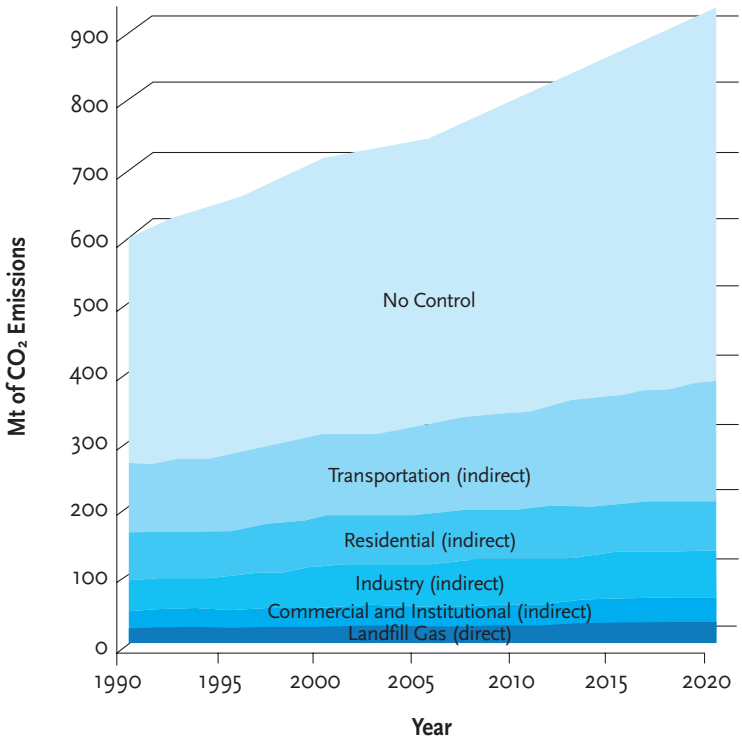
2 It is important to note that emissions from the management of residential waste (16 Mt) and industrial, commercial and institutional wastes (48 Mt) in Table 1 are related to the fossil fuels used to produce primary goods or manufactured goods, and not GHG emissions as a result of the disposal or treatment of waste. As such, we have not included a separate category associated with waste recovery and recycling measures since their impact is implicitly included in changes to the energy demands of commercial and industrial buildings or in the emissions of primary industries (that have been excluded because they are regulated under the *Canadian Environmental Protection Act*.) In fact, it is extremely difficult to ensure that there is not double counting of emission reductions projected from waste recovery and recycling measures with other measures that are implemented. However, it must be recognized that waste recovery and recycling measures have a strong potential to reduce GHG emissions from buildings and primary industries and are an essential component to an overall strategy to reduce municipal GHG emissions. In Table 2, direct emission reductions from reducing the amount of organics going to landfill are included in the landfill gas capture and utilization category.

Table 2: GHG Emissions in Canada under the Direct Control, Indirect Control or Influence of Municipal Governments (1990, 2006 and 2020)

GHG Emission Type	End Use Sector	Megatonnes (Mt) of CO_2e		
		1990	2006	2020 (forecast)
Direct Control	Municipal Operations	3.3	4.0	4.9
	Landfill Gas and Waste Management	18.0	20.0	25.9
	Sub-Total	**21.3**	**24.0**	**30.8**
Indirect Control and Influence	Residential Buildings	69.2	70.1	78.1
	Commercial and Institutional Buildings (excluding municipal)	45.4	57.4	65.0
	Industry (excluding primary industries)	31.8	30.8	39.6
	Personal and Freight Transportation (excluding, rail, marine and off-road)	98.4	133.2	174.2
	Sub-Total	**244.8**	**291.5**	**356.9**
Total Municipal Government Direct Control or Indirect Control		**266.1**	**315.5**	**387.7**

Source: 3, 4, 5

Figure 1: BAU Emissions in Canada Including End-use Emissions that Are under the Direct or Indirect Control of Municipal Governments (1990 to 2020)



3 Environment Canada. April 2008. *National Inventory Report. 1990–2006. Greenhouse Gas Sources and Sinks in Canada*. The Canadian Government's Submission to the UN Framework Convention on Climate Change

4 Natural Resources Canada. September 2008. *Energy Use Data Handbook*.

5 Government of Canada. March 2008. *Turning the Corner: Canada's Energy and GHG Emissions Projections*. Reference case: 2006–2020.

3.3 Canada's national GHG reduction obligations

As of 2006, Canada's total GHG emissions were 718 Mt, with local community emissions under direct or indirect municipal control accounting for 315 Mt. The remaining sectors include GHG emissions from primary industries; rail, marine and aircraft transportation; and agriculture. The government of Canada has a target to reduce emissions to 20 per cent below 2006 levels by 2020, which is equivalent to 575 Mt. This will require participation from all sectoral areas to achieve.

4. What have municipalities done to date to reduce GHG emissions?

Although municipalities have begun to develop plans to reduce municipal greenhouse gas (GHG) emissions, there has been only limited action when compared to the large potential that exists. For example, 40 municipalities in FCM's Partners for Climate Protection Program have reported implementing 345 GHG emission reduction measures since 1990. These measures contribute more than 1.3 Mt of GHG emission reductions annually—a very small total contribution toward Canada's targeted reductions. However, what is reported does not represent the whole picture, or the full potential of municipal contributions.

4.1 Setting the stage

Over the last two decades, municipal governments across Canada have played an active role in identifying opportunities and implementing initiatives and programs to reduce GHG emissions. One example is the participation of municipal governments in FCM's Partners for Climate Protection (PCP) Program. This national network commits municipalities to reduce GHG emissions in their own operations and within their community boundaries. Membership in PCP has increased significantly over the years and today 194 municipalities, representing over 78 per cent of the Canadian population, are included in the network. Table 3 summarizes the overall level of participation in PCP and progress toward meeting milestone commitments.

While it is clear that many municipalities have become engaged by committing to GHG emission reductions, Table 3 also indicates that only a small number of them have begun implementation of a comprehensive set of emission reduction initiatives.

Municipalities can undertake many different types of measures or actions to reduce GHG emissions. In general, these measures can be divided into the following categories, with the first two falling directly within municipal control, and the remainder under mainly indirect municipal control:

Table 3: Participation of Municipalities in Partners for Climate Protection Program

Milestones	# of Municipalities	Canadian Population Represented (%)
Membership	194	78%
Set an emission reduction target	52	41%
Develop a local action plan	41	34%
Implement the local action plan or set of emission reduction initiatives	13	12%

1. **Municipal Operations**. Emission reductions related to the improvement in energy efficiency of buildings, fleets and facilities operated directly by a municipality.
2. **Solid Waste**. Emission reductions related to capture of landfill gas at landfill sites and from the use and recycling of materials that would otherwise be permanently disposed of.
3. **Buildings**. Emission reductions through construction and retrofit of energy-efficient private buildings, implemented through federal, provincial/territorial and/or municipal guidelines, zoning bylaws, energy codes or incentives.
4. **Transportation and Land-Use**. Emission reductions achieved by reducing private and commercial vehicle trips or vehicle kilometres travelled through urban design and planning initiatives, as well as supportive federal, provincial/territorial and/or municipal regulations such as changes to tax codes or the implementation of user fees.
5. **Energy Systems**. Emission reductions achieved through the implementation of privately or publicly owned community energy systems or the acquisition of renewable energy.

4.2 Implementing action plans

The PCP Program has developed a database and prepares reports aimed at quantifying emission reductions resulting from municipal and community measures that have been implemented in recent years.[6] We reviewed the latest report and database, *Measures Report 2009*, completed in summer 2009, to better define what types of projects were being implemented, the quantity of GHG emissions that have been avoided as a result and the relative cost of different types of measures (the full report is available at http://gmf.fcm.ca/Partners-for-Climate-Protection/).

Table 4 summarizes the results of our analysis of over 350 specific mitigation measures implemented by more than 40 municipalities, as reported in *Measures Report 2009*. These municipalities include most of the largest municipalities in Canada and a representative sample of small municipalities. Of course, while PCP member municipalities are likely to be more active in implementing GHG emission reduction initiatives than most municipalities, municipalities that are not members of PCP are undertaking their own GHG reduction activities, which are not captured or reported in *Measures Report 2009* or in Table 4 on page 7.

The annualized cost of emission reductions, expressed as dollars per tonne of carbon dioxide equivalent reduced ($/t$CO_2$e), are based on the estimated project lifetime and include all costs such as capital investment, operating and maintenance, and program and administration, as well as all direct savings including energy savings and operational savings. All costs have been converted to CAN2009$, based on a discount rate of 10 per cent and Statistics Canada's consumer price index.

Annualized costs are engineering costs and do not reflect behavioural influences that drive technology choice. As such, the social costs to change behaviour and deploy technologies are most likely higher than the costs presented here. For example, if a technology will generate sufficient returns over its life to pay for its

Low hanging fruit: Landfill gas capture

Landfill gas (LFG) recovery is of particular interest because it can offer substantial emission reductions. It is estimated that 47 LFG recovery projects were active in Canada in 2006. These projects alone captured over 0.3 Mt of landfill methane, with about half of the methane being flared and the other half being used for heating and electricity applications. This activity contributed over 6.43 Mt of GHG emission reductions in 2005 and represents a reduction of 1.62 Mt compared to 1999 levels.[7] This is more than the total amount of emission reductions reported in Table 4.

Given that there are over 800 active landfills in Canada and at least 100 major landfills, the potential to implement more projects is large, although many smaller landfills do not generate enough methane for recovery to be economically feasible. It is estimated that the capital investment costs for landfill gas capture and utilization projects in Canada will cost between $250 and $400 million in order to achieve an additional 6.5 Mt of reductions annually.

6 FCM. 2009. *Measures Report 2009*. Prepared for FCM's Partners for Climate Protection Program by ICLEI Canada.

7 Methane to Markets Partnership Landfill Subcommittee Country-Specific Profile and Strategic Plan for Canada, Methane to Markets 2006, accessed November 10, 2009: http://www.methanetomarkets.org/m2m2009/documents/landfills_cap_canada.pdf

Table 4: Cumulative Annual Emission Reduction Measures by Category (2009)

Membership Category	Description of Measures	Number of Measures Implemented	Measures with Quantifiable Reductions (% of Total)	Annual Reductions Achieved (Mt CO_2e)	Estimated Cost of Reductions ($/$CO_2e$)[1]
Municipal Operations	Building retrofits and energy efficiency, streetlight replacement, low-emission vehicles and fuels	176	78%	0.277	-$13 to $8 (average -$5)
Solid Waste	Waste reduction, composting, recycling, methane flaring, capture and cogeneration	31	48%	0.803	$4 to $28 (average $11)
Buildings	Building retrofit and energy efficiency, on-site energy generation, educational programs	66	58%	0.150	-$90 to $40 (average -$22)
Transportation and Land-Use	Public transit, transportation planning, transportation demand management, low-emission vehicles and fuels	66	23%	0.069	$-10 to $75 (average $30)
Energy Systems	Acquisition of renewable energy, deep lake water cooling	5	40%	0.011	-$30 to $80 (average $24)
TOTAL		**344**	**61%**	**1.31**	**-$11 to $28 (average $5)**

Note: [1]Estimated annualized costs ($/tonne reduced in 2009$) are based on similar projects and not necessarily the projects indicated.

implementation, depicted as a negative cost below, then one could ask why this technology has not been deployed. The answer has much to do with barriers, such as a lack of incentives for tenants that don't pay energy bills, long payback periods and decisions influenced by custom and lack of information on emission reduction options. This then points to an area where policy needs to address barriers so that socially preferred outcomes are obtained. As such, these costs should be viewed as lower than needed in order to achieve the reductions presented.

Another important consideration is that annualized costs for specific types of projects, such as building retrofits, can vary considerably. This is why ranges are provided in Table 4. We have tried to factor in uncertainty through estimating average values based on ranges.

5. What more can municipalities do to reduce GHG emissions and at what cost can these reductions be achieved?

There is a large untapped potential to reduce municipal greenhouse gas (GHG) emissions and these reductions can be achieved at a low cost compared to other mitigation options. Direct and indirect municipal emission reductions have the potential to provide 20 to 55 Mt of emission reductions, accounting for 15 to 40 per cent of Canada's reduction target based on 2006 emission data.

The *Municipalities Table* prepared by federal, provincial/territorial governments and other stakeholders in 1999[8] estimated that a group of 29 GHG reduction measures had the potential to reduce annual GHG emissions by 20 to 55 Mt from a business-as-usual (BAU) scenario over the current decade (i.e., 2000 to 2010).

Only a very small proportion of this identified potential has been achieved to date, and as a result, there is considerable opportunity in all the municipal reduction categories, including municipal operations, solid waste, buildings, transportation and energy systems. Estimates drawn from *Measures Report 2009* of emission reductions from 40 municipalities in Canada over the last 10 years indicate that municipal emission reductions have risen to about 1.3 Mt annually.[9] Total municipal emission reductions for all municipalities likely exceed this amount substantially. However, trends in municipal emissions, as shown in Figure 1 on page 5, indicate that it is unlikely that more than approximately 10 Mt of municipal emission reductions from the baseline have been achieved annually to date.

Based on the estimates of the costs of many of the measures that have been implemented, further substantial emission reductions can also be achieved at reasonable cost or even in some cases at negative cost. Figure 2 presents a cost abatement curve of potential emission reductions that could be implemented by municipalities over the next decade. The costs provided are estimated average values and individual project costs may vary considerably.

Figure 2 demonstrates that municipalities are key to achieving large and low-cost emission reductions, in partnership with federal and provincial/territorial governments. The total potential of all municipal options to achieve emission reductions relative to a 2006 baseline is estimated at 48 Mt. Over one quarter of these emission reductions can provide a neutral or positive return on investment (i.e., less than $0/tonne reduced) even without the implementation of a carbon price. More than two thirds of emission reductions can be achieved at a cost of less than $25/tonne reduced. All of the emission reductions are projected to cost less than $75/tonne reduced, which is still significantly less than the projected cost of carbon capture and storage.

Each bar in the cost abatement curve represents one group of closely related options that could be implemented in local communities, led by municipalities in partnership with and with support from other orders of government. The height of the bar on the y-axis indicates the average cost of avoiding emission reductions. Negative costs below the horizontal axis indicate a net benefit or savings to the economy over the lifetime of the option. All options were based on a capital discount rate of 10 per cent. The width of the bar represents the total potential amount of CO_2e that could be reduced annually if the option was fully implemented.

As discussed above, it is important to note that negative annualized costs do not necessarily mean that they will be implemented without additional support and funding. Individual businesses and households generally require payback periods that are substantially shorter than may be acceptable to society as a whole. Also, there will be barriers to implementation that are non-monetary in nature, with preferences and behaviour influencing technology choice.

8 Canada's National Climate Change Implementation Process. Municipalities Table Options Paper—December 1999. Final Report.

9 FCM. 2009. *Measures Report 2009*. Prepared for FCM's Partners for Climate Protection Program by ICLEI Canada.

Figure 2: Cost Abatement Curve of Municipal Emission Reductions

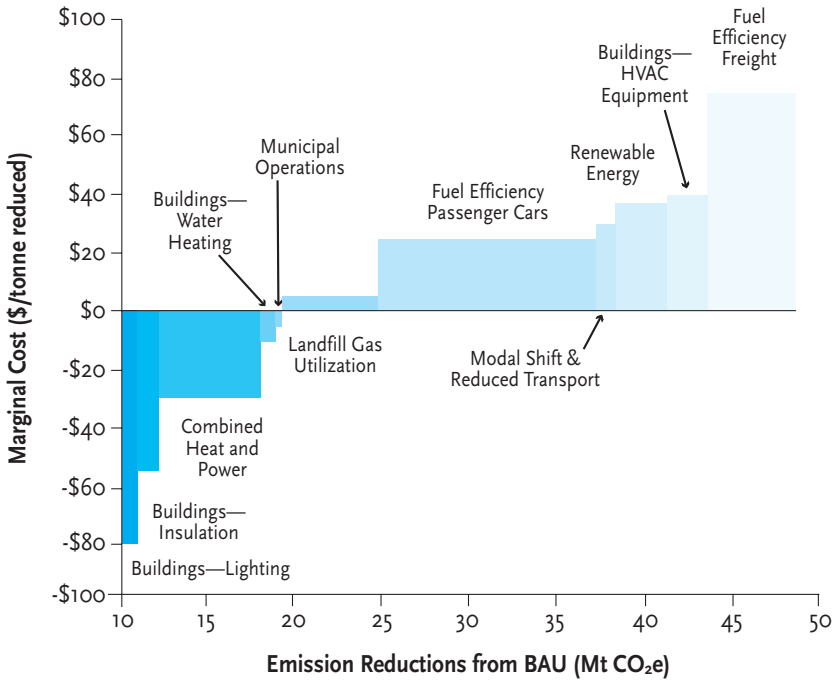
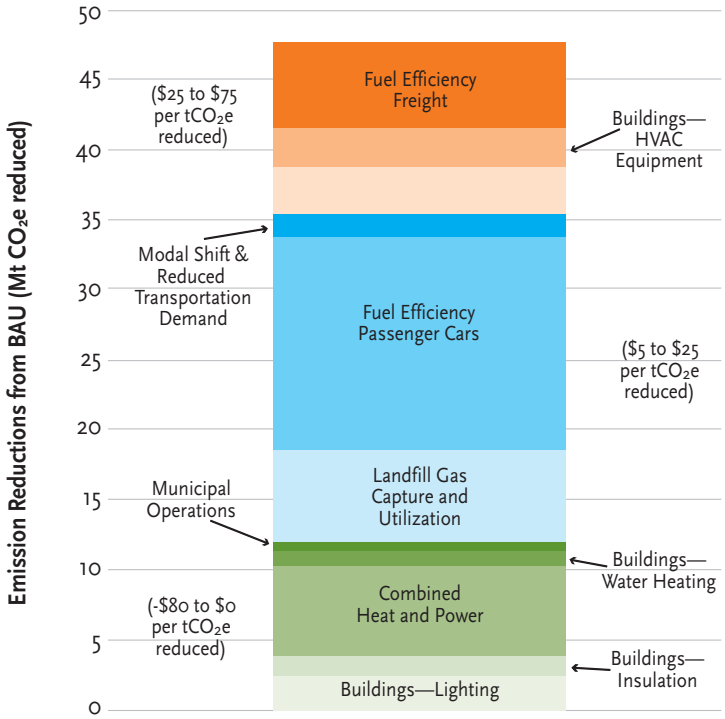


Figure 3 expresses the municipal emission reductions in the form of a bar chart and groups different measures within specific cost ranges.

Figure 3: Municipal Emission Reductions and Associated Costs



Barriers to full GHG potential: Municipal fiscal challenges

As a result of the pressures of urbanization and offloading, Canada's municipal governments are providing much more than their traditional responsibilities of basic services to property. These new municipal "responsibilities" include everything from immigrant-settlement programs, to affordable housing, to emergency preparedness and, in some jurisdictions, even daycare.

However, municipal governments lack the resources and fiscal tools they need to meet these new responsibilities. They are largely dependent on the property tax, a regressive and unresponsive revenue source, and user fees. They are facing a fiscal squeeze, caught between a growing range of responsibilities and inadequate financial resources.

The numbers tell the story: currently, 50 cents of every tax dollar collected in Canada go to the federal government, while 42 cents go to provincial/territorial governments. Municipal governments are left with just 8 cents of every tax dollar. This fiscal imbalance affects not only urban centres, but also rural and northern communities that, with small and often shrinking populations, must try to make ends meet with limited economies of scale and rising service expectations.

Federal investments in GHG reduction

In its March 2007 Budget, the federal government announced a transfer of $1.5 billion to provincial and territorial governments under the Clean Air and Climate Change Trust Fund. Environment Canada's Climate Change Plan states that the Trust Fund is expected to reduce GHG emissions by 16 Mt annually from 2008 through 2012.

In 2007, total financing for increased energy efficiency was $174 million, including expenditures for research and program development. In comparison, Budget 2009 provides $1 billion over five years to support clean energy technologies, including $150 million over five years for research, and $850 million over five years for the development and demonstration of technologies such as large-scale carbon capture and storage projects.

Since 2006, the federal government has provided $375 million to support the development of carbon capture and storage technologies. An additional $125 million is available for carbon capture and storage projects under the ecoENERGY Technology Initiative of Natural Resources Canada.

6. Recommendations: Why Canada should invest in municipal GHG emission reductions

Municipal governments are fundamental to achieving the local, community-based emission reductions projected in figures 2 and 3 since they have significant influence on development and land-use decisions that shape the pattern of energy use within communities. Municipal governments are also the order of government that is the closest to citizens and can most easily engage households and businesses to implement projects to reduce greenhouse gas (GHG) emissions. Municipal governments can affect GHG emissions as a regulator, facilitator, partner, program deliverer and educator.

6.1 Rationale for investing in local, community-based GHG emission reduction initiatives

1. **Significant emission reductions are ready to go**. A significant stock of untapped municipal emission reduction opportunities is ready to be implemented using proven technologies. This will enable Canada to get moving and push toward achieving our national commitments. Municipalities have the potential to supply between 20 and 55 Mt of emission reductions. This is equivalent to 15 to 40 per cent of Canada's 2020 emission reduction target of 20 per cent below 2006 emissions.
2. **Local, community-based emission reductions are low cost**. About 13 Mt of local, community-based emission reductions are estimated to be achievable at negative lifecycle costs (i.e., costs of less than $0/tonne reduced). More than 34 Mt of reductions can be achieved at costs of less than $30/tonne of Co_2 equivalent (tCO_2e). This compares favourably to the estimated cost of emission reductions in other sectors, such as primary industrial sectors, and well below the likely cost of carbon capture and storage (CCS), which remains above $100/$tCO_2e$ for most applications. The least expensive renewable energy technologies today such as wind, solar and biomass typically exceed $40/$tCO_2e$.

3. **Significant health benefits accompany municipal GHG actions**. Reducing GHG emissions can lead to improvements in local air quality, thereby avoiding significant health impacts and costs from fossil fuel emissions. Given human population concentrations in municipalities, the health benefits would likely be more important than those from industrial facilities in remote areas.
4. **Significant social and economic benefits accompany local, community-based actions**. Implementation of many of these GHG emission reduction initiatives can create local jobs, improve quality of life and community economic development and competitiveness, and enhance the skills of the local workforce. Reducing energy requirements for housing, buildings and transportation can lower operating costs for companies and households.
5. **Lower municipal operating costs**. Energy efficiency measures implemented for municipal operations can also lead to substantial operational cost savings. This then frees up important resources that can be redeployed to satisfy other municipal public service objectives. In addition, addressing GHG/energy issues at a municipal level allows for targeted action plans that address the unique energy profiles of the specific community. Federal and provincial/territorial legislation needs to be flexible yet support local action plans.

6.2 Barriers and challenges to maximizing the municipal potential

Realizing the full municipal potential for GHG emission reduction is not a given, and several barriers exist, both at the local, as well as national or regional levels.

Federal and provincial/territorial challenges and barriers:

1. **No carbon price in Canada**. The lack of a national policy to drive expectations is a significant hindrance to action. Without an effective price signal, action will continue to lag. Encouraging the federal government to take more concrete action would enable municipalities to plan actions that align with federal policy.
2. **Legislative barriers**: Municipal governments must operate within a framework of legislation that is set by each province and territory, which may inhibit the implementation of some GHG reduction measures. Barriers here could be reviewed and opportunities identified that enable municipalities to take action.

Municipal challenges and barriers:

1. **Spending to avoid longer-term costs**. Municipalities often have limited access to capital to make long-term investments, or the cost of acquiring capital is too high even when payback periods are relatively short. This needs to change since municipal capital decision making needs to reflect longer-term payback periods.
2. **Planning for action**. Many municipalities are organizing local action plans to determine the most viable emission reduction opportunities. However, many other municipalities have yet to begin. Without an initial assessment of key opportunities, costs and benefits and the necessary resources, action will be slow. The Partners for Climate Protection (PCP) Program plays a valuable role in this area by supporting municipal planning efforts with best practices and peer learning opportunities.
3. **Budgeting and financial reporting challenges**. Many corporate municipal measures are profitable and require only incentives rather than new investment or subsidy. Budgeting procedures within municipal governments can inhibit implementation since often they consider energy saving projects as part of operating rather than capital budgets. These projects, therefore, don't receive the investment they deserve. In addition, energy budgets are typically centrally managed and therefore energy costs are often not visible to the user.

Municipal contributions to Canada's GHG reduction objectives must be considered an essential element to achieving long-term and cost-effective emission reductions. A strategic approach, led and in part funded by the Government of Canada, is required in order to maximize this potential and ensure that more progress is made in achieving emission reductions in the next decade.

Urban Transit

An efficient urban transportation network is pivotal to the success of any city—for business investment and growth as well as environmental sustainability. As Canadians struggle to cope with environmental problems and congestion on city streets, urban transit systems reduce greenhouse gas (GHG) emissions, improve air quality, promote densification and enhance overall quality of life of Canadians, while providing an affordable and accessible means of transportation for many households.

However, urban transit requires significant capital and operating revenue assistance beyond what can be supported by property taxes and transit fares. What is needed is a commitment by the Government of Canada to long-term funding of public transit. According to the Canadian Urban Transit Association (CUTA), transit systems in Canada need $40.1 billion over the next five years to rehabilitate, replace and expand existing systems to accommodate the growing numbers of public transit users. A recent public opinion survey found that 73 per cent of Canadians believe the federal government is not doing enough to support local transit infrastructure.

Urban transportation networks are the backbone of economically competitive, vibrant, liveable and sustainable cities. They provide the foundation for communities to improve land-use planning, promote densification, integrate energy systems and change behaviours, and they are key to any urban municipal GHG reduction strategy.

ANNEX: Community GHG Reduction Projects

Examples
November 28, 2009

City of Regina Street Light Retrofit

To date, the City of Regina's corporate greenhouse gas (GHG) emissions have been reduced through a series of operational improvements, including converting street lights to high-pressure sodium vapour, in partnership with SaskPower. The street light retrofit resulted in an annual cost savings of $450,000 and a savings of 1.3 million kilowatt hours; the annual GHG reduction of this measure is 1,053 tonnes.

Town of Caledon Bylaw Hybrid Vehicle Pilot Study

In 2007, the Town of Caledon, Ontario purchased a hybrid vehicle to join its corporate fleet of service vehicles. The hybrid, used for bylaw enforcement, is a fuel-efficient and environmentally friendly option that upholds the town's commitment to promoting environmental responsibility and awareness in a publicly visible way. The town is experiencing an annual cost savings of $13,735 (for overall operating costs reported by the local government) with resource savings of 1,473 litres of gasoline.

City of Greater Sudbury Solar Wall Installation

The installation of a 569-square-metre solar wall at a Greater Sudbury Housing Corporation 250-unit high-rise dramatically increases the efficiency of the building's heating system. The solar wall technology provides a low-cost, high-value option for reducing on-site energy consumption that produces warm air. The City of Greater Sudbury reports that this measure has resulted in an annual cost savings of $23,600 and annual resource savings of 600,555 kilowatt hours; the annual GHG reduction is 108 tonnes.

City of Greater Sudbury Energy-Efficient School Upgrades

In the City of Greater Sudbury, the Conseil Scolaire Catholique du Nouvel-Ontario (CSCNO) has upgraded schools with high-efficiency (98 per cent) natural gas condensing boilers, heat recovery ventilation systems, windows and motion sensors. Since 2002, 25 schools have undergone retrofits of varying degrees. The City of Greater Sudbury reports that this measure has resulted in annual costs savings of $469,000 and resource savings of 1.53 million kilowatt hours of natural gas. The annual reduction in GHGs is 1,300 tonnes.

City of Surrey Single-Stream Recycling Program

In 2009, the City of Surrey, B.C. began residential single-stream curbside recyclables collection. The city's new recycling processing facility allows residents to place all of their recyclable materials into one blue box. This has increased ease of use and the volume of material recycled and has significantly reduced daily trips by collection vehicles. The City of Surrey reports that this measure has resulted in an annual cost savings of $1.72 million and annual resource savings of 160,400 litres of diesel fuel; the annual GHG reduction of single-stream recycling is 435 tonnes.

City of Ottawa Alternative Fuel Mix

In a City of Ottawa pilot study, public transit buses were fuelled with biodiesel as part of the city's efforts to cut GHG emissions and to reduce dependence on non-renewable fossil fuels. The city used a 5–20 per cent biofuel (soya) mix with regular fuels, thus reducing emissions of hydrocarbons, carbon monoxide and particulate matter. The City of Ottawa reports that this measure has resulted in annual resource savings of 3.5 million litres of diesel and an annual GHG reduction of 8,936 tonnes.

City of Toronto, Ont., Energy Retrofit Programs

Under numerous City of Toronto programs, energy retrofits have been carried out in over 500 city-owned buildings. The improvements include updating lighting systems; installing heat recovery systems; reducing drafts and leaks around windows, walls, and doors; installing deep lake cooling systems; and upgrading heating, ventilation, and air conditioning systems. Combined with other initiatives such as greening the city fleet, switching 2000 traffic signals to LEDs, and powering City Hall with renewable energy, these programs have resulted in annual cost savings of approximately $19 million per year, and associated annual greenhouse gas reduction of 692,000 tonnes.