



The Business Case for Cutting Greenhouse Gas Emissions from Municipal Operations

Prepared for:
Federation of Canadian Municipalities
24 Clarence Street
Ottawa, Ontario
K1N 5P3

Prepared by:
ICLEI Energy Services
City Hall, West Tower, 16th Floor
100 Queen Street West
Toronto, ON
M5H 2N2

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Executive Summary

A business case for climate protection activities is like a road map. It points you in the right direction, shows you approximately how long it will take to reach your destination, and highlights any potential obstacles along the way.

Around the world, municipal governments are creating these road maps by using whole cost, or triple bottom line accounting. This practice considers all of the economic, environmental, and social factors of any given project or group of projects, recognizing that what affects one area often has repercussions in others.

Sound fiscal management is often high on the list of priorities for a municipal government. A strong business case for climate protection activities addresses that responsibility by clearly demonstrating how to reduce costs, improve service delivery, create jobs and support local industries, all while protecting human health and the environment.

Historically, there has been a misconception that being environmentally and socially responsible is inherently more expensive. A traditional economic model might reject a project with a payback period of more than three years because it does not take into account the co-benefits of reducing greenhouse gas emissions. These types of benefits—from reduced operating and capital costs, fewer demands on physical asset management, and a healthier population and environment—are, however, taken into account when preparing the business case for climate protection activities.

One need not look far to see that protecting human health and the environment also makes good financial sense. Reducing energy use in a municipal building, for example, saves money and reduces air pollution. More jobs are created per dollar invested in the energy-efficiency and conservation sectors than are created in conventional energy supply sectors. Improved indoor air quality reduces staff absenteeism, while increasing productivity and morale.

In Canada, over 100 municipal governments are taking advantage of the Federation of Canadian Municipalities' Partners for Climate Protection (PCP) initiative. PCP is based on a five-milestone framework, which guides a municipal government through a series of steps that feed into the development of a compelling business case—from assistance compiling greenhouse gas emission and energy use inventories, to setting goals and reduction targets, and creating local action plans.

Perhaps more importantly, PCP is a forum where municipal councillors, staff, and others interested in sustainable community development can share information, ideas, and best practices.

The business case for cutting greenhouse gas emissions in municipal operations is more than just a series of facts and figures. It reflects a community's values, principles, and needs. It spells out the investment required to cut costs and emissions, how long it will take to achieve savings, and the direct and indirect benefits. It highlights the risks and the opportunities, and is one of the best ways a municipal government can guide their community towards a more sustainable future.

Introduction

A municipal government, unlike organizations that may be motivated solely by economic factors, needs clear evidence that cutting greenhouse gas (GHG) emissions from its operations will meet its fiscal and legal responsibilities, as well as protect the environment and the health and quality of life of its citizens.

In these days of fiscal restraint and environmental and social challenges, a municipal government needs a “road map” to the future—to point it in the right financial direction, while addressing community concerns and values.

A strong business case will provide that evidence and will inform a municipal council of the many financial, environmental, and social benefits to be gained. It will be based on past and forecasted energy use and GHG emissions, will include the steps that must be taken to achieve reductions, and will identify what the municipal government can expect in the future in return for its investment.

By embracing accounting practices that go beyond traditional methods, a compelling business case will justify climate protection activities, and allow municipal governments to realize new advantages for its community. Increasingly, municipal governments around the world are using “triple bottom line” accounting, a framework that informs and reviews environmental, economic, and social performance¹, to create the business case for sustainable community development.

While there is a cost to implementing climate protection activities, there is also a cost of inaction. To be effective, therefore, a business case that outlines climate protection activities must also be tailored to a municipal government's unique needs and available resources. A municipal government in a large Ontario city with poor air quality will appreciate a business case that describes the health and economic benefits of a sustainable transportation project. Retaining more municipal tax dollars through widespread energy-efficiency upgrades will resonate with a municipal government in a small Nova Scotia community.

The next sections provide several examples of the types of results that can be achieved, and outlines some of the hurdles you may encounter as you build your business case for cutting GHG emissions in municipal operations.

¹ International Council for Local Environmental Initiatives, *The Business Case for Local Government & Triple Bottom Line*. <http://www.iclei.org/anz/tbl/toolkitcontents.htm>

The Benefits of Climate Protection

The business case for GHG emission reductions includes quantitative and qualitative benefits.

Quantifiable Benefits

- Energy and operating cost savings, physical asset renewal, improved municipal service delivery, and improved health of residents and the natural ecosystem.

Qualitative Benefits

- Better working environment (i.e., improved lighting, better indoor air quality, reduced noise, etc.), increased productivity and employee morale, more green space in the community, reduced traffic congestion, reduced “urban heat island effect,”² a greater quality of life for residents, and an opportunity for municipal governments to show leadership and influence other community stakeholders to take action.

Economic Benefits

Energy and Operating Cost Savings

Most GHG emission reductions come from reduced use of fossil fuels. Energy is one of the few variable costs in municipal operations and is also a significant long-term cost.

The City of Hamilton, for example, calculated that while facilities typically provide service over 30 to 40 years, construction costs represent only eight per cent of a building’s cost. Operating costs, which include maintenance, repairs, replacements, and energy purchases, represent 92 per cent of the lifetime bill³.

The Municipalities Issue Table of the Government of Canada’s National Climate Change Process⁴ estimated annual municipal energy consumption (including municipal building operations, water supply and sewage treatment, vehicle fleet, and street lighting) typically totals 2 Gigajoules (GJ)/capita. For a city with a population of 100,000, this rule of thumb would indicate an annual energy use of approximately 200,000 GJ to provide these services. Although the corresponding energy bill depends on the mix of fuel and electricity, and local prices, the fuel to electricity ratio for a city providing these services would typically be about 50:50. The total annual cost for fuels and electricity would, in this example, be in the range of \$2 to \$2.5 million⁵.

A 2000 study by representatives of the commercial building industry and co-sponsored by the U.S. Department of Energy and other Canadian and American organizations, found that a 30 per cent improvement in energy efficiency could be achieved using existing technologies. With aggressive implementation of more innovative technologies, energy-efficiency improvements of 50 to 80 per cent could be realized.⁶

In addition, by reducing fleet fuel consumption or changing the type of fuel used, municipal governments can realize additional

financial savings. For example, beginning in 1994, the City of Regina began converting many of its fleet vehicles to burn a mixture of natural gas and gasoline. The city’s “dual fuel” fleet consumes 89 per cent natural gas, an increase of nine per cent over its initial target, saving \$62,000 annually.⁷

Physical Asset Renewal

Physical asset management involves the systematic review of a facility’s operations and equipment, and a logical repair or upgrade schedule that focuses on a proactive approach to improvements. Preventive maintenance improves the value of municipal government assets by reducing facility operating costs, modernizing equipment, and decreasing deferred maintenance. Proactive and improved asset management can extend the lifespan of buildings, and lower insurance expenditures, since better maintenance leads to fewer unexpected, costly repairs.⁸

Improved Municipal Service Delivery

Municipal governments can often provide better and more economically efficient services by investing in energy efficiency. By improving lighting in libraries, for example, municipal governments can offer a more comfortable environment. By improving indoor air quality in its facilities, municipal governments will often see a decrease in staff absenteeism and an increase in staff productivity, thereby resulting in more efficient delivery of services to citizens.

Health Benefits

Reducing the use of fossil fuels results in fewer emissions of other pollutants (e.g., sulphur dioxide, nitrogen oxides, and particulate matter) and improves air quality.

Based on the data presented in an Ontario Medical Association report published in 2000⁹, a computer model entitled “The Illness Costs of Air Pollution” provided forecasts of health and economic damages for expected or desired future air quality conditions in Ontario. The study focused on cardio-respiratory illnesses caused by ozone and airborne particulate matter.

² The urban heat island effect occurs when natural vegetation is replaced by surfaces that absorb heat, such as building roofs and walls, and pavement. This can make cities several degrees warmer than nearby rural areas.

³ New City of Hamilton, Corporate Buildings & Real Estate Department. *State of the City’s Infrastructure*. Council Presentation, February 20, 2001.

⁴ http://www.nccp.ca/NCCP/national_process/issues/municipalities_e.html

⁵ National Climate Change Process, *Municipalities Issue Table: Foundation Paper* (Ottawa: National Climate Change Process, November 23, 1998), 16-17.

⁶ U.S. Department of Energy, Office of Building Technology, State and Community Programs, Energy Efficiency and Renewable Energy, *High-Performance Commercial Buildings: a Technology Roadmap* (Washington: U.S. Department of Energy, 2000), 6.

⁷ Federation of Canadian Municipalities, *Municipal Governments and Sustainable Communities: A Best Practices Guide 2002* (Ottawa: Federation of Canadian Municipalities, 2003), 48.

⁸ For more information, see *A Guide to Sustainable Asset Management for Canadian Municipalities* (prepared for FCM by R.V. Anderson Associates Limited) or visit FCM’s Sustainable Communities Knowledge Network at <http://kn.fcm.ca>, click on “Partners for Climate Protection” and then select “Tools and Resources.”

⁹ Ontario Medical Association, *The Illness Costs of Air Pollution in Ontario*, 2000. <http://www.oma.org/phealth/icap.htm>

The study forecasted that in the year 2000, Ontario would suffer approximately 1,900 premature deaths, 9,800 hospital admissions, 13,000 emergency room visits, and 46 million minor illness cases per year as a result of air pollution. The study also estimated that if air quality conditions remained the same to the year 2020, these illnesses and deaths would increase substantially due to population growth and an aging population, which is more vulnerable to air pollution impacts.

These health impacts would result in about \$10 billion in annual economic damages. Loss of life and pain and suffering would account for between \$4.1 and \$4.8 billion of this total. Annual health care costs of air pollution would total approximately \$600 million; lost productivity would account for an additional \$560 million annually. These economic damages were expected to increase substantially over the next 20 years.

To understand how people are affected by air pollution, the City of Toronto's Public Health Department used results from air pollution studies and applied them to calculate the number of deaths or hospital admissions in Toronto due to air pollutants. Using data from 1995, Toronto Public Health estimated that about 1,000 people in Toronto died earlier than expected, and 5,500 hospital visits were linked to heart or lung diseases.¹⁰ Since air quality in Toronto has not improved since 1995, one can assume that these figures still apply.

Preliminary research by the U.S. Environmental Protection Agency found that each tonne of carbon reduced yields an average of between \$5 and \$25 CAD in health and environmental benefits. This includes the cost savings and the avoided social damage value of reduced air pollutants.¹¹

Additional Benefits

Local Job Creation

Implementing climate protection activities, such as energy-efficiency projects, can result in the creation of more local jobs. Many studies have shown that more jobs are created through energy-efficiency measures than in other energy-related sectors of the economy. A Pembina Institute survey of over 30 such studies and research reports found that the jobs created per million dollars invested in energy efficiency and conservation ranged from 15.9 to 79.8, resulting in an overall average of 36.6 jobs created per million dollars invested¹².

In comparison, employment in the alternative energy supply sector (relating to the construction of facilities and operation of technical capital equipment) varied widely depending on the technology (biomass, biofuels, wind, solar, district energy, cogeneration, small hydro) and averaged 12.2 jobs per million dollars invested. In contrast, the number of jobs created per million dollars invested in the conventional energy supply sector averaged 7.3.

One reason for the higher numbers in the energy-efficiency and alternative energy supply sectors is that these activities are generally more labour-intensive in terms of direct employment. But the key

factor is the job creation arising from the "re-spending" effect of energy savings. Re-spending employment occurs when money saved from implementing energy-saving measures is re-spent on goods and services as new, "additional" disposable income.

Support for Local Businesses

As well as creating new jobs, climate protection measures can have significant multiplier effects in the local economy. Studies have compared the economic activity created from a dollar spent on petroleum products, electricity, or energy conservation as it moves or "multiplies" through the local economy.

Although each community will have its own economic multiplier for energy, typical multipliers reveal that every dollar a community spends on energy conservation generates \$0.84 more municipal economic activity than petroleum or natural gas purchases, and \$0.57 more than a dollar spent on electricity. The reason for this difference is that the production of petroleum products and the generation of electricity tend to occur outside of the local community, while most expenditures relating to energy efficiency (such as hiring contractors or purchasing energy-efficient products) occur within the community.¹³

The City of Toronto's Better Buildings Partnership promotes and facilitates energy-efficient retrofits in commercial, institutional, and industrial buildings in Toronto. Since 1996, the program has contributed more than \$100 million to the Toronto economy and the estimated long-term impact of the program is approximately \$3 billion.¹⁴

Increased Community Investment

By reducing energy expenditures, municipal governments can apply the savings towards improving community services. These may include an increase in the number of bicycle paths, improved public transit, and greener public areas. Cutting GHG emissions with measures that make residents less dependent on automobiles can reduce traffic congestion, clean the air, and contribute to more efficient homes, offices, and land use patterns. Together, these types of measures can help build healthier, more sustainable communities.

¹⁰ City of Toronto, *Air Pollution Burden of Illness*, May 2000.
http://www.city.toronto.on.ca/health/hphec/air_quality/smog.htm

¹¹ Peter Nagelhout in *Clearing the Air: A Preliminary Analysis of Air Quality Co-Benefits from Reduced Greenhouse Gas Emissions in Canada* (Vancouver: David Suzuki Foundation, 2000), 4.

¹² Barbara Campbell, Larry Dufay, Rob Macintosh, *Comparative Analysis of Employment from Air Emission Reduction Measures* (Pembina Institute for Appropriate Development, January 31, 1997), 4.

¹³ International Council for Local Environmental Initiatives, *Fact Sheet: The Economic Power of Energy Efficiency* (Berkeley: International Council for Local Environmental Initiatives, no date).

¹⁴ City of Toronto, Better Buildings Partnership
www.city.toronto.on.ca/wes/techservices/bbp/index.htm

Encourage New Business Opportunities

Communities that have been reliant on single industries can reinvigorate lagging economies by redirecting efforts into new business opportunities. An agricultural community, for example, might create new markets by producing biofuel; a forestry community could maximize its energy use and reduce waste by burning wood waste in a cogeneration facility.

The City of Greater Sudbury, whose economy was heavily dependent on the mining industry for many years, is now focussing on renewable energy as a new economic engine. By facilitating the growth of environmental business opportunities, Sudbury will also be able to attract more people to its cleaner, greener sustainable community.

In the spring of 2002 a joint venture project between REpower AG, a German manufacturer of wind turbines, and two Sudbury companies established a Canadian corporation to manufacture wind turbines in the Sudbury area. The venture is expected to create up to 90 new and 200 spinoff jobs. The project is a significant opportunity based on the potential North American demand.¹⁵

The City has also partnered with Northland Power, another wind energy company, to conduct a feasibility study and identify suitable sites for a 50 megawatt wind farm in Sudbury and the surrounding area. The city aims to sell the green power to the Ontario electricity grid, to industrial, institutional, and commercial customers, and to residential customers through electricity retailers.¹⁶

Myths and Barriers

One of the challenges of making the business case for climate protection is that traditional economic concepts and accounting methods do not always accurately express the true costs and benefits of reducing GHG emissions.

Simple Paybacks

Many municipal governments, utilities, and other businesses use simple paybacks to decide whether or not to implement a particular energy-efficiency measure. By determining the cost to implement a measure and the resulting energy savings, it is possible to calculate how long it will take to recover the investment. While many municipal governments implement measures with very short paybacks of two to three years, a short payback is not necessarily the best indicator of a measure's effectiveness. A simple payback of three years is equivalent to a 33 per cent rate of return, an extremely high return on investment. With other type of investments however, municipal governments or investors accept much lower rates of return; a reasonable 15 per cent rate of return is equivalent to a seven-year payback.

More sophisticated financial tools for identifying the costs and benefits of various climate protection activities that take into account the time value of money include Net Present Value or Life Cycle Costing. Life Cycle Costing is particularly relevant to the sustainable management of municipal infrastructure.¹⁷

Several funding programs help municipal governments implement measures with longer paybacks. For example, the Government of Canada has endowed the Federation of Canadian Municipalities with \$250 million to establish the Green Municipal Funds that support municipal government action to cut pollution, reduce GHG emissions, and improve quality of life. Two funding programs are available: the Green Municipal Investment Fund and the Green Municipal Enabling Fund. Additional information is available on FCM's Sustainable Communities Knowledge Network [<http://kn.fcm.ca>].

Split Investment Incentives

When implementing climate protection activities there may be cases of split investment incentives. A budget manager is often not directly rewarded for achieving energy-efficiency savings in his/her operational area because the financial savings are not returned to his/her budget. Instead, these savings are generally re-directed to other budgets. This situation creates a disincentive for budget managers to reduce energy consumption or undertake projects that will result in reduced costs.

The separation of capital and operating budgets and approval processes can result in differing priorities and the implementation of practices that do not complement climate protection activities.

¹⁵ Northern Ontario Business, September 2002

¹⁶ City of Greater Sudbury News Release, October 18, 2002
www.city.greatersudbury.on.ca/English/Services/NewsReleases/newsdetail.cfm?Release_id=519

¹⁷ R.V. Anderson Associates Limited, *A Guide to Sustainable Asset Management for Canadian Municipalities*, (September 2002)

Supply versus Demand Investments

In the area of climate protection activities, it is crucial that efforts be made to first reduce demand for resources, then to focus on increasing the supply of “green” energy. For example, if it is discovered that a building uses a large amount of energy for heating purposes, a proactive approach would be to investigate the cause of the building’s excessive heating needs and remedy the situation, thereby reducing the total amount of energy required. Once demand for energy and fuel is reduced, municipal governments can then examine alternative and renewable supply options (solar, wind, geothermal, etc.) that may not have been previously economically feasible.

PCP Milestones Set Framework for Business Plan

The PCP Milestones¹⁸ provide a logical model for implementing an effective GHG reduction program:

- **Milestone One:** Creating a Greenhouse Gas Emissions Inventory and Forecast
- **Milestone Two:** Setting an Emissions Reduction Target
- **Milestone Three:** Developing a Local Action Plan
- **Milestone Four:** Implementing the Local Action Plan
- **Milestone Five:** Monitoring Progress and Reporting Results

Milestones One, Two, and Three are planning steps, while Milestones Four and Five relate to project execution and evaluation.

A municipal council could need four or more business case presentations:

1. One to set the stage for using the PCP framework and to commit to GHG reductions;
2. One to develop and approve a corporate action plan;
3. Another to develop and approve a community action plan; and
4. Business cases for individual projects.

¹⁸ Download the PCP Milestone Fact Sheets at <http://kn.fcm.ca>, click on “Partners for Climate Protection.”

CASE EXAMPLE

Milestone One: City of Bathurst, New Brunswick

As part of PCP Milestone One, the City of Bathurst collected data on corporate and community energy consumption and waste generation. A local environmental group then created geographic information system (GIS) maps to display the amount of GHG emissions coming from various sectors. The data is used to calculate current and future GHG emissions, and will also be incorporated into the city’s community planning exercises since the city is currently using GIS equipment to map its community and plan for future growth.¹⁹

CASE EXAMPLE

Milestone Two: City of Toronto, Ontario

In 1989, the City of Toronto adopted the first GHG emissions reduction target in Canada, pledging that, by the year 2005, the city would achieve a reduction of 20 per cent below the levels emitted in 1988. This target became known as the “Toronto Target” and has inspired other municipal governments around the world to undertake climate protection activities. The city continues to focus on the target when developing and implementing GHG emission reduction projects.

CASE EXAMPLE

Milestone Three: Town of Okotoks, Alberta

In 1997, the Town of Okotoks began a broad community consultation process to develop a long-term sustainability plan. The plan focuses on balancing economic, social, and environmental elements and includes a number of objectives and programs that will reduce GHG emissions from the town’s municipal operations. The town’s municipal eco-efficiency program aims to retrofit all municipal buildings and therefore reduce energy consumption and associated GHG emissions. Other planned initiatives include reducing per capita water consumption and creating a municipal infrastructure that supports the town’s carrying capacity, including an underground infrastructure (for water, sewers, and storm sewers) that is adequately sized for the town’s needs.²⁰

¹⁹ Federation of Canadian Municipalities, *PCP Monthly Electronic News Bulletin* No. 10, Vol. 1 (Ottawa: Federation of Canadian Municipalities, December 15, 2001), 1-2.

²⁰ Federation of Canadian Municipalities, *Municipal Governments and Sustainable Communities: a Best Practices Guide* (Ottawa: Federation of Canadian Municipalities, 2000), 7-11.

Conclusion

Just as an architect has a mental picture of the building she wants to create long before she begins drawing, you must have a vision of how your project will impact the future.²¹

With each passing year, the evidence of how climate protection activities has a mutually beneficial impact on the economy, the environment and on society becomes more persuasive.

This document has outlined the primary benefits a municipal government can gain by cutting GHG emissions. More detailed information and resources can be found on FCM's Sustainable Communities Knowledge Network [<http://kn.fcm.ca>] under the Economic Development section of the Topics & Discussion Centre.

Although the business case for cutting greenhouse gas emissions in municipal operations is founded on past practices and present challenges, ultimately, it must be built on the strength of the community's vision, values and principles, and must reflect a municipal government's fiscal and resource reality.

Building a strong and effective business case requires time and effort, but it is a vital step in moving forward on climate change issues. It is your road map to your community's sustainable future.

²¹ *Elements of a Business Case*, Centre for Technology in Government, University of Albany, New York. http://www.ctg.albany.edu/resources/htmlrpt/justice_for_all/designing/mission.htm.