



REACHING MILESTONE 2:

How to set emissions reduction targets



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About this document

This document will guide you through the process of setting community and corporate greenhouse gas reduction targets, which is Milestone 2 of the PCP program. It introduces principles and methodologies for target setting, shows the relationship between target setting and other PCP milestones, and provides guidance for setting achievable targets that will lead to successful action on climate change.

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CONTEXT



The Canadian experience in setting municipal GHG reduction targets

In 1989, Toronto became the first municipality in the world to set a greenhouse gas (GHG) reduction target. Since then over 100 Canadian municipalities, accounting for more than half the country's population, have reached Milestone 2 of the Partners for Climate Protection (PCP) program by adopting a GHG reduction target. Many others have set targets outside the PCP program.

While there has been great success in setting targets, achieving them has proved more elusive. A few communities have achieved, or are on track to achieve, their reduction targets but many others have come up short. This is particularly true for community targets.

“Urban centres account for more than half of the world’s population, most of its economic activity and the majority of energy-related emissions. The role of cities in reducing emissions and protecting their inhabitants is therefore central to effective climate policies.”

Key Findings from Intergovernmental Panel on Climate Change, 5th Assessment Report, 2014 (ICLEI & University of Cambridge)

Communities have encountered a variety of challenges while working to achieve their targets. Many early targets were aspirational and were set before the detailed actions required to achieve them had been determined. (See “Target-setting methods” below.) Some communities may have overestimated the pace of change, forgetting that improvements in building or vehicle efficiency only reduce emissions when buildings or vehicle fleets are replaced, which can take many years. Some may also have underestimated the impact of measures adopted by other orders of government on emissions, and found themselves achieving their targets primarily because of provincial energy policy.

More rigorous target-setting methodologies have emerged since GHG planning began in the 1990's. Municipalities, including those re-evaluating existing targets, now tend to use more advanced methods. Recognized protocols, such as the GHG Protocol for Cities, which is used by the Compact of Mayors, have also emerged.

In the past, communities sometimes made separate plans for energy and GHG emissions. Today, the two are routinely dealt with in a single plan, with a strong link between energy and GHG targets. This approach recognizes the inter-relationship between the two and provides a deeper connection between GHG planning and the community.

PRINCIPLES AND METHODS OF TARGET SETTING



General principles

For PCP recognition of Milestone 2, there are three formal requirements:

- The target must clearly state whether it is for community or corporate emissions.
- The target must be an overall GHG reduction target in the form:

**% reduction from base year
by target year**

Interim and sub-sector targets may also be set, but are not required. Targets may also be expressed in terms of emissions per capita or per dollar of GDP, but these should be considered indicators rather than true targets.

- The target must be adopted by council resolution.

Although there are many different ways that targets can be set and many factors that come into play, the following “S.M.A.R.T.” principles should guide target setting for communities looking for PCP recognition:

Stretch the targets, acknowledging the climate change imperative. Targets should recognize the urgency of climate change and the need to act. The scale of the problem requires that municipalities stretch themselves to some extent to achieve reductions and protect the long-term interests of communities.

Meaningful, connected to local context. To be successful, targets and plans should reflect the community, its values, priorities, and policy and planning activities. Targets and action plans should be linked to guiding documents such as community plans.

Adopted by council. A PCP requirement, council adoption raises awareness of the target, demonstrates commitment, and provides authority to staff to work towards the reduction objective. Targets adopted by council have the weight of official community policy.

Realistic targets. Reduction targets should be achievable. This does not mean they must be easy to achieve, or that it is known exactly how they will be achieved. But it does mean that targets should not be set if nobody believes in them and they are doomed to failure from the start.

Time bound. Also a PCP requirement, setting a target year allows communities to develop actions with a specific implementation schedule, and to effectively monitor and report on their progress.

Target-setting methods



The principle that targets should be achievable leads to questions about how targets should be set, and how municipalities can know whether targets are achievable or not.

There are two primary methods of setting GHG targets, top-down and bottom-up, referring to the order in which the target and actions are developed. These methods are sometimes described as aspirational or pragmatic. In fact, targets should be both aspirational and pragmatic: aspirational because they reflect the need for significant action on climate change, and pragmatic because they need to be realistic and achievable. These aspects of a target can co-exist, regardless of whether the target-setting methodology is top-down or bottom-up.

Top-down targets



Top-down target setting implies that the target is chosen first and action planning and analysis occurs later. This method of target setting is sometimes referred to as aspirational or visionary (although bottom-up target setting can also be aspirational). Top-down targets are usually based on targets established by other orders of government or recommended by other organizations. The most notable example is a dominant interpretation of what the

Intergovernmental Panel on Climate Change (IPCC) indicates is necessary to stabilize the climate: reductions from 1990 levels of approximately 30 per cent by 2030 and approximately 80 per cent by 2050.

Top-down targets tend to be more aggressive than bottom-up targets, although this doesn't have to be the case. Some advantages of setting a top-down target include low development costs, and alignment with other jurisdictions and orders of government. Disadvantages include a higher risk of not meeting the target, uncertainty about implementation costs, and poor connections between actions and targets. Top-down targets may carry a higher political risk; they have a greater chance of not being achieved.

It is important to realize that selecting a top-down target does not mean choosing it in a void. Top-down targets are improved by understanding community context and external factors even if they're not supported by the in-depth analysis used for bottom-up targets.

Bottom-up targets



Bottom-up targets are selected after conducting an assessment of the GHG reduction potential of various actions. Selected actions are analyzed to determine their impact on emissions by the target year. The level of analysis depends on the amount of detail, the scope of actions, and the available resources. The community sets its reduction target based on the actions it expects to implement.

While bottom-up targets are sometimes referred to as pragmatic, they can be as aspirational as top-down targets. A community may choose to model aggressive actions. It may also decide on a target that's higher than what the models predict if it is committed to seeking out further reductions in the future.

Advantages of a bottom-up target include understanding of the actions required to meet the target and their potential costs, greater confidence that the target can be met with proper implementation, and more detail on sub-sector and interim reductions. Bottom-up target setting can also provide municipalities with important indicators that can help guide implementation and support continuous improvement. Most importantly, bottom-up targets help communities reorganize and align resources to achieve their goals.

Disadvantages of bottom-up target setting include high development costs (which may be offset by lower costs to develop the action plan), and a risk that targets may be too conservative to mitigate climate change, if actions are modest and no further aspirational step is taken.

EXAMPLES OF CANADIAN MUNICIPAL TARGETS

Corporate		Community	
Bridgewater, NS	15% below 2007 by 2017	Edmonton, AB	35% below 2005 by 2035***
Halton Hills, ON	20% below 2011 by 2031	Kelowna, BC	33% below 2007 by 2020
Quebec City, QC	10% below 1990 by 2020*	Sackville, NB	10% below 2011 by 2021
Ritchot, MB	15% below 2011 by 2025	Thunder Bay, ON	10% below 2005 by 2017
Saskatoon, SK	30% below 2006 by 2020**	Whitehorse, YT	6% below 2014 by 2030****

* Revised target. Previous target was 22.3% below 2002 by 2010.

** Revised target. Previous target was 10% below 1990 by 2013.

*** Revised target. Previous target was 6% below 1990 by 2010.

****Revised target. Previous target was 6% below 2001 by 2013.

COMMUNITY TARGET SETTING



A GHG reduction target makes a public statement about a community's commitment to climate change action. Progress toward achieving the target makes an even bigger statement.

Whether targets are set using a top-down or bottom-up approach, there is a process that should be followed to ensure the target is the best for the community.

The principles are similar for corporate and community targets, but the actual process differs significantly. This section explains how best to go about setting a community-wide GHG reduction target.

Understanding the situation

Before a target is developed, it is important to assess the current situation, which will affect the community's ability to achieve its target. Understanding the community's GHG emissions profile is important; so is understanding other factors, such as urban form, economic activity, and federal or provincial/territorial government policies, which influence emissions and their growth.

Influencing factors

To set targets, a community needs to understand its energy and emissions profile. That is why developing a GHG inventory is considered Milestone 1 of the PCP program. The inventory provides information about total community emissions and the sectors responsible for them. This information helps municipalities assess how much they can influence emissions. The inventory also provides information about emission sources, such as electricity or gasoline, and their associated emissions factors (a measure of the intensity of emissions). This is important because changing emissions factors, such as generating electricity from wind power instead of coal, can have a significant impact on overall emissions.



Lastly, the inventory should include a business-as-usual (BAU) projection, which shows what will happen to emissions without intervention. The BAU projection allows communities to see what climate change actions could achieve compared what will happen if they take no action. A target that seems reasonable relative to the base year may seem unachievable in the context of the BAU projection, or vice versa.

When considering actions that may have an impact on emissions, communities should be aware of the following factors.

Community form: Transit may have more impact in active urban cores than in low-density suburbs or rural communities. Energy retrofits or building-scale renewable energy systems, such as solar panels, may have more impact in communities where single-family homes predominate than in communities where high-rise rentals are the norm.

Geography and climate: Cycling may have limited potential in communities with hilly terrain or a cold climate, but promoting wind power or biomass heating may be valuable.

Population change: High growth rates increase BAU emissions, but also lead to new home construction, an area in which municipalities have considerable influence. Other demographic and socio-economic factors such as type of employment, family size, and aging populations will also influence future emissions.

To be successful, emission reduction targets and actions need to be informed by local policy and planning documents, and aligned with the community’s economic and social dynamics. Integrating climate targets and plans with existing priorities increases the likelihood of successful implementation. For example:

- If tourism development is a community priority, actions to limit tourism are not likely to be well received; promoting “green” tourism has a greater chance of success.
- Communities concerned about air quality may support actions to reduce automobile use.
- An aging population may support special transit services and walkable neighbourhoods.

Understanding how community priorities relate to sector emissions and sources can help communities develop achievable targets and resonant strategies.

**SPHERES OF INFLUENCE
(WILL VARY BY PROVINCE/TERRITORY AND MUNICIPALITY)**

SECTORS		
<p>BUILDINGS</p> <p>LAND USE</p> <p>Land use planning</p> <p>Transportation networks</p> <p>Commercial agriculture</p> <p>Urban agriculture & forestry</p>	<p>TRANSPORTATION</p> <p>Transit</p> <p>Active transportation</p> <p>Passenger vehicle</p> <p>Freight</p> <p>INFRASTRUCTURE</p> <p>Solid waste</p> <p>Liquid waste</p> <p>Water</p> <p>Street lighting</p>	<p>LOCAL ENERGY SUPPLY</p> <p>Electricity generation</p> <p>Heat generation</p> <p>INDUSTRY</p> <p>MUNICIPAL OPERATIONS</p> <p>Fleets</p> <p>Buildings</p> <p>Purchasing</p>

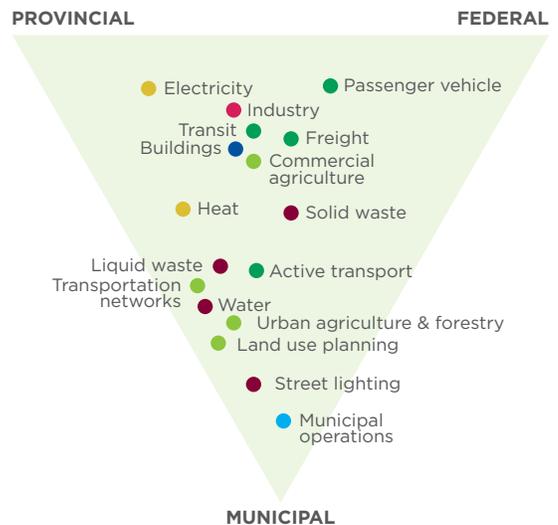
**Authority and influence:
the policy context**

Municipalities do not act in isolation when they target emissions reductions. Provincial, territorial, federal, and international policies influence future emissions. Technological and social change also plays a role. Understanding the impact of these changes, as well as the influence each order of government has over emissions, can help municipalities determine reduction targets.

Municipal powers stem from provincial and territorial legislation and vary between jurisdictions. Generally municipalities have significant control over land use planning, including size and type of buildings, and solid waste management. Local land use plans can influence transit viability, vehicle use, active transportation rates, building energy consumption, and some energy supply opportunities.

Provincial and territorial governments usually have direct control of building codes, transit, highways, and industry. They also regulate electric and natural gas utilities. Provincial and territorial governments can control the efficiency of vehicles and equipment, but often leave this to the federal government because the affected industries are national or international in scope.

Provincial and territorial action on climate change varies, but all provinces and territories have some form of climate change action plan and targets. Examples of provincial action to date include Ontario’s phasing out of coal power plants, Nova Scotia’s building code requirement that new homes have an EnerGuide rating of 80 or higher, and British Columbia’s introduction of a carbon tax.



Provincial and territorial actions that are most likely to affect community emissions include:

- energy-efficiency requirements in building codes
- changes to electricity emissions by phasing out coal or increasing renewable power generation
- legislation to reduce solid waste emissions
- commitments to improve transit and to contain urban growth

The federal government sets vehicle efficiency standards and regulates some forms of transportation, including air and marine transportation. It can also regulate pollutants, including GHGs, through the Environmental Protection Act, and has significant influence over building codes.

For municipalities, the most significant federal legislation is the harmonization of Canadian and American vehicle efficiency standards, which will result in a 50 per cent reduction in fuel consumption for new cars and light trucks by 2025. The federal government has also passed legislation to reduce emissions from coal-fired power plants.

Provincial policy influence: Ontario's phase-out of coal-fired electricity generation

In 2002 Ontario announced the phase-out of all coal-fired power plants by 2015. While air pollution was the driving force behind this decision, it is also Canada's single greatest GHG reduction measure. Between 2000 and 2012, Ontario's electricity emissions factor dropped from 290 to 96 tonnes CO₂e/GWh. Most of the reduction was due to the coal phase-out.

With electricity accounting for up to 50 per cent of emissions in Ontario municipalities, the provincial change reduced community emissions by 15 to 20 per cent. In fact, some Ontario municipalities have achieved their emissions targets solely on this basis.

Technological and social change



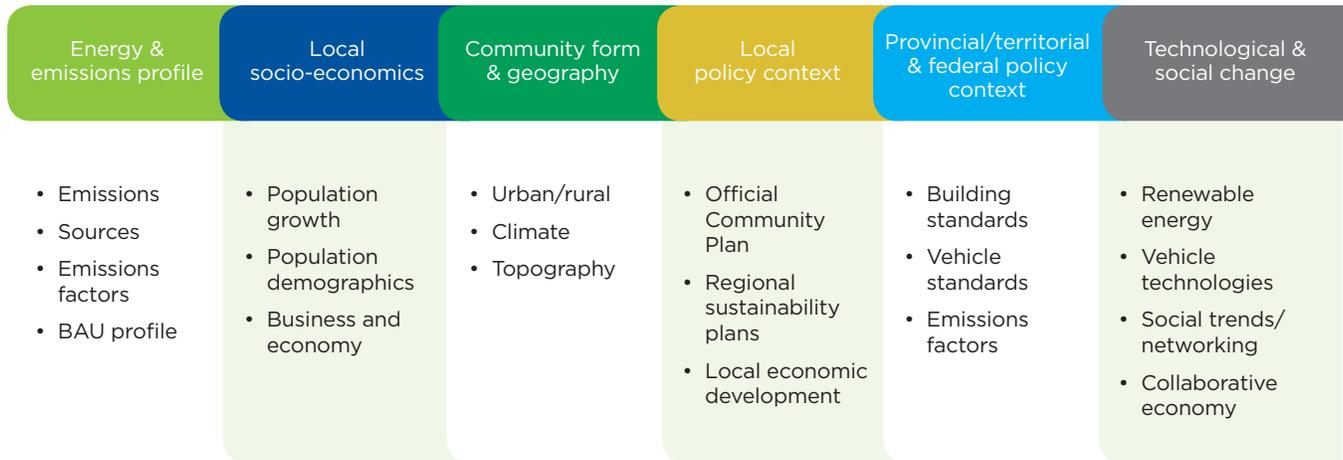
With prices falling, solar panels may become more prevalent in the future.

Although it is difficult to accurately predict technology changes and understand their impact on emissions, it is still important to be aware of changes and trends that are likely to be significant. Two current examples are electric vehicles and solar photovoltaics (PV). Electric vehicles

have recently started to enter into the mainstream, with every major automobile manufacturer producing them. Because of their high cost and limited driving range, and the slow turnover of automobile fleets, the impact of electric vehicles will not be felt for many years. Solar PV is a mature technology that has seen prices drop dramatically in the past few years. If prices continue to decline, solar PV use may see explosive growth in a relatively short time.

Social changes can be even more difficult to predict, and the best municipalities may be able to do is to be aware of current trends. These may include such things as digital networking, online shopping, and the collaborative economy. Trends and movements that may provide opportunities for climate change action include the growth of car sharing, home-based businesses, the small home movement, and increased awareness and concern over climate change.

FACTORS TO CONSIDER WHEN SETTING A COMMUNITY GHG REDUCTION TARGET



Setting a target

Once the inventory is complete and influencing factors have been reviewed, the community is ready to begin setting a target. Regardless of whether a top-down or bottom-up target is being developed, the following actions will help guide the choice of target:

1. Create a list of recognized targets that might be appropriate. Consider provincial and territorial government targets, the Canadian government target, and PCP's suggested target (six per cent within 10 years). Assess whether these targets make sense in the community's context. It may be appropriate to use a recognized percentage reduction but with different base and target years.
2. Use the inventory to identify emissions the community has some influence over and can change within the timeframe. This is where the majority of targeted emissions reductions must come from. (If you're aiming for a ten per cent reduction and half of overall emissions are outside the control of the municipality, you will have achieved only a five per cent reduction.)
3. Engage with council, staff, key stakeholders, and the public to ensure understanding and support.
4. Gain an understanding of the emissions reductions that will likely occur as a result of actions taken by other orders of government. Provincial and territorial government targets and actions are usually well documented. Where are they expecting reductions to come from? How much of those emissions are they expecting to come from sectors under municipal control, and how much from other sectors? Are there actions, such as phasing out coal-fired power plants, that will quickly reduce local emissions?
5. Select one or more targets to recommend to council. Even if the municipality is using a top-down approach, try to identify what actions will likely need to be taken in order to achieve the targets. These do not need to be detailed actions (that will come in Milestone 3), but council should have a sense of what sectors are involved, and what types of actions will be required.

Take care that short-term actions do not conflict with long-term actions. Some technologies may produce short-term results but limit longer-term reductions.



Determining methodology and scope

When choosing a methodology and determining the scope of the target-setting exercise, municipalities need to consider a number of factors:

Resources: The costs and resources required to set targets varies depending on the level of detail required. Top-down targets that match established standards may cost very little, while bottom-up targets require considerable work and expertise. Most municipalities do not have the necessary expertise in house and hire consultants to develop targets in conjunction with action plans¹. Consulting costs vary, but a comprehensive exercise can easily run into six figures. Many municipalities seek grant funding to help cover the expense². Municipalities that have the expertise to do the analysis in-house should be cautious; producing a defensible analysis requires considerable knowledge and experience related to community energy and emissions planning. Although bottom-up analysis can be costly, it produces targets that are defensible, strongly related to local planning documents, and accompanied by implementation and monitoring frameworks. A bottom-up target accelerates action and reduces false starts.

Timing: Time available may dictate the approach and level of detail used in target setting. A bottom-up process will take longer than a top-down one, particularly if funding needs to be obtained. Municipal election cycles, work plans, or provincial and territorial regulation may restrict the available time and make a detailed bottom-up methodology impractical. If the time required for developing bottom-up targets is expected to be several years, it may be appropriate to set an interim top-down target so staff can begin considering climate change implications in planning decisions.

Commitment: To meet PCP requirements, targets must be adopted by council. Councils that view GHG reduction as a lower priority may be better off with a modest target, and may prefer to use a bottom-up approach that will provide more certainty about the actions required and the costs of implementation.

Selecting a timeframe

Selecting an appropriate timeframe helps to ensure that the target will be achieved. Communities that have completed Milestone 1 often use the inventory year as the base year for measuring reductions. If a base year is not yet set, there are benefits to using a recognized base year that's aligned with other jurisdictions such as the provincial or territorial government. The benefits include the availability of data and the ability to compare targets and progress.

The base year should be fairly current and should have complete and reliable data. Some well-established base years, such as 1990 (the year chosen in the Kyoto Protocol), may be too far in the past for high-quality inventory data, or may not be relevant to the current community. A community may also choose a base year prior to major actions it has already undertaken, in order to recognize the impact of those actions on emissions reductions.

Setting the target year is a balancing act: choose one that is near enough to be relevant but distant enough to implement change and achieve reductions. While long-range targets (80 per cent by 2050) are important for addressing climate change, municipalities should include short-term targets, even if it means achieving relatively modest reductions. This is particularly so for municipalities just getting started on climate change action. Achieving some modest success over the short term will lay the groundwork for greater long-term reductions. Generally speaking, the primary target should be 10 to 20 years from the present; communities can also set a longer-range (possibly aspirational) target.

It may be advantageous to align the target year with other jurisdictions, or to synchronize with important plans such as the official community plan or a sustainability plan.

It may also be beneficial to set interim targets. An interim target may be a pro-rated portion of the primary target, but it is important to be realistic about what can be achieved in the early stage of the process. Reductions are often small or non-existent in the first few years, as plans are developed and actions implemented. The effect of federal or provincial/territorial government actions may also vary with time.

¹ The PCP program has prepared several guidance documents to assist municipalities in action planning, including *Reaching Milestone 3: How to Create a Local Action Plan to Manage Energy and Emissions*, and *Model Request for Proposals for Completing Milestones 1-3*. These are available on the PCP website at www.fcm.ca/pcp.

² FCM's Green Municipal Fund provides grants to complete Milestones 1-3 of the PCP program: www.fcm.ca/gmf.

Strategic engagement



Most municipal processes and policies require a certain amount of engagement, and adopting a climate change target is no exception. The type of engagement will depend on the community;

municipalities often have preferred methods of engagement for internal and external constituencies. Detailed information on climate change consultation is beyond the scope of this guide, but generally an engagement process should consider the following:

- Emphasize the importance of addressing climate change at a local level. Make it clear that the debate over climate change is over, and all levels of government accept the need to address it.
- Create an understanding of the community's emissions profile and where emissions growth is likely to come from in the future.
- Inform the public what actions will have the most impact, and what the implications of those actions are for the community. Be sure to highlight the co-benefits of actions. (Increasing density creates a stronger business case for better transit, for example.)
- Get a sense of the level of community support for climate change initiatives. How likely are residents and businesses to support an aggressive target?
- Engage key stakeholders, such as utilities, transit authorities, developers and builders. This can greatly strengthen the target-setting process and strengthen strategies that rely on shared efforts.
- Engage council and senior staff. They will be tasked with implementing the actions and need to have a clear understanding of what they are agreeing to and its long-term implications.
- Communicate the results of the engagement process, as well as council's adopted target, to stakeholders and the public. The vast majority of people do not participate in public engagement, but are more likely to engage if an action will affect them in the future.

A bottom-up target-setting process usually has a substantial engagement component in conjunction with the development of major strategic directions. It may be tempting to avoid public or stakeholder engagement when setting top-down targets because of shorter timelines and smaller budgets. But without external support, action planning is less likely to be implemented in the future, particularly if there is a change of council.

Bottom-up analysis



Bottom-up target setting can get considerably more involved than top-down and, unless there is significant in-house expertise, will require the use of a consultant. Identifying community GHG sources and

analyzing their growth is a complex task that involves many variables. Predicting the impact of actions requires technical expertise in the sector, and must take into account the effect of one action on another.

Bottom-up target development usually takes place as part of a larger energy and emissions planning process. Developing pragmatic targets requires a detailed BAU projection and a detailed analysis of actions. However, the level of detail may vary. A higher level of detail will result in more accurate predictions, but involves more assumptions about what the future will look like. The validity of these assumptions depends somewhat on factors that are difficult or impossible to predict, such as the economy or fuel prices. As a result, accuracy may decrease with a very detailed future scenario analysis. Consideration should also be given to whether the methodology can be repeated when current targets are achieved and new targets and actions are developed.

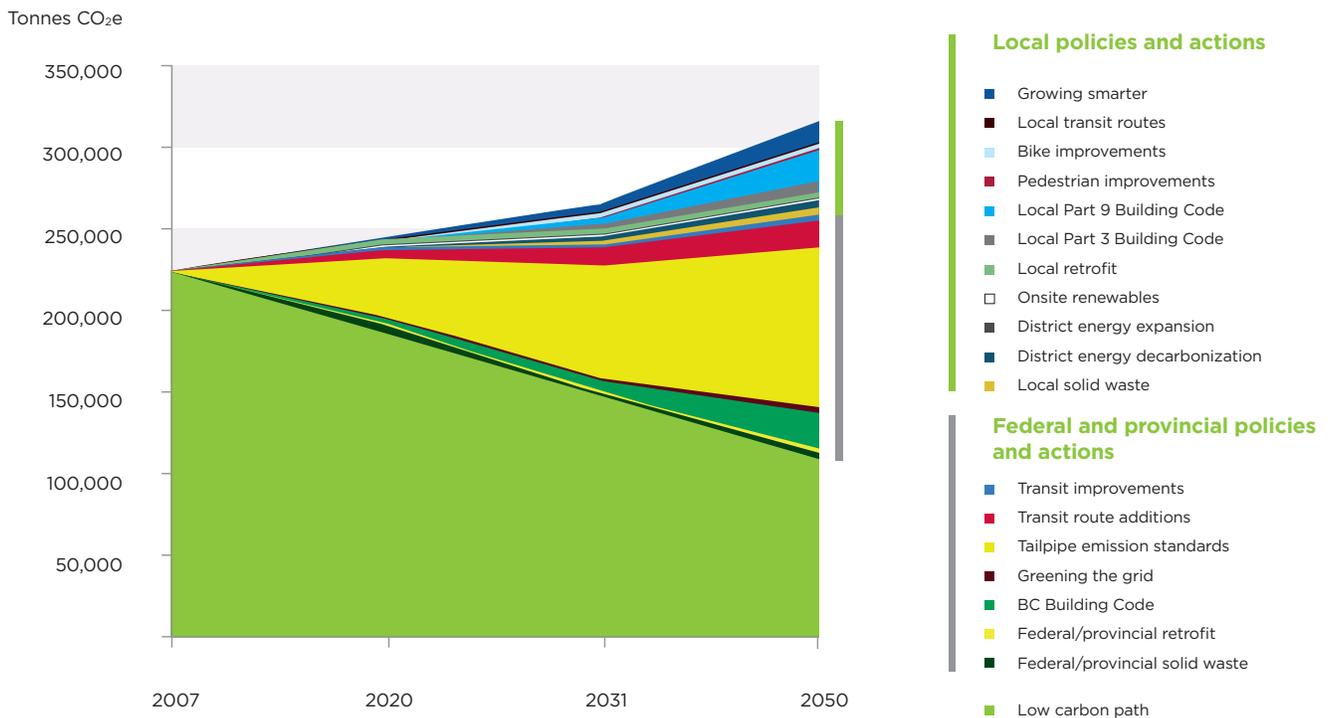
Bottom-up target development typically starts with a year-by-year projection of emissions in a BAU scenario. The projection incorporates expected population and employment growth rates, and available information on the future efficiency of buildings and vehicles. In its simplest form the projection can be based on growth rates by sector. A more sophisticated analysis may include projected residential and commercial growth combined with assumed changes in public transit, building codes and vehicle efficiency standards. The projection may also include GIS analysis of changing transportation, land use and development patterns. Changes in emissions factors over time are applied to the finished BAU scenario.

One question for the BAU scenario is whether or not to include actions taken by other orders of government and predicted technology changes. There is no right answer. Usually BAU projections include legislated changes and government commitments and ignore actions that are less certain. The choice is not overly important since it will not affect the final target, which is set relative to a base year, not to the BAU scenario. Once the BAU scenario is complete, any government measures or technology changes that were not included must be modeled, along with the actions that the municipality is considering.

When conducting the analysis, it is very important to account for any interactions that can produce 'double-dipping' in expected reductions. For example, smaller home sizes and higher efficiency standards will both reduce consumption, but if both are implemented the result will not be additive, since the higher efficiency standards are being applied to smaller homes that consume less energy to begin with.

Big strategic directions may be arranged in different scenarios that will lead to higher and lower GHG reduction targets. Municipalities can then evaluate the impact of each scenario on GHG emissions, and choose a preferred path, which can be defined in greater detail.

One of the benefits of a bottom-up target is that it allows for rigorous interim and sector-specific targets. The analysis produces sector-by-sector breakdowns by year, so almost any supplementary targets can be generated. Communities can also add non-GHG targets to the model. These might include secondary indicators such as per capita emissions, average home size, and transportation mode split. Such indicators can help guide implementation and track progress. Data for these indicators is often more readily available than GHG emissions data, and tends to be more meaningful for staff.



Wedge diagram showing emissions reductions from various actions. (City of North Vancouver Community Energy and Emissions Plan, 2010)

Choosing the target

Once the context is understood, engagement undertaken, and analysis performed it is time to select the target. One or more targets may be presented to council. Council should understand the rationale for each target and its implications.

Ensure that the target is S.M.A.R.T. It should be enough of a stretch to inspire action necessary to stabilize the climate. It should be meaningful and connected to local plans and priorities. It should also be achievable within a realistic timeframe. Finally, council must adopt the target and commit to meeting it.

Updating targets

Target setting is not a one-time event; targets should periodically be re-evaluated to ensure that they are appropriate. Some examples of when it may be appropriate to set a new target include the following scenarios:

- **Target is approaching:** If the target year is approaching it is time to set a new target. To prevent gaps in action planning, a new target should be set a few years before the existing target expires. The old target can be maintained to track progress and celebrate achievement.
- **Overachieving:** This is a nice position to be in, but municipalities should not stand pat if they are exceeding their targets. The reductions may result from actions taken by other orders of government (such as reducing emissions from electrical generation), or from technological advances that have had a greater impact than expected. If current targets are being exceeded, municipalities should set more aggressive targets.

- **Unrealistic targets:** Sometimes targets have no realistic chance of being achieved. This is particularly true for top-down targets set with too little analysis. Leaving these targets in place dampens implementation efforts. If there is truly no chance that targets will be reached, it is better to set new, more realistic targets.
- **Significant community change:** Occasionally, significant change in a community, such as municipal amalgamation or the shutdown of the town's major employer, make targets irrelevant.
- **Political change:** Targets should have broad community support and be able to withstand changes in council. However, politicians decide how much to support climate change action and a new council may reduce its support. (This may not affect the overall target, since councils may change again, but may affect interim targets.) It may be better to revise targets than to miss them. A new council that undertakes its own target-setting exercise may gain insight and be very committed to a new target.
- **Significant new strategic planning:** A municipality may have more resources available, and be able to set more rigorous targets, when it's working on a new official community plan, sustainability plan or climate action plan. It may also be able to refine target details when it's updating sectoral plans, such as a transportation plan, or a green building framework covering existing and new construction.

Updating targets: City of Toronto

In 1989, the City of Toronto became the first jurisdiction in the world to establish a GHG reduction target — a top-down target of 20% below 1989 emissions by the year 2005. The city updated its targets in 2007 with a more detailed plan and rigorous, bottom-up modeling. Toronto's current targets are 30% cuts by 2020 and 80% by 2050 relative to 1990 levels.

Toronto achieved 15% community wide GHG reduction by 2012, and is on track to meet its 2020 target. The city did better than expected in the waste and building sectors, but had lower reductions in the transportation sector

than it had projected. Deep building GHG reductions were the result of an effective district energy implementation, and the unexpected provincial commitment to phase out coal and ramp up renewable power. The shortfall in the transportation sector was due to municipal delays in implementing active transportation initiatives, and federal/provincial government delays in funding public transit. The transportation target was also based on expected changes to patterns of residential and commercial growth in the region, which failed to emerge. The city has updated its sectoral targets and is continuing to pursue its long-term goals.

CORPORATE TARGET SETTING



Municipalities control their internal operations and contracted services. They can show political leadership by setting corporate targets for energy use and GHG emissions.

Understanding the situation

Setting a corporate target is similar to setting a community target, but there are some distinct differences. Municipalities have considerable control over corporate emissions, but they are also subject to outside forces that may affect their ability to achieve their targets.

Influencing factors

Corporate target setting starts with an energy and emissions inventory. The inventory identifies the contribution of each sector and department to the corporate emissions profile. It should also identify the buildings and types of vehicles that consume the most energy. The inventory can be a valuable strategic management tool that provides basic information for setting emission targets.

How much do Canadian municipalities spend on energy?

Energy is a significant cost for local governments. Municipalities typically spend \$20–\$60 per capita on energy for their corporate activities. For a city of 50,000, that's \$1–\$3 million annually. Larger cities, like Calgary or Toronto, can spend tens of millions of dollars every year.

A number of factors influence a municipality's options:

- Municipalities have considerable control over buildings, which can be built as efficiently as desired, limited only by budget and design process.
- They have less control over vehicles, which are generally built to federal efficiency standards. Municipalities may face a limited selection when buying vehicles such as fire trucks and graders.
- Community form and geography are less important for corporate targets than for community targets, but they should be considered. Suburban expansion will increase demand for municipal services, including new parks, recreation centres, and service vehicles, and result in higher corporate energy use and emissions. Geography and climate may limit the effectiveness of certain reduction measures (for example, shade has an impact on solar power, cold weather on bio-diesel use).
- Federal and provincial/territorial government policy plays a significant role. New vehicle efficiency standards will allow municipalities to buy more efficient vehicles. Energy codes will improve the efficiency of new buildings. But if the local government is already building its own facilities to a standard higher than code (e.g. LEED® Gold rating), then there may not be any impact. Policies that alter the emissions factor of electricity or fuels can have a significant impact on emissions.

When accounting for the impact of these policies on corporate emissions, be sure to account for asset turnover — improved vehicle efficiency won't reduce consumption until old vehicles are replaced.



Existing assets



The state of municipal assets is one of the most important things to understand when setting corporate targets. In most cases existing assets will produce the bulk of emissions for many years to come.

When setting emission targets, municipalities should consider the following factors:

Age and condition: The age and condition of assets may determine whether they are upgraded or replaced. Older buildings and vehicles may be due for replacement, providing an opportunity to dramatically reduce energy consumption. If they are not ready to be replaced, older buildings can be retrofitted to increase efficiency; newer buildings may be more difficult to retrofit. Age determines when vehicles are replaced, and therefore how quickly fleet efficiency can be improved.

Impending changes: Be aware of planned changes to assets. New facilities will increase emissions unless an existing facility is being closed. New vehicles are often added to the fleet without replacing existing vehicles. If new assets are planned but not yet confirmed there is still an opportunity to influence their efficiency.

Ownership and operation: Some local government assets may be owned or operated by other organizations such as community groups or waste management companies. Before setting targets, municipalities need to understand the emissions these assets produce and whether they can influence them.

Budgets and resources



Available budget is probably the single largest factor determining how much corporate emissions can be reduced.

When municipalities set bottom-up targets, they are advised to

include implementation costs in the analysis so that appropriate funds can be budgeted. Implementation costs may include high-efficiency buildings, new vehicles, or increased recycling. While all of these costs come out of the municipal budget, a municipality that is reluctant to spend money on its assets is unlikely to achieve an aggressive corporate reduction target. Grants may be available to cover some planning and implementation costs.

Implementing a corporate plan may involve both capital costs and additional staff resources. Without these resources, action may be delayed or not implemented and the municipality may miss its targets. It's important to ensure that the timeframe for achieving targets is reasonable given the available resources.

Although municipalities bear the direct cost of reducing corporate emissions, they also reap the benefits of lower energy bills and operating costs. It is relatively simple to calculate the savings achieved by reducing energy use and GHG emissions. The calculation can help persuade councils that the investment in reduced corporate emissions is worthwhile. From a lifecycle perspective, the savings from carbon and energy management can be very cost-effective.

Setting a target

Like a community target, a corporate target may be developed top-down or bottom-up. However, the barriers to bottom-up analysis are lower for corporate target setting than they are for community target setting.

The analysis required for a bottom-up corporate target is considerably less than for a community target. The scope is much smaller and existing studies can often form the basis of analysis. Because of this, the analysis can be completed fairly quickly.

Resources are also less of an issue. Performing the analysis requires expertise, but some municipalities have the expertise in-house, and many require only modest consulting help. Corporate target-setting and planning costs are relatively low compared to community-wide analysis, and the savings go directly to the municipality.

For these reasons, some level of bottom-up analysis is generally recommended for corporate targets. The target does not have to be entirely pragmatic. In fact, it should be somewhat aspirational — more of a stretch than the community target — to show municipal government commitment and leadership.

Selecting a timeframe



Corporate timeframes are often shorter than community ones. Community targets may need to allow enough time for actions, such as land use and transportation planning, to show results.

Corporate actions tend to have more immediate results. There may be advantages to aligning the two, but a corporate target that is too far in the future may not communicate the urgency and the opportunity.

Generally speaking, the corporate target should be in a range of 5 to 15 years from the present, although a long-range target may also be set. The choice of a target year within the range depends on several factors. If considerable planning work has already been done, actions can be implemented immediately and a shorter timeframe is possible. If the cost of actions is high, expenses may need to be spread out over more years. Planned building replacements and infrastructure upgrades or the age of the vehicle fleet may also influence the choice of target year.

Interim targets should be set in order to track progress. Since corporate emissions can be measured more accurately than community emissions, interim targets can clearly indicate whether a municipality is on track to meet its commitments. With a bottom-up analysis, interim targets can be part of the implementation schedule. With a top-down target, interim targets will need to be pro-rated or estimated from the final target, with lower accuracy.

Strategic engagement

Most municipalities do not use public engagement in setting a corporate target. Some public or key external stakeholder engagement may be useful to gauge support and convince council that proposed targets have the backing of the public. If an engagement process is being used to set a community target, a small corporate component can easily be included. It is much more important to have staff engagement, particularly with senior managers and key staff who will be tasked with achieving the target. Without it, staff may not take ownership of the strategies or be committed to the target. Council engagement is also critical, to justify the investment.



Choosing the target

Setting a corporate target is similar to setting a community target. Asking the following questions will help guide the process:

- What sectors do the majority of savings need to come from? Is the proposed target reasonable for those sectors? (If the majority of emissions come from vehicles and expected fleet savings are only 10-15 per cent, then an overall target of 30 per cent is unlikely to be achieved.)
- Where is growth coming from? Are new buildings likely to be highly efficient or built according to common practice?
- What energy sources will reductions come from? (In some provinces and territories electricity has a fairly low emissions factor, so savings in electricity will have little impact on emissions.)
- What will be the impact of actions taken by other orders of government? The most important of these are vehicle efficiency standards and emissions factors for electricity and fuels.

It usually doesn't make sense to align a top-down corporate target with provincial, territorial or federal targets. These targets are intended to cover a much broader range of activities with significant differences in timeframe and control. The local top-town corporate target is most likely to be a round number, such as 10 per cent, that is considered achievable. PCP recommends a 20 per cent reduction within 10 years as a corporate target. This is an appropriate target for many municipalities.

A bottom-up corporate analysis is usually done as part of action plan development (Milestone 3), but

may be done as a standalone target-setting exercise. The people conducting a bottom-up analysis need to understand efficiency regulations and emissions factors, and be able to judge what reductions are realistic for each action. It is important for them to consider how measures will interact; using bio-diesel will affect the savings from higher-efficiency vehicles, for example.

Bottom-up analysis requires a careful assessment of business-as-usual (BAU) growth, particularly any new buildings or infrastructure being proposed. While these create opportunities, they may result in a net increase in emissions, particularly if old assets are retained.

Comparing various actions to the BAU profile will help clarify their impact on emissions. This can help prioritize actions as well as determine appropriate targets. The cost of implementation is important and should be estimated for major actions. Budget is often the primary consideration and if costs are too high the target will not be achieved.

With bottom-up analysis, various reduction scenarios can be developed, each with estimated costs and energy savings. Marginal abatement curves, which graphically display benefits and costs, may make it easier to decide which actions to incorporate into each scenario.³

Scenarios allow council to assess the merits of each target with a clear understanding of the implications. Even with a top-down target, it is necessary to identify a number of key actions, since council and senior staff need a rough idea of what will need to be done to achieve the target. The actions can then be further developed in the action plan.

TYPICAL RANGE OF SAVINGS FROM ENERGY AND GHG MANAGEMENT MEASURES IN CORPORATE OPERATIONS

Sector	Typical Unit	Savings
Buildings	Electricity (kWh) and gas (GJ)	10-30%
Streetlights	Electricity (kWh)	0-50%
Water/wastewater pumping	Electricity (kWh)	5-15%
Vehicle distance travelled	Vehicle-kilometres travelled (km)	5-15 %
Vehicle fuel consumption	Gasoline/diesel (L)	15-30%
Solid waste	Landfill waste (t)	5-50%

Note: GHG reductions will depend on emissions factors that vary by location.

³ See the 2013 report *Progress Report: Region of Waterloo's Corporate GHG Emission Reduction Plan* for an example of marginal abatement curves: www.regionofwaterloo.ca/en/aboutTheEnvironment/resources/AppendixAreportCR-FM-13-015.pdf.

SAMPLE SCENARIOS FOR CORPORATE TARGETS

Target	Actions included	GHG reduction	Estimated budget	Annual energy cost savings
Low target	<ul style="list-style-type: none"> Building retrofits New LEED building Driver training Recycling program 	500 tonnes (8.0%)	\$800,000	\$100,000
Medium target	<ul style="list-style-type: none"> Building retrofits New LEED building Solar pool water heating Driver training Green purchasing policy Recycling program 	900 tonnes (14.4%)	\$1 million	\$120,000
High target	<ul style="list-style-type: none"> Aggressive building retrofits New LEED building Solar pool water heating Biomass boiler plant Driver training Green purchasing policy Natural gas fleet conversion Zero-waste plan 	1700 tonnes (27.2%)	\$3 million	\$175,000

Updating targets

Corporate targets should be updated shortly before the existing target year is reached so that new targets will be in place and ongoing actions can continue. New targets will require a new action plan, unless the existing plan is valid beyond the target year.

The new target should reflect experience gained working on the old target, and incorporate what has been learned about timing, budget, and staff resources. Changes in corporate assets, budgets, or political direction can also be taken into account.

JOIN PCP TODAY!

MEMBERSHIP IS ONLY FIVE STEPS AWAY:

- 1** After reviewing this document, contact the secretariat for more details, and to ask questions.
- 2** Download a sample council resolution at www.fcm.ca/pcp or contact the PCP secretariat.
- 3** Appoint one staff member and one elected official to be your main contacts with PCP.
- 4** Fax, mail or e-mail your adopted council resolution, along with the staff member's and elected official's contact information, to the PCP secretariat. (See contact information below.)
- 5** The PCP secretariat will send you a PCP information package, including a list of resources and the PCP Milestone Framework. Apply to GMF for a grant to cover up to 50% of the costs of completing milestones 1, 2 and 3.

CONTACT PCP

Find out more about PCP by visiting www.fcm.ca/pcp or by contacting the PCP secretariat at 613 907 6392. Email pcp@fcm.ca



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Reaching Milestone 2: How to set emissions reduction targets

PCP is a partnership between the Federation of Canadian Municipalities and ICLEI – Local Governments for Sustainability. It is the Canadian component of ICLEI's international Cities for Climate Protection program.

