

PCP MILESTONE 1



CREATING A GREENHOUSE GAS
EMISSIONS INVENTORY AND
FORECAST



PCP Milestone One - Creating a Greenhouse Gas Emissions Inventory and Forecast

Milestone One establishes the greenhouse gas (GHG) baseline inventory and business-as-usual (BAU) forecast, providing the foundation on which municipalities will base all their subsequent milestones. A GHG inventory brings together data on community and municipal energy use and solid waste generation to estimate GHG emissions in a given year. The BAU projects future emissions based on assumptions about population, economic growth, and fuel mix. An inventory can be used to document energy consumption, waste composition data, and the resulting GHG emissions.

There are five key elements which are required for Milestone One and which PCP members must demonstrate before Milestone One recognition can be issued. These criteria include:

1. Completing a corporate and/or community inventory which follows the [PCP protocol](#);
2. Providing the emissions intensity values or coefficients for all energy types that were used to complete the emissions inventory;
3. A summary of data sources;
4. A description of any assumptions or omissions made with respect to the data; and
5. A Business-As-Usual (BAU) forecast of emissions approximately 10 years into the future.

In recognition of the variety of protocols that local governments are using to calculate and report GHG emissions, and in an effort to streamline and avoid duplication of work, the PCP program will accept GHG quantification work already completed for certain other reporting methodologies and standards.

The PCP Secretariat will accept GHG reports developed for the following reporting programs and with the following caveats:

British Columbia Local Government Climate Action Program (LGCAP)

To meet compliance with PCP Corporate Milestone 1, PCP members must also submit quantification of corporate solid waste emissions. Please refer to pg. 23 of the [PCP Protocol](#) for more details and guidance.

Ontario Regulation 507/18 Broader Public Sector: Energy Reporting and Conservation and Demand Management Plans.

O.reg 507/18 only requires quantification of GHG emissions from municipal buildings and facilities. PCP members can submit their O.reg 507/18 energy report to satisfy PCP Corporate Milestone 1 requirements for reporting emissions on the *building* sector and the *water and wastewater* sector. To achieve full Milestone 1 compliance, PCP members must still quantify emissions from the *vehicle fleet, streetlights and traffic signals*, and *solid waste* corporate sectors.

ISO 14064-1:2018: Greenhouse gases – Part 1: Specification with guidance at the organization level for quantification and reporting of greenhouse gas emissions and removals.

A GHG report prepared in compliance with ISO 14064-1 can be submitted as is to the PCP Secretariat for review.

1. Summary of Corporate and/or Community Inventory

Milestone One requires municipalities to conduct an inventory and establish an emissions baseline. The guidelines outlined in the PCP Protocol need to be followed when conducting a corporate and/or community inventory. The PCP protocol is a set of guidelines based on international best practices in municipal GHG accounting that provides communities with a standardized approach to quantifying emissions. This approach facilitates comparisons across time and between different communities in a policy-relevant fashion. With the intent of helping local governments achieve tangible reductions in their GHG emissions, the PCP enables the measurement of local government and the community's progress towards

climate-related goals. Its approach is complementary to existing or foreseeable regulatory requirements and potential emissions reduction certification.

PCP uses a sector-based inventory approach as opposed to a consumption-based approach. Consumption-based GHG accounting is an alternative to the sector-based approach to measuring city GHG emissions. This focuses on the consumption of goods and services (such as food, clothing, electronic equipment, etc.) by residents of a city, and GHG emissions are reported by consumption category rather than GHG emission source category¹.

An inventory should be divided into corporate and community.

A community inventory includes buildings (residential, institutional, commercial, industrial), transportation, and solid waste sectors.

A corporate inventory includes: municipal buildings, fleet, street lighting, water and wastewater treatment, and corporate and/or community solid waste².

It is important to note that the corporate inventory is considered to be a subset of the community inventory. The community inventory therefore captures all emissions within the municipal boundary including corporate emissions, whereas the corporate inventory is intended to account for only the emissions that are under direct municipal control.

Sources of Emissions

There is no limit to the emission sources and fuel types that local governments may quantify and include in the emissions analysis, although consistency is very important. If an emissions reduction is to be claimed relative to a baseline emissions inventory, then the original emissions source must be included in the inventory.

¹ C40 Cities. (2018). Consumption-based GHG emissions of c40 cities.

<https://www.c40.org/researches/consumption-based-emissions>

² If the landfill or waste disposal centre is owned and operated by the municipality, then all waste emissions should be accounted for under the corporate and the community inventory, as the municipality has direct operational control over the waste. This is not considered double counting, because the corporate inventory is a subset of the community inventory – the two inventories are not added together.

2. Emissions Coefficients

In order to remain transparent and consistent, PCP requires that all municipalities provide the values and source of emissions coefficients that have been used to conduct an inventory. This includes a list of all coefficients for all energy types, including electricity.

PCP strongly recommends using coefficients from the [National Inventory Report \(NIR\)](#) that is produced by Environment Canada. The support behind the NIR coefficients is that they take into consideration all of the sources feeding into and out of the electricity grid, when locally provided emission coefficients may not always. The PCP Tool automatically uses the most update emissions coefficients from the NIR for each province.

Unless the municipality is in a special situation where they are not on the main provincial grid, or where it can be proven that renewable energy is being provided to the community through a direct line connection or through the purchase of renewable energy credits, then the provincial average coefficient should be used – which PCP prefers to be provided by the NIR. This consistency facilitates comparisons within each province.

3. Summary of Data Sources

The data that is required to complete a GHG inventory is sometimes difficult to find as it comes from a wide variety of sources. Once it is located, it is beneficial to describe where the data was obtained from, what the data was, and any assumptions that were made. For example, John Smith (Fleet Coordinator) in the Transportation department provided a list of all fleet vehicles, the total amount of gasoline and diesel fuel in liters used in 2018 and this includes reimbursed business fuel purchases. Staff responsibilities change over time, thus naming the person and their position within the department can help save time locating data for future GHG inventories.

4. Description of Assumptions

PCP requires a description of all assumptions that have been made with respect to the inventory data. This includes a description of any omissions, substitutions, downscaling, or estimations that were made while compiling the inventory. There will be cases where accurate and localized data is unavailable. In these instances, it may be necessary to use estimates or to downscale provincial or national level data. Although this may influence the relative uncertainty associated with the consumption data, activity estimates are a useful secondary method that can be employed in the absence of real consumption data.

5. Business-as-Usual Forecast

A BAU forecast needs to include information on emissions for approximately 10 years beyond a baseline. The methodology used to calculate the BAU needs to be outlined to ensure transparency. An outline of any assumptions that were made, such as growth estimates, omissions, expansions, etc. should also be included. The changes in emissions from the baseline can be expressed in absolute terms (tonnes/ CO_2e) or as a percent (%) change from baseline.

BAU forecasts can range from complex modeling exercises to simpler forecasts based on population growth. If available BAU forecasts can be broken down by projected growth and/or expenditures in each sector. The method and rationale is up to the local government's discretion. See the example of a corporate BAU forecast below.

Exhibit 1: Sample BAU Corporate Forecast in %

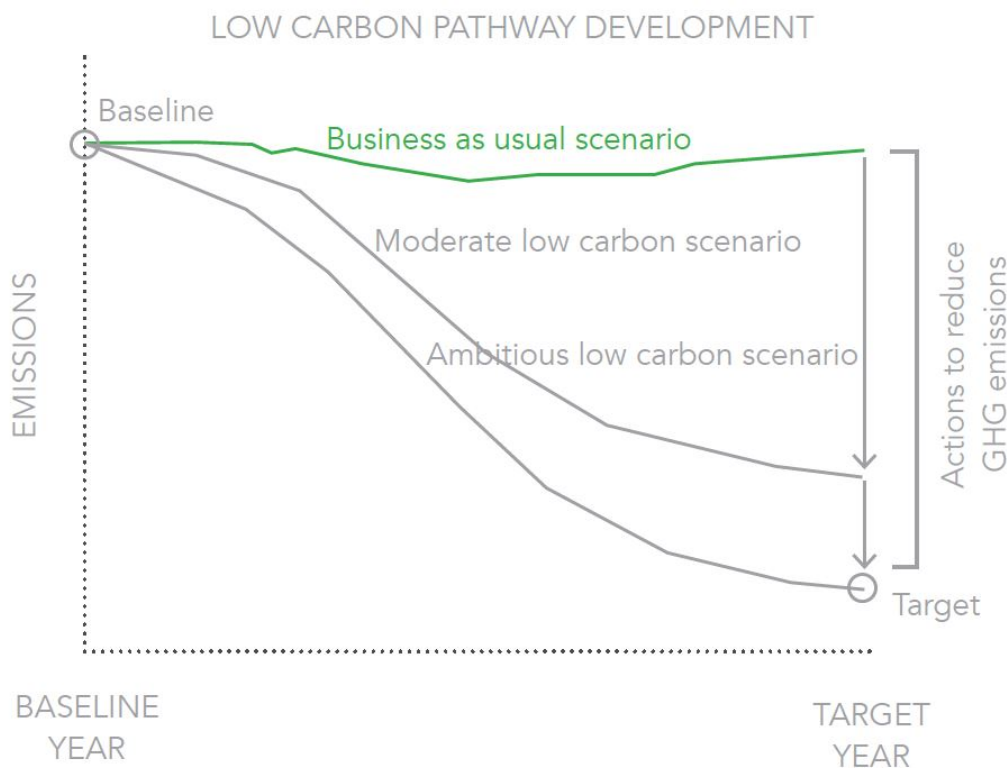
Sector	Forecasted Changes	Resulting Emissions Increase (%)
Buildings	<ul style="list-style-type: none"> • No significant plans for expansion of District buildings or facilities. • Discussion around the potential development of a multi-use community centre, however the project is not yet included in the budget projections. • Potential expansion of staff, which may require new office facilities. • Growth will not directly mirror populations projections, however a modest expansion of 1% by 2030 is estimated. 	4%
Streetlights	<ul style="list-style-type: none"> • Plans indicate a reduction of streetlights due to revision of standards for streetlight placement (i.e. increasing distance between lamps) • New developments will require streetlights, therefore an increase of 2% annually, consistent with growth projections is estimated. 	0.4%
Water and Wastewater	<ul style="list-style-type: none"> • New developments will require access to the water and wastewater operations, therefore new lift stations are expected. • Development of new parks and greenspaces will require irrigation. • Population growth, development of greenspace, and changes to climate will influence water consumption by an estimated 2.5% annually. 	1.3%
Vehicle Fleet	<ul style="list-style-type: none"> • Expected to mirror population growth at 2% annually. • No major purchases or changes to the current fleet expected. 	8.8%

Waste	<ul style="list-style-type: none"> Expected to increase at same rate as building expansion, therefore a 1% increase annually is likely. 	0.6%
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**This Exhibit has been adapted from the District of Invermere's Final GHG Plan, 2010*

A community BAU forecast would look at available historic data for the community, including provincial per capita emissions and population projections. Although a community forecast is driven by population growth, efficiency improvements that are expected as a result of senior government policy can also be considered. These might include reductions in energy demand in newly constructed buildings, improvements in fleet fuel emissions, and increasing or decreasing GHG intensity of the electricity grid. See the example of a community BAU forecast below:

Exhibit 2: Sample Community BAU Forecast in t CO₂e/year



**This Exhibit has been adapted from the City of Markham's Municipal Energy Plan*

6. Other Considerations

In addition to the criteria outlined above, the PCP Secretariat looks for a series of other items when conducting a technical review including proper data sourcing, referencing, and clear and consistent language. PCP looks for well written and well thought out reports. Often, the reviewer will make general comments that pertain to the documents submitted for Milestone recognition; these types of comments that do not pertain directly to milestone requirements remain general in nature and will not directly impact the milestone recognition process if the above criteria are satisfied.

7. Submission Instructions

Milestones 1 submissions can be submitted through the PCP Tool or all necessary documents and reports for PCP compliance can be sent by email to: pcp@fcm.ca. After technical review for PCP compliance by ICLEI Canada, a formal milestone recognition letter will be issued by FCM. If submitted through the PCP Tool, the corresponding PCP Medallion will be awarded as well. Any technical questions regarding compliance with PCP requirements can be directed to: iclei-canada@icei.org.

8. Examples of Milestone One Inventories

Community Milestone One:

[Dufferin County Community GHG Inventory](#)

Corporate and Community Milestone One:

[West Hants Regional Corporate and Community GHG Inventory](#)