

Many chemical compounds found in the Earth’s atmosphere act as and are referred to as “greenhouse gases” that allow sunlight to enter the atmosphere and prevent infrared radiation from escaping back to space.² This affects global climate and temperatures. GHG emissions occur from natural processes (biogenic and physical) and also from human activities and sources (anthropogenic) such as the burning of fossil fuels. A scientific consensus has emerged that increasing concentrations of GHG emissions in the Earth’s atmosphere results in increased average global temperatures. This, in turn, leads to changes in the Earth’s climate that are detrimental to our economies and environment. Therefore, it is important to measure and decrease anthropogenic GHG emissions. GHG inventories shall address the six internationally recognized greenhouse gases which directly impact the climate:

- Carbon dioxide (CO₂);
- Methane (CH₄);
- Nitrous oxide (N₂O);
- Hydrofluorocarbons (HFCs);
- Perfluorocarbons (PFCs); and
- Sulfur hexafluoride (SF₆).

Local governments estimate and report on community GHG fluxes using a tool known as a GHG inventory. A GHG inventory estimates the quantity of GHG emissions and removals associated with community sources and activities taking place during a chosen analysis year. By conducting additional inventories and presenting data over time, local governments can use community GHG inventory reports to provide information on trends in GHG emissions associated with a given community. Local governments may choose to develop a community GHG inventory report for a number of reasons, including to:

- inform climate action planning
- demonstrate accountability and leadership
- track GHG emissions performance over time
- motivate community action
- recognize GHG emissions performance relative to similar communities
- enable aggregation of GHG emissions data across regions, and
- demonstrate compliance with regulations, voluntary agreements, and market standards (where applicable).

Community GHG inventory reports typically focus on selected GHG emissions occurring within the jurisdictional boundary of the community (e.g., emissions from combustion of natural gas in furnaces throughout the community), as well as certain trans-boundary emission sources associated with community activities (e.g., emissions from electricity generation at a power plant located outside the community associated with electricity use occurring in the community). GHG removals may also occur, particularly in the land sector.

In-boundary GHG Emissions Sources	Activities Resulting in GHG Emissions
Any physical process inside the jurisdictional boundary that releases GHG emissions into the atmosphere (e.g., combustion of gasoline in transportation; combustion of natural gas in electricity generation; methane emissions from a landfill) or removes GHGs from the atmosphere (e.g., protecting and managing forests; planting or maintaining trees).	The use of energy, materials, and/or services by members of the community that result in the creation of GHG emissions either directly (e.g., use of household furnaces and vehicles with internal combustion engines) or indirectly (e.g., use of electricity created through combustion of fossil fuels at a power plant, consumption of goods and services whose production, transport and/or disposal resulted in GHG emissions).

In-boundary GHG Emissions Sources	Activities Resulting in GHG Emissions
Built Environment	
Use of fuel in residential and commercial stationary combustion equipment (e.g., boilers and furnaces)	Use of fuel in residential and commercial stationary combustion equipment (e.g., boilers and furnaces)
Industrial stationary combustion sources	
Power generating facilities	Use of electricity by the community ⁱ
District heating or cooling facilities	Use of district heating or cooling by the community
Industrial processes	
Refrigerant leakage	
Transportation and Other Mobile Sources ^{ii, iii, iv, v}	
On-road passenger vehicles operating within the community boundary	On-road passenger vehicle travel associated with community land uses
On-road freight and service vehicles operating within the community boundary	On-road freight and service vehicle travel associated with community land uses
On-road transit vehicles operating within the community boundary	
Transit rail vehicles operating within the community boundary	Use of transit rail travel by the community
Inter-city passenger rail vehicles operating within the community boundary	
Freight rail vehicles operating within the community boundary	
Marine vessels operating within the community boundary	Use of ferries by the community
Off-road surface vehicles and other mobile equipment operating within the community boundary	
	Use of air travel by the community
Solid Waste	
Operation of solid waste disposal facilities	Generation and disposal of solid waste by the community
Wastewater and Water	
Operation of water delivery facilities	Use of energy associated with use of potable water
	Use of energy associated with generation of wastewater
Process emissions from operation of wastewater treatment facilities	Process emissions associated with generation of wastewater

Operation of septic systems	Use of septic systems by the community
Agricultural Livestock	
Domesticated animal production	
Manure decomposition and treatment	
Forest and Lands	
Forest Lands within boundary	Direct or indirect changes to forest carbon stocks outside the community boundary, due to activities within the community boundary. Including forest protection and land use change
Trees outside forests, such as parks, street trees, and urban canopy	
Upstream Impacts of Community-Wide Activities (Optional)	
	Upstream impacts of fuels used in stationary applications by the community
	Upstream and transmission and distribution (T&D) impacts of purchased electricity used by the community ^{vi}
	Upstream impacts of fuels used for transportation in trips associated with the community
	Upstream impacts of fuels used by water and wastewater facilities for water used and wastewater generated within the community boundary
	Upstream impacts of select materials (concrete, food, paper, carpets, etc.) used by the whole community. Note: Additional community-wide flows of goods & services will create significant double counting issues.
<p>i Emissions associated with the use of purchased electricity should include delineation of electricity used in stationary applications vs. transportation vehicles to the extent possible.</p> <p>ii Community refers to residents, businesses, industries, and government co-located within a defined jurisdiction. Across each mode, travel by members of the community often involves crossing the community boundary with a portion of travel occurring outside the community. Quantifying emissions associated with the use of travel by the community generally involves estimating emissions associated with the entire length of in-boundary and trans-boundary trips, and allocating a portion of those emissions to the community for which emissions are being reported. See Chapter 3 for further detail.</p> <p>iii Vessels operating within the community boundary include docked or idling vessels.</p> <p>iv Emissions associated with use of travel by the community include energy used while vehicles are docked or charging.</p> <p>v Some communities with transportation hubs or ports may be interested in tracking emissions associated with fuel loaded into aviation, marine, or rail vessels departing from those hubs or ports. These vessels often transport people and goods associated larger geographic regions, and often most of the fuel loaded into them is combusted outside the community boundary. These emissions are not included in Table 2 for these reasons, but local governments may choose to report on them in addition to the GHG sources and activities listed in Table 2.</p> <p>vi Upstream impacts of the use of purchased electricity can include consideration of associated transmission and distribution losses.</p>	