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1. Introduction

Climate Smart Communities Program Overview

In 2009, New York State established the Climate Smart Communities program to provide local governments with guidance on how to reduce greenhouse gas (GHG) emissions, save taxpayer dollars, improve operations and infrastructure, and advance community goals for health and safety, economic vitality, energy independence, and quality of life. The Climate Smart Communities program is a unique partnership of six New York State agencies, including the Department of Environmental Conservation (DEC), the New York State Energy Research and Development Authority (NYSERDA), the Department of Transportation (DOT), the Department of Health (DOH), the Department of State (DOS), and the Public Service Commission (PSC).

This guide has been developed through the Climate Smart Communities Regional Coordinator program, launched in 2012, with the goal of providing resources and technical assistance to Climate Smart Communities to advance their climate protection efforts and achieve the program’s goals of reducing greenhouse gas emissions, adapting to a changing climate, and saving taxpayers money. More information about the CSC program is provided on the New York State Department of Environmental Conservation website.

Climate Smart Communities Pledge

Local governments in New York State can join the CSC program by adopting the voluntary Climate Smart Communities Pledge to reduce greenhouse gas emissions, prepare for a changing climate, protect public health and safety, and support a secure economic future. The CSC pledge element framework guides local governments in the development and implementation of successful local climate action programs. The pledge includes the following ten pledge elements:

1. Pledge to be a Climate Smart Community
2. Set Goals, Inventory Emissions, Plan for Climate Action
3. Decrease Community Energy Use
4. Increase Community Use of Renewable Energy
5. Realize Benefits of Recycling & Other Climate-Smart Solid Waste Management
6. Reduce GHG Emissions Through Climate-Smart Land-Use Tools
7. Enhance Community Resilience & Prepare for the Effects of Climate Change
8. Support Development of a Green Innovation Economy
9. Inform & Inspire the Public
10. Commit to an Evolving Process of Climate Action

Pledge Element 2 entails developing baseline greenhouse gas (GHG) emissions inventories for local government operations and the community, establishing GHG emissions reduction target(s) and financing strategy, and developing a local action plan for reducing emissions. Developing a local government operations GHG inventory, as discussed in this guide, is a key component of Pledge Element 2, and a necessary initial step in the climate protection process.
What is a Local Government Operations GHG Inventory?

A local government operations GHG inventory is an accounting, analysis, and baseline report of the GHG emissions resulting from the day-to-day operations of a village, town, city or county. This includes consumption of energy and materials from the operation of government-owned or managed facilities, emissions from vehicle fleets, energy from outdoor lighting, wastewater and water treatment facility processes, decomposition of waste, and other sources. The inventory can be used as a starting point for developing climate mitigation strategies or a climate action plan and as a benchmark for tracking progress for GHG reductions.

Why is a Local Government Operations GHG Inventory Important?

The purpose of conducting a local government operations GHG emissions inventory is to gain an understanding of the emissions sources, establish a baseline, and identify opportunities to reduce energy use and GHG emissions. A local government operations GHG inventory can lead to the following benefits:

- **Improved ability to manage energy use.**
  A GHG inventory helps a local government identify the largest energy users and GHG emissions sources (e.g., by building, sector, or department), which will help to target energy efficiency strategies to the areas with the greatest opportunities.

- **Leading by example.**
  Local governments can set an example for local businesses, the community, and their peers by developing a GHG inventory and helping others understand the results. The more others understand the benefits of measuring GHG emissions and implementing energy efficiency improvements, they will begin to take similar actions. The GHG inventory can also be the starting point to open up a dialogue and share best practices with local businesses and other organizations.

- **Increased Transparency.**
  Publicly releasing the results of an inventory and explaining the results, helps to increase transparency and accountability of local governments to their taxpayers to operate efficiently and use resources effectively.

- **Cost Savings.**
  Energy efficiency improvement opportunities that can arise from a GHG inventory help to save taxpayer dollars, as described in Case Study 1. Many energy efficiency improvements can pay for themselves within a few years or less, resulting in direct and measurable energy and cost savings.

You can’t manage what you don’t measure.

This guide is intended to help you quickly gain an understanding of the process of developing a local government operations GHG inventory, and will provide tips and helpful resources designed to save you time and resources in the inventory process.
2. Getting Started

Designate a GHG Inventory Project Coordinator and Technical Lead

One of the first steps in developing a GHG inventory is to designate a **Project Coordinator** and **Technical Lead**. The GHG Inventory Project Coordinator will be responsible for the overall management of the project, and the Technical Lead will be responsible for gathering all of the data, calculating the GHG emissions, and developing the GHG inventory report.

The Project Coordinator is often a local government staff member, typically with other responsibilities related to climate change and sustainability, such as planning, recycling, or energy management. The Project Coordinator could act solely as the project manager for the effort, or in many cases also take on the role of the Technical Lead by gathering all of the data and developing the GHG inventory.

Case Study 1 - New York City’s GHG Inventory: Identifying Largest Emission Sources

New York City conducted its first local government operations GHG emissions inventory in 2007 and determined that 64% of emissions came from city-owned buildings and 17% from water and sewer related emissions. This helped the city to develop energy conservation and climate protection strategies in its sustainability plan, *PlaNYC*, and other corresponding plans. Using this information, the city focused funding and resources toward building energy efficiency, which has ultimately led to significant cost savings.

**Tip 1**

**Tips for Working with Interns & Volunteers**

- Clearly define roles & responsibilities
- Provide access to training & resources
- Make sure interns & volunteers are available for the duration of the project to be consistent with developing the inventory
- Help team members contact local government staff with data requests & communicate the importance of the project
- Monitor progress regularly to ensure the project is on track
- Provide timely feedback

The Technical Lead will need strong analytical abilities, and to be highly organized and diligent in gathering and managing all of the data that go into an inventory. Many local governments elect to have a junior staff member, intern, or volunteer act as the Technical Lead, which is a cost effective approach to developing an inventory. If a local government elects to use an intern or a volunteer, it should work with someone with strong analytical, organizational, and writing skills, often a graduate student, who has an interest in climate change or sustainability and is studying a related field. **Tip 1** provides some suggestions for successfully working with interns.
Identify Key Contacts and Stakeholders

Conducting a local government operations GHG inventory requires the cooperation and collaboration of a number of people to be successful, including the chief elected official, department heads, staff, and even the utilities. Getting organized upfront and identifying all of the relevant contacts and stakeholders will help to expedite and simplify the process of gathering data. The Project Coordinator will need to assist the Technical Lead in identifying the right departments and people. The contacts are staff members who will be providing data to conduct the GHG inventory, while the stakeholders are the staff responsible for managing the operations that will be analyzed in the inventory, such as a facilities manager or fleet manager. In many cases, a stakeholder could be a contact, but often the stakeholder will have another staff member responsible for managing the relevant data. A list of typical emissions sectors and the possible contacts are provided in Table 1.

Table 1: Local government operations GHG inventory Sectors and Possible Contacts

<table>
<thead>
<tr>
<th>Emissions Sectors</th>
<th>Possible Contacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buildings and other facilities</td>
<td>Facilities Manager, Finance Department</td>
</tr>
<tr>
<td>Streetlights and traffic signals</td>
<td>Facilities Manager, Finance Department, Parks Department</td>
</tr>
<tr>
<td>Vehicle fleet</td>
<td>Fleet Manager, Finance Department</td>
</tr>
<tr>
<td>Solid waste management and facilities</td>
<td>Public Works Department, Finance Department</td>
</tr>
<tr>
<td>Water delivery facilities</td>
<td>Public Works Department</td>
</tr>
<tr>
<td>Airport and port facilities</td>
<td>Airport Manager, Port Authority</td>
</tr>
<tr>
<td>Transit fleet</td>
<td>Public Transit Agency, Finance Department</td>
</tr>
<tr>
<td>Power generation facilities</td>
<td>Public Utility</td>
</tr>
<tr>
<td>Wastewater facilities</td>
<td>Wastewater Treatment Plant, Finance Department</td>
</tr>
<tr>
<td>Employee commute</td>
<td>Human Resources Department</td>
</tr>
</tbody>
</table>

The Technical Lead and Project Manager should note that some local governments centrally manage all of their buildings and fleet, while others allow delegate management of buildings and fleet to individual departments, such as police or fire departments. If this is the case, then contacts from those departments will also need to be included to make sure all of the building and fleet data is captured.

In addition to identifying these key contacts and stakeholders, the Project Coordinator should also ensure that the chief elected official and department heads are supportive of the project and willing to dedicate their resources and staff time to supporting the Technical Lead in gathering the data. The chief elected official should send out a letter or memo to the relevant contacts and stakeholders, notifying them of the upcoming inventory and the need for their support and cooperation. A sample letter from a chief elected official to kick-off the inventory process is provided in Appendix C.

A longer discussion of the specific data needs along with tips for gathering data is provided in Section 4.
Expected Timeline

The total amount of time expected to conduct a GHG inventory varies based on several factors:

- Size and complexity of the local government
- Availability and quality of data
- Amount of resources dedicated to the effort
- Promptness of contacts in providing data

Depending on these factors, local governments can expect the process to take about two to six months and a total of 180 to 350 person-hours. The process can take several months because of the time involved in gathering and reviewing all of the data. The data collection process is the most time consuming, so the Project Coordinator and Technical Lead should move as quickly as possible through the preparatory steps to allow sufficient time for data collection. Methods for streamlining data collection are provided in Section 4 of the guide to help local governments simplify this part of the process as much as possible.

3. GHG Protocol and Tools

Local Government Operations Protocol

The Local Government Operations Protocol (LGOP) provides a standardized set of guidelines to assist local governments in quantifying and reporting GHG emissions associated with their operations. The LGOP was developed through a partnership among the California Air Resources Board (ARB), California Climate Action Registry (CCAR), and ICLEI – Local Governments for Sustainability (ICLEI), in collaboration with The Climate Registry and many experts and stakeholders. The LGOP is the standard for developing a local government operations GHG inventory. Version 1.0 of the LGOP was released in 2008 and Version 1.1, which is the current version, was released in May 2010. The LGOP provides detailed guidance on all components of a local government operations GHG inventory, including what to include in an inventory, how to calculate emissions, and how to report the results. The LGOP should be used as a reference for understanding which emissions sectors and data to include in an inventory and the preferred and alternative methodologies for calculating GHG emissions from each sector.

GHG Inventory Tools

The Climate Smart Communities program developed and released a Local Government GHG Accounting Tool for calculating GHG emissions for a local government operations GHG inventory in January of 2014. All Climate Smart Communities can access this Microsoft Excel-based tool for free. This user-friendly format provides guidance on where to input energy use, waste, and other data, and automatically calculates the GHG emissions for each sector and creates graphs and charts that can be copied into a GHG inventory report. An instructional User’s Guide for Local Government GHG Accounting Tool has been developed to show users how to input data into the tool, calculate GHG emissions, and develop reports and graphs.

Local governments in New York State are encouraged to use the Local Government GHG Accounting Tool, but are not required to do so. There are other GHG inventory tools on the market for local governments. For a brief summary of the possible tools, see Table 2. Most other tools have some cost
associated with using them. Two commonly used, low-cost tools are ICLEI’s *Clean Air Climate Protection Software (CACP)* and The Climate Registry’s *Climate Registry Information System (CRIS)*. There are also many energy and greenhouse gas emissions management software packages on the market which are not necessarily designed for local governments but can be used to develop a local government operations GHG inventory. Many of these tools have more advanced energy management functionality, particularly for managing energy use in buildings. For communities seeking a more advanced tool, they should make sure it allows them to calculate GHG emissions for all sources discussed in the LGOP.

**Table 2: Highlights of GHG Inventory Management Tools**

<table>
<thead>
<tr>
<th>Tool</th>
<th>Highlights</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSC Local Government GHG Accounting Tool</td>
<td>• Local government operations inventory&lt;br&gt;• Compliant with LGOP&lt;br&gt;• Pre-defined reports&lt;br&gt;• MS Excel based</td>
<td>Free</td>
</tr>
<tr>
<td>ICLEI Clean Air Climate Protection Software (CACP)</td>
<td>• Local government operations and community inventory&lt;br&gt;• Compliant with LGOP&lt;br&gt;• Less user-friendly&lt;br&gt;• Desktop based (not web-based)</td>
<td>Low (included in ICLEI membership)</td>
</tr>
<tr>
<td>TCR Climate Registry Information System (CRIS)</td>
<td>• Local government operations inventory&lt;br&gt;• Compliant with LGOP&lt;br&gt;• Basic functionality&lt;br&gt;• Web-based</td>
<td>Low (included in TCR membership)</td>
</tr>
<tr>
<td>Enterprise energy and GHG management software tools</td>
<td>• Local government operations inventory&lt;br&gt;• Designed more for corporate use&lt;br&gt;• Robust functionality and reporting&lt;br&gt;• Web-based</td>
<td>High (depends on tool)</td>
</tr>
</tbody>
</table>

*Source: Review of Top 10 Energy Management Software (EMS) Comparison*
4. Prepare for GHG Inventory

Identify Emissions Sources & Select Baseline Year

After the initial organizational steps are completed, the Project Coordinator and Technical Lead should work together to determine what will be included in the local government operations GHG inventory, including which GHG emissions the local government is responsible for and the baseline year for the inventory. This information can then be confirmed with the key contacts and stakeholders. The steps in this section are presented sequentially but may be completed in any order and even simultaneously.

Define GHG Inventory Boundaries

Local governments must account for all GHG emissions resulting from their operation. The Local Government Operations Protocol (LGOP) provides a detailed description of the two types of organizational boundaries that can be used for the GHG inventory: operational control and financial control. Local governments must select one of these approaches and apply it throughout the inventory. Most local governments typically use the operational control approach, which is also strongly recommended by the LGOP. These two approaches are derived from the Greenhouse Gas Protocol Corporate Standard developed by the World Resources Institute and the World Business Council for Sustainable Development. The financial control approach is more relevant for calculating corporate GHG emissions and is consistent with international financial accounting standards. These standards state that GHG emissions are measured if the entity (in this case a local government) has financial control over an operation that is fully consolidated into its accounting system.

Using the operational control approach, local governments must account for emissions from all facilities, operations, or sources. This includes measuring emissions resulting from buildings or other operations due to a joint venture, joint operating agreement, or partnership in which the local government has the ability to define policies and control operations from the emissions source (e.g., recycling center or wastewater treatment plant). If the local government leases a facility and has operational control of the space, it must include it in the inventory. If the local government leases one of its buildings or facilities and does not maintain operational control, it can elect not to include it in the inventory. For further discussion of organizational boundaries, refer to Chapter 3 of the LGOP.

Emissions are also classified by their operational boundaries. Direct and indirect emissions are categorized into “scopes” (see Figure 1) and the following commonly-used definitions, which are included in the GHG Protocol Corporate Standard:

- **Scope 1**: All direct GHG emissions (with the exception of direct CO₂ emissions from biogenic sources).
- **Scope 2**: Indirect GHG emissions associated with the consumption of purchased or acquired electricity, steam, heating, or cooling.
- **Scope 3**: All other indirect emissions not covered in Scope 2, such as emissions resulting from the extraction and production of purchased materials and fuels, transport-related activities in vehicles not owned or controlled by the reporting entity (e.g., employee commuting and business travel), outsourced activities, and waste disposal.
Figure 1: Overview of Scopes and Emissions Sources

Under the framework of the 3 scopes, local governments can identify the sources of emissions to be measured and organize emissions by the degree of control. All emissions should be classified by scope in the inventory, to illustrate the local government’s direct versus indirect control of its emissions. Local governments should account for and report all Scope 1 and 2 emissions, at a minimum. Reporting on Scope 3 emissions is considered optional in the LGOP, however most local governments typically include Scope 3 emissions from waste disposed outside of its operational boundary, employee commute, and employee business travel.

Identify Greenhouse Gas Emissions Sources

As described in the LGOP, there are a number of types of GHG emissions sources resulting from operating municipal buildings and vehicles, outdoor lighting, and water and waste treatment plants. These types can be summarized as follows:

- **Stationary or Mobile Combustion**: Emissions resulting from on-site combustion of fuels (natural gas, diesel, gasoline, etc.) to generate heat, electricity, or to power vehicles and mobile equipment.

- **Purchased Electricity**: Emissions produced by the generation of power from utilities outside of the jurisdiction.

- **Fugitive Emissions**: Emissions resulting from the unintentional release of greenhouse gases into the atmosphere (e.g., leaked refrigerants, methane from waste decomposition, etc.).

- **Process Emissions**: Emissions resulting from physical or chemical processing of a material (e.g., wastewater treatment or cement production).
Local governments should include all six greenhouse gases defined in the Kyoto Protocol in their local government operations GHG inventory. These six GHGs are listed in Table 3, and the global warming potential (GWP) of each is provided. GWP is a relative measure of the radiative forcing (degree of warming to the atmosphere) that would result from the emission of one mass-based unit of the given GHG compared to one equivalent unit of carbon dioxide (CO₂) over a given period of time. For example, each unit of methane is 21 times more potent as a greenhouse gas (over a 100-year period) than an equivalent unit of carbon dioxide. In the local government operations GHG inventory, the Technical Lead should account for emissions of each gas separately and report emissions in metric tons of each gas and metric tons of carbon dioxide equivalent (CO₂e).

Organize Emissions by Local Government Sector

Along with scopes, greenhouse gas emissions are also organized by sector in the LGOP, which is a more policy-relevant approach to organizing and reporting GHG emissions. In using the sectors approach, all types of emissions, such as purchased electricity and stationary combustion of heating oil, will be summarized and reported for each sector. This allows local government staff, policymakers, and the public to understand the total impact of each sector in a way that corresponds to how the local government operations are managed. Table 4 lists the local government sectors as defined in the LGOP, along with the possible types of emissions.

<table>
<thead>
<tr>
<th>Table 4: Local Government Sectors and Types of Emissions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Local Government Sectors</strong></td>
</tr>
</tbody>
</table>
| Buildings and other facilities | • Purchased electricity  
• Stationary combustion  
• Fugitive emissions |
| Streetlights and traffic signals | • Purchased electricity |
| Water delivery facilities | • Purchased electricity  
• Stationary combustion |
| Port facilities | • Purchased electricity  
• Stationary combustion  
• Mobile combustion |
| Airport facilities | • Purchased electricity  
• Stationary combustion  
• Mobile combustion |
| Vehicle fleet | • Mobile combustion |
| Transit fleet | • Purchased electricity |

Table 3: GHGs to Include in the Inventory

<table>
<thead>
<tr>
<th>Types of GHGs</th>
<th>Global Warming Potential</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon dioxide (CO₂)</td>
<td>1</td>
</tr>
<tr>
<td>Methane (CH₄)</td>
<td>21</td>
</tr>
<tr>
<td>Nitrous oxide (N₂O)</td>
<td>310</td>
</tr>
<tr>
<td>Sulfur hexafluoride (SF₆)</td>
<td>23,900</td>
</tr>
<tr>
<td>Hydrofluorocarbons (HFCs)</td>
<td>12-11,700</td>
</tr>
<tr>
<td>Perfluorocarbons (PFCs)</td>
<td>6,500-9,200</td>
</tr>
</tbody>
</table>

Table 4: Continued on the next page >>
### Table 4: Local Government Sectors and Types of Emissions

<table>
<thead>
<tr>
<th>Local Government Sectors</th>
<th>Possible Types of Emissions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Mobile combustion</td>
</tr>
<tr>
<td>Power generation facilities</td>
<td>• Stationary combustion</td>
</tr>
<tr>
<td></td>
<td>• Fugitive emissions</td>
</tr>
<tr>
<td>Solid waste facilities</td>
<td>• Purchased electricity</td>
</tr>
<tr>
<td></td>
<td>• Stationary combustion</td>
</tr>
<tr>
<td></td>
<td>• Fugitive emissions</td>
</tr>
<tr>
<td>Wastewater facilities</td>
<td>• Purchased electricity</td>
</tr>
<tr>
<td></td>
<td>• Stationary combustion</td>
</tr>
<tr>
<td></td>
<td>• Process emissions</td>
</tr>
<tr>
<td></td>
<td>• Fugitive emissions</td>
</tr>
<tr>
<td>Other process and fugitive emissions</td>
<td>• Process emissions</td>
</tr>
<tr>
<td></td>
<td>• Fugitive emissions</td>
</tr>
</tbody>
</table>

**Typical Data Needs and Sources for Each Local Government Sector**

The Technical Lead will need to gather data for all types of emissions for each relevant local government sector. While each local government operations GHG inventory will differ in data availability and final results, the sectors and data needs are the same for all communities. Table 5 provides an overview of the data needed, and sources of data for all of the possible emissions sources for a local government. The Technical Lead will determine which of these local government sectors and data sources are relevant for the local government’s operations. If your community does not own or operate some of the sectors listed, such as a wastewater treatment plant or transit fleet, you will not include those in your inventory.

The data needs listed in Table 5 are for the activity data for each emissions sector (see definition for activity data). Using a GHG emissions measurement tool, such as the Local Government GHG Accounting Tool, activity data is then multiplied by an emissions factor to determine the GHG emissions. While gathering data on energy use, the Technical Lead is encouraged to also gather data on the costs associated with the energy use. The cost data isn’t required for a GHG inventory, but is useful information for the ongoing management of energy and GHG emissions. Additional resources on GHG management systems are provided in Appendix A.

**Activity Data Defined:**

*Activity data measures the magnitude of a human activity which results in emissions taking place during a given period of time. Examples include: energy use from a town hall, fuel used by a police cruiser, vehicle miles traveled by the Mayor, or waste collected at a landfill. The data collected from these activities could be used to compute GHG emissions.*
### Table 5: Local Government Sectors, Data Needs, and Data Sources

<table>
<thead>
<tr>
<th>Local Government Sectors</th>
<th>Scope</th>
<th>Data Needed</th>
<th>Sources of Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buildings and other facilities</td>
<td>Scope 2</td>
<td>Electricity use (kWh and cost)</td>
<td>Utility Bills</td>
</tr>
<tr>
<td></td>
<td>Scope 1</td>
<td>Natural gas and other fuel used, e.g. propane, diesel, gasoline, biodiesel (therms/gallons and cost)</td>
<td>Utility Bills</td>
</tr>
<tr>
<td></td>
<td>Scope 1</td>
<td>Refrigerant leakage from HVAC systems</td>
<td>Maintenance records, purchase records</td>
</tr>
<tr>
<td>Streetlights and traffic signals</td>
<td>Scope 2</td>
<td>Electricity use (kWh and cost)</td>
<td>Utility Bills</td>
</tr>
<tr>
<td>Water delivery facilities</td>
<td>Scope 2</td>
<td>Electricity use (kWh and cost)</td>
<td>Utility Bills</td>
</tr>
<tr>
<td></td>
<td>Scope 1</td>
<td>Natural gas and other fuel used (propane, diesel, gasoline, biodiesel) (therms/gallons and cost)</td>
<td>Utility Bills</td>
</tr>
<tr>
<td>Airport and port facilities</td>
<td>Scope 2</td>
<td>Electricity use (kWh and cost)</td>
<td>Utility Bills</td>
</tr>
<tr>
<td></td>
<td>Scope 1</td>
<td>Natural gas and other fuel used (propane, diesel, gasoline, biodiesel) (therms/gallons and cost)</td>
<td>Utility Bills</td>
</tr>
<tr>
<td></td>
<td>Scope 1</td>
<td>Refrigerant leakage from HVAC systems</td>
<td>Maintenance records, purchase records</td>
</tr>
<tr>
<td>Vehicle fleet</td>
<td>Scope 1</td>
<td>Fuel used (gallons by type, mileage, and cost)</td>
<td>Fuel tracking system, (Alternative: Usage estimated based on known expenditures and estimated fuel efficiency of vehicles)</td>
</tr>
<tr>
<td>Transit fleet</td>
<td>Scope 2</td>
<td>Electricity use (kWh and cost)</td>
<td>Utility Bills</td>
</tr>
<tr>
<td></td>
<td>Scope 1</td>
<td>Fuel used (gallons by type, mileage, and cost)</td>
<td>Fuel tracking system, (Alternative: Usage estimated based on known expenditures and estimated fuel efficiency of vehicles)</td>
</tr>
<tr>
<td></td>
<td>Scope 1</td>
<td>Refrigerant leakage from AC systems</td>
<td>Maintenance records, purchase records</td>
</tr>
</tbody>
</table>

*Table 5: Continued on the next page*
### Table 5: Local Government Sectors, Data Needs, and Data Sources

<table>
<thead>
<tr>
<th>Local Government Sectors</th>
<th>Scope</th>
<th>Data Needed</th>
<th>Sources of Data</th>
</tr>
</thead>
</table>
| Power generation facilities | **Scope 1** | For facilities with a continuous emissions monitoring system (CEMS):  
  - CO₂ emissions | CEMS |
|  | **Scope 1** | For facilities without a CEMS, follow the fuel use calculation methodology:  
  - Annual fuel consumption for each fuel used at the facility | Fuel consumption records |
| Solid waste facilities (government owned/operated landfill) | **Scope 2** | Electricity use (kWh and cost) | Utility bills |
|  | **Scope 1** | Natural gas and other fuel used, e.g. propane, diesel, gasoline, biodiesel (therms/gallons and cost) | Utility bills |
|  | **Scope 1** | Landfills with landfill gas (LFG) collection system:  
  - Landfill gas collected (million standard cubic feet)  
  - Percent of methane in collected landfill gas  
  - Methane destruction efficiency of LFG collection system  
  - Methane soil oxidation factor  
  - Area of landfill covered/not covered by LFG collection systems  
Note: refer to LGOP for data needs for landfills without a LFG collection system | Landfill operator (Alternative: use national averages for methane collection, destruction, and soil oxidation from LGOP) |
| Wastewater facilities | **Scope 2** | Electricity use (kWh and cost) | Utility Bills |
|  | **Scope 1** | Natural gas and other fuel used, e.g. propane, diesel, gasoline, biodiesel (therms/gallons and cost) | Utility Bills |
|  | **Scope 1** | Methane flared | Wastewater treatment process records |
|  | **Scope 1** | Anaerobic digestion of biosolids: Average daily digester gas collected and percent of Methane (CH₄) in biogas | Wastewater treatment process records |

*Table 5: Continued on the next page*
## Table 5: Local Government Sectors, Data Needs, and Data Sources

<table>
<thead>
<tr>
<th>Local Government Sectors</th>
<th>Scope</th>
<th>Data Needed</th>
<th>Sources of Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wastewater facilities (<strong>continued</strong>)</td>
<td>Scope 1</td>
<td>Anaerobic and facultative lagoons: BOD$_5$ load and percent of overall BOD$_5$ removed during primary treatment (if applicable)</td>
<td>Wastewater treatment process records</td>
</tr>
<tr>
<td></td>
<td>Scope 1</td>
<td>Effluent discharged to aquatic environments: Average daily nitrogen load discharged in effluent</td>
<td>Wastewater treatment process records</td>
</tr>
<tr>
<td>Other process and fugitive emissions</td>
<td>Scope 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Optional Scope 3 Emissions</strong></td>
<td></td>
</tr>
<tr>
<td>Solid waste disposed outside of organizational boundary</td>
<td>Scope 3</td>
<td>Solid waste generated: Solid waste hauled (tons and cost) Composition of waste stream (percent of waste by type of waste)</td>
<td>Waste hauler bills/collection records Existing analysis of local (or regional) waste stream (Alternative: national averages, provided in the <a href="https://example.com">LGOP p. 96</a>)</td>
</tr>
<tr>
<td>Employee commute</td>
<td>Scope 3</td>
<td>Number of miles traveled by employees in daily commute</td>
<td>Employee commute survey (Alternative: U.S. Census Journey-to-work study)</td>
</tr>
<tr>
<td></td>
<td>Scope 3</td>
<td>Distribution of transportation modes</td>
<td>Employee commute survey (Alternative: U.S. Census Journey-to-work study)</td>
</tr>
<tr>
<td>Employee business travel</td>
<td>Scope 3</td>
<td>Number of miles flown by employees traveling on local government business</td>
<td>Travel records</td>
</tr>
</tbody>
</table>

For a more detailed discussion of the data needs, sources of data, and preferred and alternative calculation methodologies, refer to the [LGOP](https://example.com).
Getting Organized

Once all of the emissions sectors and sources have been identified, the Technical Lead can prepare a Microsoft Excel spreadsheet for tracking all of the data. The Technical Lead will be requesting and receiving large volumes of data, so it is important to create a system for tracking all activity data in the beginning. The Activity Data Tracking Spreadsheet should include tabs for each emissions sector, as shown in Figure 2. Each tab should include the following:

- Contact information for the data source
- Date the data was received
- Units for the data
- Costs associated with energy use
- Department (for relevant data)
- Building name (for relevant data)
- Building address (for relevant data)
- Notes and comments

Figure 2: Example Activity Data Tracking Spreadsheet

Track as much detail as possible, such as energy consumption by individual building or vehicle. This detail will be useful when you want to run reports on GHG emissions using the Local Government GHG Accounting Tool, or another tool. The Local Government GHG Accounting Tool allows users to enter and report on energy use and GHG emissions at various levels of detail, such as by building, department, or the total.

You might also want to use the Activity Data Tracking Spreadsheet for keeping track of the status of data requests on a separate tab, such as when the data was requested and what the status is of receiving the data. Section 5 provides more detail and tips on how to gather data.
Select a Baseline Year

The next step in the process is to select a baseline year to recommend to the stakeholders. The selected baseline year must be confirmed with the people who manage the relevant data, to make sure that all needed data are available and that there are no operational anomalies in the selected year that might make it a poor choice as a baseline year (e.g., staff was temporarily located in a leased location during building renovations). The Project Coordinator and Technical Lead should work together to develop a baseline year to recommend to the key stakeholders and contacts. You should consider the following when selecting a baseline year:

- ✔ Report emissions on a calendar year, not a fiscal year. This is the recommended approach in the LGOP and is used by local governments around the country.
- ✔ Align baseline year with 2010 regional GHG emissions inventories developed through the CSC program. Many local governments elect to use the same baseline year for their local government operations and community inventories, although there is no requirement to do this through the CSC program or LGOP.
- ✔ Select a year which is representative of the general level of emissions of the surrounding period. It is best to avoid selecting a year which was particularly hot or cold, due to the greater level of energy use in such a year.
- ✔ Choose the year prior to energy upgrades or renewable installations. Did your local government implement any energy conservation actions, such as a large-scale energy efficiency upgrade or a new solar PV system, which you want to be able to account for or get credit for as an action toward meeting your emissions reduction target? If this is the case, then you would want to select a baseline year prior to the year in which this action was completed, so future inventories will demonstrate a reduction in greenhouse gas emissions due to this action.
- ✔ Consider all other plans and timelines that may be relevant to air quality or energy consumption. Are there other related planning documents or performance management efforts, such as a comprehensive plan, climate action plan, or key performance indicator program that use a baseline year that might be relevant for the local government operations GHG inventory?
- ✔ Check the availability of historical data. Make sure to select a year in which the data are readily available. This can be confirmed with the stakeholders in the next step.

The Local Government Operations Protocol (LGOP) does not recommend a specific baseline year but provides recommendations consistent with those provided above.
Engage Key Stakeholders and Contacts

After completing the main steps to prepare for the inventory, it is time to engage the relevant stakeholders and contacts who will be involved in the process. A common way to do this is through a kick-off meeting, in which you can review the purpose of the inventory, explain the process and data needs, and discuss the recommended baseline year and other data availability issues. The Project Coordinator will typically lead this meeting, with some assistance from the Technical Lead. The Project Coordinator may want to have the chief elected official or other senior staff member send out the announcement of the kick-off meeting and/or welcome everyone to the meeting, to help convey the importance of the inventory.

The goal of the meeting is to make sure the key stakeholders and contacts are aware that the local government operations GHG inventory is being developed and that their help is required for this important effort. The Project Coordinator should communicate the purpose of the inventory and what is expected from the contacts, and should gather input into the proposed baseline year, emissions sectors and sources, data sources, and contacts. Tip 2 provides a sample agenda for the kick-off meeting.

Make sure an agenda goes out in advance, so participants can prepare ahead of time. Following the meeting, make sure to distribute the minutes and make any adjustments to the list of emissions sectors and sources, data needs, and contacts. To keep up the momentum, the Technical Lead should move into the data gathering process right away and follow up with a clear request for data, as described in the next section.

---

Sample Agenda for GHG Inventory Kick-Off Meeting

1. Review the purpose of the inventory and the steps involved
2. Confirm the list of emissions sectors and sources, data sources, and contacts is complete and accurate
   ✓ Other stakeholders that need to be at the table or have access to data?
3. Discuss data availability:
   ✓ How is data tracked?
   ✓ How far back does it go?
   ✓ What format is it in?
   ✓ What data has already been collected?
4. Confirm the recommended baseline year:
   ✓ Is data available for the recommended baseline year?
   ✓ Were there any anomalies in this year that affected operations or energy use?
5. Discuss the timeline and any key deadlines for submitting data
5. Gather Data

Best Practices for Requesting Data

The data gathering process can take from several weeks to a couple of months and is one of the largest and most time consuming tasks of the inventory. The Technical Lead will be responsible for all aspects of data collection and management. It is important to get started with the data requests as early as possible, and to be patient, as sometimes the people providing the data have to run multiple reports or manipulate the data to put it in a format that is relevant to your needs. The Technical Lead should develop a template for a letter that can be tailored and sent to key contacts requesting relevant data. The letter should clearly specify the data needs and format in which you need the data. The Technical Lead can use the sample letter in Appendix C as a starting point for your template along with the guidelines in Tip 3 for drafting your data request letters.

If data is either difficult to obtain or not available (e.g., leaked refrigerants), don’t worry. Document what you need and develop a plan to start collecting the missing data for an update to your GHG inventory. Refrigerants data is considered de minimis in the Local Government Operations Protocol (LGOP), which means that the percent of emissions resulting from that source is so small it is not necessary to collect that data. If you are missing more critical data (e.g., accurate fuel consumption records by vehicle) refer to the LGOP for alternative methods for calculating GHG emissions using estimates.

Review the Raw Data

As you receive the data from each contact, make sure to review it for completeness, accuracy, consistency, and relevance. Confirm that the full set of data has been provided (e.g., all buildings are listed), make sure that the data are for the correct time period, the units are provided, and is what you have requested. Note the date received and contact information of the person who provided the data in the Activity Data Tracking Spreadsheet, for future reference. If there are any discrepancies, follow up with the data provider promptly. All of the raw data and notes should be tracked in the Activity Data Tracking Spreadsheet, so you have a central repository to be used in the inventory. Make sure the Activity Data Tracking Spreadsheet is stored in a location that is accessible by others and backed up regularly. See Figure 2 to for an example an Activity Data Tracking Spreadsheet.

Keep track of the status of data requests as the data are coming in and send out friendly reminders as deadlines approach. If one of your contacts is having trouble providing information to you, make sure that your request is clear and ask if there are any ways that you can support them in the collection of the data. For example, you may request heating oil consumption for a given year and the contact may only have hard copy invoices with this data. Offering to sort through the hard copy invoices and completing data entry yourself or identifying someone who can do this may keep the process moving.

Key Information for Data Request Letters

Tip 3

- Thank contact for providing data and briefly explain why it is needed.
- Specify the following information:
  - Year for data request
  - Type of data, including preferred units of measurement
  - Costs associated with the energy use (if possible)
  - Preferred format (MS Excel)
  - Department (if available)
  - Building or facility (if relevant)
- Set a deadline for providing data.
- Include contact information of Technical Lead for questions.
6. Calculate GHG Emissions

The Technical Lead will continue to be responsible for managing all of the data and calculating the GHG emissions. Now that you have all of the data for the inventory, you can calculate the GHG emissions using the Local Government GHG Accounting Tool, or a different tool, if you prefer. The Local Government GHG Accounting Tool allows you to enter activity data, and it will calculate the CO₂e emissions for each emissions source, and produce graphs and tables for you to use in your GHG inventory report. Refer to the User’s Guide for Local Government GHG Accounting Tool for more information on how to enter data and run reports.

After you have entered the information into the Local Government GHG Accounting Tool, you should perform a quality assurance/quality control (QA/QC) review of the data. The Technical Lead will want to review the data first, and may wish to enlist the help of another colleague to perform a second QA/QC review to make sure that all data was entered correctly and the inventory results make sense.

**Quality Assurance/Quality Control Review Checklist:**

- Make sure all data was entered into the Local Government GHG Accounting Tool.
- Confirm the correct units and fuel types were selected for each data source.
- Make sure all buildings and facilities are included in the data.
- Make sure all emissions sources for each sector are included.
- Compare total emissions to neighboring jurisdictions of a similar size and with similar operations.
- Look at the breakdown of emissions by sector.
  - How does this compare to similar jurisdictions and the example in Figure 2?
  - If there are large differences, is there a reason for those differences?
  - How does this compare with the example shown in Figure 3?
After performing the QA/QC review, you will want to review the inventory results to identify the key findings. Along with the detailed inventory results, these key findings can be discussed and highlighted in the GHG inventory report, outlined in Section 8. Some questions to help identify the key findings include:

- Which sectors were the largest emitters of GHG emissions? Why?
- Why is your emissions profile similar (or different) to other neighboring jurisdictions?
- Which buildings consumed the most energy?
- Which departments used the most energy?

This information can help to identify opportunities for energy conservation and emissions reduction strategies, which could be mentioned in the GHG inventory report and explored in greater detail in a climate action plan.

7. Develop a GHG Emissions Forecast

A forecast is helpful to understand how GHG emissions will likely grow if no action is taken, under a “business as usual” scenario, which is useful when establishing a GHG emissions reduction target. The business as usual forecast allows you to calculate the total emissions reductions that will be needed over time, as illustrated in Figure 4.

The CSC Local Government GHG Accounting Tool includes a feature to enable users to develop a forecast for the business as usual scenario, which takes into account projected growth in energy demand, changes to emissions factors, future fuel efficiency factors, and projected population changes. Users can customize the factors in the tool if they do not wish to use the defaults or if they are aware of any changes to government operations, such as a new building, that would affect the emissions profile.

![Figure 4: Example Business As Usual Local Government Operations GHG Emissions Forecast](image-url)
8. Develop a GHG Inventory Report and Announce Results

Using the charts and tables from the CSC Local Government GHG Accounting Tool, the final step is to develop a report summarizing the results of the local government operations GHG inventory. The Technical Lead will want to provide a brief overview of the results and key findings in an executive summary, followed by a more detailed discussion of the methodology and results in the body of the report. **Tip 4** provides a sample outline for an inventory report.

Graphics and tables should be widely used throughout the report (see examples in the **Appendix B**), to make the information easier to read and understand. You may also want to develop a one- or two-page summary or executive summary (see **Figure 5**) which presents the results and key findings and can be used at events or announced in a press release.

The inventory report should be reviewed in detail by several people, including the Project Coordinator. The contacts and key stakeholders should also review the inventory report, to allow them the opportunity to identify any errors, and to be familiar with the results before the report is publicly released.

Once the report is reviewed internally, the final step in the process is to announce the results and publicly release the report. Most local governments develop a press release and post the report or handout on their website. Some communities also host an event or announce the results at an already scheduled event in which it makes sense to have the chief elected official present the outcomes. You should be prepared to answer any questions about the inventory, and explain the results to the public, reporters, and senior staff members.

---

**Example Outline for Local Government Operations GHG Inventory Report**

1. Foreword
2. Executive Summary
3. Introduction
   a. Climate Change Background
   b. Climate Smart Communities
   c. Purpose of the Inventory
4. Methodology
5. Inventory Results
6. Forecast
7. Conclusion

---

**Figure 5: City of Albany 2009 GHG Inventory Report**

Source: City of Albany, Office of Energy and Sustainability
Next Steps

1. Establish a local government operations GHG emissions reduction target.

To help drive action and measure progress, local governments should establish a greenhouse gas (GHG) emissions reduction target for local government operations. The New York State Energy Plan set a GHG emissions reduction target of reducing GHG emissions by 80 percent below 1990 levels before the year 2050 and an interim emissions reduction goal of 40 percent below 1990 levels by 2030. Although a baseline year of 1990 may not be feasible, local governments are encouraged to establish targets similar to neighboring communities, counties, the region, and the state. Regional plans, such as those developed under the NYS Climate Smart Communities and Cleaner Greener Communities programs, rely on local governments aligning implementation efforts with existing goals and initiatives to achieve the larger sustainability goals of the region or state. Consider adopting similar GHG emissions reduction targets to support collaborative efforts and/or align milestones to facilitate regional reporting.

2. Develop a local government operations climate action plan.

The local government greenhouse gas emissions inventory provides the data needed to develop a climate action plan for reducing emissions from local government operations to prioritize actions and gather support for short- and long-term investments, policies, projects, and programs aimed at conserving energy and reducing GHG emissions. The plan should outline the policies, programs, and projects needed to achieve the government’s emissions reduction target(s). Having such a framework helps facilitate coordination across local government departments and community stakeholders when implementing initiatives from the plan. The CSC program created the Climate Action Planning Guide for local governments to facilitate this process. The Guide was released in 2014.

3. Periodically update GHG emissions inventories and report on progress.

Conducting a GHG inventory update will allow local governments to track progress toward meeting their GHG reduction goals and allows local governments to modify, add, or remove strategies from the climate action plan to keep the local government on track.
## Glossary

Unless otherwise noted, all of the definitions below are taken from the [Local Government Operations Protocol, Version 1.1](#).

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Activity data</strong></td>
<td>Data on the magnitude of a human activity resulting in emissions taking place during a given period of time. Data on energy use, fuel used, vehicle miles traveled, input material flow, and product output are all examples of activity data that might be used to compute GHG emissions.</td>
</tr>
<tr>
<td><strong>Activity Data Tracking Spreadsheet</strong></td>
<td>A spreadsheet recommended by the CSC program to organize and manage all of the data for the GHG inventory.</td>
</tr>
<tr>
<td><strong>Baseline year</strong></td>
<td>A specific year against which an entity’s emissions are tracked over time.</td>
</tr>
<tr>
<td><strong>Boundaries</strong></td>
<td>GHG accounting and reporting boundaries can have several dimensions, i.e., organizational, operational and geographic. These boundaries determine which emissions are accounted for and reported by the entity.</td>
</tr>
<tr>
<td><strong>Carbon dioxide (CO₂)</strong></td>
<td>The most common of the six primary GHGs, consisting of a single carbon atom and two oxygen atoms, and providing the reference point for the GWP of other gases. (Thus, the GWP of CO₂ is equal to 1.)</td>
</tr>
<tr>
<td><strong>CO₂ equivalent (CO₂e)</strong></td>
<td>The universal unit for comparing emissions of different GHGs expressed in terms of the GWP of one unit of carbon dioxide.</td>
</tr>
<tr>
<td><strong>Control approach</strong></td>
<td>An emissions accounting approach for defining organizational boundaries in which an entity reports 100 percent of the GHG emissions from operations under its financial or operational control.</td>
</tr>
<tr>
<td><strong>De minimis</strong></td>
<td>Per the California Climate Action Registry’s program-specific requirements, emissions reported for a source or sources that are estimated using alternate methodologies that does not meet CCAR’s third-party verification requirements. De minimis emissions can be from one or more sources, for one or more gases which, when summed, equal less than 5% of an organization’s total emissions.</td>
</tr>
<tr>
<td><strong>Direct emissions</strong></td>
<td>Emissions from sources within the reporting entity’s organizational boundaries that are owned or controlled by the reporting entity, including stationary combustion emissions, mobile combustion emissions, process emissions, and fugitive emissions. All direct emissions are Scope 1 emissions, with the exception of biogenic CO₂ emissions from biomass combustion.</td>
</tr>
<tr>
<td><strong>Global warming potential (GWP)</strong></td>
<td>The ratio of radiative forcing (degree of warming to the atmosphere) that would result from the emission of one mass-based unit of a given GHG compared to one equivalent unit of carbon dioxide (CO₂) over a given period of time.</td>
</tr>
<tr>
<td>Term</td>
<td>Definition</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Greenhouse gases (GHGs)</td>
<td>For the purposes of this Protocol, GHGs are the six gases identified in the Kyoto Protocol: carbon dioxide (CO2), nitrous oxide (N2O), methane (CH4), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF6).</td>
</tr>
<tr>
<td>Greenhouse gas source</td>
<td>Any physical unit or process which releases GHG into the atmosphere.</td>
</tr>
<tr>
<td>Hydrofluorocarbons (HFCs)</td>
<td>One of the six primary GHGs, a group of manmade chemicals with various commercial uses (e.g., refrigerants) composed of one or two carbon atoms and varying numbers of hydrogen and fluorine atoms. Most HFCs are highly potent GHGs with 100-year GWPs in the thousands.</td>
</tr>
<tr>
<td>Indirect emissions</td>
<td>Emissions that are a consequence of activities that take place within the organizational boundaries of the reporting entity, but that occur at sources owned or controlled by another entity. For example, emissions of electricity used by a manufacturing entity that occur at a power plant represent the manufacturer’s indirect emissions.</td>
</tr>
<tr>
<td>Inventory boundary</td>
<td>An imaginary line that encompasses the direct and indirect emissions included in the inventory. It results from the chosen organizational and operational boundaries.</td>
</tr>
<tr>
<td>Kilowatt hour (KWh)</td>
<td>The electrical energy unit of measure equal to one thousand watts of power supplied to, or taken from, an electric circuit steadily for one hour. (A Watt is the unit of electrical power equal to one ampere under a pressure of one volt, or 1/746 horsepower.)</td>
</tr>
<tr>
<td>Kyoto Protocol</td>
<td>A protocol to the United Nations Framework Convention on Climate Change (UNFCCC). Ratified in 2005, it requires countries listed in its Annex B (developed nations) to meet reduction targets of GHG emissions relative to their 1990 levels during the period of 2008–12.</td>
</tr>
<tr>
<td>Local Government GHG Accounting Tool</td>
<td>A software tool developed by the CSC program for calculating GHG emissions for a government operations inventory.</td>
</tr>
<tr>
<td>Methane (CH₄)</td>
<td>One of the six primary GHGs, consisting of a single carbon atom and four hydrogen atoms, possessing a GWP of 21, and produced through the anaerobic decomposition of waste in landfills, animal digestion, decomposition of animal wastes, production and distribution of natural gas and petroleum, coal production, and incomplete fossil fuel combustion.</td>
</tr>
<tr>
<td>Metric ton (MT, tonne)</td>
<td>Common international measurement for the quantity of GHG emissions, equivalent to about 2,204.6 pounds or 1.1 short tons.</td>
</tr>
<tr>
<td>Nitrous oxide (N₂O)</td>
<td>One of the six primary GHGs, consisting of two nitrogen atoms and a single oxygen atom, possessing a GWP of 310, and typically generated as a result of...</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>soil cultivation practices, particularly the use of commercial and organic fertilizers, fossil fuel combustion, nitric acid production, and biomass burning.</td>
<td></td>
</tr>
<tr>
<td>Operational boundaries</td>
<td>The boundaries that determine the direct and indirect emissions associated with operations within the entity’s organizational boundaries.</td>
</tr>
<tr>
<td>Operational control</td>
<td>Full authority to introduce and implement operating policies at an operation.</td>
</tr>
<tr>
<td>Organizational boundaries</td>
<td>The boundaries that determine the operations owned or controlled by the reporting entity, depending on the consolidation approach taken.</td>
</tr>
<tr>
<td>Perfluorocarbons (PFCs)</td>
<td>One of the six primary GHGs, A group of man-made chemicals composed of one or two carbon atoms and four to six fluorine atoms, containing no chlorine. Originally introduced as alternatives to ozone depleting substances, PFCs have few commercial uses and are typically emitted as by-products of industrial and manufacturing processes. PFCs have very high GWPs and are very long-lived in the atmosphere.</td>
</tr>
<tr>
<td>Scope</td>
<td>Defines the operational boundaries in relation to indirect and direct GHG emissions.</td>
</tr>
<tr>
<td>Scope 1 emissions</td>
<td>All direct GHG emissions, with the exception of direct CO2 emissions from biogenic sources.</td>
</tr>
<tr>
<td>Scope 2 emissions</td>
<td>Indirect GHG emissions associated with the consumption of purchased or acquired electricity, heating, cooling, or steam.</td>
</tr>
<tr>
<td>Scope 3 emissions</td>
<td>All indirect emissions not covered in Scope 2. Examples include upstream and downstream emissions, emissions resulting from the extraction and production of purchased materials and fuels, transport-related activities in vehicles not owned or controlled by the reporting entity, use of sold products and services, outsourced activities, recycling of used products, waste disposal, etc.</td>
</tr>
<tr>
<td>Sector</td>
<td>A term used to define the categories for organizing emissions data for a local government operations GHG inventory.</td>
</tr>
<tr>
<td>Sulfur hexafluoride (SF6)</td>
<td>One of the six primary GHGs, consisting of a single sulfur atom and six fluoride atoms, possessing a very high GWP of 23,900, and primarily used in electrical transmission and distribution systems.</td>
</tr>
</tbody>
</table>
Appendix A: Resources

- New York State Climate Smart Communities program: [http://www.dec.ny.gov/energy/50845.html](http://www.dec.ny.gov/energy/50845.html)
- New York State Regional Sustainability Plans: [http://www.nyserda.ny.gov/Statewide-Initiatives/Cleaner-Greener-Communities/Regional-Sustainability-Plans.aspx](http://www.nyserda.ny.gov/Statewide-Initiatives/Cleaner-Greener-Communities/Regional-Sustainability-Plans.aspx)
- New York State Climate Smart Webinar presentations: [http://www.dec.ny.gov/energy/84359.html](http://www.dec.ny.gov/energy/84359.html)
- New York State Climate Smart Community Regional Coordinators: [http://www.dec.ny.gov/energy/84508.html](http://www.dec.ny.gov/energy/84508.html)
- Climate Smart Communities Local Government GHG Accounting Tool: [http://www.midhudsoncsc.org/documents/CSC%20Local%20Government%20GHG%20Accounting%20Tool%20FINAL.zip](http://www.midhudsoncsc.org/documents/CSC%20Local%20Government%20GHG%20Accounting%20Tool%20FINAL.zip)
- Other GHG Emissions Management Software Tools:
Appendix B: Examples of Local Government Operations GHG Inventories in New York State:

- New York City Government Operations GHG Inventories:  
- City of Albany 2009 Greenhouse Gas Emissions Inventory:  
  http://www.albanysustainability.org/documents/Albany_GHG_Emissions_Inventory.pdf
- City of New Rochelle 2005 Greenhouse Gas Emissions Inventory:  
- Village of Croton-on-Hudson 2007 Greenhouse Gas Emissions Baseline Inventory:  
- Town of Bedford Greenhouse Gas Emissions Analysis, 2004:  
- Schenectady County – 2010 Greenhouse gas Emissions Inventory:  
- Town of New Castle 2008 Greenhouse Gas Inventory included in 2011 Climate Protection Plan: PP. 8 - 9  
- Town of Somers - 2009 Greenhouse Gas Emissions Inventory  
  http://greensomers.org/ghg/municipal.pdf
- Village of Mamaroneck - 2011 Greenhouse Gas Emissions Inventory included in Local Waterfront Revitalization Plan: PP. 11-40  
  http://www.village.mamaroneck.ny.us/Pages/MamaroneckNY_WebDocs/COMPLETE%20WORKING%20DRAFT.pdf
  http://www.dec.ny.gov/docs/administration_pdf/larchmontcap.pdf
Dear Colleagues,

As part of our community’s commitment to climate protection and sustainability, we will be taking a number of steps to reduce our greenhouse gas emissions, resulting from both our government operations and from the entire community. We are starting this process by focusing on our government operations, and the first step in the process is to develop a baseline of our energy use and greenhouse gas emissions. The baseline, called a greenhouse gas emissions inventory, will enable us to set goals and measure progress.

Developing the local government operations greenhouse gas emissions inventory will involve collecting data on energy use in buildings and facilities, streetlights and traffic signals, and wastewater treatment, along with fuel use in vehicles and waste produced in government facilities. With this data on our energy use, we will be able to calculate our greenhouse gas emissions.

We ask for your participation in a kick-off meeting on <<Month Day, Year>> at <<Time>> and for your timely assistance in providing any requested data needed for the inventory. Further details and instructions will be provided regarding the data needs.

Climate change is not just a global issue, but it is also a local issue on which we can have a direct impact, by measuring and reducing the greenhouse gas emissions from the operation of our government. We look forward to working with you on this important effort and thank you in advance for your support. If you have any questions about this project, please contact <<Project Coordinator/Technical Lead>> at name@localgovernment.gov or (###) ### - ####.

Sincerely,

Mayor of Climate Smart Community
Appendix D: Sample Data Request Letter

To:
Public Works Department

<< Month Day, Year>>

Dear <<Name>>,

As you know, the <<Name of Local Government>> has launched a new climate protection initiative to reduce the energy use and greenhouse gas emissions resulting from local government operations. At the core of the success of this program is the ability to measure progress. To do this, the City is conducting its first greenhouse gas (GHG) emissions inventory to establish a baseline from which to measure progress. As discussed in the kick-off meeting, we will be gathering data on energy use, fleet management, waste disposal, and other sources of GHGs.

The <<Office of Sustainability and Environment>> is requesting that the Public Works Department provide information on the <<local government>> energy use in buildings. We would appreciate a response by <<Month Day, Year>>. We would like the following information, for each facility:

1. Energy consumption and cost for the YYYY calendar year, including:
   a. Electricity
   b. Natural Gas
   c. Other fuels
2. Indicators, such as:
   a. Name, address, and square footage of each facility
   b. Number of occupants in each facility
   c. The type of heating system in each facility (electricity, natural gas, steam), if known.
   d. Changes in either building systems or building function since 2010 which have helped to reduce energy use
3. Any refrigerant usage for the YYYY calendar year due to HVAC system maintenance or leakage.

Please specify the units for each form of energy use and provide the data in MS Excel. If you have any questions regarding above, please contact <<Project Coordinator/Technical Lead>> at name@localgovernment.gov or (###) ### - ####.

Thank you in advance for your participation in this important effort to collectively understand and address our contribution to global climate change.
Appendix E: Sample Internship Position Description

The Town & Village of Rhinebeck, Energy & Resilience Task Force

Greenhouse Gas Emissions Inventory of Government Operations

Internship Description

Job Title: Intern – Greenhouse Gas Emissions Inventory
Reports to: Jane Smith, Chair, Energy & Resilience Task Force
Location: Rhinebeck, NY
Begins: June/July 2012 – 30 hours/week for 4 months

Energy & Resilience Task Force

In 2010, the Town and Village of Rhinebeck signed the Climate Smart Communities Pledge, joining 121 other New York local governments in combating climate change by making their communities more energy efficient and working toward a sustainable future. The Village and Town authorized the creation of a task force to identify the greenhouse gas (GHG) emissions of both communities and to then advise them on strategies to reduce emissions and adapt to climate change.

In determining how to best conserve energy and reduce emissions, the task force needs to establish an inventory of GHG emissions of government operations. That inventory will be guided by The Climate Registry, http://www.theclimateregistry.org/, a non-profit organization that “sets consistent and transparent standards to calculate, verify and publicly report greenhouse gas emissions into a single registry.”

Job Activities/Scope:

The task force seeks a dynamic self-starter with a background in environmental science, or similar education, to complete the Town & Village of Rhinebeck’s GHG emissions inventory of government operations. With the support of the Energy & Resilience Task Force Chair as well as the staff at The Climate Registry and VHB Engineering, Surveying and Landscape Architecture, P.C., the intern will gather and analyze data from 2010 and 2011 related to local government operations and summarize the results in a written report. In conjunction with the Chair, the intern will develop and present a formal presentation to the Town and Village on the results of the inventory and the strategies the Town and Village can take to reduce GHG emissions. The intern will attend monthly task force meetings and some village and town meetings. A potential second internship could entail developing a climate action plan for the Town and Village of Rhinebeck.

Knowledge and Skills:

- A background in Environmental Science, Business, Engineering, Environmental Policy, Chemistry, etc.
- A willingness and ability to work independently
- Demonstrated interest in climate change/environmental management
- An interest in local government
- Excellent computer, organizational and communication skills
- Expertise in Excel
- Detail-oriented
Appendix F: Possible Intern Sources

The following list of academic institutions provides some possibilities for identifying interns to conduct a local government operations GHG inventory. This list is not considered exhaustive, nor is it a guarantee that these institutions could have interested students, but local governments are encouraged to post intern positions with these institutions.

- Columbia University School of International and Public Affairs
- Cornell Cooperative Extension
- Cornell Local Roads Program
- NOAA’s Northeast Regional Climate Center
- Pace University Land Use Law Center
- SUNY New Paltz, Center for Research, Regional Education and Outreach
- SUNY, College of Environmental Science and Forestry
- Ulster County Community College Sustainability Program

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