



Measuring Your Cool City's Greenhouse Gas Emissions

The first step to creating your city's Climate Action Plan is to measure the amount of your city's global warming emissions. A baseline inventory and periodic updates make it possible to track the success, in terms of cost savings and greenhouse gas pollution reductions, of specific solutions in your city's Climate Action Plan. (For more on Climate Action Plans, see Sierra Club's "Climate Action Plan" fact sheet at www.coolcities.us)

GREENHOUSE GAS INVENTORY

An accurate greenhouse gas (GHG) inventory should account for all GHG emissions produced in your city, allow for the comparison of emissions from different sectors (transportation, buildings, etc...), analyze and forecast emissions and growth, identify necessary reductions to meet targets, and measure potential impacts of reduction measures. A city's options for creating a GHG inventory are: utilizing local government staff, working with local university experts, hiring a private consultant, or becoming a member of the non-profit organization "ICLEI – Local Governments for Sustainability".

For most cities, joining ICLEI is the best option because their "Clean Air and Climate Protection" software is recognized as the most comprehensive and widely-used GHG emissions forecast and analytical tool for municipalities. ICLEI's software streamlines the inventory and baseline process and helps cities to track reduction solutions. Using the software allows cities to invest more time and resources in reducing GHGs rather than just quantifying them. Cities that use the software also have the advantage of creating inventories that are comparable to inventories around the country and world because of the widespread use of this software.

To supplement the software support that ICLEI provides to their members, ICLEI and Sierra Club have partnered together to train Sierra Club staff and volunteer leaders so that they can assist cities that choose to use the ICLEI software. Information about joining ICLEI can be found at <http://www.iclei.org>. For Sierra Club support and training on ICLEI's software or other inventory tools, contact Stephanie Cutts at stephanie.cutts@sierraclub.org.

GETTING STARTED

1. Identify Emissions

Inventories and baselines can be designed to measure GHG emissions generated by city government operations and/or the emissions generated by the entire community. GHG emissions come from two basic categories:

1) Direct Emissions, those produced directly by city or community activities (i.e. stationary combustion at on-site boilers and fuel usage for heating; mobile fuel usage for vehicles; and waste emissions from landfills or incinerators) and **2) Indirect Emissions**, those that are a consequence of the activities in the city, but occur at sources not controlled or owned by the city (i.e. emissions at power plants because of electricity consumption).

2. Organize Inventory by Sector

Actions in all sectors of a city generate direct or indirect GHG emissions and sometimes both. Organizing the inventory by sectors reveals where the greatest opportunities for reductions are and how emissions are structured within the government or community.

- **Community Sectors**
 - Residential
 - Commercial

- Industrial
 - Transportation
 - Waste
 - Other
- **Municipal Sectors**
 - Buildings
 - Vehicle Fleet
 - Employee Commute
 - Water/Sewage
 - Waste
 - Streetlights
 - Other

Because Cool Cities want to lead by example, some cities start with quantifying the municipal sector to demonstrate through early implementation of solutions (such as replacing inefficient indoor and outdoor lighting with super-efficient compact fluorescents and light-emitting diode bulbs) that energy and waste efficiency projects benefit city operations and save money. The city should also inventory the entire community to begin creating solutions and policies that reduce GHG emissions on a community-wide scale.

3. Collect Data

After deciding the organization of the inventory, the next step is to locate the data for each emissions source and begin collecting data. In many cases utilities maintain records for energy consumption, and city employees or contractors in charge of managing operations that produce emissions should have records.

In some cases, energy usage for the same emissions source may be measured differently. For example, natural gas might be tracked in *therms* in one part of the city and in *cubic meters* in another part of the city. ICLEI's software can convert all measurements to the same unit so apples-to-apples comparisons can be made and emissions can be accurately quantified. Detailed notes should always be taken on the methodology used and assumptions made for each piece of data collected.

4. Selecting Your Baseline Year and Annual Updates

Cities that have signed the U.S. Mayors Climate Protection Agreement have committed to reducing their GHG emissions 7% below 1990 levels by 2012. If your city does not have complete data for a 1990 baseline, ICLEI's software can take a given baseline for a year with more available data and "backcast" to a given year using growth rates in the city during that period.

Your city's baseline selection may be influenced by the desire to reflect efficiency or other GHG mitigation projects already implemented in the city. For example, if an energy efficiency program was started in 1998, the city may want to have 1997 as the baseline to demonstrate the impact of the efficiency program. The baseline should reflect a balance between available accurate data and desire to demonstrate past efficiency efforts that have moved the city closer to goals. It is often not possible to decide which year will be the best base year until your city begins the data collection process and understands the data quality available from past years. It is essential that your city conducts annual updates of its emissions inventory to track overall progress and the success of specific solutions.

COOLING YOUR CITY

The principles outlined above will help your city create a practical, cost-effective and meaningful climate action plan. For examples of specific city climate action plans and best practices (energy efficiency, renewable power, cleaner vehicles, land use/transportation, community outreach etc.), see www.coolcities.us. For more information, email cool.cities@sierraclub.org.