



ACUPCC Greenhouse
Gas Inventory
Brief



AMERICAN COLLEGE & UNIVERSITY
PRESIDENTS CLIMATE COMMITMENT

GREENHOUSE GAS INVENTORY BRIEF

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INTRODUCTION

This Greenhouse Gas Inventory Brief is a short description of the inventory process, including tools and resources. It is a companion to the [ACUPCC Implementation Guide](#), which defines the specific obligations represented in the Commitment, explains technical issues related to implementation, and sets out the conditions to be considered in “good standing” within the ACUPCC.

The time and amount of effort required to complete an inventory ranges depending on the size of university or college, accessibility of information, and size of team working on the inventory. Students at many colleges and universities at both the undergraduate and graduate level have conducted greenhouse gas (GHG) inventories under the supervision of faculty and/or staff, as part of a class assignment or research project. The ACUPCC team highly recommends this approach if possible, as it provides the opportunity for students to learn the process, which they will likely find useful as they enter their careers. Most small- to medium-sized signatories estimate approximately 4 months to complete an inventory. For a larger institution, 6 to 9 months may be more accurate.

There are three stages to the GHG emissions inventory process: data collection; GHG emissions calculation; and data analysis for climate action planning.

DATA COLLECTION

The raw data required for a campus GHG inventory calculation falls generally under the following major categories (specific details are outlined in inventory calculators):

- Purchased Electricity
- Purchased Steam / Chilled Water

- On Campus Stationary Sources (energy generation)
- Transportation (commuting, air travel, campus fleet)
- Agriculture (fertilizer use, animal waste)
- Solid Waste (incinerated, landfill)
- Refrigerants and other Chemicals
- Offsets (Renewable Energy Credits purchased, composting, forest preservation, local offset project such as paying for boiler conversion at a local K-12 school, etc.)

This data may be acquired from a variety of sources, including: the physical plant department, the campus planning office, local utilities, etc. Experienced teams recommend the following:

- Keep a journal of the process and source of data, including who you contacted, when you contacted them, their response
- As you identify the correct data sources, record these in a legacy document to facilitate future inventory processes
- Give people deadlines for gathering information
- Where possible, create systems for future reporting, such as reporting forms to be collected by the climate action team annually
- Foster positive relationships along the way
- Where data is incomplete or unavailable, gather the information you can and note gaps to encourage better record keeping in the future

EMISSIONS CALCULATIONS

The next step is to calculate your GHG emissions from the raw data collected. There are several calculator tools available to facilitate this step. The most commonly used are: the Clean Air Cool Planet Campus Carbon Calculator, the Climate Action Registry Reporting Online Tool (CARROT), and the ~~the~~ World Resources Institute (WRI) / World Business Council for Sustainable Development (WBCSD) Greenhouse Gas Protocol. Each has its own merits, and signatories are free to choose the tools that work best for their context. The ACUPCC reporting framework will be compatible with multiple calculators, so signatories that are participating in other GHG initiatives will not have to calculate their emissions multiple times. The ACUPCC recommends using the Clean Air Cool Planet Carbon Calculator, for the reasons outlined below.

[The Greenhouse Gas Protocol Initiative](#)

The Greenhouse Gas Protocol is a partnership of the World Resources Institute and the World Business Council for Sustainable Development, working with businesses, governments, and environmental groups to build credible and effective programs to address climate change. It is the basis for most major climate change initiatives, including the International Standards Organization, the EU Emissions Trading Scheme, the California Climate Registry, the Chicago Climate Exchange, and Clean Air Cool Planet's Campus Climate Action Toolkit.

The GHG Protocol consists of two modules and an inventory calculator (see below for calculator information):

[The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard](#)

Methodologies for organizations to inventory and report GHG emissions

[The Greenhouse Gas Protocol for Project Accounting](#)

Guidelines for calculating reductions in GHG emissions from specific GHG-reduction projects, including key GHG project concepts, policy aspects and principles of GHG project accounting

GREENHOUSE GAS INVENTORY CALCULATOR TOOLS

[Clean Air Cool Planet Campus Carbon Calculator](#)

The Clean Air Cool Planet Campus Carbon Calculator is an MS Excel-based spreadsheet tool that provides procedural protocols and a framework for investigation of campus GHG emissions. It is based on workbooks by the Intergovernmental Panel on Climate Change for national inventories and the methodologies and calculators of the GHG Protocol, and has been adapted for higher education institutional use. The data collection module includes the following major emissions sources: on-campus energy production; purchased electricity; transportation (including air travel and commuting); waste; agriculture; and refrigerants.

Step 3 is a planning module, which provides some basic analysis of project will be expanded in the next release. Anyone interested in providing input into the development of this module and the new release can contact Jennifer Andrews, Campus Program manager at Clean Air Cool Planet (jandrews@cleanair-coolplanet.org | 603-422-6464 ext. 7).

The ACUPCC team has recommended the Clean Air Cool Planet Inventory Calculator because it is based on GHG Protocol methodology, but adapted for campus use. It has been designed to be used by an undergraduate or graduate level student, intern, or employee in a semester or less. The calculator covers all sources within the defined scopes of the ACUPCC (see the ACUPCC Implementation Guide for more information), and allows users to input the exact fuel mix used for generation by their electricity provider, which provides a more accurate and precise picture of organizational emissions (the GHG Protocol uses a generalized regional mix). It is our belief that the Campus Carbon Calculator is the most user-friendly and appropriate tool currently available for application in the higher education context.

[Clean Air Cool Planet Campus Carbon Calculator](#)

Includes the MS Excel-based spreadsheet tool and an explanatory user guide

[The GHG Protocol Calculators](#)

Because it is the most widely-used international accounting tool for government and business leaders to quantify and manage greenhouse gas emissions, there may be an inherent learning opportunity for the team that is conducting the inventory in using the GHG Protocol calculators. Because the GHG Protocol is emerging as the common standard used in the business context, it can be argued that it is important that students become familiar with these tools. The GHG Inventory Calculators are a series of tools that measure individual elements of emissions sources, and a sufficient combination of these tools must be used to meet the requirements of the ACUPCC (which is essentially the work that was done by the Clean Air Cool Planet team in creating the Campus Carbon Calculator).

[GHG Protocol Inventory Calculators](#)

MS Excel-based spreadsheet tools with accompanying step-by-step guidance document, which includes: an overview of the process; approaches for determining GHG emissions; guidance on data collection, emissions sources and related scopes; and additional information.

[The Greenhouse Gas Protocol: Designing a Customized Greenhouse Gas Calculation Tool](#)

Guidebook for customizing existing GHG Protocol calculation tools for a specific GHG program or to more closely reflect national, regional, and institutional circumstances

[Climate Action Registry Reporting Online Tool \(CARROT\)](#)

The CARROT tool is both an emissions calculation and reporting tool, and serves as a companion to the California Climate Action Registry ("Registry") General Reporting and Certification Protocols. It has four main functions: to help Registry participants calculate and report GHG emissions; to facilitate certification; to permit public viewing of aggregated reports; and to enable data tracking. The CARROT tool is a web-based spreadsheet tool that is consistent with the GHG Protocol Initiative, and therefore the results of calculations from raw data to emissions should align with the ACUPCC standardized reporting framework. The CARROT tool is only accessible to Registry participants, and is therefore most useful to California signatories that also wish to report to the Registry.

[California Climate Action Registry General Reporting Protocol: Reporting Entity-Wide Greenhouse Gas Emissions \(V 2.2, March 2007\)](#) - provides guidance for businesses, government agencies, and non-profit organizations to participate in the Registry, including information on using the CARROT tool.

DATA ANALYSIS FOR CLIMATE ACTION PLANNING

The inventory calculators summarize the emissions totals in CO₂-equivalent, based on the emissions factors of each emissions source and the global warming potential (GWP) of the particular GHG. This summary helps to compare emissions sources to determine the largest sources of global warming pollutants and thereby identify areas of greatest opportunity for GHG emissions abatement.

The greenhouse gas inventory results help to guide the development of a Climate Action Plan. In combination with financial analysis, the identification of the emissions-reduction potential of various project ideas will illuminate initiatives that will generate reductions with lower marginal abatement costs and create operational savings ("low-hanging fruit"). These are great places to start, as they free up operational resources to put toward projects with higher

marginal abatement costs over the long term. There will likely be a myriad of options to choose from, and in the institutional context, it is appropriate to evaluate these options in light of the question: *how can we prioritize at an increasingly detailed level among the options?*

As mentioned above, the Clean Air Cool Planet Campus Carbon Calculator has a brief planning module that will be expanded in the next release. The ACUPCC team will be working with their development team to create a tool that fits the needs of signatories.

Some resources available now that may be helpful as you consider your Climate Action Planning process are:

[The Greenhouse Gas Protocol for Project Accounting](#)

Guidelines for calculating reductions in GHG emissions from specific GHG-reduction projects, including key GHG project concepts, policy aspects and principles of GHG project accounting

[UC Berkeley Climate Action Partnership Feasibility Study 2006-2007 Final Report](#) (Jul 2007)

Final report of a feasibility study conducted by UC Berkeley's Climate Action Partnership, including financial analysis, recommendations on target dates and identification of a GHG reduction project portfolio with a 4-year payback

[The Carbon Neutrality Toolkit, An Annotated Guide to: A Proposal for Carbon Neutrality at Middlebury College](#) (Jan 2007)

A template for other student proposals for climate neutrality, including the document that was sent by students to the Board of Trustees, and the students' comments, thoughts, and suggestions

SOURCES

California Climate Action Registry
<http://www.climateregistry.org/>

Chicago Climate Exchange
<http://theccx.com/>

Clean Air Cool Planet

<http://www.cleanair-coolplanet.org/>

Greenhouse Gas Protocol

<http://www.ghgprotocol.org/>



www.presidentsclimatecommitment.org

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