

User's Guide

Tribal Greenhouse Gas Inventory Tool: Government Operations Module

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Acronyms and Abbreviations

%	percent
BAU	business-as-usual
BOD₅	Biological Oxygen Demand (the amount of oxygen consumed in five days by decomposing waste, used to measure the amount of waste input or output into a system)
CH₄	Methane
CO₂	Carbon dioxide
CO₂e	Carbon dioxide equivalent emissions
days/yr	days per year
eGRID	Emissions & Generation Resource Integrated Database
EPA	U.S. Environmental Protection Agency
ft³	cubic feet
ft³/yr	cubic feet per year
G.G.E.	gasoline gallon equivalent
kg	kilograms
kWh	kilowatt-hours
kg N/day	kilograms of Nitrogen per day
LFG	Landfill gas
LGOP	Local Government Operations Protocol
LGGIT	Local Greenhouse Gas Inventory Tool: Government Operations Module
mcf	thousand standard cubic feet
MMSCF	million standard cubic feet
MMSCF/yr	million standard cubic feet per year
MT	metric Tons
N₂O	Nitrous oxide
TGGIT	Tribal Greenhouse Gas Inventory Tool
WARM	EPA's WASTE Reduction Model

Getting Started

1. Tool Overview

This User's Guide accompanies and explains the Tribal Greenhouse Gas Inventory Tool: Government Operations Module. The module was developed to support tribal governments across the United States to evaluate the greenhouse gas emissions associated with their tribal operations.

Understanding these emission levels provides a base year for tracking emission trends against, developing mitigation strategies and policies, and assessing progress towards meeting goals. This tool and examples throughout will be useful to tribes due to their unique structure and organization, and the greenhouse gas inventory sectors relevant to their government operations.

The tool helps users to develop a greenhouse gas inventory of tribal operations for a base year, following the Local Government Operations Protocol (LGOP), version 1.1. A companion tool for estimating greenhouse gas emissions at the community level is also available. While the Government Operations Module estimates emissions at the government level, the separate Community Module estimates emissions for the tribal community as a whole and follows the Global Protocol for Community-Scale GHG Emissions. Any emissions estimated in the Government Operations Module can be included in the Industrial/Commercial sector in the Community Module. This tool is not intended for use in developing a Tribe's Quality Assurance Projection Plan. A resource for assisting in your Quality Assurance Project Plan is available online at: <http://www.epa.gov/region1/lab/qa/qaprojectplandevtool.html>.

2. Getting Started

The Tribal Greenhouse Gas Inventory Tool: Government Operations Module was developed using Microsoft® Excel 2007 and 2010. The tool will only operate properly using Excel 2007 or later. Before using the tool, ensure your computer meets the system requirements. In order to install and run the tool, you must have:

- IBM-PC compatible computer with the Windows XP operating system or later;
- Microsoft® Excel 2007 or later, with calculation set to automatic and macros enabled;
- Hard drive with at least 20MB free; and
- Monitor display setting of 800 x 600 or greater.

Microsoft Excel Settings

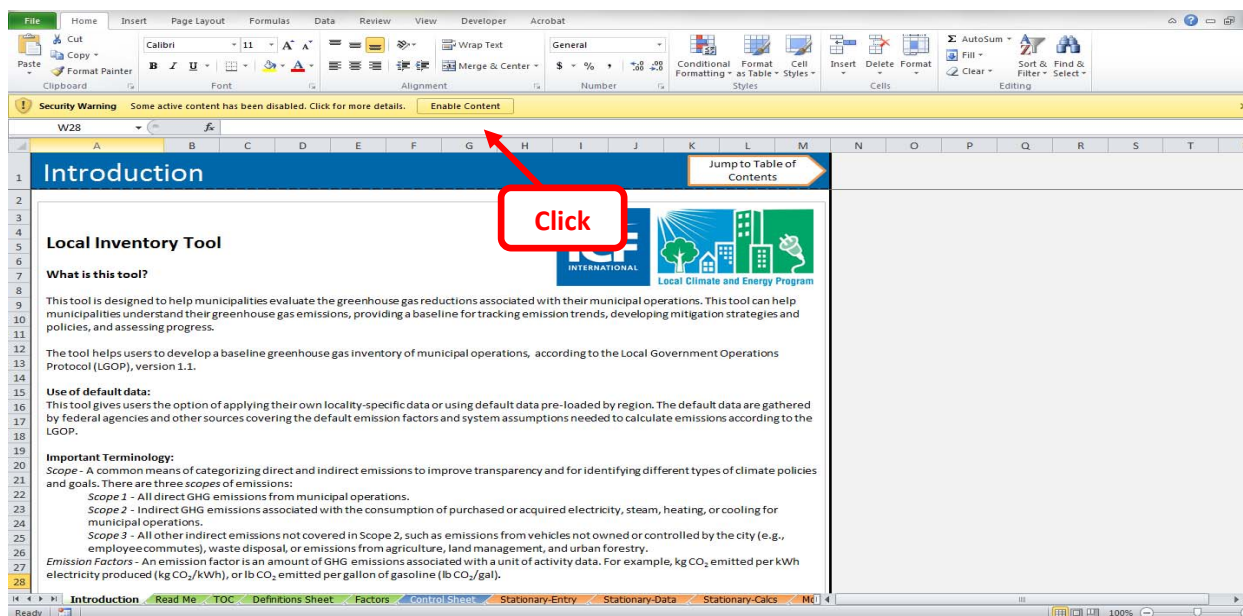
For the tool to function properly, Excel must be set to automatic calculation. Go to the Formulas ribbon and select "Calculation Options." Make sure that the box next to the "Automatic" option is checked.

Running Macros in Microsoft Excel

To make the user's experience as smooth as possible, the module uses macros. Macros are series of commands and functions that are stored in Excel that run automatically to perform tasks, which allow the tool to carry out tasks in an automated way. Because macros are such a powerful tool, Excel checks with the user for approval before allowing them to run.

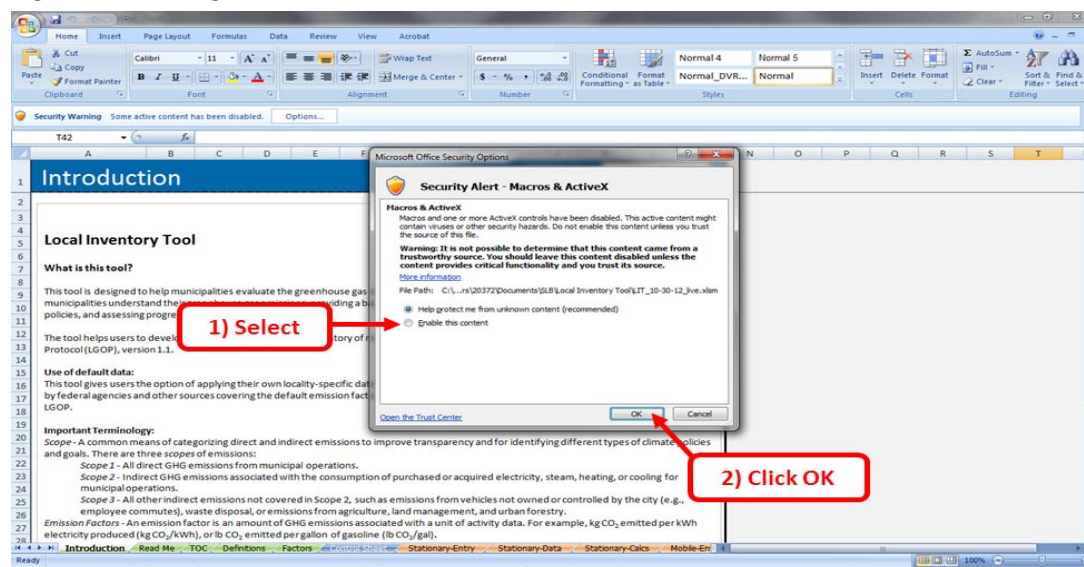
If Excel's security settings are set at the default level, a Security Warning appears above the formula box in Excel when the file is initially opened (Figure 1).

Figure 1. Enabling Macros, Excel 2010



The Security Warning lets the user know that some active content from the spreadsheet has been disabled, meaning that Excel has prevented the macros in the spreadsheet from functioning. Since the Government Module needs macros in order to function properly, the user must enable macros. To do so in Excel 2010, simply click the “Enable Content” button in the security message (Figure 1). To do so in Excel 2007, click the “Options” button in the security message and then select, “Enable this content” in the pop-up box (Figure 2). Enabling the macro content for the tool in these ways only enables macros while you are using this spreadsheet. The security settings will return to your default when you close the spreadsheet.

Figure 2. Enabling Macros, Excel 2007



If the Security Warning does not appear when the tool is first opened, it may be necessary to change the security settings for macros.

To change the settings in Excel 2010, follow the steps below:

1. Exit out of the tool and re-launch Microsoft Excel without opening the Government Module.
2. On the “File” tab, select Options from the bottom of the left-hand menu.
3. In the Excel Options pop-up box, click on “Trust Center” at the bottom of the left-hand menu.
4. Click on the gray “Trust Center Settings” button.
5. When the Trust Center options box appears, click “Macro Settings” in the left-hand menu.
6. Select “Disable all macros with notification.”
7. Click “OK” to exit out of all pop-up boxes.
8. Once the security level has been adjusted, open the tool and enable macros in the manner described in **Figure 1** above.

To change the settings in Excel 2007, follow the steps below:

1. Exit out of the tool and re-launch Microsoft Excel without opening the Government Module.
2. Click on the Microsoft Excel icon in the top left of the screen.
3. Scroll to the bottom of the menu and select the “Excel Options” button to the right of the main menu.
4. When the Excel Options box appears, select “Trust Center” in the left hand menu of the box.
5. Click the gray “Trust Center Settings” button.
6. When the Trust Center options box appears, click “Macro Settings” in the left-hand menu.

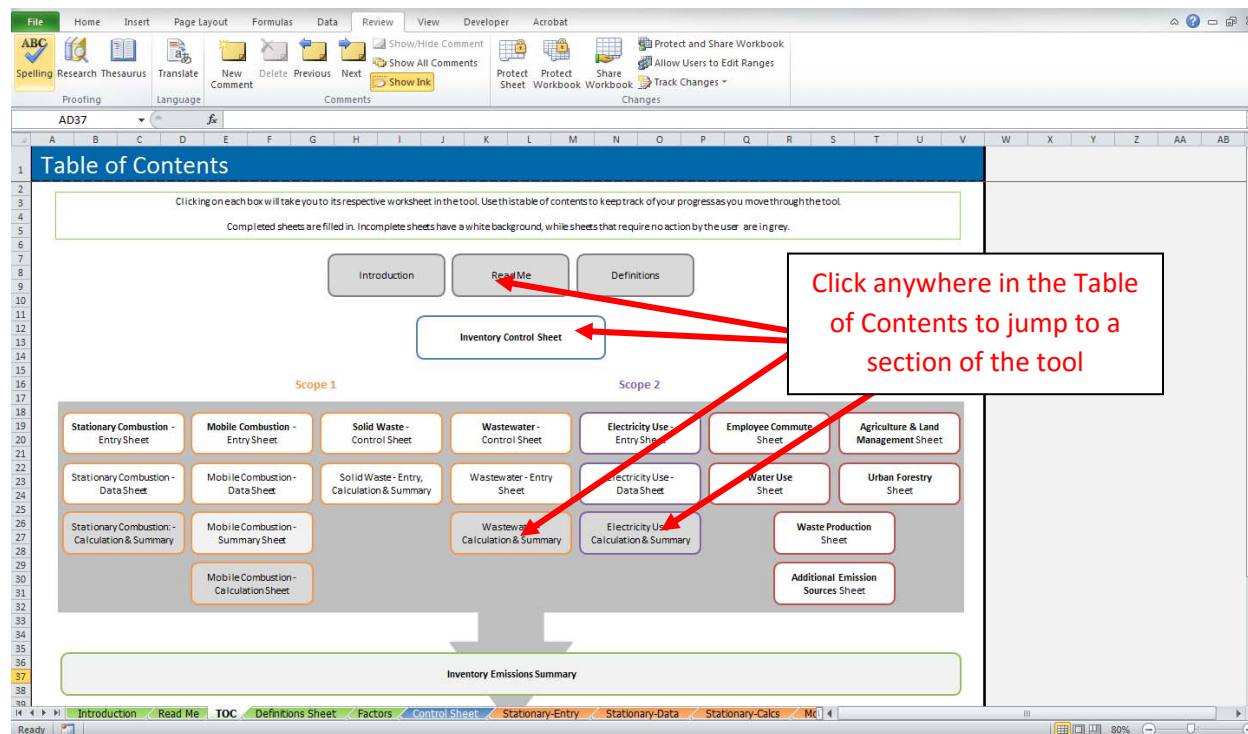
7. Select “Disable all macros with notification.”
8. Click “OK” to exit out of all pop-up boxes.
9. Once the security level has been adjusted, open the tool and enable macros in the manner described in **Figure 2** above.

Navigating the Tool

The Government Module’s Table of Contents is its main navigational portal. The Table of Contents is also used to track your progress throughout the tool. You may click on the name of any part of the tool within the Table of Contents to be taken to that sheet (Figure 3). Every sheet also features an arrow-shaped navigation button on the upper right-hand corner that returns the user to the Table of Contents.

There are two main sections of this tool: Background Data Collection and Emissions Calculations. In each, the user will enter data to configure the tool to their specific tribe and receive customized results.

Figure 3. Table of Contents



The Table of Contents is also used to track your progress as you complete the tool. On every sheet that requires user action, you will see a check box in the upper right-hand corner of the tool that reads “Check if you have completed this sheet” (

Figure 4). Check this box as you complete each sheet. Doing so will change the color of that sheet’s icon in the Table of Contents. For example, Figure 5 shows the Table of Contents after the “Mobile

Combustion - Entry" sheet has been completed. The "Mobile Combustion – Entry Sheet" box has changed, and is now filled in with color.

Figure 4. Sheet Navigation and Tracking Tools

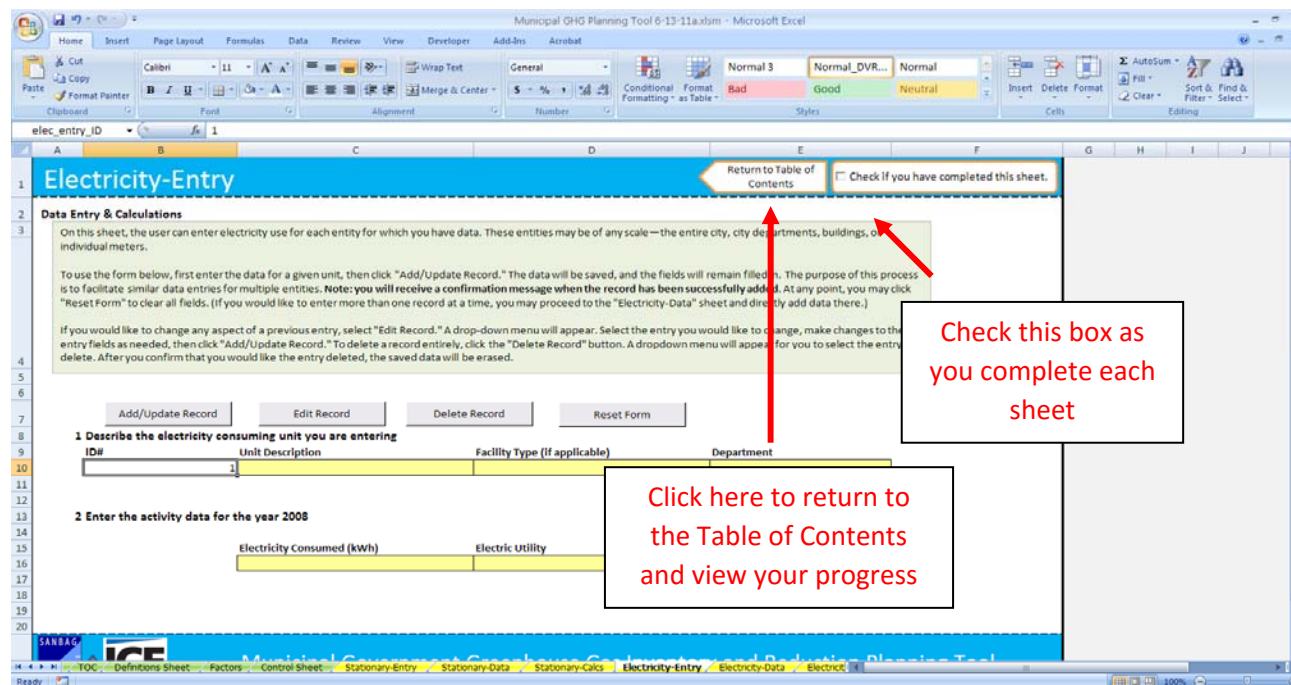
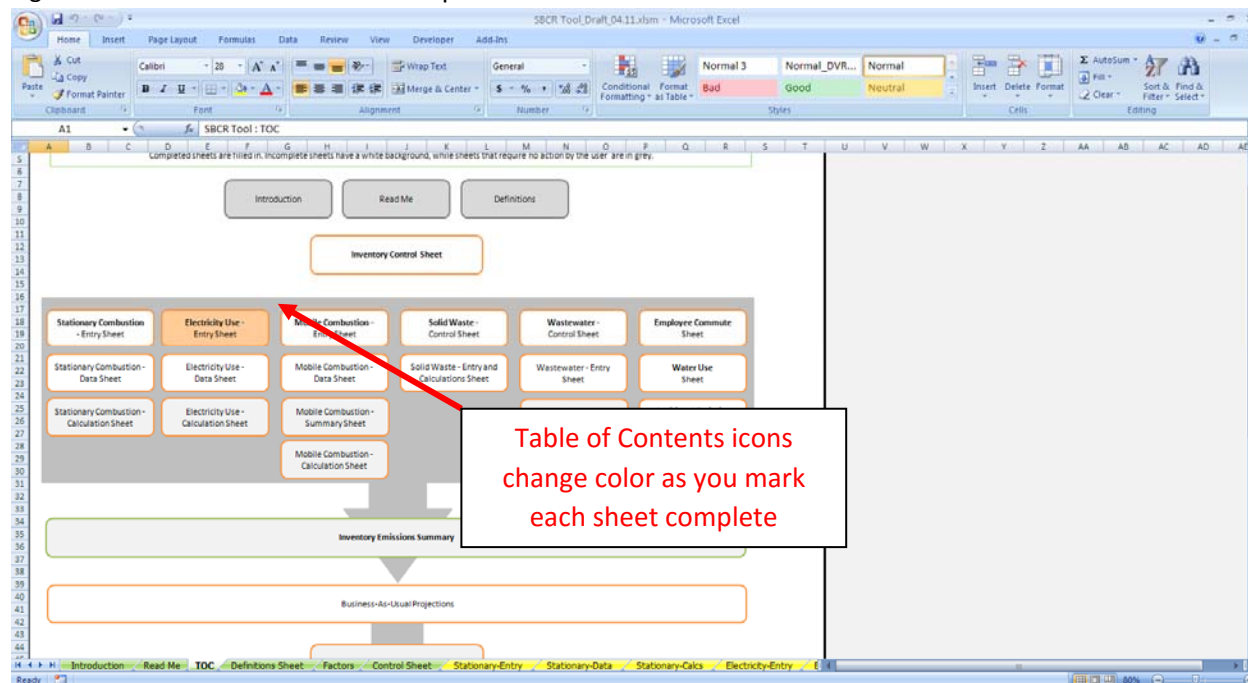


Figure 5. Table of Contents with Completed Sheet



Data Requirements

The Government Module is designed to accept any level of data granularity in order to be flexible to the needs and constraints of different tribes. Data can be entered at any scale, ranging from tribal-wide activity data to data by reservation, facility, or meter. The more specific the data provided by the user, however, the more accurate and useful the tool will be. See Box 1 for details.

The GHG inventory segment of the tool proceeds through ten main sectors of tribal government emissions. These sectors and the type of data the user needs to provide are show in

Table 1. Gray cells indicate if a default value is available for that input or if the input is optional.

In general, this tool is pre-programmed with default emission factors and system assumptions needed to calculate emissions from LGOP. Default emission factors are generally provided from national or state publications, and provide a relatively accurate estimate of emissions. If local, or site-specific factors are available for your locality, those should be used to overwrite the default factors. Wherever possible in the inventory process, default values from the LGOP are used. The tool provides users the option to use default data or to override default values if they have tribe-specific information.

Throughout the tool, cells are shaded yellow where the user is required to enter data.

Box 1. GHG Inventory Data Input Options

Option A: “Quick” Inventory

- Enter tribal-wide fuel, electricity, and water consumption data.
- This method takes less time, but does not allow the tool to as effectively calculate emission levels.

Option B: Thorough Inventory

- Enter fuel, electricity, water consumption by facility or meter.
- This method requires more time and data availability from the user, but provides the most detailed GHG inventory.

Table 1. Required Data Inputs for the Tribal Greenhouse Gas Inventory Tool: Government Operations Module—Inventory Calculations

GHG Sectors	Input Data
Stationary Combustion of Fossil Fuels (i.e., fuel use at tribal facilities)	Stationary fuel use (by fuel type)
Electricity Consumption	Electricity consumed (kWh) Electric utility
Mobile Combustion of Fossil Fuels (i.e., fuel use by tribal fleet)	Fuel used (by fuel type) (gallons or G.G.E.) Vehicle Miles Traveled (miles) Vehicle Model Year Vehicle Type
Solid Waste Management	Tribal Landfills (number) Landfill Gas Collected (MMSCF/yr) Fraction of CH ₄ in landfill gas Landfill Gas Collection Area (fraction)
Wastewater Treatment	Wastewater treatment process details (aerobic, anaerobic, nitrification, denitrification) Population served by wastewater treatment system(s) (people) Population served by septic systems (people) Digester gas produced daily (ft ³ /day) Fraction of CH ₄ in biogas System BOD ₅ load/influent (kg BOD ₅ /day) Fraction BOD ₅ removed in primary treatment Industrial Nitrogen load (kg N/day) Average total Nitrogen discharged (kg N/day)
Employee Commute	Number of employees (people) Employees who use each mode of transit (%) Average one-way commute length (miles) Work days per year (days/yr)
Agriculture & Land Management	Synthetic fertilizer use (short tons N) Organic fertilizer use (short tons) Manure fertilizer use (short tons)
Forestry	Total reservation area (km ²) Area with tree cover (%)
Waste Generation	Waste emissions (MTCO ₂ e from EPA's Waste Reduction Model) Department contribution to total waste (%)
Water Use	Percentage of imported water (%) Water use (gallons)
Additional Emission Sources	GHG emissions from each additional source, by gas (MT CO ₂ e)

Tool Layout

There are two main sections of this tool: *Background Data Collection*, and *Emissions Calculations*. In each, the user will enter data to configure the tool to their specific tribe and receive customized results.

Background Controls

On the Inventory Control Sheet, identify the tribe, the inventory year for the inventory, and set up and define departments for your tribe. Depending on what data are available and at what scale, the user can determine how to configure the tool. The departments input into the tool do not need to correspond to every department within the tribe, but set up to reflect organizational units for which the most comprehensive data is available. For example, if the user has tribal-wide data, they may set up only one department, "Tribe." If data are only available by reservation, that could also be one way of organizing data within the tool. Alternatively, if the user has data broken down by billing units which are different from tribal departments, they may name the "Departments" after those units. You must enter a minimum of 1 department in this step.

The user will also set up information about their electricity providers. Users can select which eGRID sub-region serves the area view the default emission factors, and can enter up to five utilities with utility-specific emission factors (if available).

GHG Emission Scopes

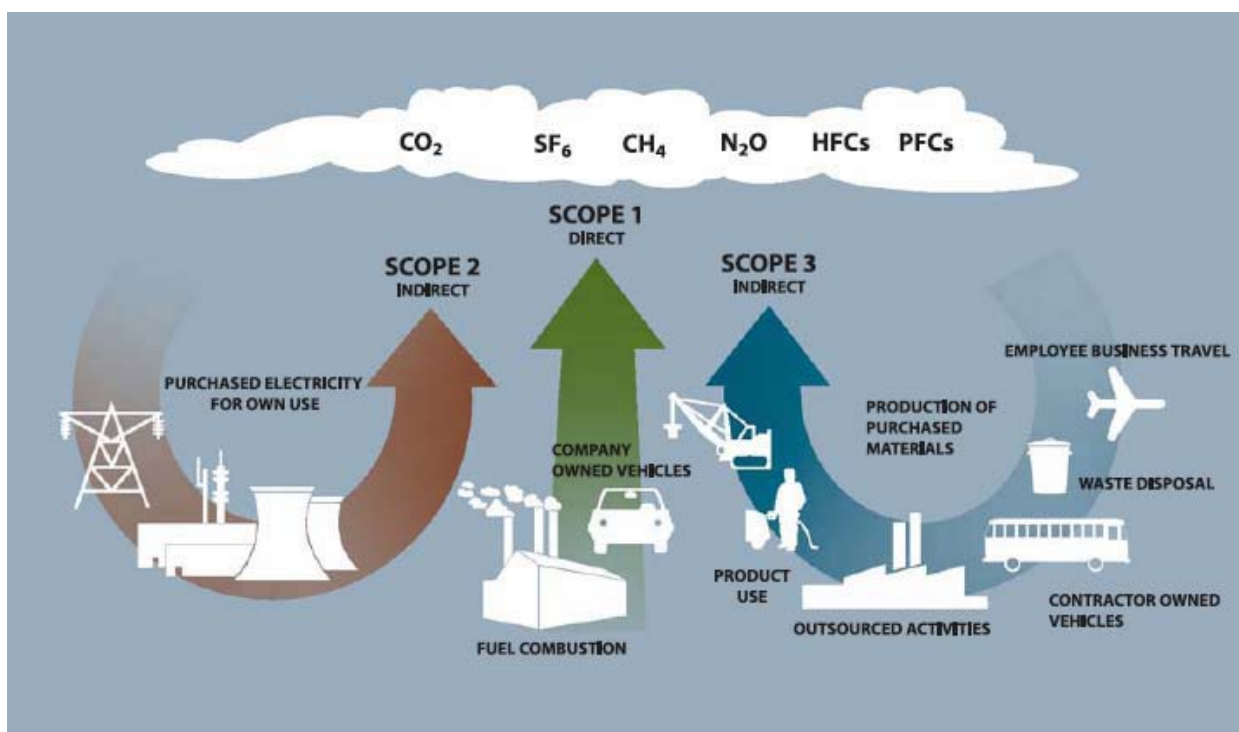
To account for direct and indirect emissions, and to provide transparency and a guiding framework for the inventory tool, GHG estimates are categorized according to 3 scopes. The following scopes are defined by the Local Government Operations Protocol and are used throughout the tool:

Scope 1: All direct GHG emissions (with the exception of direct CO₂ emissions from biogenic sources).

Scope 2: Indirect GHG emission associated with the use 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, waste disposal, etc.

In addition to accounting for emissions according to these 3 scopes, the LGOP provides guidance on imports and exports by a local government, and how emissions for these should be taken into account. As an example, waste imported into the city, and treated at a government run facility is reported as Scope 1 emission estimates. Waste generated by the local government, and exported and treated outside of the local government's boundaries is included in Scope 3 estimates. The LGGIT accounts for in-boundary consumption and resulting emissions and excludes any emissions released from products consumed or services exported from the locality.



Source: WRI/WBCSD GHG protocol Corporate Standard, Chapter 4 (2004).

Some local governments also choose to purchase green power or renewable energy certificates (RECS). According to section 6.2.4 of the LGOP, a local government “may not deduct these purchases from your Scope 2 emissions because doing so would constitute double counting. This is because the renewable energy portion of a utility’s power supply is already accounted for in the region’s eGRID factor.” The LGOP encourages local governments to disclose information about these activities in their inventory report, but not to include them in the calculations as this would lead to double counting.

Since Scope 3 emissions vary in complexity and in the activities they represent, it is recommended that users calculate emission estimates for additional sources outside the tool and enter the estimates in the Additional Emission Sources worksheet. An example of Scope 3 calculations from one local government is included in the box below.

City of Eugene 2000 and 2005 GHG Inventory Report Scope 3 Emissions

The City of Eugene included Scope 3 emissions from vehicle fuels used by City employees commuting to work, disposal of the City's solid waste from internal operations, and the embodied energy in goods and services purchased by the City.

For embodied energy in goods and services purchased by the City, the City of Eugene provided an estimate that was derived from a national model (developed by Carnegie Mellon University) of the GHG emissions embodied in different types of purchases. The City estimated that approximately 18,120 metric tonnes of GHG emissions was attributable to \$40 million in purchases of local goods and services.

Inventory Calculations

After the user has configured the tool on the Control Sheet, the tool will calculate the tribal emissions, or the base year greenhouse gas inventory for the tribe's operations. The inventory is separated into the 10 main emission sources below, from the Local Government Operations Protocol (LGOP), and these sources are further organized by scope. Users can also enter emissions for any additional sources they would like to calculate outside of the tool, and enter the estimates in the Additional Emission Sources worksheet.

1. Stationary Combustion of Fossil Fuels (Scope 1)
2. Building/Facility Electricity Consumption (Scope 2)
3. Mobile Combustion of Fossil Fuels (Fleet) (Scope 1)
4. Solid Waste Disposal (Scope 1)
5. Wastewater Treatment (Scope 1)
6. Employee Commutes (Scope 3)
7. Water Consumption in Tribal Facilities (Scope 3)
8. Agriculture & Land Management (Scope 3)
9. Forestry (Scope 3)
10. Waste Generation (Scope 3)
11. Additional Emission Sources (optional) (Scope 1,2, or 3)

For each source, the user will be asked to enter data about relevant tribal activities (e.g. electricity consumed, fuel used) during the inventory base year. The tool can be used to develop emissions estimates for a base year, as well as used to track emissions over time if different versions of the

Excel file are saved. Default emission factors for each activity are provided, and the user is given the option to override these factors, if necessary. There are multiple sheets for some emission sources, but not for all sources. Each emissions source follows a distinct process the user will follow to determine the emissions, as explained below:

Stationary Combustion, Electricity Use, and Mobile Combustion

1. Users enter activity/fuel use data on Entry Sheet OR
2. Users can batch import data on Data Sheet.
3. Emissions are calculated and summarized on the Calculation Sheet.

Solid Waste

1. Users answer questions about their tribe's solid waste disposal system on the Control Sheet.
2. Based on the answers to the questions, users will enter data about their solid waste system and view emissions summary on the Entry, Calculation & Summary Sheet.

Wastewater Treatment

1. Users answer questions about their tribe's wastewater treatment system(s) on the Control Sheet.
2. Based on the answers to the questions, users will enter data about their wastewater treatment systems on the Entry Sheet; and
3. Emissions will be calculated and summarized on the Calculation & Summary Sheet.

Employee Commutes, Water Consumption, Agriculture & Land Management, Forestry, and Waste Generation

1. Users will enter necessary data, and view emissions on a single sheet.

Additional Emission Sources

1. Users can enter emissions from up to 10 additional sources on a single sheet.

All tribal emissions for the inventory year are summarized on the Emissions Summary sheet.

The tool estimates emissions for the 6 Kyoto Gases- CO₂, CH₄, N₂O, PFCs, HFCs, and SF₆. Gases included for each Scope are provided in the following table.

Local Government GHG Inventory Tool Worksheet	Gases Included
Scope 1	
Stationary Combustion	CO ₂ , CH ₄ , N ₂ O
Mobile Combustion	CO ₂ , CH ₄ , N ₂ O
Solid Waste	CH ₄
Wastewater	CH ₄ , N ₂ O
Scope 2	
Electricity Use	CO ₂ , CH ₄ , N ₂ O
Scope 3	
Employee Commute (Scope 3)	CO ₂

Agriculture & Land Management (Scope 3)	N ₂ O
Urban Forestry (Scope 3)	CO ₂ (sequestered)
Waste Generation (Scope 3)	CH ₄
Water Use (Scope 3)	CO ₂ , CH ₄ , N ₂ O
Other (Scope 1, 2, or 3)	
Additional Emission Sources	CO ₂ , CH ₄ , N ₂ O, HFCs, PFCs, SF ₆

Biogenic emissions are not included in the module, and as a standard practice the CO₂ emissions occurring from biofuel combustion are not included in total inventory estimates. According to the U.S. Environmental Protection Agency, biogenic CO₂ emissions are defined as CO₂ emissions related to the natural carbon cycle, as well as those resulting from the combustion, harvest, combustion, digestion, fermentation, decomposition, or processing of biologically based materials. EPA provides examples of biogenic CO₂ emissions including:

- CO₂ from the combustion of biogas collected from biological decomposition of waste in landfills, wastewater treatment, or manure management processes
- CO₂ from combustion of the biological fraction of municipal solid waste or biosolids
- CO₂ derived from combustion of biological material, including forest-derived and agriculture-derived feedstocks.

According to the LGOP, because of the distinction between biogenic and anthropogenic emissions, if you choose to quantify biogenic emissions, they should be tracked separately from Scope 1 direct emissions. In addition, the LGOP advises the following:

“Biogenic emissions related to forestry and land management should not be quantified under this Protocol as the Protocol is designed to account primarily for the anthropogenic sources of GHG emissions, and is not designed to assess the carbon stocks of government-owned lands (see Section 2.3 in the LGOP). Biogenic emissions also occur from sources other than combustion, such as the aerobic decomposition of organic matter. These non-combustion biogenic emissions should not be included in your GHG inventory.”

Emission factors for each calculation are included in the “Factors” worksheet of the module, and specific sources for each of the emission factors are provided in the table below.

Scope 1	Emission Factor Source
Stationary Combustion	US EPA Mandatory Reporting Rule
Mobile Combustion	U.S. EPA, National GHG Inventory
Solid Waste	U.S. EPA, National GHG Inventory
Wastewater	U.S. EPA, National GHG Inventory
Scope 2	
Electricity Use	EPA’s eGRID
Scope 3	
Employee Commute	U.S. EPA, National GHG Inventory
Agriculture & Land Management	U.S. EPA, National GHG Inventory
Urban Forestry	U.S. EPA, State Inventory Tools
Waste Generation	U.S. EPA, National GHG Inventory
Water Use	California Energy Commission

3. Sheet Instructions and Methodology

This section provides a guide to using the Government Operations Module to estimate greenhouse gas emissions from tribal government operations. The methods and default values used for the inventory component of this tool are from the LGOP. Calculation sheets are provided so that methods and emission estimates are transparent in the tool. Instructions for completing each sheet of the tool are below.

Control Sheet

Use the Control Sheet to configure the tool to your tribal government. Enter up to 20 tribal departments, identify electricity providers, and click the "Set Up" button (in Step 4 at the bottom of the Control Sheet) to get started.

The module can be used to inventory GHG emissions from 2000 through 2020. EPA decided not to include inventory years going back to 1990, as there is limited availability of emission factors dating back to 1990 and tribes will likely not have data going back to 1990. According to the LGOP, "It is good practice to compile an emissions inventory for the earliest year for which complete and accurate data can be gathered. The base year for the UNFCCC and subsequent Kyoto Protocol is calendar year 1990. However, required data from 1990 is often prohibitively difficult or impossible to collect. Given that the priority for a greenhouse gas management program should be on practical results, it is more important that the base year be documented with enough detail to provide a good basis for local action planning than it is that all local governments produce an inventory with the same, stipulated base year."

NOTE: Once you click the "Set Up" button, you may not go back and change tribal departments you have already entered. You may add departments, but be sure to click "Set Up" again.

Stationary Combustion and Electricity Consumption Inventory Sheets

Entry Sheets

Enter annual stationary fuel use and electricity consumption for each entity for which you have data in the yellow cells. These entities may be of any scale—the entire tribe, reservation, tribal departments, buildings, or individual equipment such as furnaces. To use the form, first enter the data for a given unit (Unit Description, Facility Type, Department, Fuel Type, and Fuel Consumption), then click "Add/Update Record." The data will be saved in a data sheet, and the fields will remain

Box 2. Tribe-Owned/Operated Electric Utilities

If your tribal government owns and operates an electric utility, those data should be entered on the Stationary Combustion worksheet. If this is the case for your tribe, select "Other" for facility type, and enter a descriptive title for the electric utility under "Unit Description."

Examples of tribal owned/operated electric utilities are available online at:

http://apps1.eere.energy.gov/tribalenergy/pdfs/tribal_authority.pdf.

with the current data entered. The purpose of this process is to facilitate similar data entries for multiple entries. You will receive a confirmation message when the record has been successfully added. At any point, you may click "Reset Form" to clear all fields. If you would like to enter more than one record at a time, you may proceed to the "Stationary-Data" or "Electricity-Data" sheet and directly add data there.

If you would like to change any aspect of a previous entry, select "Edit Record." A drop-down menu will appear. Select the entry you would like to change, make changes to the entry fields as needed, and then click "Add/Update Record." To delete a record entirely, click the "Delete Record" button. A dropdown menu will appear that contains the previously entered data. Select the entry to delete from the drop-down, and confirm that this entry should be deleted. After you confirm that you would like the entry deleted, the saved data will be erased.

If you enter data at the facility level, please specify the type of facility from the dropdown menu under "Facility Type (if applicable)." Types of facilities include office buildings, warehouses, outdoor lighting, wastewater infrastructure, health, school, and other.

Data Sheets

Data entered through the Entry Sheet forms appears here (Figure 6). If you would like to upload a large set of data without using the form, you may do so by clicking the blue "Create Data File Template" button. This will open up a new batch data template file, which has two tabs. The "Read Me" tab explains any restrictions (such as units) you need to know when preparing your data file. Complete the template data sheet with your data, then copy and paste it into the Data sheet below the "Saved Data" section, beginning in Row 9.

Figure 6. Stationary and Electricity Data Sheets

Electricity-Data

This sheet stores the individual data records added via the form on the previous sheet. If you wish to add multiple records at once without using the input form, you may directly add data to this sheet. Please click on the button to the right to generate a template file with instructions for this process. Please be careful to follow the instructions and enter data using the format and parameters specified in the template.

[Return to Table of Contents](#) ☐ Check if you have completed this sheet.

[Create Data File Template](#)

ID#	Unit Description	Department	Utility	Electricity Consumed (kWh)	Facility Type
1	1111 First Street	Municipal Services	Southern California Edison	101910	Office Building
2	City Building	Municipal Services	Southern California Edison	118200	Office Building
3	15 Elm Street	Building	Southern California Edison	1672381	Office Building
4	Fire Station 1	Fire	Southern California Edison	139400	Other
5	Fire Station 2	Fire	Southern California Edison	103240	Other
6	Police Station B	Police	Southern California Edison	281840	Other
7	Administrative Buildings	Municipal Services	Southern California Edison	46980	Office Building
8	Oak Plaza	Municipal Services	Southern California Edison	46980	Office Building
9	Central Park	Parks & Maintenance	Southern California Edison	117020	Other
10	96 Street Building	Municipal Services	Southern California Edison	55950	Other
11	95 Dunster Street	Municipal Services	Southern California Edison	64680	Other
12	Finance Department	Finance	Southern California Edison	90990	Office Building
13	Art Museum	Municipal Services	Southern California Edison	97920	Other
14	Small Library	Library	Southern California Edison	133320	Other
15	33 Hayden Ave	Municipal Services	Southern California Edison	1362188	Office Building
16	City Hall	Municipal Services	Southern California Edison	122760	Office Building
17	Police Station A	Police	Southern California Edison	3431920	Other
18	Public Library	Library	Southern California Edison	841483	Other
19	City Building 2	Municipal Services	Southern California Edison	219040	Other
20	California Street	Municipal Services	Southern California Edison	56800	Office Building

Paste data from template file here beginning in row 9. If not using batch import, data will appear here as entered on Entry sheet.

The process for completing the mobile combustion sector follows nearly the same format as the stationary and electricity sectors. However, due to the complicated nature of mobile emissions calculations, one extra step is required. After all data has been entered, either through the Entry Sheet form or the batch data template file, you must click the “Update Calculations” near the bottom of the Mobile Entry sheet, as shown below in **Figure 7**.

Figure 7. Mobile Entry—Update Calculations

Mobile-Entry

After you have completed data entry, please click on the “Update Calculations” button in Step 3.

[Add/Update Record](#) [Edit Record](#) [Delete Record](#) [Reset Form](#)

1) Describe the vehicle(s) you are entering

ID# Vehicle or vehicle group description Department

Vehicle Year Vehicle Type Vehicle Model (optional) Fuel type

2) Enter the activity data for the year 2008

Fuel consumed (l): Entries

Vehicle miles traveled (VMT)*:

* Helpful Hint: If you do not know the VMT for this entry, you can multiply the fuel consumed by the MPG of the vehicle/vehicle group. Use your own efficiency data or see the table below for average MPG by vehicle type and fuel. → Vehicle Miles = Gallons × Miles/Gallon

Vehicle Type	Average MPG
Gasoline & Other Fuels	24
Diesel & Biodiesel	20

3) Update the calculations.

[Update Calculations](#)

Click “Update Calculations” once all mobile combustion data has been entered

Solid Waste Inventory Sheets

Control Sheet

On the control sheet, first select whether your tribe has operational control over any landfills. If not, you may opt to use the U.S. Environmental Protection Agency's (EPA) Waste Reduction Model (WARM) to calculate your Scope 3 emissions. This step is optional, but can also be used to calculate waste emission reductions.

For every landfill over which you have operational control, please select whether those landfills have landfill gas collection systems and whether those systems are comprehensive or partial. Under the LGOP, landfill gas (LFG) collection systems are considered "comprehensive" if the landfill is required to have a LFG collection system under EPA's New Source Performance Standards or a system more stringent as dictated by local regulations.

For these landfills that do not have LFG collection systems, you need to use the

[California Air Resources Board's \(CARB\) Landfill Emissions Tool](#), which is based on the IPCC First Order Decay (FOD) model. To use the model, you will need the annual waste deposited in each landfill as well as the opening and closing year of each landfill. Once you have run the model, please paste the final methane (CH₄) emissions output for each landfill in the yellow cells on in the tool.

Box 3. Tribe-Owned/Operated Landfills

If your tribal government owns and operates a landfill, those data should be entered on the Solid Waste worksheets.

Calculations Sheet

Depending on your entries on the Solid Waste control sheet, you will be presented with formulas to calculate your tribe's emissions from solid waste management. Enter values requested in the pale yellow cells. Click on the checkbox to use default values for the fraction of CH₄ in your tribe's landfill gas. Your solid waste emissions will be summarized at the bottom of the sheet.

Wastewater Treatment Inventory Sheets

Control Sheet

On the wastewater control sheet, answer the series of questions about the type(s) of wastewater treatment systems in your tribe. For every type of system (anaerobic or aerobic treatment with or without nitrification/denitrification), you will be asked to provide the population served by that system on the entry sheet. You will also answer questions about data availability for your wastewater treatment systems.

Entry Sheet

The wastewater entry sheet provides data input cells based on your answers to the questions on the wastewater control sheet. Enter data in the yellow cells in the specified units as requested.

Calculations Sheet

The calculation sheet shows the formulas used to determine your tribe's emissions from wastewater treatment, using methodology from the LGOP. The gray cells link to the values you entered on the Wastewater Entry Sheet.

Your total emissions are summarized in the table at the top of the sheet. You may scroll down to view the detailed calculations, but no action is required on this sheet. If you would like to change any of the entered values, you may do so on the entry sheet.

Employee Commute Inventory Sheet

The employee commute sheet will calculate Scope 3 emissions from employee commutes to work. In the yellow cells, enter the number of employees per department, the proportion of those employees who take various modes of transportation to work, average commute distance, and the annual number of work days. Default data for every entry except number of employees has been provided, but you may change them if you have better data.

Once you enter this information, the total emissions from employee commutes will be calculated.

Imported Water Inventory Sheet

The water sheet is where you will calculate the Scope 3 emissions associated with imported water consumption by your tribal government. These emissions are indirectly associated with electricity use and other emissions required to provide water to your tribe. This does not include the electricity or energy use used directly at tribal water facilities. Any such electricity use associated with water within your tribe (such as tribal water pumps) should be entered under the Electricity tab.

If your tribe imports water, enter the amount of water consumed by department during the inventory year and where that water is imported from. Each import source is associated with different emission factors, and will be used to calculate your tribe's indirect emissions from water consumption.

Agriculture & Land Management Inventory Sheet

The agriculture & land management sheet is where you will calculate the Scope 3 emissions associated with fertilizer application by your tribe. These emissions are associated with the application of synthetic, organic, and manure fertilizers. A portion of applied fertilizers volatilize into the air in the form of N₂O.

Once you enter the information for each department on the amount of fertilizer applied by fertilizer type, the total emissions from this source will be calculated.

Forestry Inventory Sheet

The forestry sheet is where you will calculate the Scope 3 emissions associated with trees managed by your tribal government. Changes in carbon stocks in trees are calculated by estimating the total

reservation area, the percent of that area with tree cover, and applying a carbon storage factor to estimate carbon sequestration from trees. Note the LGOP states that biogenic forestry emissions are not quantified under the LGOP and can be reported optionally (see Section 2.3 in the LGOP). EPA decided to include these estimates in the tool so that local governments could optionally estimate carbon stocks of government-owned land if this was applicable.

Once you enter the information on the tree coverage for each department, the total carbon sequestration from this source will be calculated.

Waste Generation Inventory Sheet

The waste generation sheet is where you will calculate the Scope 3 emissions associated with the decomposition of waste generated within your borders by government operations, but landfilled elsewhere. This sheet applies to waste produced directly or indirectly by government operations activities and disposed of in a solid waste facility not operated by the tribe. To calculate Scope 3 emissions from waste, utilize EPA's WASTE Reduction Model (WARM) either as a web-based calculator or an Excel spreadsheet. If the waste is disposed of in a facility operated by the tribe, emissions should be calculated as Scope 1 emissions on the Solid Waste-Control and Solid Waste-Entry sheets.

Once you enter the information for each department on the waste generation, the total emissions from this source will be calculated.

Additional Sources Inventory Sheet

Use this sheet to enter emissions from any additional sources you would like to include in your inventory. Assign each source to a department, note what scope the emissions fall under, and enter any greenhouse gas emissions in metric tons of carbon dioxide equivalent (MTCO₂e). In Chapter 11, the LGOP provides a list of other processes and fugitive emissions that could be estimated outside of the tool, and the results of the emissions calculations can be input on this sheet.

Box 4. Additional Sources Examples

Examples of additional government-owned sources that could be added include emissions from industrial processes, livestock, HVAC from refrigeration, and mobile vehicle air-conditioning (MVAC's), to name a few.

4. Uncertainty

The GHG inventory component of the tool follows the methodology of the LGOP. Users should refer to the LGOP for a discussion of the uncertainty associated with default assumptions.

5. Tool References

These references refer to resources cited in the Tribal Greenhouse Gas Inventory Tool: Government Operations Module as well as in the User's Guide.

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U.S. EPA. 2015. eGRID 2012 Version 1.0. Office of Clean Energy, U.S. Environmental Protection Agency. Available at: <http://www.epa.gov/cleanenergy/energy-resources/egrid/index.html>.

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U.S. EPA. 2007. eGRID 2005 Version 1.1. Office of Clean Energy, U.S. Environmental Protection Agency. Available at: <http://www.epa.gov/cleanenergy/energy-resources/egrid/index.html>.

U.S. EPA. 2002. Updating Fuel Economy Estimates in MOBILE6.3 – DRAFT. U.S. Environmental Protection Agency. EPA420-P-02-005. Available at: <http://www.epa.gov/oms/models/mobile6/p02005.pdf>.

6. Additional Resources

Below are additional resources that can help facilitate the development of your local government GHG inventory.

Resource Name	Link
ENERGY STAR Portfolio Manager	http://www.energystar.gov/buildings/about-us/how-can-we-help-you/benchmark-energy-use/use-energy-star-benchmarking-tools
Local Government Operations Protocol	http://www.arb.ca.gov/cc/protocols/localgov/localgov.htm
Landfill Emissions Tool	http://www.arb.ca.gov/cc/protocols/localgov/localgov.htm
EPA MOVES on-road Emissions Model	http://www.epa.gov/oms/stateresources/ghgtravel.htm
Local Climate Action Framework	http://epa.gov/statelocalclimate/local/implementation/inventory.html