

Cities for Climate Protection
**Greenhouse Gas
Emissions Software --
Canadian Edition
User's Guide**
May, 1999

***Partners for Climate
Protection***

A partnership of the Federation of Canadian Municipalities (FCM) and the International Council for Local Environmental Initiatives (ICLEI) to support Canadian municipal government commitments to reduce greenhouse gas emissions

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User's Terms and Conditions

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Under no circumstances can the Borland Database Engine© be distributed separately.

Preface

This software was developed by Torrie Smith Associates Inc. for the International Council for Local Environmental Initiatives (ICLEI) and its Cities for Climate Protection Campaign to help local governments develop action plans to reduce greenhouse gas emissions. The support of Environment Canada in making the software available in Canada to members of the FCM/ICLEI Partners for Climate Protection Programme is gratefully acknowledged.

ICLEI's Cities for Climate Protection Campaign was initiated in January 1993, at the first Municipal Leaders' Summit on Climate Change in New York. By mid-1999, over 300 municipalities worldwide had joined the campaign. Through their climate protection work, these communities are also improving local air quality and creating more livable communities.

All Campaign jurisdictions pledge to reduce greenhouse gas emissions and improve the energy efficiency of their communities by agreeing to:

- **conduct a base year emissions analysis and forecast of municipal and community-wide greenhouse gas emissions**
- **develop a local action plan that spells out a greenhouse gas reduction target and the policies and measures that will achieve that target**
- **actively implement the climate protection measures contained in the local action plan**
- **promote public education and awareness on global warming and climate protection**

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Getting Started


The CCP Greenhouse Gas Emissions Software is designed to run in a Windows environment and requires at least 7 Megabytes of free hard disk space. Caution: do not install on a Mac unless it has a PC card. For best results it should be run on a computer with a 486 or Pentium processor and with at least 8 Megabytes of RAM. The software can be run under any Windows environment from Windows 3.x forward.

Before you install the software, reboot your computer. If you are installing the software from a CDROM or a set of installation diskettes, insert the CDROM or Diskette #1 in your computer and run the file called setup.exe. If you are installing from an installation file downloaded from Torrie Smith's Web page, run the downloaded file, which will have an .exe extension.

FOR WINDOWS 3.X USERS:

The install program will suggest a default directory named C:\CCPCANAD. During the setup procedure, you can rename the working directory. The setup program will take care of the rest, including the creation of a program group.

FOR WINDOWS 95/98 USERS:

The install program will suggest a default directory named C:\CCPCANAD. During the setup procedure, you can rename the working directory. The setup program will take care of the rest including the placement of the program in a program group in the  Programs Menu.

NETWORK INSTALLATION AND OPERATION: The CCP Greenhouse Gas Emissions software is not Client/Server software but it can be run on networks. See Appendix A: Notes on Network Installation for detailed information on the operation of the software on a peer-to-peer network.

The software installation will create two directories on your computer. One, usually called c:\idapi, holds the data base engine on which the software depends. The other, which the Installation Wizard will suggest be called C:\CCPCANAD, holds the CCP Greenhouse Gas Emissions software.

IF YOU DECIDE TO MOVE THE CCP SOFTWARE TO ANOTHER DRIVE AFTER YOU HAVE INSTALLED THE SOFTWARE, you must:

EITHER reinstall the software onto the new drive in order to properly setup the software's database drivers, then overwrite the data files installed onto this new drive with the ones from your C: drive (the software's default drive -- see below for more information on the location of your data files). When moving data files, you must move them all in order for the model to work properly.

OR perform a separate installation of the Borland Database Engine on the receiving computer. An installation file for this purpose (called borland.exe) is available from Torrie Smith Associates' web site at www.torriesmith.com.

If you have any technical problems or questions regarding the installation of the software, you can contact Torrie Smith Associates Inc. directly at 613-824-3045, fax 613-824-3297, or email: software@torriesmith.com. Users are encouraged to register at Torrie Smith Associates' web site for user bulletins, upgrade downloads and technical support for the software.

Register Software

There is a Licence Registration form included as Appendix B to this User's Guide, and this same document is installed in the software's Program Group with the name Regform.rtf. It is in rich text format (.rtf), readable by most word processing programs. Fill out the form and send it in.

There is also an item on the File pull-down menu called Register Software. The CCP Greenhouse Gas Emissions software licences must be renewed each year. About a month before the renewal date, you will begin to receive notices when you use the software that you need to contact Torrie Smith Associates for your free renewal.

If you have an unregistered copy of the software or if your registration has expired, the software will stop working (the main module buttons will all be grayed out) until you acquire the necessary registration code. When the code is typed into the box in the Register Software window, the software will be activated again.

The code is available from Torrie Smith Associates by email at software@torriesmith.com, by telephone from TSA in Canada on 613-824-3045, fax on 613-824-3297. For general assistance you can also contact the staff of the Partners for Climate Protection Programme.

FIRST STEPS....

1. Geographical Information

GO THE GEOGRAPHICAL INFORMATION ITEM ON THE SETTINGS PULL-DOWN MENU AND TYPE IN YOUR MUNICIPALITY. The municipality and state or province entered here will appear in the headers of the pre-formatted reports. In addition, in countries with multiple states or provinces with different electricity coefficients, it is the selection of the state or province that determines which set of coefficients to use as the default values for electricity.

2. Identify Base Year, Target Year and Set Target

The setting of an emissions reduction target is one of the basic steps of developing a local action plan for greenhouse gas emission reductions and is one of the required milestones in the Cities for Climate Protection Campaign. You can set separate targets for your Community and Corporate action plans by clicking on the Targets item in the Settings Menu and choosing which target you wish to set.



Fill in the appropriate values in the three windows provided:

Base Year—recommend 1990 or 1994

Target Year -- recommend 2010

3. File Open Year

The software has been preset to open to the year 1994. Make sure that you use the *Open Year* command on the *File* pull-down menu to open the year for which you wish to conduct your emissions inventory.

HELP

This CCP Greenhouse Gas Emissions Software contains context-sensitive Help files that can be accessed by pressing the F1 key while operating the software. Much more information than you will find here is available on line by using the F1 key. For help on any item just position the cursor on the screen where you would like help and press F1.



There are also Help buttons located throughout the software which can be used to access the Help files. Finally, the Help topics and a Glossary of Terms can also be accessed from the pull down Help Menu that is accessible from any screen in the software.

The rest of this guide consists primarily of similar information to some key Help topics that are contained in the software. At the back of the Guide there is an alphabetized index of all the Help topics to assist you in locating a particular topic.

Single or double underlining of a word or phrase generally indicates a link to another Help topic.

Unit Converter

There is also a unit converter within the fuel units boxes. Just click on the box and a pick list will appear which will give you a choice of units. By entering your numerical information and selecting the unit type, the software will convert your numeric information into an equivalent amount in the units you have selected.

Calculators

There are calculators to help you estimate greenhouse gas emissions reductions from the community and corporate measures, and other aids to help you build forecasts and estimate CO₂ from community-wide transportation.

The Main Screen

Across the top, just below the menu, are module selector buttons that access the software's main components. The Windows menu command to Close All will return you to this screen.

Module Selector Buttons

These are the four long rectangular buttons across the top of the Main Screen which provide access to the main modules of the software:

Community Analysis - Opens the Community Emissions Analysis module.

Community Measures - Opens the Community Measures module.

Corporate Analysis - Opens the Corporate Analysis module for quantifying emissions from local government operations.

Corporate Measures - Opens the Corporate Measures module for quantifying measures from local government operations.

Software Functions -Main Modules

The software is designed to assist in the development of a Local Action Plan for reducing greenhouse gas emissions. It has four main components; two support the development and implementation to reduce emissions on a community basis and two support the development and implementation of a plan to reduce emissions from your local government's in-house or "corporate operations". Access a module by clicking on the appropriate module sector button, located across the top of the main screen.

Community Analysis - This module is designed to help you conduct the community-wide emissions analysis by quantifying greenhouse gas emissions from fuel and

electricity use and waste production in your community. For purposes of your Local Action Plan, this is the module in which you quantify the base year greenhouse gas emissions in your community and develop an emissions forecast for the target year. You can quantify emissions for as many different years as you like.

Community Measures - This is a companion module to the Community Analysis module. It helps you quantify the greenhouse gas emission reductions from initiatives and programs in the community-at-large.

Corporate Analysis - This module helps you conduct the community-wide emissions analysis by quantifying the greenhouse gas emissions that result from fuel and electricity use and waste production in the in-house or “corporate” operations of your local government, including waste production and the fuel and electricity use of buildings, vehicles, streetlighting, and water and sewage pumping and treatment operations.

Corporate Measures - This is a companion module to the Corporate Analysis module. It helps you quantify the greenhouse gas emission reductions from existing and proposed measures implemented in your local government’s own buildings, vehicles, and other operations.

Community Analysis Module

To Get Help

For more details about specific aspects of how the module works or what information to enter, click on any green underlined text or, FOR ANY SCREEN, PLACE THE CURSOR IN THE AREA OF THE SCREEN ON WHICH YOU WANT HELP, AND PRESS F1.

What Does This Module Do?

The Community Emissions Analysis is one of the basic building blocks of developing a local action plan for greenhouse gas emission reductions in your community. It is organized in six sectors—residential, commercial, industry, transportation, waste, and “Other”.

With the aid of this module, you first develop an analysis of the emissions for the base year you have selected for your local action plan, and then develop an emissions forecast for the target year in your local action plan.

What Information Do You Need?

For all the sectors except Waste and Other, the key information you need to use this module is fuel and electricity consumption by sector (residential, commercial, industry, and transportation) for your community. For the residential, commercial and industrial sectors, local fuel and electricity providers will usually have this type of information in the form of total sales by different customer classes.

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For the Waste sector, you need the total amount of waste hauled to landfill, an estimate of the percent of methane recovered (if any) at the local landfills in the base year of your local action plan (the Help files have suggested defaults if you cannot get this), and a breakdown of the composition of the waste.

For the transportation sector, you need information on vehicle kilometres traveled by the different vehicle types represented in the software, and you need estimates of the fuel economy (L/100 km) for each vehicle type. (We provide suggested default values for fuel economy). If you cannot get vehicle kilometres traveled from your transportation planning or traffic management department, try to get Annual Average Daily Traffic (AADT) counts by road type, along with the total length of each of those road types in your community. This data can be used in the VKT Calculator to make an estimate of VKT in your community.

For the Other sector, you can simply input emissions of greenhouse gases directly which are not covered by the previous sectors. Your emissions input data should be in tonnes for carbon dioxide, methane and nitrous oxide and in kilograms for the PFC's, HFC's and SF6.

The information above is needed to quantify greenhouse gas emissions for any particular year. In addition, the software prompts you for a number of indicator inputs. These include: population, total number of households, total commercial sector employment, total commercial building floor area, total industrial sector employment, and total industrial sector building floor area. These indicator inputs are optional and do not affect the calculation of greenhouse gas emissions and emission reductions.

How Does It Work?

Use the File Menu Open Year Command to identify the year on which you wish to work—this becomes the active year. The Community Analysis module is organized according to six sectors—Residential, Commercial, Industrial, Transportation, Waste and Other. Click on one of the Sector Tabs to get started.

- **For the Residential, Commercial, and Industrial sectors:**

In the Energy Inputs Table, enter the total fuel consumption for the sector, by fuel type. CO2 emissions are calculated on the basis of information you provide about total use of fuels and electricity in these sectors. This information is combined with emission coefficients to determine greenhouse gas emissions.

- **For the Transportation Sector:**

In the Transportation sector, separate data is developed for each vehicle type.

Either:

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Use the Record Navigator Bar to select the vehicle type. Then, for each fuel type used by that vehicle type, enter the total annual vehicle kilometres traveled and the average fuel economy (in L/100 km) for that vehicle type in the VKT Inputs Table.

OR

Use the Transportation Assistant to subdivide total VKT by vehicle type and fuel type. The Transportation Assistant will then enter the appropriate VKT values for each of the vehicle type and fuel type combinations in the VKT Inputs Table, once you have typed in a number for total annual VKT. If you use the Assistant, you must still enter estimates for L/100 KM for each vehicle type and fuel combination for which there is a non-zero VKT entry.

Within the Transportation Assistant, there is also a VKT Calculator. If you are unable to get VKT data directly from your information providers, the VKT Calculator provides a way of estimating it from commonly available traffic statistics.

The software calculates transportation energy and CO₂ emissions on the basis of the VKT and fuel economy (L/100 KM) information entered in the VKT Inputs Table.

- **For the Waste Sector:**

Enter the number of tonnes of waste produced and sent to landfill in your community in the Waste to Landfill Box.

Enter the percentage composition of this waste in the rightmost column of the Waste Composition Inputs Table.

If landfill gas (methane) recovery was already being practiced in the base year of your local action plan, go to the Settings Menu and enter the appropriate Base Year Methane Recovery Factor under the Methane Recovery Factor option on the Settings Menu. The software assumes a default Base Year Methane Recovery rate of zero.

With these inputs, the software computes landfill methane emissions using the methane commitment method. Based on the information you provide about the amount of waste in your community hauled to landfills, the composition of that waste, and the rate of methane recovery (if any) at the landfills, the software calculates the methane emissions that will eventually occur and assigns them to the active year, the year in which the waste was produced.

The software can also calculate methane emissions occurring in the active year as the result of the accumulated waste already in the landfills using the Waste-in-Place Method. A Waste-in-Place Assistant on this sector screen supports a calculation of methane emissions using this method. A toggle switch on the Waste-In-Place Assistant screen allows the automatic transfer of results from the Assistant to the “Other” sector of the Community Analysis module.

- **For the Other Sector:**

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In the “Other” sector, you enter emissions of greenhouse gases directly in the Other Emissions Inputs screen in tonnes for carbon dioxide, methane and nitrous oxide, and in kilograms for PFC’s, HFC’s and SF6.

- **For All Sectors:**

Use the Notes Regarding... box as a scratch pad. We recommend you record the source of the data and any assumptions or details you may wish to recall later. For example, this is a convenient place to note the names and telephone numbers of the people who have provided you with the data you used or that screen.

There are also windows on all the sector screens where you can enter indicator inputs. These are used to compute indicators of energy use and greenhouse gas emissions, such as emissions per household (in the residential sector), or emissions per square metre of floor area (in the commercial buildings sector). These indicators, which are presented in the Indicators Report, serve as benchmarks that can help you to measure progress from year-to-year and compare emissions in your community with other communities. They are optional inputs and do not affect the calculation of greenhouse gas emissions and emission reductions.


The current subtotals for the active sector are displayed in the Output Panel at the bottom of the window.

For all sectors, there is a Forecast Builder Assistant which helps you conduct your emissions forecast by quickly developing an emissions analysis for a future year (usually your target year) by starting with the active year (usually your base year) and scaling it up. The Forecast Builder prompts you to provide growth multipliers for fuel consumption, waste production, vehicle kilometres traveled and other key variables. These multipliers are used to create an emissions analysis for the forecast year, which you can then modify as you see fit.

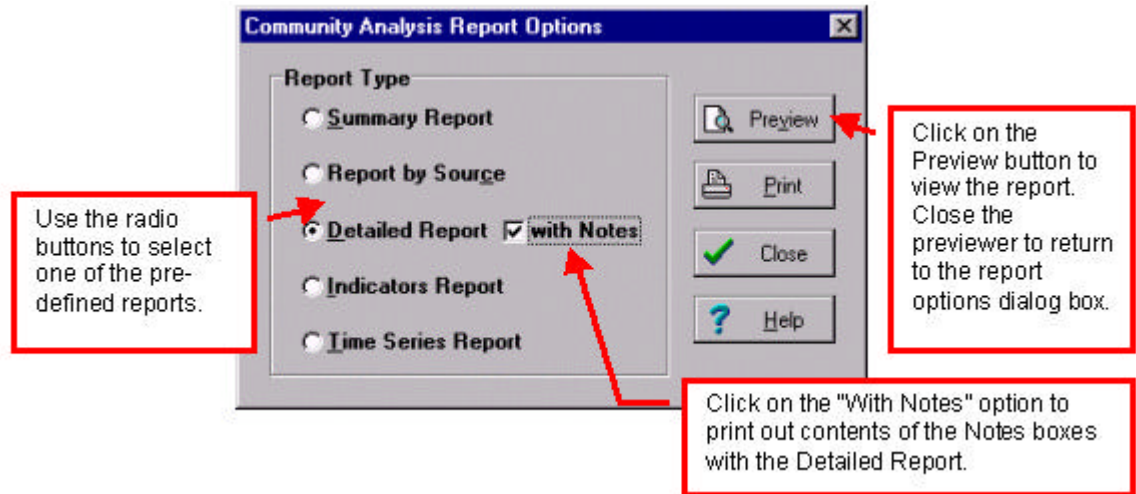
NOTE: The emissions forecast for the target year should NOT include the impact of any existing or proposed measures in your local action plan. Its purpose is to provide a “business as usual” baseline against which the impact of your local action plan can be measured.

Finally, there is a Report button on each sector screen that opens up a dialog box containing a menu of the Community Analysis Report Options.

Community Analysis Report Options

Clicking on Report menu or the Report button  while in the Community Analysis module brings up the Community Analysis Report Options dialog box:

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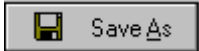
Summary Report - contains annual sector totals only (Residential, Commercial, Industry, Transportation, Waste) for greenhouse gas emissions (in eCO₂) and energy use (in GJ). For the Transportation sector, there is a separate line for each vehicle type. The percent contribution of each sector to total emissions is also shown.

Report by Source - contains a single line for each fuel type and waste type, summed over all sectors.

Detailed Report - contains a breakdown of emissions and energy use for each sector, by fuel type, and by waste type for the Waste sector. In the Transportation sector, there is a breakdown for each vehicle type. The "With Notes" option will produce a version of the Detailed Report that includes entries you have made to the Notes boxes for each sector.

Indicator Report - contains "per indicator input" values for emissions (in eCO₂), energy (in GJ) and waste (in tonnes). The report will only generate inputs corresponding to the Indicator Input information you have provided. Note: The per capita indicators in all sectors are based on the population figure you provide in the Indicator Inputs section of the Residential sector screen.

Time Series Report - contains a summary report of total greenhouse gas emissions (in eCO₂ units) and energy use (in GJ) for each sector and for each of up to five years. There is a column for each year. Click on Time Series from the Settings Menu to select the years you wish to see displayed in the time series report. You can select any five years you wish, but if you request years for which you have not yet entered data the report will contain zeroes for those years.

TIP: From the Report Preview screen, click on the Save As button  at the top of the screen to save the report in a standard .TXT format. The resulting text file can then be imported into spreadsheets, word processors, graphics programs, etc.

Corporate Analysis Module

To Get Help

For more details about specific aspects of how the module works or what information to enter, click on any green underlined text or, FOR ANY SCREEN, PLACE THE CURSOR IN THE AREA OF THE SCREEN ON WHICH YOU WANT HELP, AND PRESS F1.

What Does This Module Do?

Developing your local action plan for greenhouse gas emission reductions includes a plan for your community and a plan for your own in-house or corporate operations. This module computes greenhouse gas emissions from your local government's operations based on information you provide about fuel and electricity use and waste production.

Scope: The municipal operations portion of the Emissions Analysis covers all buildings, facilities, operations, lands, programs, and vehicles owned and/or operated directly by the local government. The exception is public transit, which is included in the community-wide emissions analysis to facilitate comparisons with emission reduction measures, some of which likely include the encouragement of transit use. (Exception: While transit vehicle energy consumption is considered part of the Community Emissions Analysis, if the transit authority is part of the local government, then the fuel and electricity consumption of the transit authority's buildings, maintenance fleet, etc. can be included in the Corporate emissions analysis.)

You first develop an analysis of the emissions in the base year, and then develop an emissions forecast for the target year in your local action plan. The module has six separate sectors for keeping track of emissions from local government operations: Buildings, Vehicle Fleet, Streetlighting, Water and Sewage, Waste, and Other. Click on the appropriate sector tab near the top of the screen to get started.

What Information Do You Need?

For all the sectors except Waste, the key information you need is fuel and electricity consumption records. These will typically be available for your buildings from the building managers, for the vehicle fleet from the fleet manager, for the water and sewage treatment facilities from the facilities operators, and for the streetlights from the department that pays the electricity bill (or in some cases from the local electric utility). In addition to energy consumption, the software accepts inputs on the associated fuel and electricity costs. Although it is not needed to compute greenhouse gas emissions, we recommend you input this cost information. It will allow you to track costs as well as emissions, which may prove useful as you develop, market, and implement your local action plan.

You may find it easier to obtain records of expenditures on fuel and electricity than to get data on the consumption in physical units. If this is the case, you will have to

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calculate the physical units by dividing the expenditures by the unit costs (dollars per gallon, cents per kWh, etc.)

Within each sector, the level of detail you enter depends on the information that is available and how much detail you wish to track. For example, for the Buildings Sector, you can enter the fuel and electricity consumption of every single building that is owned and operated by your local government individually, or you can enter it in groups that are useful or convenient for your own purposes (e.g. by department).

For the Waste sector, you need total waste hauled to landfill from your local government operations, an estimate of its percent composition by different types of waste (a list is provided), and an estimate of the percent of methane gas being recovered (if any) at the local landfill(s). This information will often be available from the department that is responsible for waste management in your organization, or from the department that pays the bills for waste haulage. If your organization has a waste management program, that is a good place to look for total volume and waste stream composition data.

Finally, there is a place on each sector screen where you can input a number of statistics we call indicator inputs. While not required for the computation of greenhouse gas emissions, these indicator inputs are used to generate a report that includes indicators that are very useful for tracking your progress over time or for comparing your results with other cities and members of the Campaign. The indicator inputs vary by sector. For Buildings, for each building or building group they include floor area, annual operating hours and number of occupants. For the Vehicle Fleet, for each vehicle or vehicle group they include Vehicle Kilometres and Number of Vehicles. For the other sectors indicator inputs include the total number of streetlights (for Streetlights), the total volume processed (in cubic metres) (for Water and Sewage) and the total number of municipal employees (for Waste).

How Does It Work?

Use the File Menu Open Year Command to identify the year on which you wish to work. The module is organized according to six sectors—Buildings, Vehicle Fleet, Streetlighting, Water and Sewage, Waste, and Other. Click on one of the Sector Tabs to get started.

For Buildings, Vehicle Fleet, Streetlighting, Water and Sewage:

Information for these sectors is stored in records, with each record corresponding to a group (of buildings, vehicles, streetlights, water and sewage facilities, etc.). Use the Record Navigator Bars to insert new groups, delete groups you no longer need, or to locate and select an existing group.

Enter a unique name for the group in the Group Name Box.

Just below the Group Name Box is the Type Selector Box. When you click on this box you are offered a pull-down list which, depending on what sector you are working in, contains a pre-defined list of building types, vehicle types,

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streetlighting types, or water and sewage facility types. Click on the type that best describes the group.

In the two rightmost columns of the Energy Inputs Table, enter the group's fuel consumption and the cost, by fuel type.

Use the Notes Regarding... window to enter any information on this group which may help to better identify it. You can also use this space to note your data sources and contacts, or any other notes associated with the group.

For the Waste Sector only:

Enter the number of tonnes of waste produced and sent to landfill by your local government operations in the Waste Hauled to Landfill Box.

Enter the percentage composition of this waste in the rightmost column of the Waste Composition Inputs Table.

If landfill gas (methane) recovery was already being practiced in the base year of your local action plan, go to the Settings Menu and enter the appropriate Base Year Methane Recovery Factor under the Methane Recovery Factor option on the Settings Menu. The software assumes a default Base Year Methane Recovery rate of zero.

With these inputs, the software computes landfill methane emissions using the methane commitment method. Based on the information you provide about the amount of waste hauled to landfills from your local government operations, the composition of that waste, and the rate of methane recovery (if any) at the landfills, the software calculates the methane emissions that will eventually occur and assigns them to the active year, the year in which the waste was produced.

For the Other Sector:

Enter emissions of greenhouse gases directly in the Other Emissions Inputs screen, in tonnes for carbon dioxide, methane and nitrous oxide, and in kilograms for PFC's, HFC's and SF6. This is a multi-record sector so you can make separate entries for each emissions source.

For All Sectors:

Use the Notes Regarding... box as a scratch pad. We recommend you record the source of the data and any assumptions or details you may wish to recall later. For example, this is a convenient place to note the names and telephone numbers of the people who have provided you with the data you have used for this screen.

There are also windows on all the sector screens where you can enter Indicator Inputs. These are used to compute indicators of energy use, greenhouse gas emissions, and cost, such as energy use per square metre of floor area (for Buildings) or emissions per vehicle (for Vehicle Fleet) or energy costs per cubic metre processed (for Water and Sewage), etc. These indicators, which are output in the Indicators Report, serve as benchmarks that can help you to measure progress from year-to-year

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and to compare emissions in your operations with other local governments with similar operations.


The current subtotals for the active sector are displayed in the Output Panel at the bottom of the window.

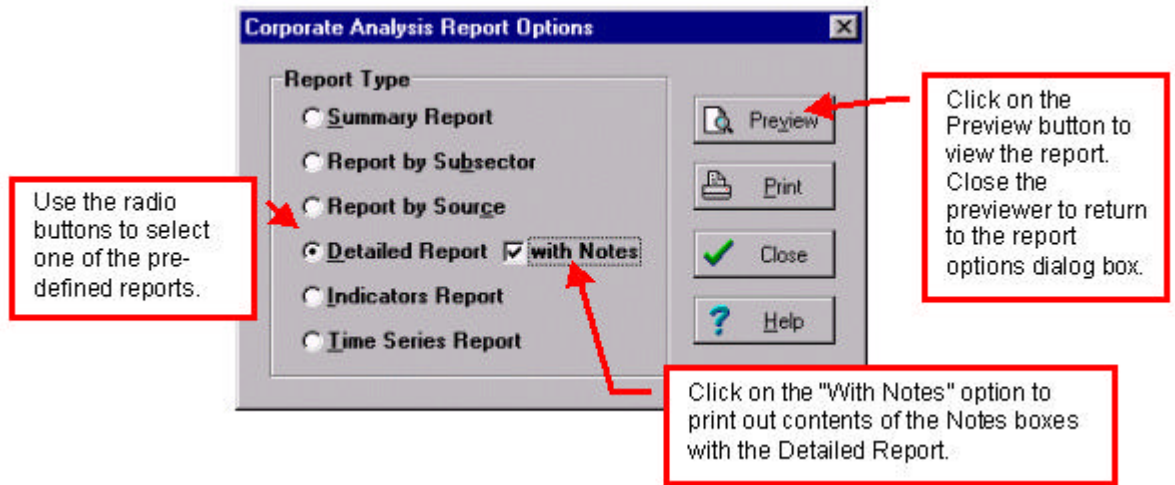
For all six sectors, there is a Forecast button on the screen that provides a shortcut for developing a forecast emissions analysis for your target year. When you click on this button, a window opens up in which you are asked to enter the future year for which you wish to create a forecast emissions analysis. Normally you should enter the target year from your local action plan in this Window. Once you have entered the forecast year and click on the OK button, the software creates an emissions analysis for that forecast year by copying the data from the active year (i.e. whatever year you had open when you clicked on the Forecast button). There are no growth multipliers in this module like there are for the Forecast Builder in the Community Analysis. You can then modify the data for that forecast year by opening it in the same way you open any other year, and adjusting the inputs until they reflect your assumptions about energy consumption and waste production in the forecast year.

REMEMBER: The emissions forecast for the target year should NOT include the impact of any existing or proposed measures in your local action plan. Its purpose is to provide a “business as usual” baseline against which the impact of your local action plan can be measured.

Finally, there is a Report button on each sector screen that opens up a dialog box containing a menu of the Corporate Analysis Report Options.

Corporate Analysis Report Options

Clicking on Report menu or the Report button  while in the Corporate Analysis module brings up the Corporate Analysis Report Options dialog box:



Summary Report - contains annual sector totals only (Buildings, Vehicle Fleet, Streetlights, Waster/Sewage, Waste) for greenhouse gas emissions (in eCO₂), energy use (in GJ) and cost (in \$). The percent contribution of each sector to total emissions is also shown.


Report by Subsector - contains a breakdown of each sector, with a line for each group name. The groups are subtotaled by group type (type of building, type of vehicle, etc.) provided you have indicated a group type when inputting your data.

Report by Source - contains a single line for each fuel type and waste type, summed over all sectors.

Detailed Report - contains detailed breakdown of emissions by fuel type for each group in each sector and for each waste type in the waste sector. If you click on the "With Notes" option, the Detailed report will include any notes you have entered in the Notes box of the various data input screens.

Indicator Report - contains values for emissions (in eCO₂), waste (in tonnes), energy (in GJ) and cost for each indicator.

Time Series Report - contains a summary report of total greenhouse gas emissions (in eCO₂ units) and energy use (in GJ) for each sector and for each of up to five years. There is a column for each year. Click on Time Series from the Settings Menu to select the years you wish to see displayed in the time series report. You can select any five years you wish, but if you request years for which you have not yet entered data the report will contain zeroes for those years.

TIP: From the Report Preview screen, click on the Save As button  Save As at the top of the screen to save the report in a standard .TXT format. The resulting text file can then be imported into spreadsheets, word processors, graphics programs, etc.

Community Measures Module

To Get Help

For more details about specific aspects of how the module works or what information to enter, click on any green underlined text or, FOR ANY SCREEN, PLACE THE CURSOR IN THE AREA OF THE SCREEN ON WHICH YOU WANT HELP, AND PRESS F1.

What Does This Module Do?

The heart of your local action plan consists of measures for reducing greenhouse gas emissions from their forecast level to the target level. The Community Measures module helps you quantify the greenhouse gas emission reductions from measures and analyzes and reports the results. In addition to describing the energy, cost and emission savings from the measures, the reports include an analysis of how the total emission reductions compare with the target in your local action plan, and what the co-benefits of the measures are in terms of reductions in air pollutants.

What Information Do You Need?

In this module, you will be creating a record for each measure you wish to quantify. There are a few types of information that apply to every measure. The rest of the information you are asked to provide will vary, and depends on the type of measure you are quantifying.

For all measures:

Name and brief description of the measure

The year of implementation

The cost of the measure (optional)

Ramp-In Schedule (optional)

In the Residential, Commercial and Industrial sectors:

For energy efficiency measures, you need to provide *ONE* of the following sets of information:

- The total amount of each type of energy saved by the measure, OR
- The total amount of each fuel type affected used BEFORE the measure and the percentage saving of each fuel type achieved by the measure, OR

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- The amount of each fuel type used per item affected BEFORE the measure (e.g. energy used per lighting fixture or per computer or per square metre of floor area (e.g. energy used per lighting fixture or per computer or per square metre of building floor area, etc.), the total number of items affected by the measure (e.g. number of lighting fixtures, number of computers, number of square metres of building floor area, etc.), and the percent savings achieved for each fuel type.

For measures that involve a change in energy source, you need to provide ONE of the following:

- the total amount of the initial energy source used BEFORE the measure and the total amount of the replacement energy source used AFTER the measure,

OR

- the fuel type and amount of the initial energy source used per item affected BEFORE the measure and the fuel type and amount of the replacement energy source used per item affected AFTER the measure.

In the Transportation sector:

In this sector, the information you need to quantify the emission reductions depends on the type of measure you are quantifying.

For **car and vanpooling** measures and for measures that involve a **switch to public transit**, you need to know the total number of passenger-kilometres affected. (In these types of measures the passenger-kilometres are the same before and after the measure). In addition, you need to provide the vehicle type, fuel type, vehicle fuel efficiency (L/100 km) and occupancy factor (number of people per vehicle) both BEFORE and AFTER the measure.

For measures that involve a **switch to walking and/or bicycling**, you need to provide the total number of person kilometres or passenger kilometres switched, as well as the vehicle type, fuel type, vehicle fuel efficiency and occupancy factor BEFORE the switch.

For general **VKT reduction** or other VKT reduction measures, you need to provide the total number of VKT BEFORE and AFTER the measure, as well as the vehicle type, fuel type and fuel efficiency (L/100 km).

For **fuel switching** measures, you need to identify the vehicle type and total VKT of the vehicle or vehicles being switched. In addition, you must input the fuel type and vehicle fuel efficiency (L/100 km) both BEFORE and AFTER the fuel switch.

For **fuel efficiency improvements**, you must identify the vehicle type and total VKT of the vehicle or vehicles affected by the efficiency improvement, as well as the fuel type used. In addition, you must input the fuel efficiency both BEFORE and AFTER the measure.

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For **land use measures**, the impact on emissions is the result of both changes in the number and length of trips (which together make up PKT) and changes in the mode of travel or choice of vehicle (with associated changes in occupancy factor and vehicle fuel efficiency). To fully characterize the emissions impacts of land use and zoning measures, you need to know the total number and length of trips BEFORE and AFTER the measure. In addition, for each mode or vehicle type (including walking and cycling) you need to input the fuel type and vehicle fuel efficiency as well as the BEFORE and AFTER PKT and occupancy factor.

For the Waste sector:

In this sector, there are four types of measures -- reduction, recycling and composting, and methane recovery. For the waste reduction, recycling and composting measures, the input information required is the same in all cases. Essentially, you need to provide either:

the type of waste (select from list of waste types provided) and the total annual amount (in tonnes) being reduced or recycled or composted. There is also an optional input window for the unit cost of the waste material; this can be used for the salvage value of recycled or composted waste and for waste reduction measures, or it can be left blank.

OR

the type of waste and total annual amount being recycled per item affected, along with the number of items affected. For example, for a household newsprint recycling program, the household could be taken as the item affected and the required inputs would be the amount of newsprint recycled per household and the total number of households participating in the program.

The methane recovery measure is simply a place where you can enter the total amount of methane being recovered, in terms of equivalent CO₂ (eCO₂). For more on how to compute the total methane recovered if you do not have direct inputs, see the entry on methane recovery measures.

For the Other Sector:

In this sector, there is only one generic type of measure—Absolute Emission Reduction—and the only information you need is the total amount of greenhouse gas emissions reduced by each measure you wish to record. In addition to carbon dioxide, methane and nitrous oxide, this sector can be used to record reductions in emissions of HFCs, PFCs and sulphur hexafluoride.

How Does It Work?

Step 1. Create a blank record by choosing Insert from the Record Menu or by clicking on the Insert button on the Record Navigator bar. Click on Select to open the record for a previously entered measure.

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Step 2. Choose the type of measure you wish to quantify by selecting it from the pick list in the Measure Type Window.


Step 3. Type in a short name and brief description of the measure in the Measure Description window.

Step 4. Type in the Year Implemented. Optionally, you may also fill in the Ramp-In Schedule. The cost of implementation is another optional field that may be filled in during this step.

Step 5. Except for the Transportation sector, a window will open prompting you to specify the fuel, waste or emission type affected by the measure. Click on your choice from the pick list. In the Transportation sector, this step and Step 6 are bypassed and you go directly to the Transportation Calculator to quantify emission reduction measures.

Step 6. After you pick the energy, waste or emission type affected, one or more Measure Impact windows will open, prompting you for the energy or waste input information the software uses to calculate the emission reductions. You can fill these in directly or use the Calculator to come up with the numbers. Finally, below the Measure Impact window, there is an optional unit cost window that you can use to enter the fuel or electricity price of the energy sources affected by the measure, or the value per tonne of recycled materials for some waste related measures. In the Other sector, there is just a single window that prompts you to enter the total amount of greenhouse gas reduced by the measure.

When you are in the Community Measures module, the Output Panel at the bottom of the screen provides immediate feedback on the energy savings, emission reductions (in eCO₂) and cost savings (if you have entered the unit cost data of the affected energy sources) associated with the measure on the screen. More detailed reports of measure impacts are available by clicking on the Report menu or the

Report  button near the top of the module screen.

Corporate Measures Module

What Does This Module Do?

The heart of the local action plan consists of measures for reducing greenhouse gas emissions from their forecast level to the target level, for both your community and your in-house or corporate operations. The Corporate Measures module helps you quantify the greenhouse gas emission reductions from measures that apply to your local governments' operations and analyzes and reports the results. In addition to describing the energy, cost and emission savings from the measures, the reports include an analysis of how the total emission reductions compare with the target in your local action plan, and what the co-benefits of the measures are in terms of reductions in air pollutants.

What Information Do You Need?

In this module, you will be creating a record for each measure you wish to quantify. There are a few types of information that apply to every measure. The rest of the information will vary, and depends on the type of measure you are quantifying.

For all measures:

Name and brief description of the measure

Group Identifier(except in the Waste sector)

The year of implementation

The cost of the measure (optional)

Ramp-in Schedule (optional)

For the Buildings, Streetlights, and Water/Sewage sectors:

For measures involving reductions in energy use or improved energy efficiency the types of information required are similar and include *ONE* of the following sets of information:

the total annual amount of each type of energy saved by the measure,

OR

the amount of each fuel type used per item affected BEFORE the measure (e.g. energy used per lighting fixture or per computer or per square metre of building floor area, etc.), the total number of items affected by the measure (e.g. number of lighting fixtures, number of computers, thousands of square metres of building floor area, etc.), and either the percent savings achieved for each fuel type or the actual amount of each fuel type used per item affected AFTER the measure.

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For measures that involve a change in energy source or fuel switching, you need to provide *ONE* of the following:

the total amount of the initial energy source BEFORE the measure and the total amount of the replacement energy source used AFTER the measure,

OR

the fuel type and amount of the initial energy source used per item affected BEFORE the measure and the fuel type and amount of the replacement energy source used per item affected AFTER the measure, along with the number of items affected.

For the Vehicle Fleet Sector:

This sector utilizes the same measure types and methods as the Transportation sector in the Community Analysis module. The information you need to quantify the emission reductions depends on the type of measure you are quantifying.

For **car and vanpooling** measures and for measures that involve a **switch to public transit**, you need to know the total number of passenger-kilometres affected. (In these types of measures the passenger-kilometres are the same before and after the measure). In addition, you need to provide the vehicle type, fuel type, vehicle fuel efficiency (L/100 km) and occupancy factor (number of people per vehicle) both BEFORE and AFTER the measure.

For measures that involve a **switch to walking and/or bicycling**, you need to provide the total number of person kilometres or passenger kilometres switched, as well as the vehicle type, fuel type, vehicle fuel efficiency and occupancy factor BEFORE the switch.

For general **VKT reduction** or other VKT reduction measures, you need to provide the total number of VKT BEFORE and AFTER the measure, as well as the vehicle type, fuel type and fuel efficiency (L/100 km).

For **fuel switching** measures, you need to identify the vehicle type and total VKT of the vehicle or vehicles being switched. In addition, you must input the fuel type and vehicle fuel efficiency (L/100 km) both BEFORE and AFTER the fuel switch.

For **fuel efficiency improvements**, you must identify the vehicle type and total VKT of the vehicle or vehicles affected by the efficiency improvement, as well as the fuel type used. In addition, you must input the fuel efficiency both BEFORE and AFTER the measure.

For **land use measures**, the impact on emissions is the result of both changes in the number and length of trips (which together make up PKT) and changes in the mode of travel or choice of vehicle (with associated changes in occupancy factor and vehicle fuel efficiency). To fully characterize the emissions impacts of land use and zoning measures, you need to know the total number and length of trips BEFORE and AFTER the measure. In addition, for each mode or vehicle type (including

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walking and cycling) you need to input the fuel type and vehicle fuel efficiency as well as the BEFORE and AFTER PKT and occupancy factor.

For the Waste sector:

For the Waste sector, there are four types of measures -- reduction, recycling, composting, and methane recovery. For the reduction, recycling and composting measures, you need to provide either:

the type of waste (select from list of waste types provided) and the total annual amount (in tonnes) being reduced, or recycled or composted. There is also an optional input window for the unit cost of the waste material; this can be used for the salvage value of recycled, or composted waste and for waste reduction measures it can be left blank.

OR

the type of waste and total annual amount being recycled, reduced, or composted per item affected, (for example, the amount of recycled annually per employee) along with the number of items (i.e. # of employees) affected.

The methane recovery measure is simply a place where you can enter the total amount of methane being recovered, in terms of equivalent CO₂ (eCO₂). For more on how to compute the total methane recovered if you do not have direct inputs, see the entry on methane recovery measures.

For the Other sector:

Here you simply need to know the type of greenhouse gas or gases reduced by the measure and the annual total reduction for each gas, in tonnes for carbon dioxide, nitrous oxide and methane and in kilograms for the other gases.

How Does It Work?

Step 1. Create a blank record by choosing Insert from the Record Menu or by clicking on the Insert button on the Record Navigator bar. Click on Select to open the record for a previously entered measure.

Step 2. Choose the type of measure you wish to quantify by selecting it from the pick list in the Measure Type Window.

Step 3. Type in a short name and brief description of the measure in the Measure Description window and (optionally) identify the group to which the measure is being applied.


Step 4. Type in the Year Implemented. Optionally, you may also fill in the Ramp-In Schedule. The cost of implementation is another optional field that may be filled in during this step.

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Step 5. When you select a measure type (Step 3), a window will open prompting you to select the fuel, waste or emission type affected by the measure. Click on your choice from the pick list.

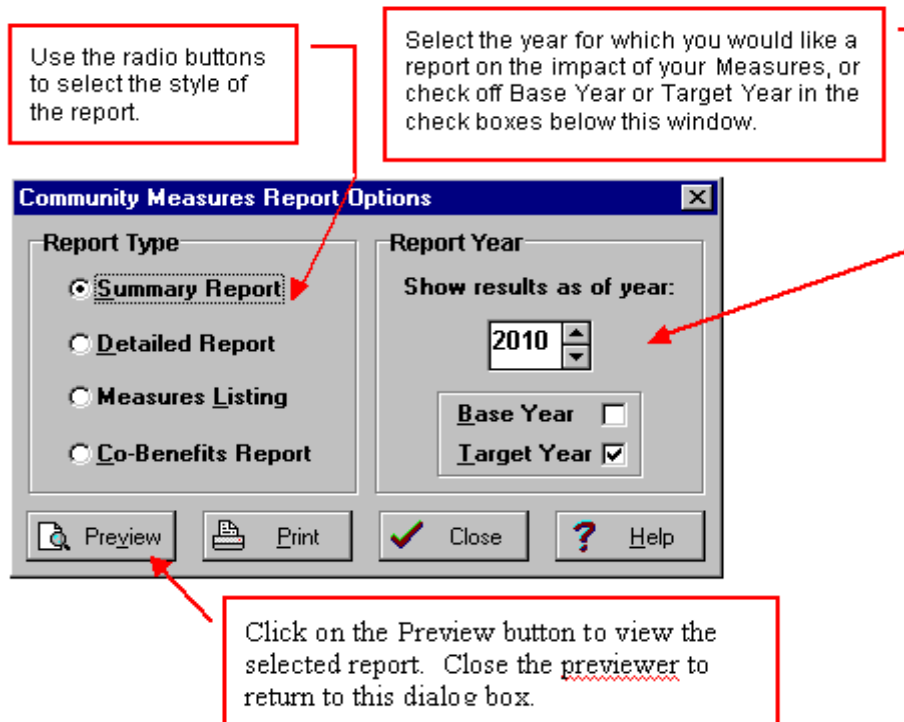
Step 6. After you pick the energy, waste or emission type affected, one or more Measure Impact windows will open, prompting you for the energy or waste input information the software uses to calculate the emission reductions. You can fill these in directly or use the Calculator to come up with the numbers. Finally, below the Measure Impact window, there is an optional unit cost window that you can use to enter the fuel or electricity price of the energy sources affected by the measure (or the value per tonne of recycled materials in the case of some waste related measures). For the other sector, there is no need for the Calculator and you simply identify the greenhouse gas being reduced and type in the total quantity reduced in the appropriate window.

When you are in the Corporate Measures module, the Output Panel at the bottom of the screen provides immediate feedback on the energy savings, emission reductions (in eCO₂) and cost savings (if you have entered the unit cost data of the affected energy sources) associated with the measure on the screen. More detailed reports of measure impacts are available by clicking on the Report menu or the

Report  button near the top of the module screen.

Measures Report Options

Clicking on Report Menu or the Report button  while in either the Community Measures or Corporate Measures modules opens the Community or Corporate Measures Report Options dialog box:



The screenshot shows the 'Community Measures Report Options' dialog box. It has two main sections: 'Report Type' and 'Report Year'. The 'Report Type' section has four radio buttons: 'Summary Report' (selected), 'Detailed Report', 'Measures Listing', and 'Co-Benefits Report'. The 'Report Year' section has a 'Show results as of year:' label, a year spinner set to '2010', and two checkboxes: 'Base Year' (unchecked) and 'Target Year' (checked). At the bottom are buttons for 'Preview', 'Print', 'Close', and 'Help'. Three callout boxes with red borders and arrows point to specific elements: one points to the 'Summary Report' radio button, another points to the year spinner, and a third points to the 'Preview' button.

Use the radio buttons to select the style of the report.

Select the year for which you would like a report on the impact of your Measures, or check off Base Year or Target Year in the check boxes below this window.

Click on the Preview button to view the selected report. Close the previewer to return to this dialog box.

The Community Measures Report Options dialog box is portrayed here, but the Corporate Measures Report Options dialog box is identical. All the reports include the measures that are in *effect* in the year for which you request the report to be prepared. (see Year Implemented and Ramp In Schedule for more on this).

The Summary Report - contains annual sector totals only for total greenhouse gas emissions (in eCO₂), energy saved (in GJ), and energy cost savings (if you have provided information on the unit costs of the fuels saved by your measures). The sectors are Residential, Commercial, Industry, Transportation, Waste and Other for Community Measures reports and Buildings, Vehicle Fleet, Streetlights, Water/Sewage, Waste and Other for Corporate Measures reports.

The Summary Report also includes a section entitled Local Action Plan that summarizes actual base year emissions, forecast emissions in the target year (i.e. without the effect of measures), the target emissions level, the total emission reductions needed to meet the target, and the total emission reductions from the measures you have quantified in the software. For example, in a city that had a total of 7.5 Megatonnes of emissions in their base year (1990), forecast emissions to grow

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to about 10 Megatonnes by their target year of 2010, set a target of reducing emissions by 20% relative to the base year, and have so far entered measures that will reduce emissions by about 3.5 Megatonnes per year, the “LAP” section of the Summary Report looks like this:

Local Action Plan	(tonnes)
Base Year Emissions	6,440,000
Target Year Emissions Forecast	8,050,000
Target Emissions Level	5,152,000
Emissions Reductions Required to Meet Target	2,898,000
Emissions Reductions in Local Action Plan	382,039

The target emissions level depends on both the target in the Settings Menu and the actual base year and forecast target year emissions.

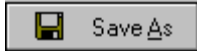
This line is the total of the existing and proposed measures that have been entered in the module. When it equals the Reductions Required, you have a plan that meets your target.

This line is the difference in the quantity of emissions in the base year and the quantity of emissions in the target year deducted from the percent that you have set as your target.

The Detailed Report contains a single line for each measure, showing the emission reductions (in eCO₂), the energy savings (in GJ), and the cost savings (if the unit cost information has been entered), grouped by sector and sorted by measure type.

The Measures Listing Report produces a detailed report on each measure for the active year, with one measure to a page, containing all the information about the measure that has been entered in or produced by the software.

The Co-Benefits Report produces a summary of the annual reductions in air pollutants (for the active year) from all the measures that have been entered in the module.

TIP: From the Report Preview screen, click on the Save As button  Save As at the top of the screen to save the report in a standard .TXT format. The resulting text file can then be imported into spreadsheets, word processors, graphics programs, etc.

Emissions forecast

The Emissions Forecast is an estimate of the greenhouse gas emissions that would occur in the target year in a business as usual future—without the impacts of the measures in the local action plan. In doing your forecast, if you come across any measures slated for implementation that could reduce emissions, include these in your Local Action Plan, and don't account for them in your forecast.

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Developing a forecast of emissions in the target year is a key element of the emissions analysis step in the local action plan. *To avoid double counting emission reductions, it is important that the forecast be of emissions under a business as usual scenario, and that it NOT reflect the impact of any emission reduction measures that are included and quantified in the local action plan.* The emissions forecast is created for the community in the Forecast Builder, and for municipal (corporate) operations in the Generate Forecast Year screen.

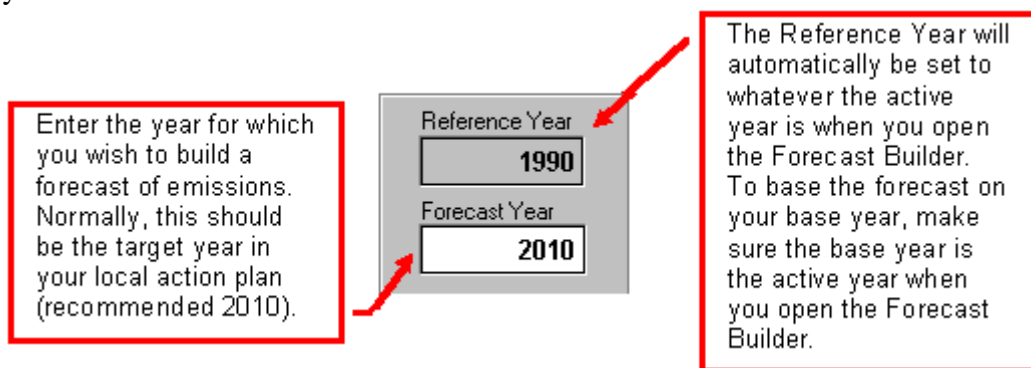
Forecast Builder

The Forecast Builder in the Community Analysis module is designed to help you create an emissions analysis for your target year by applying growth multipliers to the emissions analysis in the reference year.

The Forecast Builder can be opened from the Assistants Menu in the Community Analysis Module, or by clicking on the Forecast Builder button near the bottom left corner of the sector screens.



Step 1. Type in the year for which you wish to create a forecast in the Forecast Year window. Normally this will be your target year, which is recommended to be 2010 in CCP local action plans. Notice that the reference year for the forecast, which is the year that will be used to scale up the emissions to their forecast year levels, will already be filled and will be the active year. This means that to use your base year as the reference year for the forecast, you must make sure that you have opened the file for the base year and that it is the active year.



Step 2. Fill in the Table of Growth Multipliers for each sector. The Table for the Residential sector is depicted below, and the tables for the Commercial and Industrial sectors are identical except for the indicator inputs, which vary by sector, and slight differences in the list of fuel types. The Transportation sector has a single growth multiplier, for total VKT. The Waste sector also has a single growth multiplier, for total landfilled waste.

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The growth multipliers are numbers that, when multiplied by the reference year, values for energy use, indicator inputs, VKT (for the Transportation sector), landfilled waste (for the Waste sector), will yield a forecast of energy use, indicator input, VKT, or landfilled waste in the forecast year, *in the absence of the effects of the measures in your local action plan.*

Fuel Type	Growth Multiplier
Electricity	1.0
Natural Gas	1.0
Heating Oil	1.0
LPG	1.0

Indicator Multipliers

Population:

Households:

Reset

The default Growth Multipliers are all set to 1.0 and clicking on the Reset button at any time will reset all the values for all sectors back to 1.0.

For example, if you estimate that electricity consumption in the residential sector will be 15% higher in the forecast year than in the reference year, enter 1.15 on the electricity line of the Growth Multiplier Table for the residential sector.

Note that while the table will support different growth rates in the different fuel types, you may wish to assume the same growth multiplier for all fuels in a sector, or even for all sectors. It depends on the quality of the information you have to go on.

For the residential sector, a first cut forecast can be generated by applying the forecast growth in the number of households in the community to all the fuel types.

For the commercial sector, a first cut forecast can be generated by applying the forecast growth in total commercial building floor area to all the fuel types.

For the industrial sector, a first cut forecast can be generated by applying projected rates of growth of industrial sector employment.

For the transportation sector, your transportation planning department may have a forecast of VKT that you can use; alternatively forecasts of population growth or of employment growth can be used to get a first approximation of VKT growth.

For Waste, if you are unable to obtain a direct forecast from the landfill operators or waste management officials in your community, you can use forecast population growth to approximate business as usual growth in landfilled waste.


Step 3. When you have completed the Growth Multipliers Table, click on the

Generate button **Generate** to have the software apply the growth multipliers to the reference year to create a set of forecast emissions data for the forecast year. You can now open the forecast year and make whatever modifications or refinements to the data you wish.

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Caution: If you have already opened the forecast year and entered data, when you click on the Generate button you will be warned that you are about to overwrite any data that has already been entered for the forecast year. Proceed with care; there is no undo feature in this software.



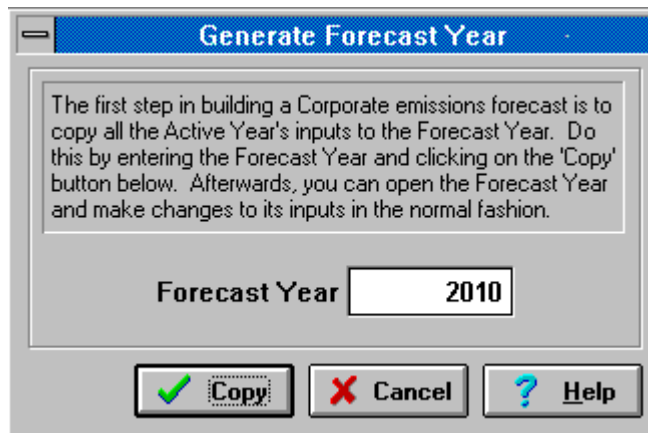
Click on the Cancel button.  to leave the Forecast Generator screen without applying the multipliers to generate a forecast.

REMEMBER: The Forecast Builder is simply a way of quickly generating a set of emission numbers for a future year by scaling up the reference year values by the growth multipliers. Once you have done that by clicking on the Apply button, you are free to revise the emissions for the forecast year in the same way you would revise any other year in the software—by opening the year and editing the inputs. The Forecast Builder will not overwrite those edits unless you ask it to by clicking again on the Apply button in the Forecast Builder.

Generate Forecast Year

In the Corporate Analysis module, generate a forecast of emissions in the target year of your local action plan by clicking on the Forecast button in the bottom left corner of any of the sector screens.

This opens the Generate Forecast Year window. Type in the year for which you wish to create a forecast (normally this will be the target year in your local action plan, recommended year is 2010). When you then click on the Copy button, the software will simply copy the data for the active year, without any changes, to the forecast year. This gives you a base set of emission numbers for the forecast year which you can then edit to produce the final forecast.



Emission Coefficients

This software computes emissions of carbon dioxide and air pollutants automatically by taking information you provide on energy use and energy use reduction and converting it to emissions information using coefficients that relate the emissions of a particular pollutant (e.g. CO₂) to the quantity of the fuel being burned. The software comes with a set of defaults for these coefficients, which you can see by clicking on the Emissions Coefficients item in the Settings menu.

The emission coefficients in this table are the ones that are currently in use by the software. When you first load the software, the table will contain the default values that have been prepared by the CCP. This version of the software contains only one value for the emissions of any particular pollutant from any particular fuel, but within this constraint the default values have been selected to be consistent with Canada's national inventory of greenhouse gas emissions, as maintained by Environment Canada.

Electricity is a partial exception insofar as a separate set of coefficients is specified for each year. The electricity line is imported from a separate table that holds the emission coefficients for electricity, and that table comes with default values for your province or territory for the years from 1990 through 1997. These defaults are annual average kilowatt-hour coefficients and have been computed by Torrie Smith Associates on the basis of Statistics Canada data on total electricity consumption by province and total primary fuel consumption for electricity production by province. See the Help topic on Electricity Coefficients for additional information.

When viewing this table, if the cursor is in the Units column, you can change the base unit (the denominator in the emission coefficient) by clicking on the Change Unit



at the bottom of the screen.

You can also change the numerical value for a particular fuel and pollutant by positioning the cursor in the cell containing the value you wish to change and clicking

on the Change Value button .

Note on the Air Pollution Coefficients:

NOTE: At the time of this first release of the Canadian Edition of the CCP software (May 1999) there is an active research project at Environment Canada to develop air pollutant coefficients for different fuels and electricity used in Canada. Rather than put numbers in the software which we know will very shortly be obsolete, we have left the air pollutant coefficients blank in this version, with the result that the Co-benefits report produces only null results. As soon as the new coefficients are available (June 1999), licence holders of the CCP software in Canada will receive an upgrade that includes the new numbers.

Electricity Coefficients

The CCP software allocates greenhouse gas emissions to end use kilowatt.hours of electricity consumption by dividing the total emissions of greenhouse gases from power production utilized in the province by the “final demand” or consumption of electricity in the province. This procedure yields a greenhouse gas emissions coefficient for electricity expressed in kilograms per kilowatt-hour (kg/kWh).

An emissions coefficient is calculated for each province, for Canada and for the United States. The Canadian coefficient is used for electricity flowing into a Canadian province from another Canadian province where the originating province or generating site for the electricity cannot be readily identified. In most cases, however, the originating province can be identified and the appropriate provincial electricity coefficient is used. The U.S. coefficient is used for international imports of electricity to Canadian provinces, with the exception of international flows into British Columbia, which are assumed to be from hydroelectric sites on the Columbia River Basin in the U.S. Pacific Northwest.

Final emissions coefficients are a blend of emissions coefficients from intra-provincial generation of electricity, interprovincial net inflows (called interregional transfers or IRTs) and international imports from the United States. Provinces that import electricity from the United States are usually net international exporters, but the imports are in some cases substantial and so they are counted as contributors to the province’s energy supply. The origin of interprovincial inflows of electricity are often clear, as in the case of Quebec’s imports of electricity from Churchill Falls, Labrador. In these circumstances, the emissions coefficient assigned to these inflows of electricity are those of the originating province, or, as in the case of Churchill Falls, the originating generating site.

Data with respect to greenhouse gas emissions from electric power generation were available from Environment Canada for the years 1990 through 1994. Environment Canada’s figures were used for these years. For 1995 through 1997, Statistics Canada data on fuel quantities used to produce electricity were multiplied by the appropriate fuel emissions factors found in Trends in Canada’s Greenhouse Gas Emissions, 1990-1995, Appendix C, to yield total emissions from power production for 1995 through 1997.

Final demand for electricity is total primary and secondary electric power production minus producer consumption. In circumstances where there are interprovincial inflows of electricity or international imports, a prorated share of producer consumption is assigned to each source of electricity. This is done to take line losses into account for all sources of electricity, and not merely intraprovincial electricity generation. This method probably overestimates line losses from international imports and interprovincial imports because producer consumption also includes electricity used at generating facilities. The overestimates will have a very minor effect on the final emissions coefficients, as for all provinces the bulk of power

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consumed in the province is generated in the province, and therefore the bulk of producer consumption is assigned to locally generated electricity.

All data on primary and secondary electricity production, international imports, interregional transfers and producer consumption are taken from Statistics Canada's Quarterly Report on Energy Supply-Demand in Canada, publication 57-003. Electricity generated by industry is included in the calculation of emissions coefficients. Industrial generation is generally very small compared to utility generation, and so has only a minor effect on the provincial coefficients.

The CO₂ and other coefficients for electricity are expressed in kilograms per kilowatt-hour (or tonnes per Megawatt.hour) of electricity used. Although electricity does not emit CO₂ or other air pollutants when it is used, there are significant emissions at the fossil fuel (coal, oil, natural gas) power plants where it is generated. In the Cities for Climate Protection approach to counting greenhouse gas emissions, these power plant emissions are incorporated into the end use of electricity through the emission coefficients for electricity (tonnes of emissions per Megawatt.hour of electricity used).

The software comes with a set of default electricity coefficients for 1990 through 1997 for each province and territory. When you identify your province or territory in the Geographical Information form on the Settings menu, the software selects the appropriate default coefficients. You can override any of the default values by positioning the cursor in the cell containing the value you wish to change and simply typing in the new value.

Note: There must be a set of electricity coefficients defined for every year for which you wish to quantify emissions or emission reductions. Click on the Add Row button to fill in a new set of coefficients for a new year. After you type in the year for which you wish to add a set of coefficients, the software will offer you an input form for the year containing values that have already been defined for another year. If you do not have better information just accept these values—you can always modify them later and the software will recalculate all the emissions and emission reductions associated with electricity so that the results agree with the new values.

TIP: The most important coefficient is the CO₂ coefficient. If you do not have values for emissions of the other pollutants, you can leave them as zeroes and it will not make a big difference to the calculation of greenhouse gas emissions.

Also, please note that in this end use system of keeping track of emissions from electricity, double counting will result if the power plants themselves are also entered as sources of emissions. For example, while it is possible to enter power plants in the Industrial sector of the Community Analysis, this would result in double counting of the power plants emissions, which are already rolled into the calculation of the CO₂ coefficient for electricity. The software Help files include a table showing the complete set of default coefficients for each province and for each year.

Alphabetical Listing of All Help File Topics

Active Year	Delete Saved Year
Air Pollutants	District Energy
Annual Average Daily Traffic (AADT)	Electricity Coefficients
Assistants Menu	Emission Coefficients
Base Year	Emissions Forecast
Base Year Methane Recovery Factor	Emissions Reduction Target
Buildings	Energy and Cost Inputs Table
Buildings Measures	Energy Efficiency Measures
Calculating Methane Recovery	Energy Inputs Table
Calculator	Energy Source or Waste Type Selector
Car Or Van Pooling	Energy Use Reduction Measure
Carbon Dioxide	Equivalent Co2 (Eco2)
Carbon Dioxide Concentration	Export To File Utility
Change In Fuel Type	File Menu
Commercial Measures	Focus Of Measure
Commercial Sector	Forecast Builder
Community Analysis	Fuel or Waste Type
Community Analysis Report Options	Fuel Switching Measures
Community Measures	Fuel Units and Conversions
Community Waste Measures	Generate Forecast Year
Compressed Natural Gas (CNG)	Geographical Information
Copy And Paste Utility	Greenhouse Effect
Corporate Analysis	Greenhouse Gases
Corporate Analysis Report Options	Group
Corporate Average Fuel Economy	Group Identifier
Corporate Measures	Group Name
Corporate Waste Measures	Haulage Costs
Delete Record	Help Menu

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Hydrofluorocarbons (Hfc's)	Notes
Implementation Cost	Notes On Network Installations
Increase In Fuel Efficiency	Open Year
Indicator Inputs—Community Analysis Module	Operating The Software
Indicator Inputs—Corporate Analysis Module	Other Emissions - Inputs Table
Indicators	Other Emissions Sector
Industrial Measures	Other Sector - Community Measures
Industrial Sector	Other Sector - Corporate Measures
Initial Energy Source	Other Sector - Name Of Emission Source
Insert Record	Other VKT Reduction
IPCC - Intergovernmental Panel On Climate Change	Output Panel
Land Use Related Measures	Perfluorocarbons (PFC's)
Landfill Gas Utilization	Person Kilometres Traveled (PKT)
Local Action Plan	PKT Calculator
Main Modules	Pull Down List Boxes
Measure Description	Radio Buttons
Measure Impact Windows	Ramp In Schedules
Measure Type	Recalculate
Measures Report Options	Record
Memo Boxes	Record Menu
Menu Commands	Record Navigator Bar
Methane	Register Software
Methane Commitment Method	Replacement Energy Source
Methane Recovery Factor	Report Menu
Methane Recovery Factor For Measures	Residential Measures
Methane Recovery Measures	Residential Sector
Module Selector Buttons	Save, Save As
Multiple Insert	Sector Tabs
New Electricity Coefficients	Select Record Form
	Set Target
	Settings Menu

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Streetlights	Vehicle Type
Streetlights Measures	VKT Calculator
Sulphur Hexafluoride (Sf6)	VKT Inputs Table
Switch To Public Transport	Walking/Biking Measures
Target Year	Waste
The Main Screen	Waste Composition Inputs Table
Time Series Year Selection	Waste Composting Measures
Transportation Assistant	Waste In Place
Transportation Emissions Primer	Waste In Place Method
Transportation Measures	Waste In Place Report Options
Transportation Measures Calculator	Waste Recycling Measures
Transportation Sector	Waste Reduction Measures
Type Selection	Waste Reduction Vs. Recycling
Unit Converter	Waste Sector Primer And Coefficients
Unit Cost	Waste To Landfill
Vehicle Fleet	Water and Sewage Measures
Vehicle Fuel Efficiency	Water/Sewage
Vehicle Kilometres Traveled	Wood and Biomass Fuel
Vehicle Measures	Year Implemented

Appendix A -- Installing and Using Cities for Climate Protection Software on Peer-To-Peer Networks

In this note a peer-to-peer network is a network where each machine acts as a client and a server and can be one of the following, including other network platforms that are compatible with these: Windows 95, Windows NT, Lantastic, and Netware Lite.

Once installed on any workstation of a network, the Cities for Climate Protection software (version 3.3 and later) may be run from that workstation without any further set-up. However the CCP software should not be run by more than one user at the same time, as this will cause loss and/or damage to data. To be run safely from other workstations across the network, the procedures outlined in this document must be followed. If these procedures are followed, access across the network will be enabled while a locking mechanism will be enforced to prevent multiple users from accessing the software at the same time.

- 1) Decide which workstation will contain the CCP software, and install it there. Each software installation creates (1) a “destination” folder (e.g. C:\CCPCANAD) to hold the software and (2) the folder C:\IDAPI on the installing machine containing the Borland Database Engine. The destination folder must be a fully shared folder or a subdirectory of such, accessible to all other users of the software. ***Every other accessing workstation must create a mapped drive for this shared folder.*** (There is no requirement that all workstations use the same drive letter for this. However, it may simplify network management to enforce standardization.) All access to the software across the network must take place via the mapped drive. Always use the mapped drive reference when creating shortcuts to the destination folder’s main EXE.
- 2) The BDE must be installed on every other workstation from which the software is to be accessed. Torrie Smith Associates web page (www.torriesmith.com) contains an installation file for installing the Borland Database Engine only. (The BDE is automatically installed as part of the installation of the CCP Greenhouse Gas Emissions Software, so any computer on which the software has been installed will also have the BDE installed.)

(If no separate BDE-only installation procedure is available, and the only way to install the BDE on your computer is to install the full version of the CCP Greenhouse Gas Emissions software, then on each of these workstations run the full software installation and delete the resulting destination folder so that only the BDE installation remains, usually in the default directory c:\idapi)
(There is a way to circumvent having to install the BDE on every workstation; see the Technical Addendum for Network Administrators.)
- 3) Decide on the location of a shared “Network Directory” to which all users of the software will have read/write/create rights. (There is no requirement for this to

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reside on the same workstation as the software.) The sole purpose of this folder is to hold a file named “PDOXUSRS.NET”, which the BDE uses to coordinate network operations. The file PDOXUSRS.NET itself will be created automatically by the BDE when the software is run. Drives mapped to the Network Directory (or to a folder containing it) must be created on all other workstations from which the software is to be accessed. (There is no requirement for all workstations to use the same drive letter for this. However, it may simplify network management to enforce standardization.)

- 4) On each workstation from which the software is to be accessed, run the BDE configuration program BDECFG.EXE (in folder C:\IDAPI). Then make the following settings:
 - ◆ On the Drivers page, under “Driver Name:” click on “Paradox”. Then, on the right, under “Parameters:” click on “NET DIR”. Type in the space to the right the full path of the Network Directory relative to the current workstation. Always use the mapped drive designation when referring to another workstation. (Note: if you use the “...” button, which brings up a directory browser, you must type in “PDOXUSRS.NET” under “File name” (in place of “*.net”) after selecting a folder, or the screen will not accept data.)
 - ◆ On the System page, set LOCAL SHARE to TRUE.
 - ◆ After changing both of these settings, close the BDE Configuration Utility, answering “Yes” when asked to save changes.
- 5) If, when you try to run the software, you get the message “Multiple .NET files in use. File: (Path) PDOXUSRS.LCK,” it most likely means you’ve got old files with the extension ‘.LCK’ in the destination folder. These should be erased. It is always safe to delete .LCK files so long as no application that uses the BDE is running at the time.

Technical Addendum for Network Administrators – Alternative BDE

There is a way to circumvent having to install the BDE on every workstation. What is really necessary is that lines similar to the following get inserted in the WIN.INI file of each workstation from which the software is to be accessed (which happens during normal BDE installation):

```
[IDAPI]
DLLPATH=C:\IDAPI
CONFIGFILE01=C:\IDAPI\IDAPI.CFG
```

On each accessing workstation, the DLLPATH must point to a valid folder containing the nine DLL files that form the BDE. (These are IDAPI01.DLL, IDASCI01.DLL, IDBAT01.DLL, IDDBAS01.DLL, IDODBC01.DLL, IDPDX01.DLL, IDQRY01.DLL, IDR10009.DLL, ILD01.DLL. These nine files, along with the BDE configuration program BDECFG.EXE, the help file BDECFG.HLP and the configuration file IDAPI.CFG, comprise the entire contents of the originally installed C:\IDAPI directory.) The folder pointed to by DLLPATH can be located on another workstation so long as it is shared (with read-only access or better) and so long as a mapped drive pointing to it is created on each accessing workstation. Any number of workstations may share the same set of DLL files; each possibly using different letters to reference the same mapped drive containing this folder. It is possible for all workstations on the network to share a single set of DLL files in a single IDAPI folder (see Sample Installation below).

On each workstation, CONFIGFILE01 must point to a valid BDE configuration file (.CFG). CFG files are maintained by the BDE configuration program BDECFG.EXE. Like the DLLs, the CFG file may reside in any folder on the network that is accessible via a mapped drive. There is no requirement for DLLPATH and CONFIGFILE01 to point to the same folder or even the same workstation. Furthermore, the CFG file need not be named 'IDAPI.CFG', but can have any valid short filename (8 characters or less) with extension '.CFG'. (The configuration program BDECFG.EXE has the capability of saving (i.e. creating) CFG files under different names. When BDECFG.EXE is opened, it loads the CFG file referenced by CONFIGFILE01.) Any number of workstations with identical configuration settings may share the same CFG file. (This implies they all are using the same mapped drive letter to reference the network directory. See Sample Installation.)

NOTE: Whatever its name and wherever its location, the configuration file referenced by CONFIGFILE01 on each accessing workstation must receive the NET DIR and LOCAL SHARE settings described in the Step 4 of the main document.

6. To the WIN.INI file of each accessing workstation other than the “Server” add the following section:

[IDAPI]

DLLPATH=I:\

CONFIGFILE01= I:\SHARED.CFG

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Make sure that the WIN.INI file on the “Server” contains the section:

[IDAPI]

DLLPATH=C:\IDAPI

CONFIGFILE01=C:\IDAPI\IDAPI.CFG

7. On every accessing workstation other than the “Server”, map shared folder C:\CCPCANAD into drive T:\. (Add the line “NET USE T: \\[servername]\CCPCANAD” to each workstation’s startup script, or create the mappings through the Windows Explorer.) On each workstation you may now create shortcuts to the destination folder’s main EXE on drive T:\. On the server create a shortcut to the EXE file in C:\CCPCANAD. Use any of these shortcuts to launch the Cities for Climate Protection software.

Final note: Only short file and folder names should be used in all specifications referred to in this document; no long file or folder names allowed.

Appendix B – Registration Form and Software Licence

Cities for Climate Protection™ Greenhouse Gas Emissions Software

Climate Action Plan Edition (May 1999)

SITE LICENCE AGREEMENT

IMPORTANT-READ CAREFULLY:

The Site Licence Agreement (SLA) is a legal agreement between you (either an individual or a single entity) and Torrie Smith Associates Inc. (TSA) who owns this software product ("Software"). By installing, copying or otherwise using the Software, you agree to be bound by the terms of this SLA. If you do not agree to the terms of this SLA, Torrie Smith Associates Inc. is unwilling to licence the Software to you. In such event, you may not use or copy the Software, and you should promptly contact Torrie Smith Associates Inc. for instructions on returning the unused Software.

I. Introduction

This is an Agreement between, Torrie Smith Associates Inc. (Licensor), owner of the Cities for Climate Protection™ Greenhouse Gas Emissions Software, and your Local Government (Licencee), for the purpose of specifying the conditions under which the Licencee will use the software.

II. Definitions

- "Software" shall mean the Cities for Climate Protection™ Greenhouse Gas Emissions Software.
- "CPU" shall mean a single computer or central processing unit.
- "User's Guide" shall mean the help files describing the use and operation of the Software, together with any supporting written documentation.
- "Licencee" shall mean and include Licencee's divisions and departments within Licencee's organization at the licenced locations.
- "Licenced locations" shall mean Licencee's premises.

- "Publisher" shall mean the International Council for Local Environmental Initiatives (ICLEI).

- "Technical Support" shall mean help installing the software, help with interface problems or software malfunctions.

III. Licence Grant

Licensor hereby grants to Licencee, and Licencee hereby accepts, subject to the terms and conditions set forth in this Agreement, a non-exclusive and non-transferable corporate licence to use the Software and User's Guide as set forth in this Agreement. The term "corporate licence" as used in this Agreement shall mean and include:

a) the right to use the licenced copy of the Software in executable form for internal operations on CPUs located only at the licenced locations;

b) the right to use and copy the Software User's Guide for Licencee's internal operations only at the licenced locations;

c) the right to make backup copies of the Software; and

d) the right to install copies of the Software on CPU fixed disk memory units subject to restrictions in clause IV.

IV. Restrictions on Licence

In accepting the corporate licence granted by Licensor, Licencee agrees that it shall NOT:

a) transfer or allow the transfer of copies of the Software except as permitted in clause III;

b) use the Software on CPUs at locations other than the licenced locations;

c) make copies or make use of the Software or User's Guide except as expressly set forth in this Agreement;

d) attempt to disassemble or reverse engineer the Software; or

e) create derivative works based on the Software.

Any rights not expressly granted to Licencee are retained by Licensor.

V. Term of Licence

The term of this Agreement shall commence upon receipt of the software and shall continue for as long as the Software is in the Licencee's possession.

VI. Copyright and Proprietary Information

Licensor reserves all rights with respect to the Software and User's Guide under all applicable laws for the protection of proprietary information.

Licencee shall not cause or permit unauthorized copying, reproduction or disclosure of any portion of the Software, or any instructions, guides, or other documentation, or the delivery or distribution of any part thereof to any third person or entity, for any purpose whatsoever, without the prior written permission of Licensor. This restriction shall continue to bind Licencee and its agents and representatives beyond the termination of this Agreement.

VII. Limited Warranty

To the Original Licencee only, the publisher warrants the magnetic diskette on which the Software is recorded to be free from defects in materials and faulty workmanship under normal use for a period of one year from the date of purchase. If during this period the diskette should become defective, it may be returned to Torrie Smith Associates Inc. for a replacement without charge, provided that the Licencee has previously sent in the Cities for Climate Protection™ Greenhouse Gas Emissions Software Registration Form.

VIII. Indemnification

Licencee shall indemnify and defend against any and all claims, including claims by third parties or employees of Licencee, which arise directly or indirectly out of Licencee's use or operation of the Software. Your sole remedy under the warranty is replacement of the software.

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Cities for Climate Protection Greenhouse Gas Emissions Software -- Version 3.6 CAP Edition (Philippines)

REGISTRATION FORM

IMPORTANT-READ CAREFULLY: The Site Licence Agreement (SLA) is a legal agreement between you (either an individual or a single entity) and Torrie Smith Associates Inc. (TSA) who owns this software product ("Software"). By installing, copying or otherwise using the Software, you agree to be bound by the terms of this SLA. If you do not agree to the terms of this SLA, Torrie Smith Associates Inc. is unwilling to licence the Software to you. In such event, you may not use or copy the Software, and you should promptly contact Torrie Smith Associates Inc. from whom you received the Software for instructions on the return of the unused Software.

Mail or fax this Registration Card now to activate your licence registration. This will allow you to receive benefits, including: notification of software updates or upgrades and technical support.

Local Government _____

Mr. / Ms. First Name _____ Last Name _____

Job Title _____

Department _____

Address _____

Address _____

Country _____

Postal Code _____ Telephone (____) _____

Fax (____) _____ Email _____

Network Type _____ CPU _____ MHZ _____

OPERATING SYSTEM: Win98 ____ Win95 ____ Windows3.x ____ Other _____

How many copies of the software will you be installing? _____

Please list the names and department of any other people who will be using this software in your municipality:

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CONTINUED ON PAGE TWO....

***** **USE OF CONSULTANTS** *****

If you plan to give the software to a consultant or a consulting firm, please contact Torrie Smith Associates Inc. for the consultants' software version. The software is fully functional but it is limited to assisting you with your Local Action Plan.

You are responsible for seeing that the software is returned to the possession of your local government when the consultant's work is completed. Any and all copies of the software in the possession of the consultant are to be deleted. Failure to fulfil the terms of the CCP licensing agreement will put you in contravention of your licence. Your licence will be revoked and further damages may be charged against you.

Date_____

Signature_____

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