Manual for the
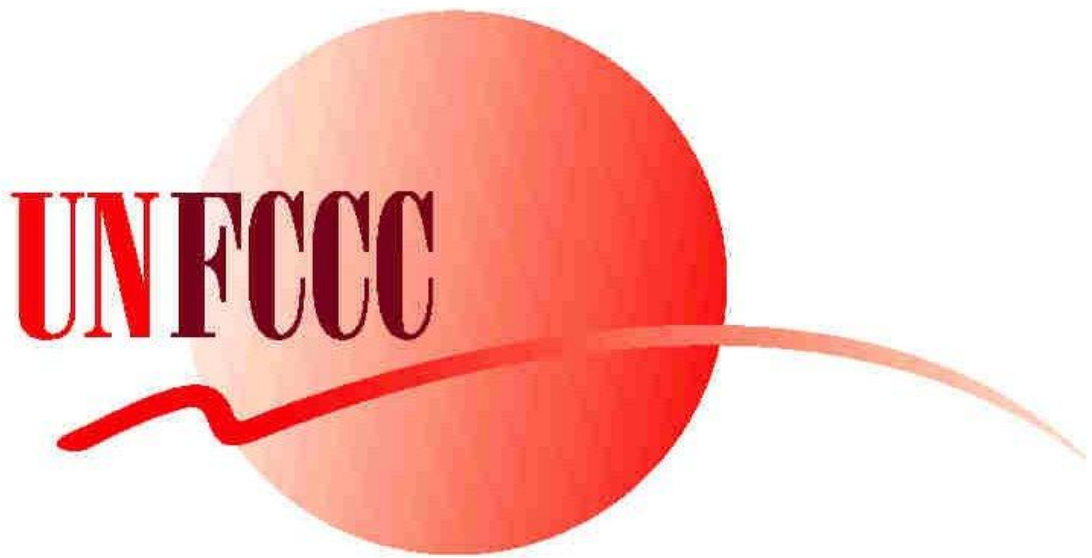
UNFCCC non-Annex I Greenhouse Gas Inventory Software

Version: 1.3

Version 5 April 2006

Contents

This manual should be used in conjunction with the **Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories** and, where appropriate, with the **2003 IPCC Good Practice Guidance for Land Use, Land-Use Change and Forestry**.

This software should be used with the commercial spreadsheet application Excel, version 2000 or later.

The software package consists of the following files:
- START.XLS
- OVERVIEW.XLS
- MODULE1.XLS
- MODULE2.XLS
- MODULE4.XLS
- MODULE5.XLS
- MODULE5B.XLS
- MODULE6.XLS

1   Introduction

Decision 17/CP.8 (paragraphs 6 to 24) encourages non-Annex I Parties to, among other things, include in their national communications the inventory sectoral tables and worksheets of the Intergovernmental Panel on Climate Change (IPCC), in both electronic and hard copy format (paragraph 23). Non-Annex I Parties should also use the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories (paragraph 8), and are encouraged to apply the IPCC Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories (paragraph 11), and to the extent possible, to undertake any key category analysis (paragraph 12). Each non-Annex I Party is also encouraged to use tables 1 and 2 of decision 17/CP.8 in reporting its national greenhouse gas inventory (paragraph 22).

Therefore, in order to facilitate the tasks of non-Annex I Parties, the UNFCCC secretariat produced this software which incorporates all the elements a national GHG inventory could contain. It is hoped that the software is flexible enough to accommodate the great variety of needs and constraints faced by non-Annex I Parties.

The UNFCCC secretariat welcomes any comments or suggestions, which can be sent to: secretariat@unfccc.int. Please clearly refer to the Non-Annex I Greenhouse Gas Inventory Software.

This software will support non-Annex I Parties to the UNFCCC in the compilation of their national greenhouse gas (GHG) inventory and in the preparation of their national communication. The software is based on the commercial spreadsheet application Microsoft Excel. You must have Excel 2000 or a later version installed on your computer to be able to run this software. The software has a custom menu system to help you move through the worksheets and the reporting tables. Furthermore, many of the formulas for calculating the emission estimates have been included in the worksheets.

In general, this software uses Tier 1 methodologies for estimating GHG emissions and removals for all source categories described in the *Revised 1996 IPCC Guidelines*. The software is based on the IPCC inventory software version 1.1, but has additional features not present in the IPCC software. These are described in Sections 4 and 5 of this document.

For example, a new module (Module 5B) has been added to the present software so that inventory compilers may apply the more recent methodologies developed by the IPCC to the Land Use, Land-Use Change and Forestry (LULUCF) sector, as described in the *IPCC Good Practice Guidance for Land Use, Land-Use Change and Forestry (2003 GPG-LULUCF)*. The UNFCCC encourages the use of these methodologies, though the user may still choose to use the outdated Module 5 *Land-Use Change and Forestry (LUCF)* described in the *1996 IPCC Guidelines*.

In the *Good Practice Guidance and Uncertainty Management (2000)* the IPCC developed the concept of a *key source* and in the *Good Practice Guidance for Land Use, Land-Use Change and Forestry (2003)* this was extended to the more general concept of a *key category.* A key category analysis of a national inventory is a useful method that allows the inventory compiler to identify those emission categories of the inventory that require particular attention, may it be because it contributes a large share to the total national emissions or because it has a significant influence on the trend in national emissions relative to a chosen reference year. The software contains a tool that links directly to the summary tables and allows the user to perform both level and trend key category analyses.

For non-Annex I Parties the use of tables contained in decision 17/CP.8 is encouraged. These tables are included in the software and are (partly) filled automatically, so that once the inventory has been compiled using this software, the time for preparing the reporting tables can be kept to a minimum. Even if higher-tier methods are chosen to estimate emissions/removals, the summary tables in this software can still be used for reporting.

In estimating GHG emissions and removals, and in reporting these to the UNFCCC, the software offers multiple benefits.
- It guides the user in a simple step-by-step approach through the emission/removal calculations, which can easily be followed for Tier 1 with the instructions given in the *Revised 1996 IPCC Guidelines* and the *2003 IPCC Good Practice Guidance (LULUCF)*;
- It helps to avoid potential mistakes/inconsistencies in the inventory preparation and enhances transparency;
- It helps to save resources, in particular time;
- It facilitates the reporting to the UNFCCC, as well as the management of data;

- It offers a uniform data management system for inventories from more than one year. This is particularly useful in trend analyses, such as the Key Category Trend Analysis, for which this software provides a tool;
- It provides boxes in each worksheet for documenting data sources and individual steps in the inventory preparation.

This manual describes the main functions of the UNFCCC software and provides instructions on how the software works. It does not however give an explanation of the methodologies for estimating GHG emissions.

2 Installation and Start

Once you have downloaded the file "UNFCCC_NAI_IS_12.zip[1]", extract the contents (8 Excel files) into a directory of your choice (e.g. "C:\UNFCCC\Software"). The software can then be started by double-clicking "START.XLS". **Do not double click any of the other files!**

Optional: You may want to create a short-cut to the software on your desktop. For this, go to the directory into which you have extracted the files, right-click on START.XLS, and select Sent To -> Desktop (create shortcut). An icon called "Shortcut to START.XLS" will appear on your desktop. Rename this icon to, e.g. UNFCCC_NAI_Software.

3 General operation

This software is a customized spreadsheet software that contains seven modules (OVERVIEW, MODULE1, MODULE2, MODULE4, MODULE5, MODULE5B, MODULE6) and an initialization routine (START).

The individual sheets of the Excel workbooks are protected so that only relevant cells can be modified. It uses Visual Basic Macros which you need to activate when prompted by Windows. You will find that the menu bars in your spreadsheet application are customized to allow easy navigation from the Overview to the sectoral modules and back, and also within the modules. Each module has its own color scheme to make them more easily distinguishable on the screen.

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[1] You may need to download the appropriate software at http://www.winzip.com

At times it may be necessary to insert rows or columns to the worksheets in order to add a source (sub-)categeory (or fuel types) to a table. In Module 5B (LULUCF) this can be done by clicking on the appropriate buttons provided in the worksheets. In the other modules, it may be necessary to first unprotect a sheet (via Edit -> Protection -> Unprotect Sheet), then to insert a row and a column (Insert -> Row/Column), and finally to protect the sheet again (Edit -> Protection -> Protect Sheet). When asked for a password, press the 'Return' key, so that the sheet is not protected by a password (it is strongly recommended not to password-protect any of the sheets). In general cells, rows, and columns should only be inserted if the user is confident that she/he is aware of the implications for the present worksheet and all worksheets that refer to it or are referred to.

> **WARNING:** *You should be cautioned that, if the base worksheets are modified, it is your responsibility to ensure that all formulas, calculations and links between tables are correct.*

Inventory compilers are encouraged to use notation keys in cells of the summary tables where no estimate has been provided (as described in FCCC/SBSTA/2004/8). [2] Furthermore they are encouraged to use the boxes provided in each worksheet to document data sources and other relevant information.

Before starting the software, be sure that Excel 2000 or a later version is correctly installed on your computer. Follow the instructions in Section 2 to start the software. The UNFCCC logo will appear and you have to click the button in the lower right corner to continue. You will be presented with a dialogue box requesting the year of your inventory (Figure 1). Select a year from the dropdown list (the default is the current year) or type in a new year (4 digits).

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[2] However, care needs to be taken in the input table for the key category assessment, see below, Section 4.4.1 .
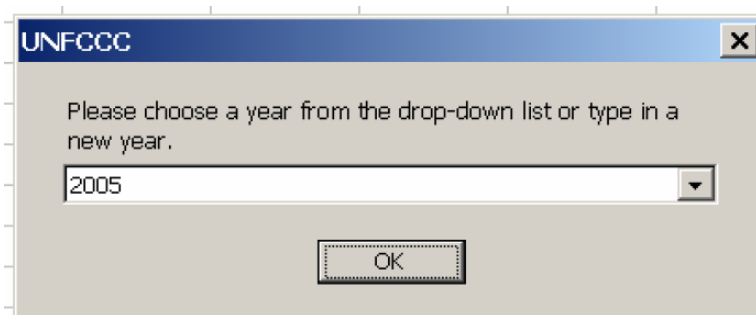
Figure 1. Enter year dialogue box

If no inventory exists yet for this year, you will be prompted with a dialogue box (Figure 2) asking whether you would like to create a new inventory for that year. Click 'Yes' to start your inventory, if you choose 'No' the software will close.

Figure 2. New year dialogue box

You will then be asked to select an inventory to use as a template (Figure 3). From the drop-down list, you can select a year which already contains inventory data or you can select a set of blank sheets. If you would like to use the format and data from a previous year's inventory as a starting point, select a year from the list. If you would like to start with a blank set of worksheets, select Blank sheets from the list.
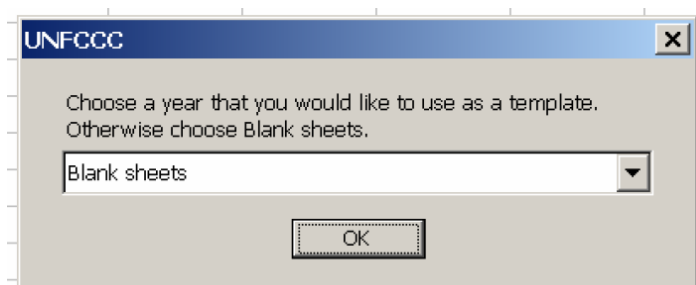
Figure 3. Selection of a template for a new inventory

Once you have created an inventory, the next time you start the software this inventory will appear in the drop-down list.

After you have selected the inventory you would like to work with the Overview module opens automatically (Excel will load the file called Overview.xls). This file contains the reporting tables from the Reporting Instructions (Volume 1, IPCC Guidelines) and other general information relating to your inventory. It will be open at all times when you are running the software. This is to make sure that all the calculations are updated as you work.

Please note the following:

- **Always start the software by running START.XLS and select the inventory year that you would like to edit.** The software will automatically open the OVERVIEW module of the year selected. Do not open the Overview.xls file in the main directory! If you would like to circumvent the START.XLS opening and open an existing inventory of a particular year directly, go to the year whose inventory you would like to edit and open the Overview.xls in this subdirectory named after the year of the inventory.
- **Do not attempt to run an individual sectoral module directly by double-clicking on it from the Windows Explorer!** The sectoral modules only run in conjunction with the Overview module.

4   The OVERVIEW module

The Overview module serves two purposes: first, from here the modules for individual sectors can be accessed through the menu bar; and second, the Overview module contains summary tables that can be used for reporting, and also the Key Category Analysis tool that can be used for identifying key categories in the inventory.

The Overview module opens automatically in the sheet "head" (Figure 4). Here you can enter your country, the inventory year and contact information. It is very useful from a data management point of view to fill in these cells, and you only have to do it once. The country name and inventory year you enter will appear automatically on all worksheets.
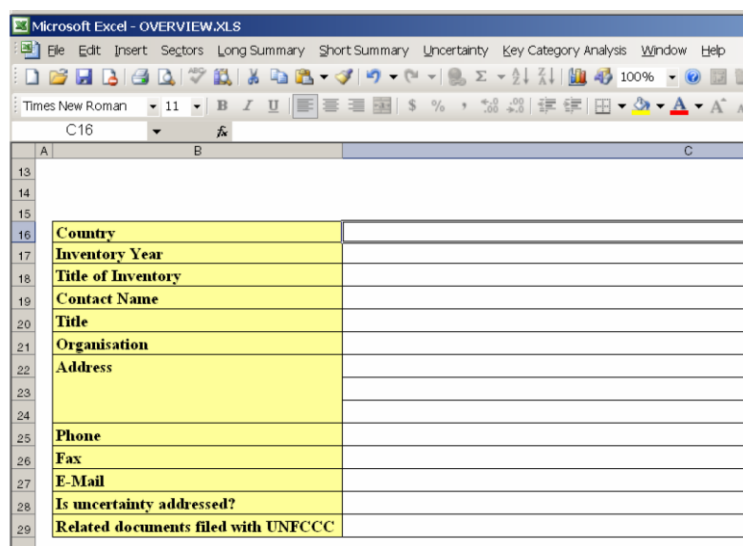
Figure 4. Overview.xls, sheet 'head'

4.1 The Menu Bar

The menu bar is customized to allow quick navigation within the overview module and to get to the sectoral modules easily. It contains essential Excel menus, but also additional menus specific to this software.

- The File, Edit, Insert, Window and Help menus are standard Excel menus that can be used to open and close files, modify the worksheets, change from one worksheet to another and obtain help within the Excel programme. There are currently no Help items for this software.
- The Long Summary menu option contains three choices which will guide you to the summary table 7A, sheets 1, 2 and 3 of the IPCC Reporting Instructions.
- The Short Summary menu option guides you to summary table 7B of the IPCC Reporting Instructions and to Tables 1 and 2 of decision 17/CP.8.
- The Uncertainty menu option will show you summary table 8A, sheets 1, 2 and 3 of the IPCC Reporting Instructions.

You will find that each worksheet in the software has its own custom menu system which will help you move through the various areas requiring data input. You can also click on the tabs at the bottom of the window to move from one worksheet to another (Figure 5). Alternatively, you can also use the Ctrl-PageUp/Ctrl_PageDown keys to navigate in the workbook as usual.
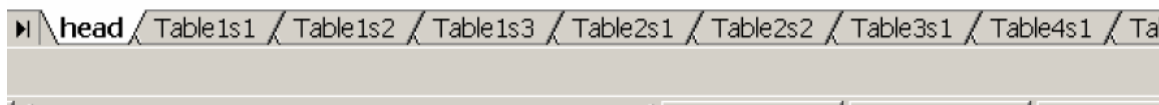
Figure 5. Worksheet tabs from the Overview module.

The tabs are labeled using the same format as the IPCC Workbook and Reporting Instructions and the *2003 Good Practice Guidance for Land Use, Land-Use Change and Forestry* (Module 5B). In the Overview module, the tabs are labeled with Summary Table names. For all the sector worksheets (Energy, Industrial Processes, Agriculture, Land-Use Change and Forestry, Waste) the tabs are labeled with the number of the worksheet and the number of the sheet within that worksheet.

4.2 Completing your inventory

To start constructing your inventory, begin by filling in the country name, year and contact information into the table you see in Figure 4. Then click on Sectors at the top and select the sector you will work with (e.g. Energy, Industrial Processes, Agriculture, etc.: Modules 1, 2, 4, 5, 5B, 6 (see Figure 6). [3] A new file will be opened when you select a sector. This file contains the worksheets from the workbook for that particular sector.
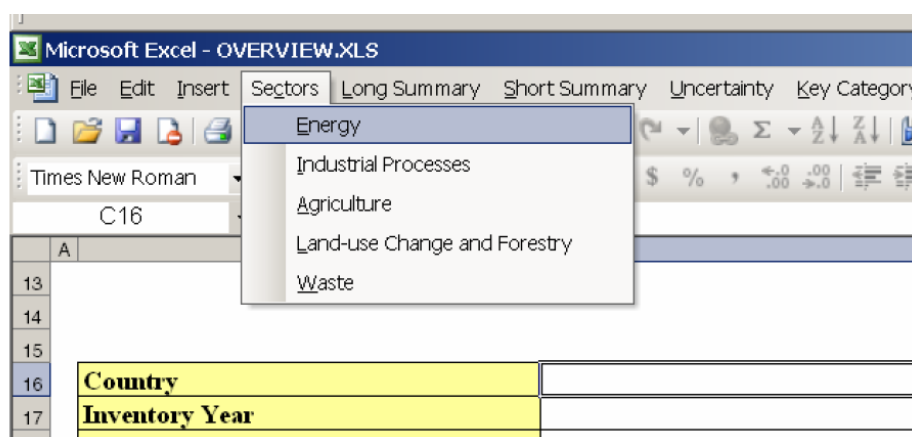

Figure 6. Selecting a sector to work on

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[3] There is no Module 3 for "Solvent and Other Product Use" provided in this software since there is no workbook methodology provided in the *Revised 1996 IPCC Guidelines*.

After choosing the sector you wish to work on and the file has been opened, use the instructions in the workbook to fill in the required information for making the emission estimates. The workbook contains detailed explanations on how the calculations should be made. After you have filled-in the information for that sector you should save the changes by selecting File -> Save. Then you will need to move to the next sector. To do this, click on Window and select Overview.xls from the menu. This will take you back to the main menu. Click on Sectors again and choose a new sector. Follow the same procedure for all the sectors. The following sections will describe the sector worksheets in more detail.

Users are encouraged to provide additional documentation in the worksheets. Once your inventory is completed, please make sure that all summary tables have been filled in, either by the methodologies provided in the worksheets or by filling in the results by hand. Where you cannot make an emission estimate, because data is lacking or there is no methodology, put NA (not available) in the summary tables. If there are no emissions from a particular source in your country, put NO (not occurring) in that space in the summary tables. When you have finished all your data input, verify that the totals are correct.

4.3 Summary Tables

There are a number of summary tables in this Overview module that can be used for reporting. Decision 17/CP.8 encourages the use of tables 1 and 2 of these guidelines in reporting national GHG inventories by non-Annex I Parties. These tables are labeled "17CP.8_1" and "17CP.8_2". You will notice that Table 17CP.8_1 is directly linked to the appropriate cells in the summary tables, so that this reporting table is filled automatically when the necessary information is entered and the emissions are calculated correctly in the worksheets (Module 1 to Module 6) of this software.

It is however necessary to carefully fill Table 17CP.8_2 because the software does not provide automatic links from the sub-sectors in the worksheets to this summary table. In fact, in this table you need to specify the emissions of individual species of F-gases and the software allows you to insert additional species of HFCs and PFCs by clicking the appropriate buttons (see Figure 7).
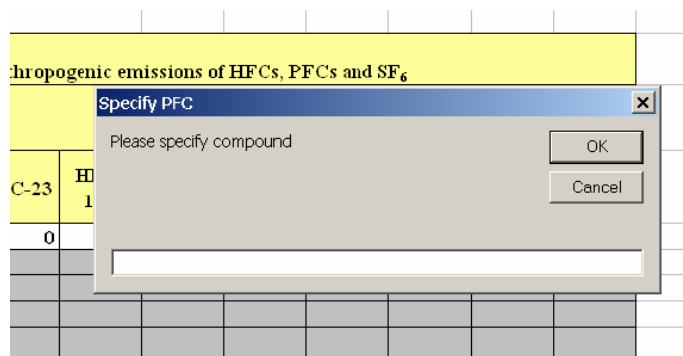
Figure 7. Detail of Table 17CP.8_2 where the user can specify additional species of HFCs and PFCs by clicking appropriate buttons.

Note that, if you follow the *IPCC Good Practice Guidance for Land Use, Land-Use Change and Forestry (2003)* and use Module 5B rather than Module 5, then you have to fill the CO_2 emissions and removals separately and manually into Table 5Bs1. For non-CO_2 gas emissions automatic links are established. Should you wish to add other items into the category G (other), click the button next to the category name and insert a name for the subcategory (see Figure 8).

Figure 8. Button to add more emission/removal categories in Table 5Bs1 of the Overview module

You may also need to check that the information in Table 1 through Table 7 corresponds to what was calculated in the sectoral worksheets. Note, however, that if you follow the *IPCC Good Practice Guidance for Land Use, Land-Use Change and Forestry (2003)* and use Module 5B rather than Module 5, then you have to first use a 'mapping-back' procedure and express emissions and

removals in the LUCF structure of the *Revised 1996 IPCC Guidelines* in Table 7As1. A general description of such a mapping is given in the *IPCC Good Practice Guidance for Land Use, Land-Use Change and Forestry (2003)*. For guidance on how to fill Table 8, please consult the *Revised 1996 IPCC Guidelines*.

4.4 The Key Category Analysis Tool

The Key Category Analysis has not been part of the *Revised 1996 IPCC Guidelines*, but was devised only in the *Good Practice Guidance and Uncertainty Management (2000)* for sources and later extended to sinks. Its aim is the identification of emission/removal categories that contribute significantly to the inventory. For guidance on the meaning of *key categories* and on further action to be taken once they are identified, please consult the documents mentioned. In addition, follow the instructions in this section carefully.
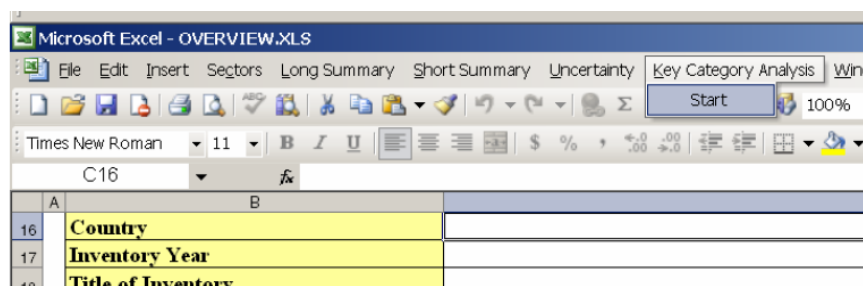

Figure 9. Link to the Key Category Analysis tool in the Overview module

The Key Category Analysis consists of three steps: (1) Data Input, (2) Level Assessment, (3) Trend Assessment.

4.4.1   Key Category Analysis: Data input

The data input for the key category analysis is through Table KeyCatInput in the Overview module. When you open this table you will note that the IPCC categories and sub-categories from all sectors are listed, together with the relevant GHGs. For (sub-)categories shaded in yellow a direct link to the emission estimate in the corresponding summary sheet has been established, so there is no need for you to enter data for these manually. (Sub-)categories shaded in light green should be filled manually as appropriate.

For example, since CO_2 emissions from Stationary combustion are likely to be a major source category, it will be useful to further disaggregate the sources into solid, liquid and gaseous fuels, and these may even be split further (up to three types of fuels). Emissions must be entered in the corresponding cell in column E. Further down in this table (row 42+) you may specify additional sub-categories in the Energy sector, together with the relevant GHG and the corresponding emissions. Ensure that these emissions are entered in units of Gg of CO_2eq., i.e. they need to be multiplied with their global warming potentials (GWPs), i.e. 1 for CO_2, 21 for CH_4 and 310 for N_2O.

Figure 10. Key Category Analysis Data Input table

For Industrial Processes CO_2 and N_2O emissions have been directly linked to the summary sheets, whereas the F-Gas emissions need to be entered manually, as above.[4] Much the same applies to the Agriculture and Waste sectors. There is also room for additional sub-categories under the heading "Other" (row 105).

The Land-Use Change and Forestry sector can only be included in the Key Category Analysis if the category structure of the *Good Practice Guidance for Land Use, Land-Use Change and Forestry (2003 GPG-LULUCF)* is being used. This is achieved by:
- **either:** applying this structure throughout the inventory, i.e. by following the *2003 GPG-LULUCF* guidance completely and consequently to use Module 5B of this software, rather than Module 5;

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[4] Ensure that this information is consistent with Table 17/CP.8_2.

- **or:** by aggregating and disaggregating the emissions/removals from the LUCF categories of the *Revised 1996 IPCC Guidelines,* into the categories of the *2003 GPG-LULUCF* (some guidance on how to do this is given in the 2003 document). This will result in emission/removal data that can be entered manually into Table 5Bs1 of the Overview module (see above).[5]

In both cases, net emissions/removals from LULUCF should be entered in **column F** of Table KeyCatInput. LULUCF emissions/removals are treated separately in the Key Category Analysis (see below), which is why **LULUCF net emissions/removals must *not* be entered into column E**. When entering LULUCF net emissions/removals follow the guidance given in Section 5.4 of *2003 GPG-LULUCF* on the level of aggregation at which these should be included. Also make sure to convert net emissions/removals to CO_2-equivalent units.

At the top of columns E and F in Table KeyCatInput the sums of emissions from all sectors except LULUCF and the emissions/removals from LULUCF are shown, respectively. It is now possible to perform the Key Category Level Assessment.

Before we look at this, however, a final remark on the data input. As you will have noticed the software gives you some flexibility to include emissions/removals from sub-categories not included in the standard setup (currently the maximum total number of categories that can be included is 182). The price to be paid for this flexibility is that the sub-categories which you enter have to be exactly the same (and in exactly the same place in the Table KeyCatInput) for all inventory years. **If the sub-categories entered in this Key Category Data Input sheet fail to match completely across inventory years, the Key Category Trend Assessment will not deliver correct results.**

And finally:

> **Do not include notation keys (e.g. "NO", "NE") or other text in columns E and F of this key category analysis input table!**

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[5] Please note that the emissions/removals from category G ("Other"), including Harvested Wood Products, are not automatically linked to Table KeyCatInput. If appropriate, they need to be entered manually in KeyCatInput.

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The Key Category Analysis tool can exclusively handle numerical information, so if text information appears in column E or F of this input sheet, you have to remove it (first unprotect the sheet, then delete the text, finally protect the sheet again without a password).

4.4.2   Key Category Level Assessment

The Key Category Level Assessment is performed on clicking the button "Perform Level Assessment" in Table KeyCatInput (column S).
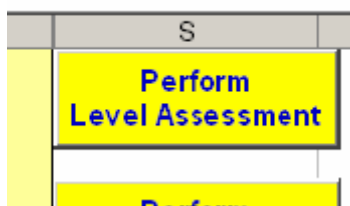

Figure 11. Button to initiate the Key Category Level Assessment

A new table ("KeyCatLevel") appears in the workbook and is opened automatically. In this table all sub-categories with non-zero emissions or removals are listed in descending order of their magnitude, i.e. contribution to the total inventory: columns E and F show the emissions/removals from LULUCF and all other sectors, respectively. Column G shows the total absolute estimate (including the LULUCF emissions/removals, as absolute figures). Columns L and M show the level assessment of the inventory excluding the LULUCF contribution, as percentages and cumulative percentages, respectively. Finally, columns N and O show the corresponding results for the inventory including the LULUCF contribution.[6]

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[6] For guidance on the meaning of *key categories* and on further action to be taken once they are identified, please consult *2003 GPG-LULUCF*.

**Figure 12. Example output from a Key Category Level Assessment.
In a typical national inventory there will be more entries**

4.4.3   Trend Assessment

For the trend assessment first return to Table KeyCatInput and enter a base year relative to which the trend should be calculated (enter the 4-digit base year, e.g. "1994" into Column S, row 5).

**Figure 13. Base year specification and button to initiate
the Key Category Trend Analysis**

Ensure that an inventory for the specified base year was generated in advance using this software, in particular the sheet Table 'KeyCatInput' need to be completed for the base year.[7] It is not necessary to first perform a Level

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[7] If you have not yet prepared an inventory for the base year, save the current year inventory and close it. Then open the software again by running START and compile the national inventory for the base year. Once the base year inventory is complete make sure that the Table KeyCatInput is

Assessment before starting a Trend Assessment, neither in the current year, nor in the base year. However, the software will not work if either the inventory for the selected base year does not exist, or if the base year is the same as the selected current year (for instance, in the Overview module of the 1994 inventory the year 1994 is the *current* year, and so 1994 cannot be selected as the *base* year.[8]) Most importantly, the Table 'KeyCatInput' must be completed both in the current year as well as in the base year inventory.

After clicking the "Perform Trend Assessment" button, the availability of the base year data is checked first, and then, the user is guided to sheet "KeyCatTrend" where the results of the Key Category Trend Assessment is displayed as in the example in *2003 GPG-LULUCF*.

> **Ensure that you start your Key Category Assessment always in the sheet "KeyCatInput" –**
> **the sheets "KeyCatLevel" and "KeyCatTrend" are output tables only!**

5 Sectoral Tables (Modules 1, 2, 4, 5, 5B, 6)

From the Overview module you can launch the sectoral modules by selecting a sector from the menu bar ('Sectors'). Most of the sectoral tables are almost identical to the worksheets provided in the *Revised 1996 IPCC Guidelines* and the IPCC software Version 1.1, with the exception of Module 5B (Land Use, Land-Use Change and Forestry), whose tables are based on the worksheets provided in Chapter 3 of the *2003 GPG-LULUCF*. In this section are highlighted some changes in the software relative to the tables in the above documents.

5.1 Energy (Module 1)

You can open this file by selecting Sectors -> Energy from the Overview.xls menu. This file will help you calculate your emissions from the energy sector using the methods in the workbook. The custom menu for this file will help you move through the various methods for the energy sector (Figure 14).

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completed as well. Save the base year inventory modules and exit the software. Finally open the current year inventory. Now you can select your completed base year inventory in the Key Category Trend Assessment.

[8] In particular this means that a trend analysis can only be performed if at least two inventories are available: the reference year and the current year.
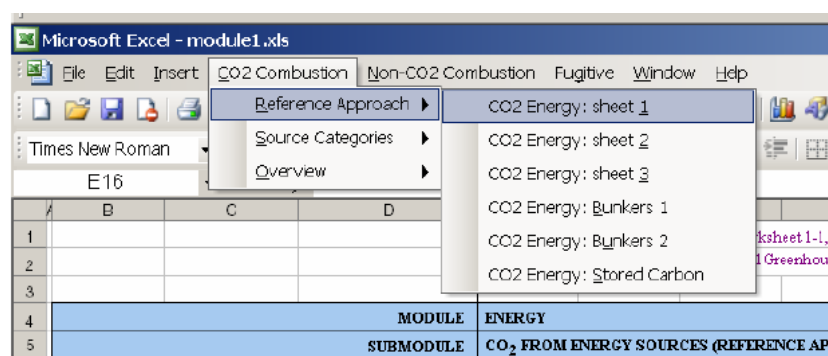
Figure 14. The Energy sector main menu

Changes relative to the *Revised 1996 IPCC Guidelines* and their software include:

- **CO_2 from Fuel Combustion: Manufacturing Industries.** The current software provides two copies of Table 1-2s3-4, one for auto-generation (A) and one for process heat (B). Similarly for Tables 1-2s9-10, 1-2s13-14, 1-2s15-16. The entries of the two tables are added automatically in the summary sheet.

- **SO_2 Emissions.** The current software provides a copy of Table 1-4 for each sub-sector so that SO_2 emissions can be calculated separately by sub-sector without inserting new sheets manually. The corresponding links to Tables 1 and 7As1 in the Overview have been established. The memo items (Bunker fuels) appear only in the transport sheet (1-4s3).

- **Methane Emissions from Coal Mining**. In Step 1 of Sheet 1-6s1 columns D and E were inserted to allow for taking into account methane that was recovered or flared.

- **Methane Emissions from Oil and Gas Activities**. The software contains two versions of Table 7s. Version 7s1 is the version of the *Revised 1996 IPCC* Guidelines, whereas Version 7s2 can be used if activity data and emission factors are used in units that are suggested by the *GPG2000*. It also contains more detailed emission sub-categories. Ensure that only **either** Table 7s1 **or** Table7s2 is filled, **not both**.

- **In Table 1-2overview: Fuels used in combustion**. Three columns (AO to AQ) were inserted, and they should be filled manually. If you have used columns AG to AK to specify the combustion of other (additional) fuels, then aggregate these other fuels here into solid,

liquid and gaseous. These 'other' fuels are linked automatically to the totals in Table 1-2overview and to the appropriate cells in Table 1-3s1.

5.2 Industrial Processes (Module 2)

You can open this file by selecting Sector -> Industrial Processes from the Overview.xls menu. This file will help you calculate emissions from the Industrial Processes sector using the methods contained in the workbook. The custom menu for this file will help you move through the worksheets of the Industrial Processes sector (Figure 15).
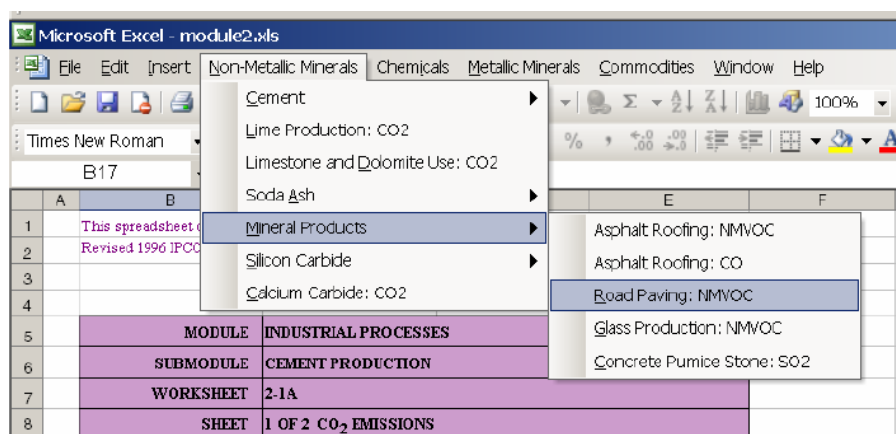

Figure 15. The Industrial Processes main menu

In the current software the CO_2 emissions from cement production are now calculated in two separate sheets, Table 2-1s1A for emissions from cement production proper; and Table 2-1s1B for emissions from clinker production, which take into account the CKD factor. To avoid double counting please only fill EITHER Table 2-1s1A OR Table 2-1s1B.

5.3 Agriculture (Module 4)

You can open this file by selecting Sectors > Agriculture from the Overview.xls menu. The custom menu in this worksheet will help you calculate your emissions from agriculture using the methods in the workbook. You can move around the worksheets by using the custom menu system (Figure 16).
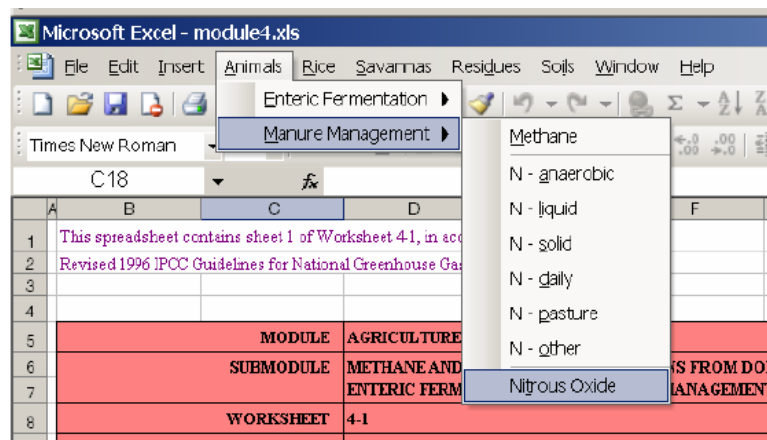
Figure 16. The Agriculture main menu

5.4 Land-Use Change and Forestry (Module 5)

You can access this file by selecting Sectors -> Land-Use Change and Forestry from the Overview.xls menu.

For the "Land-Use Change and Forestry" sector **you have the choice between two alternatives**: if you select this sector you will be further asked whether you would like to use IPCC Good Practice Guidance format, i.e. the sectoral structure laid out in the *IPCC Good Practice Guidance for Land Use, Land-Use Change and Forestry (2003),* see (Figure 17). Selecting "Yes" opens the summary table of Module 5B, and you will find instructions for this module in the next section. Selecting "No" opens Module 5, the Land-Use Change and Forestry module as described in the *Revised 1996 IPCC Guidelines*. For preparing a complete inventory it is necessary to use either of the modules, **but not both**.
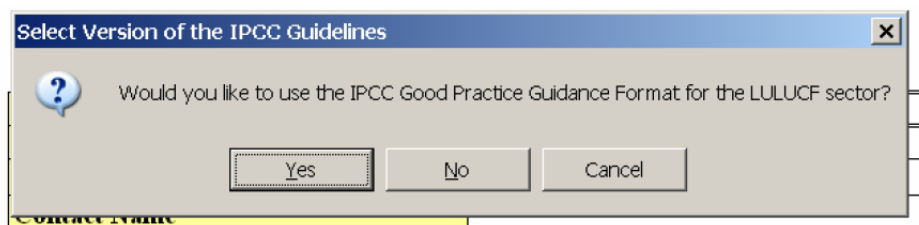

Figure 17. Selection the sectoral format for the Land Use, Land-Use Change and Forestry Sector

If you have selected 'No' in the screen of Figure 17, the Module 5 file will help you calculate your emissions from Land-Use Change and Forestry using the methods in the workbook. The custom menu system will help you move through the various worksheets (Figure 18).
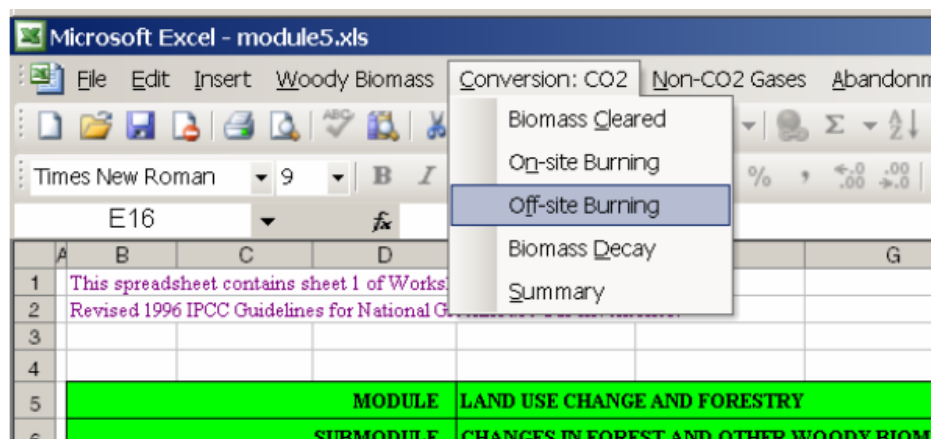

Figure 18. The Land-Use Change and Forestry main menu

This file contains a slight modification of the methodology for estimating carbon emissions or removals by soils. Worksheets 5-5s1 and 5-5A have been extended so that many different land-use management systems can be included in the calculation. You will notice that the top table in worksheet 5-5s1 adds up the results of all the tables below it. To make the calculations correctly, follow these steps.

Step 1 - Defining land-use management systems

In worksheet 5-5s1, you should enter the name of each land-use management system in the upper left cell of each calculation table under the main table (e.g. cell B29, B35, B41 etc.). These names will also appear in worksheet 5-5A, since some of the land may be agriculturally impacted. You may be limited by data availability and need to estimate the areas covered by each type of land-use.

Step 2 - Calculating soil carbon from agriculturally impacted lands

If the land is agriculturally impacted, use the corresponding table in sheet 5-5A to calculate the soil carbon from the type of agricultural practice (scroll down to where the name of the land-use system is). The amount of soil carbon (column G) will be automatically transferred to the corresponding table in 5-5s1. You should then enter in the land areas for t-20 years and t in columns D and E of worksheet 5-5s1. The net change in soil carbon over the 20 years will then be calculated in column H.

Step 3 - Calculating soil carbon from non-agriculturally impacted lands

If the land is not agriculturally impacted, simply put the quantity of soil carbon per hectare in column C (this writes over the formula contained in that cell). Then enter the land areas for t-20 years and t. The net change in soil carbon for this land-use management system will then be calculated in column H. Once all land-use management systems have been entered in the tables, the totals for land area and net carbon change will appear in the top table.

5.5 Land Use, Land-Use Change and Forestry (Module 5B)

If you have selected 'Yes' in the screen of Figure 17, Module 5B file will help you calculate your emissions from Land Use, Land-Use Change and Forestry using the methods in the *2003 GPG-LULUCF.* Users are strongly encouraged to consult this document before using the software module to estimate emissions and removals from Land Use, Land-Use Change and Forestry.

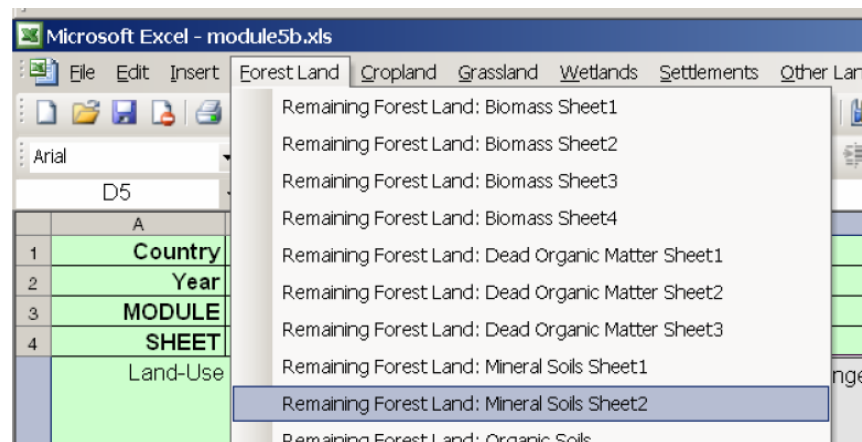The custom menu system will help you move through the various worksheets (Figure 19).

Figure 19. The main menu of Module 5B (Land Use, Land-Use Change and Forestry)

Here is some additional guidance on how to use this module.

- In the **summary table** emissions and removals should be collected manually. Guidance on how this is done can be found in *2003 GPG-LULUCF.* The non-CO_2 part of the summary table is then automatically linked into Table 5Bs1 of the Overview module, whereas the CO_2 part of Table 5Bs1 should be filled in manually, separating emissions and removals.
- In the various tables it may be useful to **disaggregate Land Use or Land-Use Change categories into sub-categories**. This can easily be done by clicking the button provided in the worksheet and to specify the name of the sub-category (Figure 20). In some cases the same sub-categories should be used in several successive sheets, so that the software automatically inserts the same categories into more than one sheet. For example, the sub-categories that you insert into Table FL-1a_1of4 will automatically be inserted into Tables FL-1a_2of4, FL-1a_3of4, and FL-1a_4of4. Ensure that sub-categories are used consistently.

Figure 20. By clicking the blue button the user can specify sub-categories for land uses and land-use changes.

- In the Land-Use Change Tables (e.g. Land Converted to Forest Land) sub-categories can be specified for each type of land-use change (Figure 21). Make sure that these sub-categories are consistent in all relevant tables.

Figure 21. Blue buttons for the insertion of sub-categories are provided for each land-use change category.

- Each of the tables provided in the software gives reference to the appropriate pages in *2003 GPG-LULUCF* where further guidance can be found on how to fill these tables.

5.6 Waste (Module 6)

You can access this file by selecting Sectors -> Waste from the Overview.xls menu. This file will help you calculate your emissions from waste using the methods in the workbook. The custom menu will help you move around the various worksheets (Figure 22).
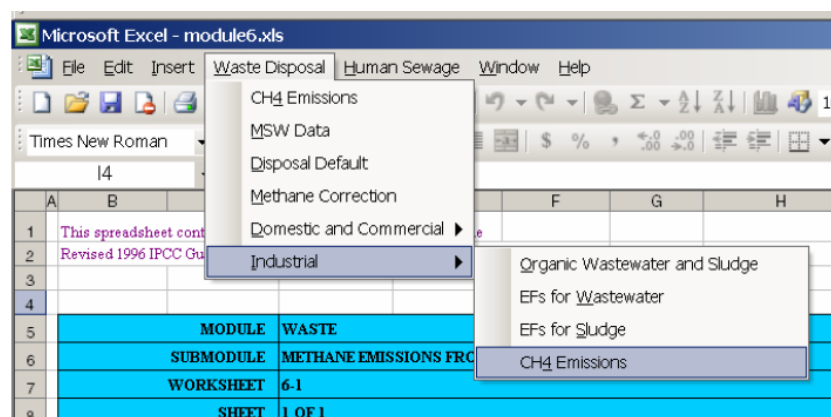

Figure 22. The Waste Sector main menu

Relative to the *Revised 1996 IPCC Guidelines* the following changes have been made in this software:

- **Indirect N$_2$O emissions from human sewage.** For the software columns E and F in Sheet 6-4s1 have been inserted to facilitate the correction for human sewage N being applied to soils in the form of sewage sludge.
- An *optional* sheet on **waste incineration** (Table 6-5s1) is provided in the software. **Emissions from this table are not automatically linked to the summary tables.** If you use this table to estimate greenhouse gas emissions from waste incineration, make sure that the relevant estimates are included in the summary tables (unprotect the summary and add the emissions as necessary), but carefully read the instructions in the footnote.

6 Frequently Asked Questions (FAQ)

1. *Why does the software ask if I would like to enable macros?*
   - In Excel there is a function which warns users if there is a macro in a spreadsheet. This is to protect against macro viruses. You can disable this function in the Options menu. If you do not disable it, Excel will ask you this question every time you open the software.
2. *After starting the UNFCCC software nothing happens. Why?*
   - You may have disabled the macros. Restart the UNFCCC software and enable the macros. Should the problem persist change the security settings of your spreadsheet software to medium or low (Tools-> Options -> Security -> Macro security).
3. *I am running a Spanish version of Windows and after starting the UNFCCC software I get an error message. How can I fix this?*
   - A problem with running the software on a Spanish platform has been identified. In a certain combination of versions of Windows/Excel the software looks for an 'Edit' menu, but only finds an 'Edición' and does not recognize that as being the same. However, there is no patch for this. If you encounter this problem send an email to secretariat@unfccc.int.
4. *Why are there number signs (######) in some cells?*
   - When a number is too long to display, Excel substitutes number signs (#####) for the number. It does not mean the number is gone, but simply that Excel cannot display it using the column width which has been selected. To correct this, disable the protection, and widen the column.
5. *When I start the software I get an error message 'VB40016.DLL cannot be found'. What should I do?*
   - You are probably running a recent version of the spreadsheet software (e.g. 2003) that does not contain the Visual Basic Library 4.0. Remedy: Download for free the Visual Basic Library 4.0[9] from the Windows internet site and follow the instructions given there. Then restart the UNFCCC software.
6. *Can I automatically import inventories that were compiled using the IPCC software Version 1.1 that came with the Revised 1996 IPCC Guidelines?*
   - An automatic import is not possible, the UNFCCC and IPCC software packages differ. It is, however, possible to copy and paste

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[9] See http://support.microsoft.com/default.aspx?scid=kb;en-us;196286

large parts of the worksheets manually from the IPCC software to the UNFCCC software. Care needs to be taken in ensuring that the content fits the worksheets. If you have compiled inventories with the IPCC software, the introduction of this new software may offer an opportunity to recheck/recalculate the inventories that have been compiled using the IPCC software.

7. *When I try to access a specific module in a specific year directly with the Explorer the module will not open. What is going on?*

- Individual Modules cannot be started as stand-alone workbooks. You should always begin by starting the software from the START menu.

8. *Where do I enter the base year emission data for the key category trend assessment?*

- The data need to be entered in the Table KeyCatInput in the Overview Module of the base year inventory. If no such inventory exists, create it by starting the software and selecting the year you would like to be a base year in the analysis. Complete the base year inventory and make sure that the Table KeyCatInput is filled correctly. Save the base year inventory and re-open the current year inventory. In this inventory, you can then select your newly completed inventory as the base year inventory for the trend analysis.

9. *The key category trend analysis results in an empty table. Why?*

- This means that the inventory contains zero emissions, or that the KeyCatInput sheet contains text information in columns E or F (e.g. notation keys, such as 'NO', 'NE' etc). Since the key category tool can only deal with numerical values, but not with text entries. You should remove the text items from columns E and F, by first unprotecting the KeyCatInput sheet, then removing the text, and finally protecting the sheet again. It may be needed to do this in the current year and in the base year relative to which the trend is calculated.

10. *In Module 5B, by mistake I have added the same sub-category twice into the same worksheet. Can I remove one of them?*

- Added lines cannot be deleted. If you would like to rename a sub-category, unprotect the sheet (select Edit -> Protection -> Unprotect sheet), then rename the sub-category, and finally protect the sheet again (select Edit -> Protection -> Protect sheet).

- Care needs to be taken if the software has inserted the sub-category into more than one consecutive sheets. For example, all sub-categories that are inserted into sheet FL-1a_1of4 are automatically inserted also into sheets FL-1a_2of4, FL-1a_3of4, FL-1a_4of4. In this case, the sub-category needs to be renamed in each of the four sheets, following the steps described above.