Task Force on
National Greenhouse Gas Inventories

ipcc
INTERGOVERNMENTAL PANEL ON climate change

WMO UNEP

IPCC Inventory Software

User Manual Version 2.69

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1 Background and Purpose

IPCC National Greenhouse Gas Inventories Programme and its Technical Support Unit located at IGES in Hayama, Japan, initiated the development of new GHG Inventory Software ("IPCC Inventory Software"). The purpose of this software is to implement Tier1 and Tier2 methodologies in the *2006 IPCC Guidelines* for National Greenhouse Gas Inventories for the preparation of national GHG inventories according to *2006 IPCC Guidelines* either for complete inventories or for separate categories or groups of categories. The primary target groups of users are inventory compilers who wish to apply default *2006 IPCC Guidelines* methods, trainers and trainees on national GHG inventory compilation, and Parties not included in Annex I of the Convention having limited resources without their own inventory systems.

The basic inventory data model looks like Figure 1.1

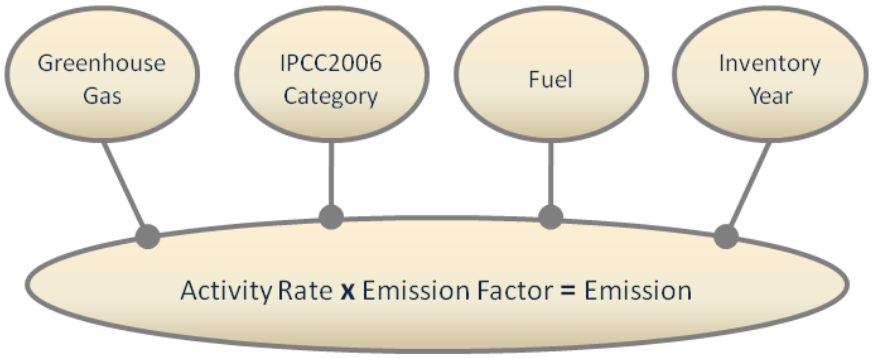


Figure 1.1 - Basic data relations

The basic approach of the software is to enable filling out the *2006 IPCC Guidelines* category worksheets with the activity and emission factor data. In addition it also supports many other functions related to database administration, Quality Control, data export / import as well as data reporting, as shown on the Figure 1.2.

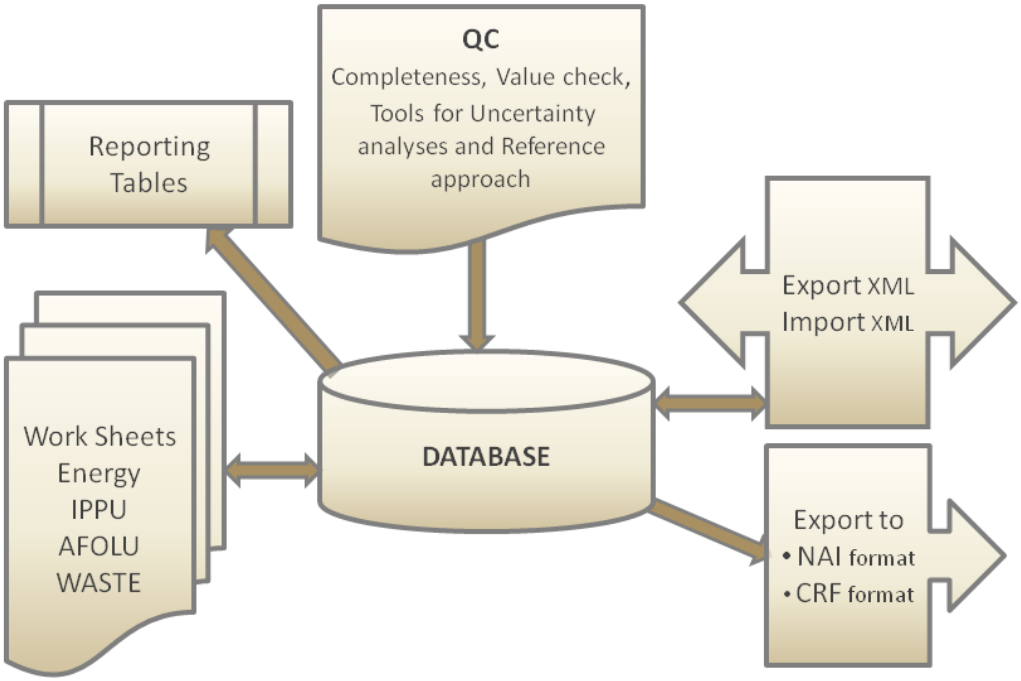


Figure 1.2 - Basic software modules

2 Getting started with the software

The following chapters describe the steps necessary to initialize the software and the database. After performing these steps, the database is ready for distribution and sharing among inventory compilers participating in the national inventory, if desired, maintaining consistency among users.

2.1 First run

After installing the IPCC Inventory Software you are ready to launch the software for the first time. You will be asked to perform several mandatory actions described in the following sections to initialize the software and the database.

2.1.1 Define Superuser

It is necessary to define a **Superuser** that is responsible for defining additional users and has full control over the application and corresponding database (Figure 2.1).

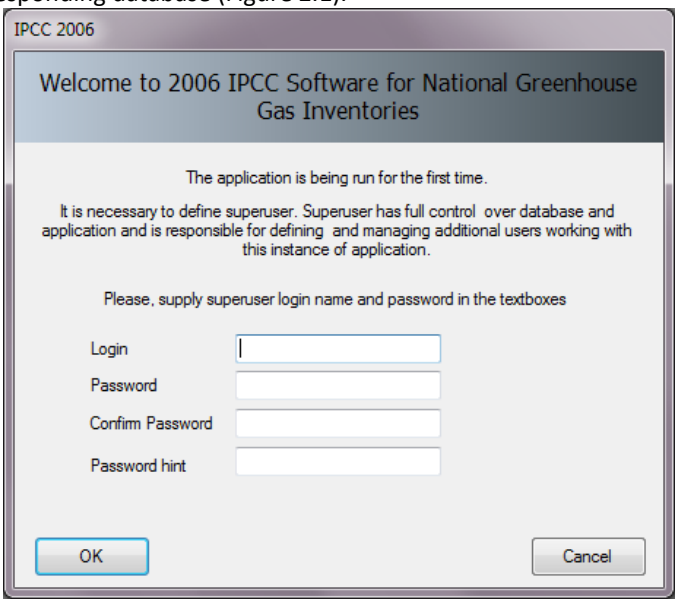


Figure 2.1- Define Super User

2.1.2 Choose country

In this step it is necessary to choose desired **Region** and **Country/Territory** following Figure 2.2 below. Country is relevant for F-Gases, AFOLU and Waste worksheets. Selected country has no direct impact on other worksheets (Energy, IPPU). Please note that this country list is based on the UN list, which is available at http://unstats.un.org/unsd/methods/m49/m49regin.htm.

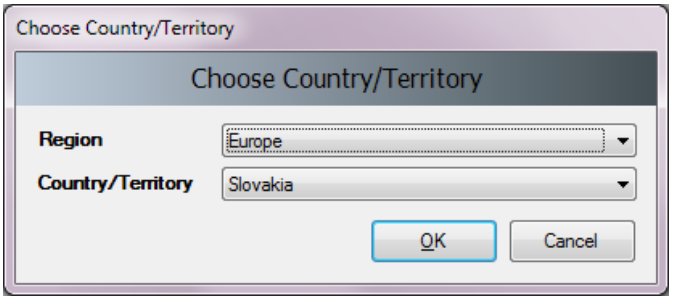


Figure 2.2 - Choose Country

2.1.3 Create Inventory Year

In this step it is necessary to create initial **Inventory Year** (Figure 2.3). After creating **Inventory Year**, software is successfully initialized and prepared for use or for additional tuning described in the next chapters.

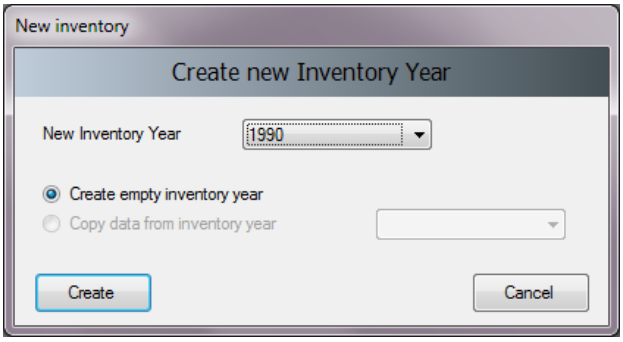


Figure 2.3 – Creating Inventory Year

2.2 Check and modify Inventory Preferences

Use *Application / Preferences* menu to access Application preferences (Figure 2.4). Switch to *Inventory Year* tab as shown in the picture below.

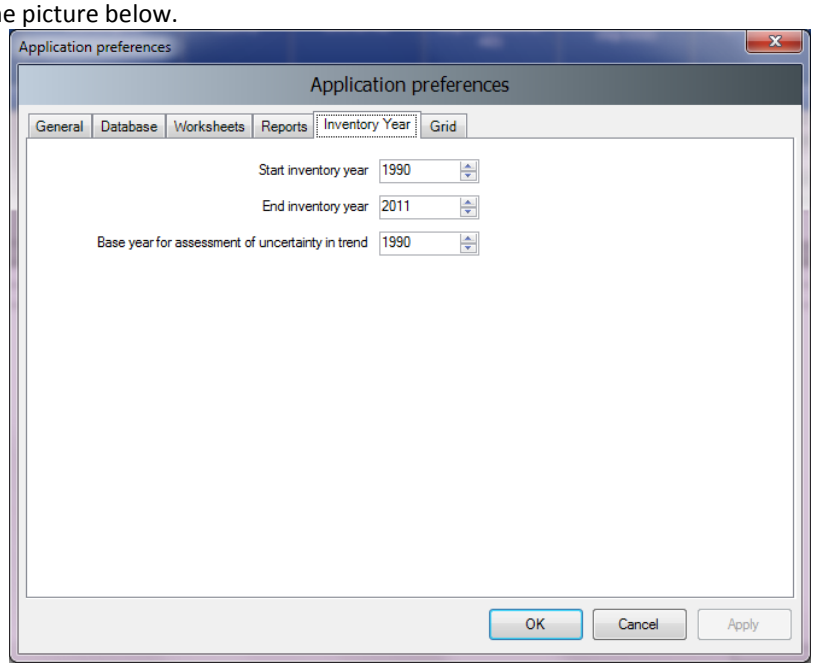


Figure 2.4 – Setting Inventory Preferences

Check and modify following values, if necessary:

1) Use **Start inventory year** numeric box to set starting inventory year. Default is 1990.
2) Use **End inventory year** numeric box to set ending inventory year. Default is current year.
3) Use **Base Year for assessment of uncertainty in trend** numeric box to define Base Year for assessment of uncertainty in trend. Default is 1990.

If the start inventory year needs to be changed to earlier than 1990 (e.g. 1980), it is recommended to create new inventory for that year before starting working with the worksheets (menu *Inventory Year / Create New…*) or before distributing the database to other compilers.

After lowering start inventory year and creating new inventory for that year, you can delete default empty 1990 Inventory created in step 2.1.3 using *Administrate / Delete inventory* menu, if necessary.

2.3 Check and set default CO_2 Equivalents

Currently active (default) **CO_2 Equivalent Type** is indicated in the status bar located at the bottom of the main software window.
Use *Administrate / CO_2 Equivalents* menu to access management of CO_2 Equivalents.

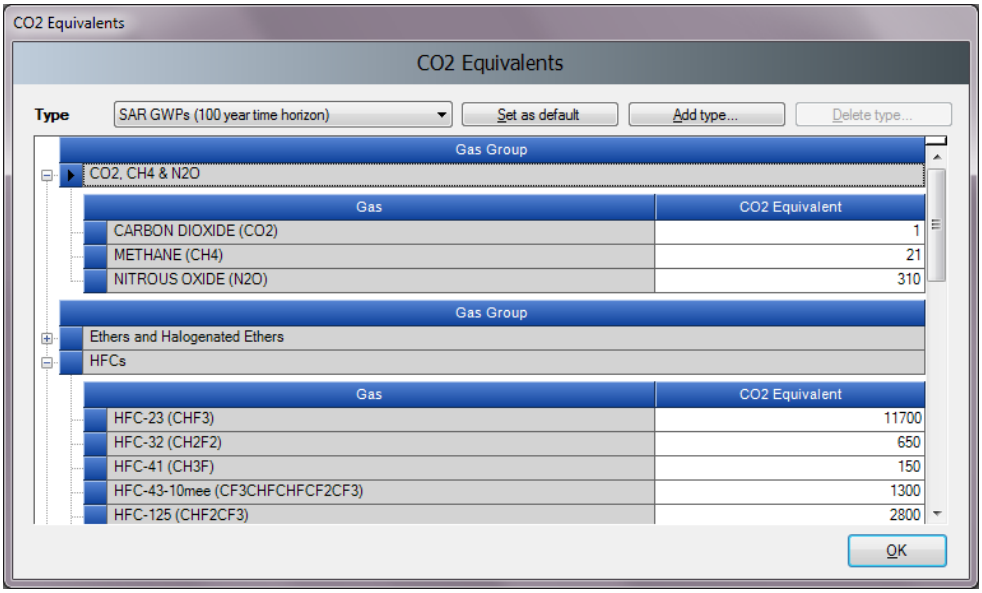


Figure 2.5 – CO_2 Equivalents

2.3.1 Fixed CO_2 Equivalent types

The **Type** list contains 3 fixed types with fixed CO_2 Equivalent values, that cannot be changed or deleted:

- SAR GWPs – these are set as default
- TAR GWPs
- AR4 GWPs

2.3.2 Adding custom CO_2 Equivalent type

To add custom **CO_2 Equivalent type**, follow the next steps:

1) Click **Add type…** button
2) Enter the unique name of the new type when asked and click OK - new custom CO_2 Equivalent type will appear within the **Type** list.
3) Use grid to go through all gases within all Gas groups and enter desired CO_2 Equivalent Values

2.3.3 Deleting custom CO_2 Equivalent type

To delete custom CO_2 Equivalent type, follow the next steps:

1) Use **Type** list to select custom CO_2 Equivalent type to be deleted
2) Click **Delete type** button and commit or cancel deletion when asked

2.3.4 Setting default CO_2 Equivalent type

To set the default CO_2 Equivalent type to be used for calculations within the whole software, follow the next steps:

1) Use **Type** list to select desired CO_2 Equivalent type
2) Click **Set as default** button to set it as default – new default CO_2 Equivalent type will be indicated in the status bar located at the bottom of the main software window.

2.4 Define users

Use *Administrate / Users* menu to access User Management system which is designated for adding new users and editing and deleting existing users in the currently open database.

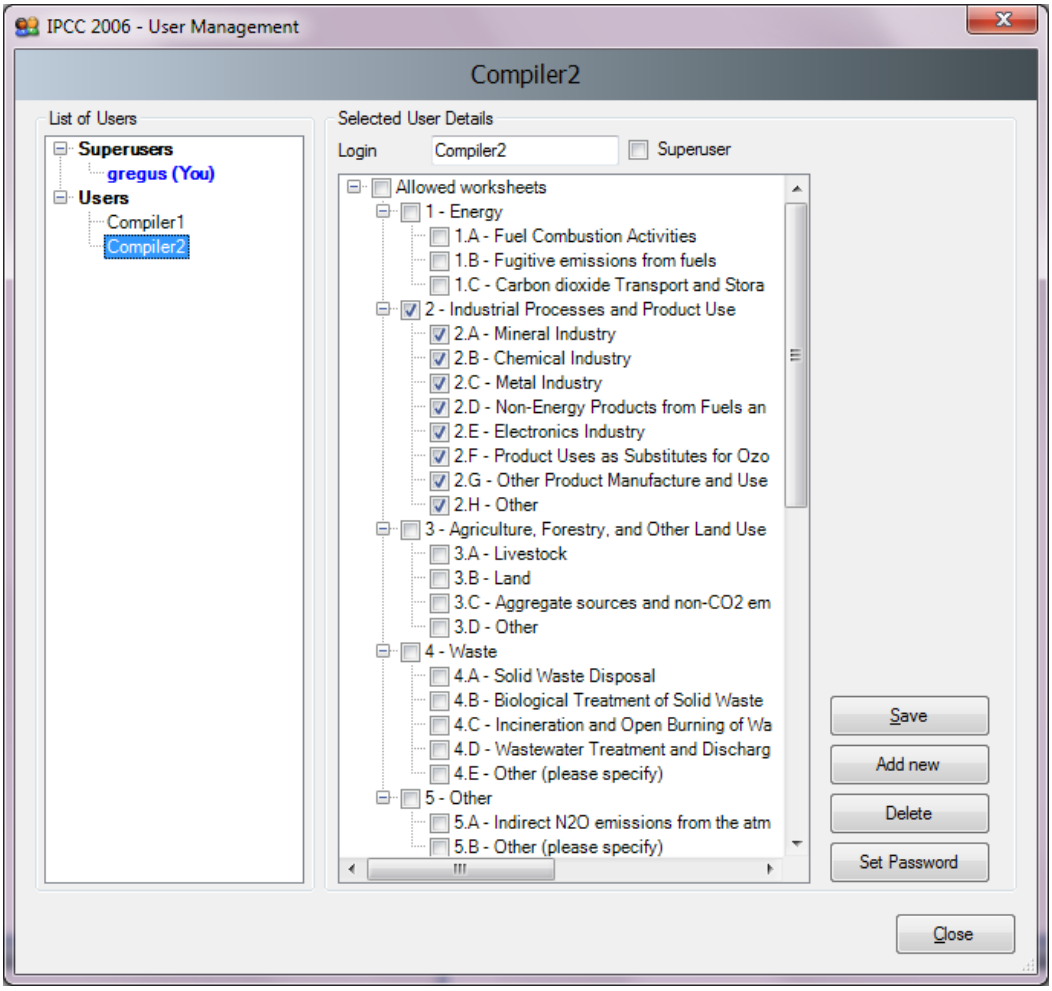


Figure 2.6 – User Management

2.4.1 List of Users

This section contains the list of all users defined in the database divided into two groups:

- **Superusers –** contains the list of all Superusers. User marked blue represents currently logged in user. Following restrictions apply for Superusers:
  - Currently logged in user is prohibited to remove itself from the Superusers group for security reasons.
  - Currently logged in user is prohibited to delete itself
  - All worksheets are allowed automatically without possibility to change the list of allowed worksheets
- **Users –** contains the list of ordinary users. Following restrictions apply:
  - Access to Administrate section of the software is prohibited
  - Can see and edit only worksheets specified as *Allowed Worksheets*

2.4.2 Selected User Details

- **Login** – represents the login name. Login name must be unique within one particular database.
- **Superuser** – defines the user as a Superuser (if checked)
- **Allowed Worksheets** – defines the list of worksheets user can see and edit (applies to ordinary users only)

2.4.3 Adding new user

Take following steps to define new user:

1) Enter the desired unique login name into the **Login** textbox
2) Use **Superuser** checkbox to define user as a Superuser (checked) or ordinary user (unchecked)
3) In case of ordinary user define **Allowed Worksheets** for the user to work with
4) Click **Set password** button to explicitly set password for new user
5) Click **Add new** button to save new user into database

2.4.4 Editing existing user

Take following steps to edit existing user:

1) Click on the desired user within **List of users**
2) Change desired user details
3) Click **Save** button to save changes into database

2.4.5 Deleting existing user

Take following steps to delete existing user:

1) Click on the desired user within **List of users**
2) Click **Delete** button to delete user
3) Commit or cancel deletion when asked

2.4.6 Resetting password of existing user

Take following steps to reset existing user's password:

1) Click on the desired user within **List of users**
2) Click **Set password** to reset password to new one
3) Enter and confirm new password when asked

2.5 Distribute database

After performing all steps described in the previous chapters, the database is ready to be used or distributed to additional inventory compilers participating on national inventory, if necessary.

2.5.1 Saving database

Use *Database / Save As…* menu to save currently open database to a new file:

1) Select destination folder and file
2) Choose whether to remove password protection (see note below)
3) Decide whether to compress (ZIP) database file (compressed database file must be uncompressed (unzipped) before opening it in the software).

NOTE: Do not remove password protection. Removing the password protection will prevent the database from opening in the software (Software strictly accepts password protected database only for security reasons).

2.5.2 Share one database vs. maintaining multiple databases

Now you can decide how you would prefer the database to be distributed. There are the following possibilities:

1) Share database file on a network drive – copy your database file created in chapter 2.5.1 to some shared folder on the network, where other inventory compilers have read/write access. This alternative is strongly recommended, because after making administrative changes, all compilers are automatically affected.
2) Send a copy of database file created in chapter 2.5.1 to each of the inventory compilers (e.g. via e-mail). Administrative changes must be performed within each copy of the database to maintain consistency across inventory compilers. This approach can easily lead to inconsistency amongst compilers and therefore is not recommended.

2.5.3 Using the software in an inventory team

The safe and simple way to share the data between users is to share one database. The following steps, 2) through 4) should be performed iteratively. Figure 2.7 shows the data-flow in an inventory team.

1) The project manager should initialize the database as described in Chapter 2.1 – 2.4.
2) The project manager provides the database (MDB file) to each user.
3) After users update the data to their database, this data should be exported as XML file (see Chapter 3.2.7).
4) The manager imports the XML file to update the database.

This will reduce the chances of losing or overwriting the data unintentionally.

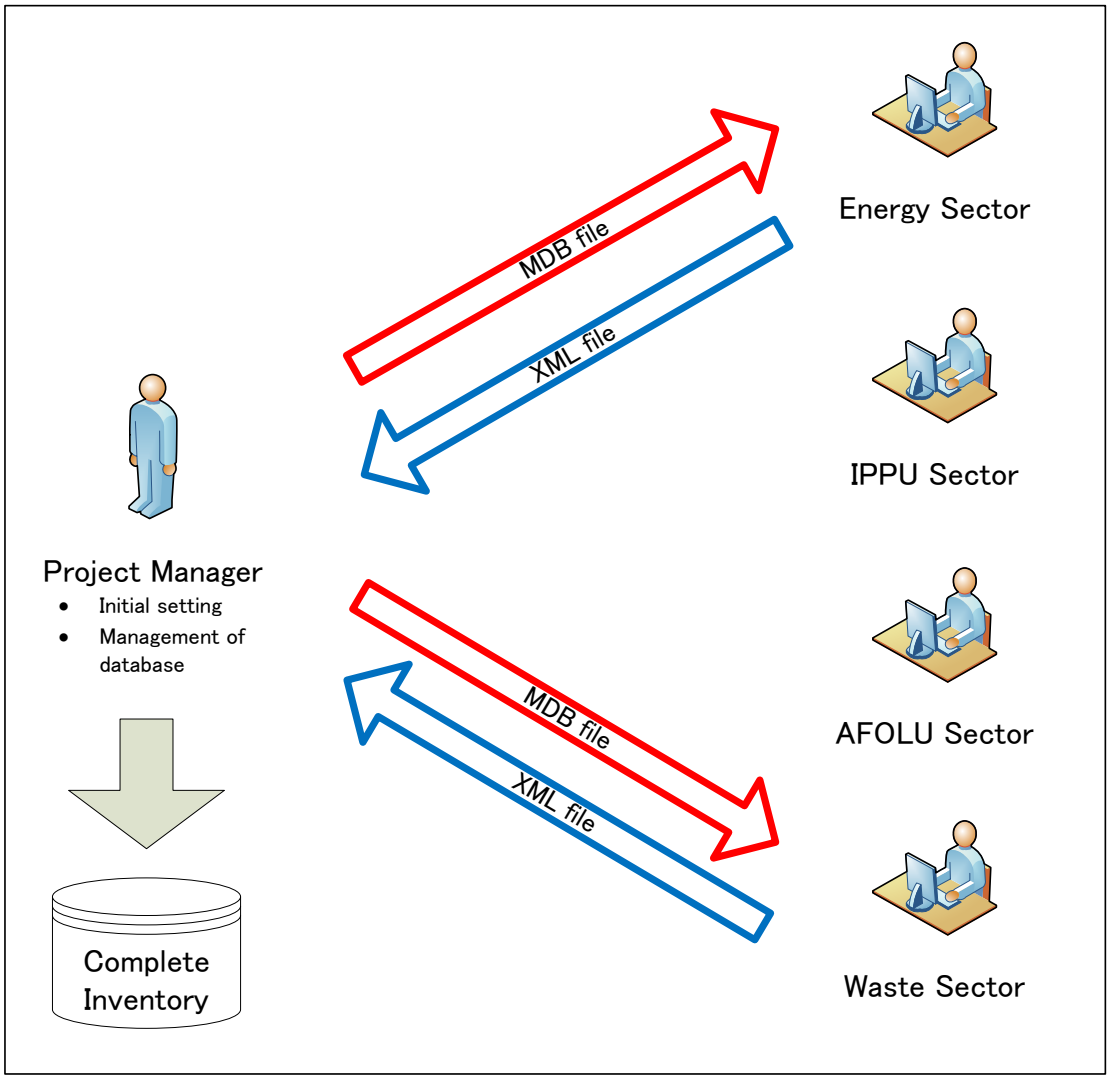


Figure 2.7 – Using the software in an inventory team

3 Working with the Software

3.1 Main window

Main window is a Multiple Document Interface window which acts as a container for all other software dialogs and windows.

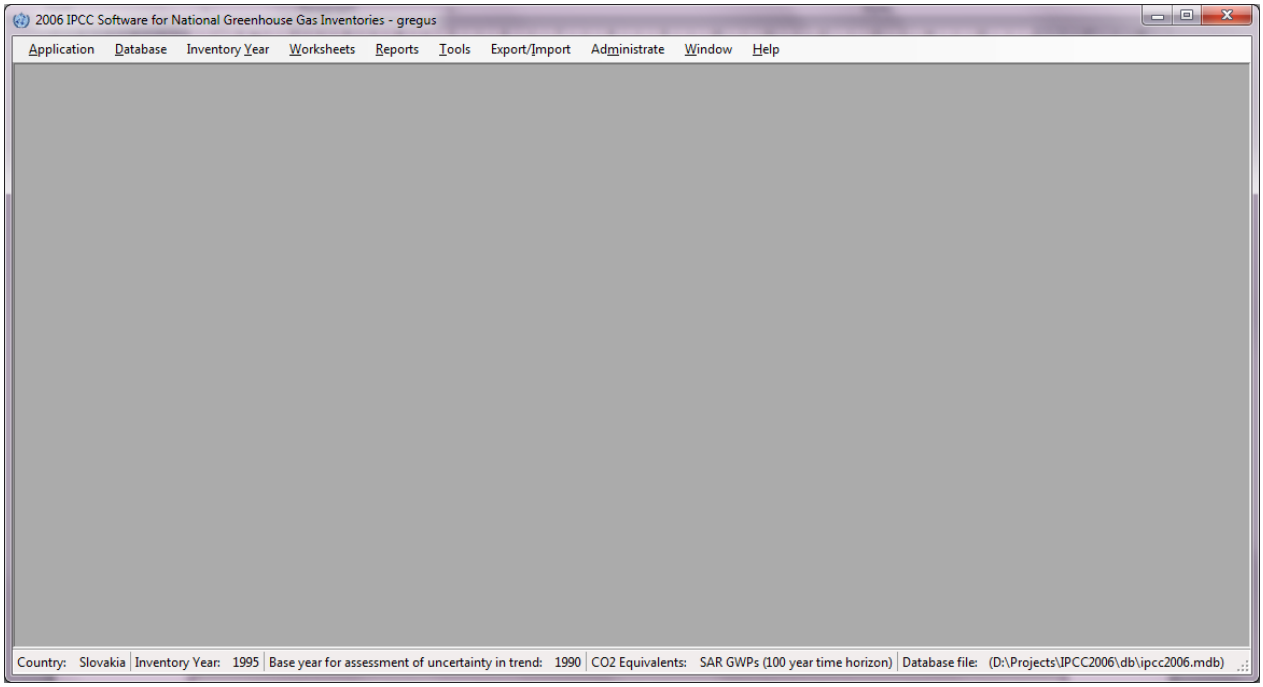


Figure 3.1 – Main window

It consists of:

- Window title – Main software title followed by the login name of currently logged in user and optionally name of the currently active child window.
- Main menu (top) – for accessing all of the software functions / modules
- Working area (center) – place where all dialogs and child windows are displayed
- Status bar (bottom) – bar that contains useful information related to currently open database, currently chosen Inventory Year, etc.

3.2 Main menu structure

3.2.1 Application menu

3.2.1.1 Preferences

This opens dialog window that allows the user to adjust preferred working area settings, like appearance of dialogs, database related preferences and backup, default number of decimal places shown in worksheets and reports, range of inventory years and coloring and other properties of grids.

General

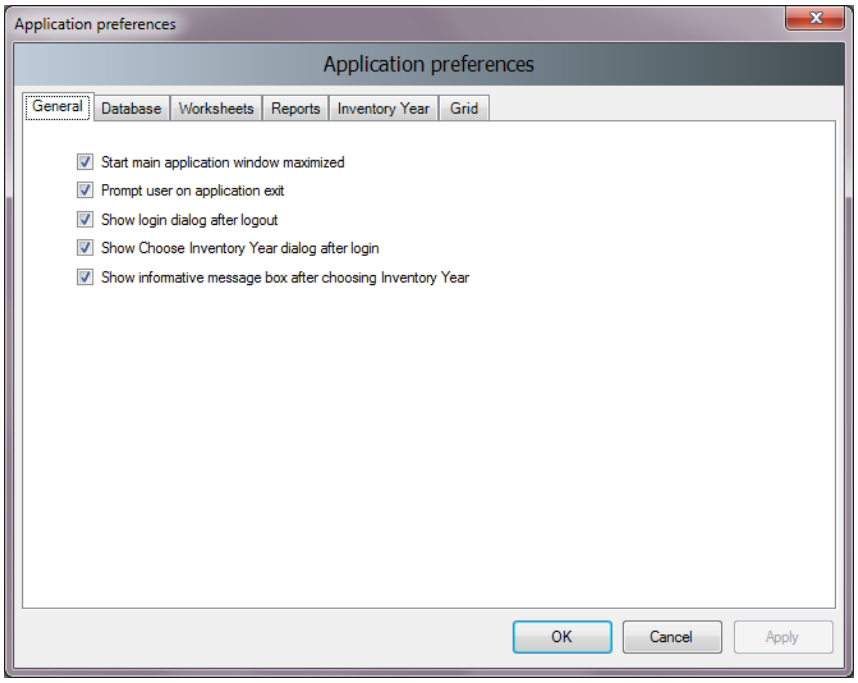


Figure 3.2 – General preferences

- **Start main application window maximized** – if checked, main application window size will be automatically scaled to fit the whole available screen after starting the software.
- **Prompt user on application exit** – if checked, user is always prompted whether to really exit application or not.
- **Show login dialog after logout** – if checked, new login dialog will appear automatically after currently logged in user logs out.
- **Show choose inventory year dialog after login** – if checked, user is prompted to choose inventory year to work with. If unchecked, previously used inventory year will be activated automatically.
- **Show informative message box after choosing Inventory Year** – if checked, user is informed of currently active inventory year after activating particular inventory year (activated automatically or by user action).

Database

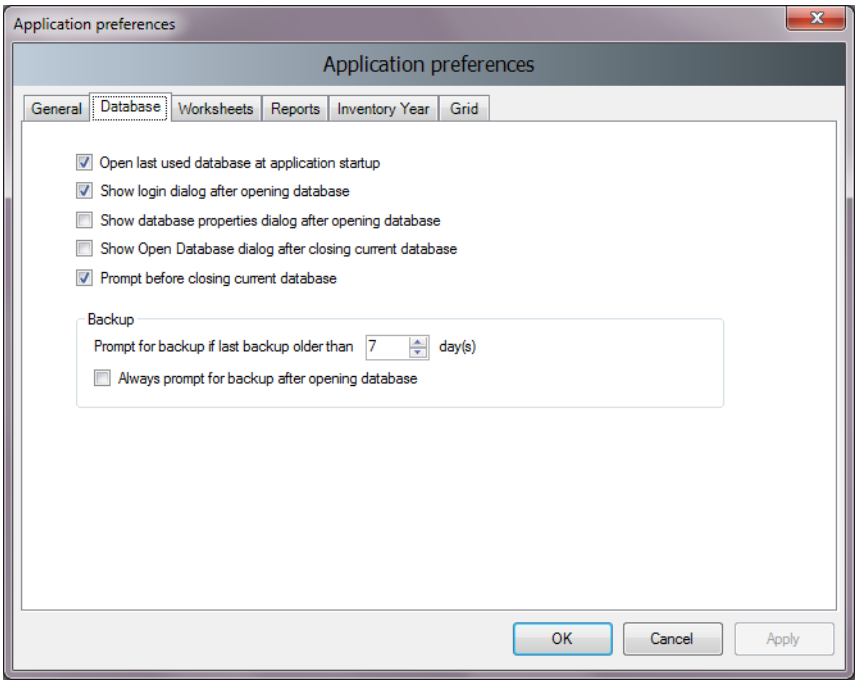


Figure 3.3 – Database preferences

- **Open last used database at application startup** – if checked, previously database will be open automatically at startup; otherwise user will have to explicitly open the desired database.
- **Show login dialog after opening database** – if checked, login dialog will be displayed automatically after opening the database file; otherwise user will have to explicitly open login dialog via menu.
- **Show database properties dialog after opening database** – if checked, dialog containing currently open database details will be shown automatically after opening database file.
- **Show Open Database dialog after closing current database** – if checked, Open Database dialog will be automatically shown after closing current database.
- **Prompt before closing current database** – if checked, user will be asked to confirm the closing of the current database; otherwise the database will be closed without warning.
- **Prompt for backup if last backup older than N day(s)** – user is automatically asked to make a backup of the database if last backup is older than N day(s).
- **Always prompt for backup after opening database** – if checked, user is asked to make a backup of the database every time the database is open, no matter how old the last backup.

Worksheets

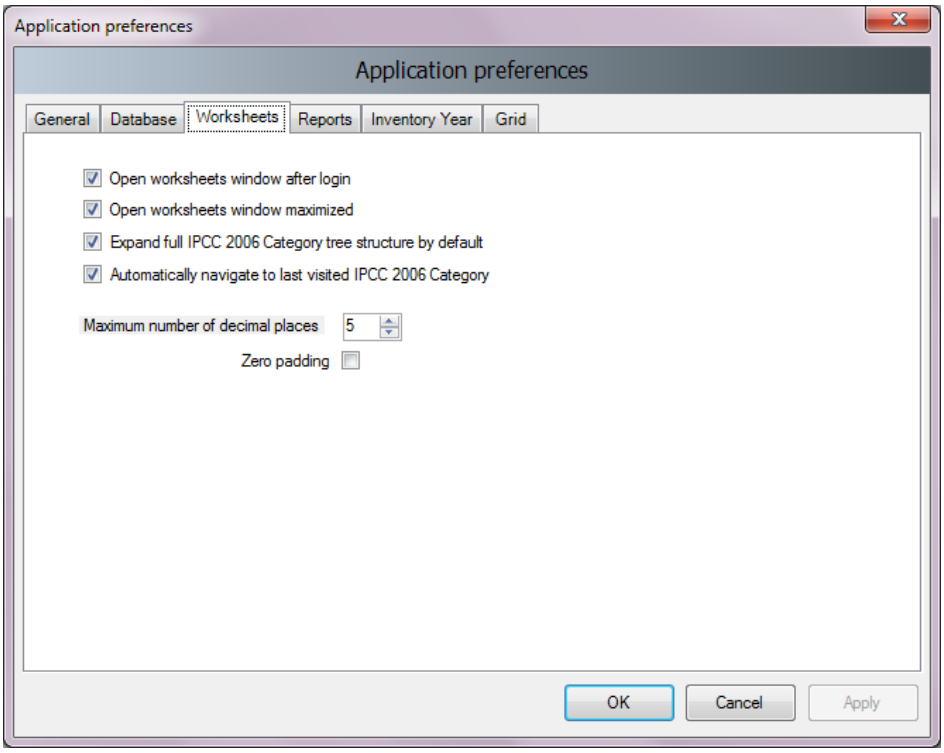


Figure 3.4 – Worksheet preferences

- **Open worksheets window after login** – if checked, window containing worksheets will be automatically open after user logs in; otherwise user will have to open worksheets window via menu.
- **Open worksheets window maximized** – if checked, worksheets window will automatically scale to fit main application window.
- **Expand full IPCC 2006 category structure by default** – if checked, tree containing 2006 IPCC hierarchy will be expanded automatically to show the whole hierarchy; otherwise only main sectors will be shown initially.
- **Automatically navigate to last visited IPCC 2006 Category** – if checked, last visited IPCC category will be automatically selected upon opening the Worksheet window.
- **Maximum numbers of decimal places** – defines maximum numbers of decimal places for numbers to be displayed in calculation sheets (worksheet grids).
- **Zero padding** – if checked all decimal numbers in grids will be zero-aligned.
  E.g. 0.1 will become 0.10000 - padded with zeros up to the maximum number of decimal places – 5 in this case.

Reports

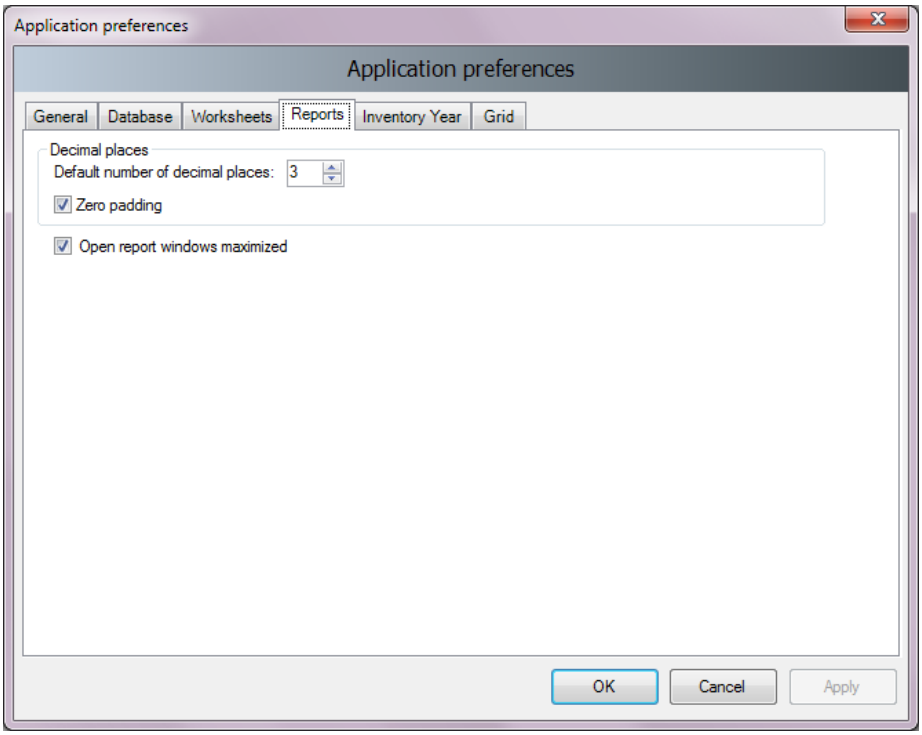


Figure 3.5 – Reports preferences

- **Default number of decimal places** – numbers in reports will be automatically rounded according to defined number of decimal places here.
- **Zero padding** – if checked all decimal numbers in grids will be zero-aligned.
  E.g. 0.1 will become 0.100 - padded with zeros up to the maximum number of decimal places – 3 in this case
- **Open report windows maximized** - if checked, reporting windows will automatically scale to fit main application window.

Inventory Year

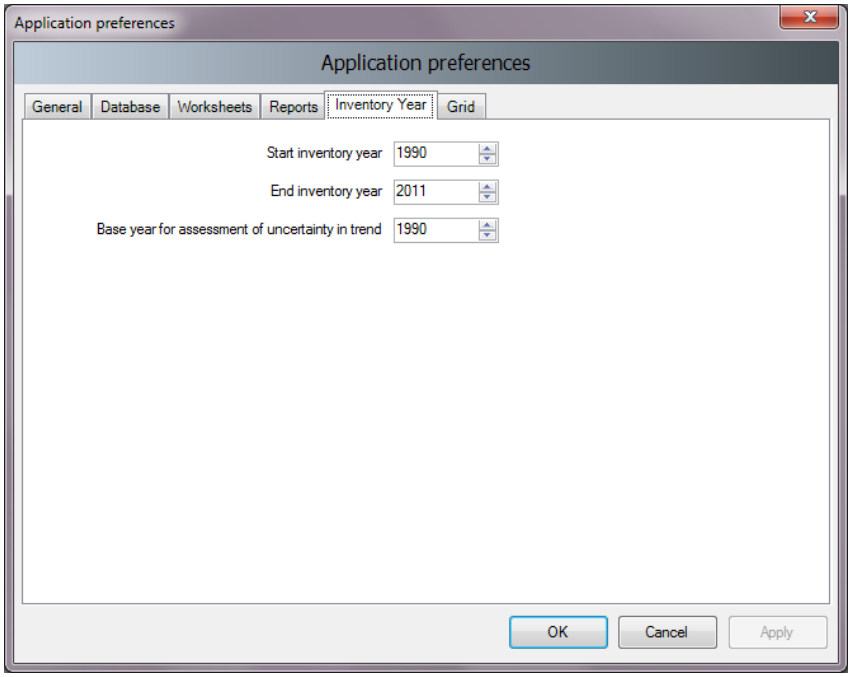


Figure 3.6 – Inventory Year preferences

- **Start inventory year** – defines starting inventory year. Default is 1990.
- **End inventory year** – defines ending inventory year. Default is current year.
- **Base Year for assessment of uncertainty in trend** – defines base year used in Uncertainty Analysis. Default is 1990.

Grid

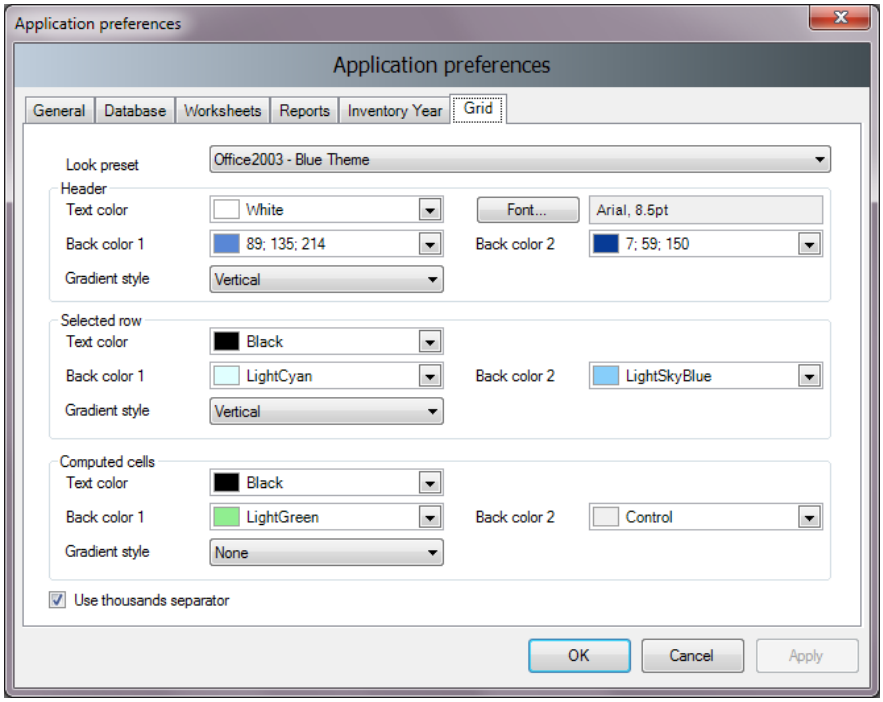


Figure 3.7 – Grid

- **Look preset** – provides the user with the set of standard predefined look presets to choose from
- **Header** - defines the look of the grid header
- **Selected row** – defines the look of the selected grid row
- **Computed cells** – defines the look of grid cells that are computed (calculated)
- **Use thousands separator** – if checked, thousand separator will be used to separate thousands in all numbers in grids. Thousands separator follows the operating system's Control Panel / Regional Settings.

3.2.1.2 Language

This allows the user to switch between different languages. Default language is English. Supplementary software called **Translation Editor** (which is included in setup) can be used to define other languages and translate texts.

3.2.1.3 Exit

Exits the software.

3.2.2 Database menu

3.2.2.1 Open/Close Database

If database is open, use this menu item to close the current database. Current logged- in user will be logged out automatically. All database related functions and modules of the software will become disabled.

If database is closed use this menu item to browse for and open new database. All database related functions will become available again after valid user logs in.

Automatic database upgrade
Starting from version 2.10 software supports automatic conversion of databases coming from the previous versions of the software (versions 2.00 and later are supported). This means users can comfortably use their existing databases from previous versions without putting any extra effort to transfer existing data. When database from older version of the software is open in new version of the software user will be prompted to start automatic database conversion. After database is successfully converted it will become fully compatible with the new version of the software.

3.2.2.2 Save as

This menu item allows the user to save database under a different file name to a different location. It is possible to compress (ZIP) saved database file to save space. This opens the possibility to maintain several independent versions of the database. Database is password protected, however it is possible to remove password protection during saving. Database with password protection removed cannot be opened by the software.

3.2.2.3 Properties

This menu item can be used to display dialog window containing properties of the currently open database.

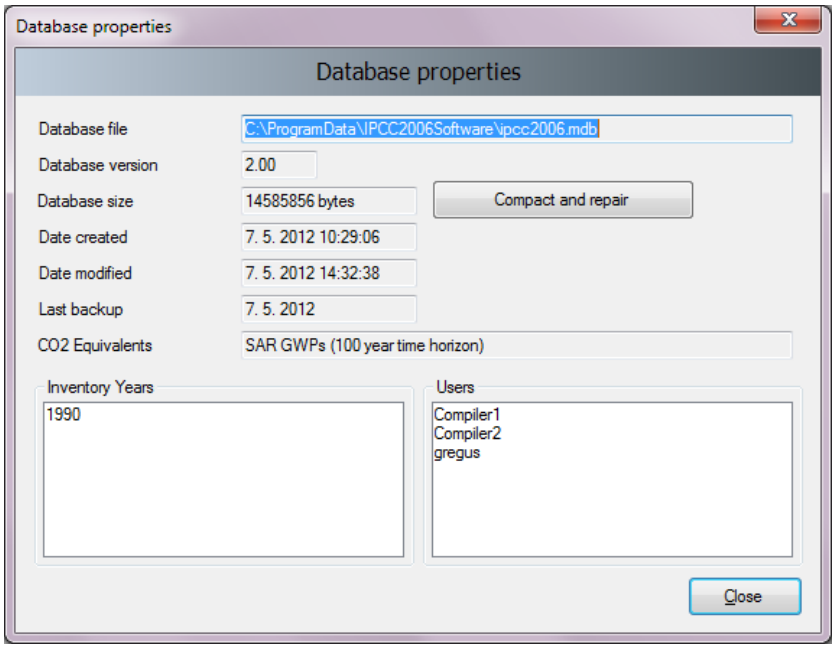


Figure 3.8 – Database properties

Following information is available:

- **Database file** – full path to currently open database file (MDB)
- **Database version** – version of the database file
- **Database size** – size of the database file in bytes
- **Date created** – the date when the database was created
- **Date modified** – the date of the last modification of data in the database
- **Last backup** – the date of the last database backup
- **CO2 Equivalents** – currently selected GWP type. GWP types can be managed using the *Administrate / CO2 Equivalents* menu.
- **Inventory Years** – the list of inventory years in the currently open database
- **Users** – the list of defined users in the currently open database

Button **Compact & Repair** can be used to compact (to reduce size on disk) or repair the database file (in case it is corrupted).

3.2.2.4 Logout

This menu item logs out currently logged in user.

3.2.3 Inventory Year menu

This menu allows the user to choose current inventory year as well as to create new inventory year.

3.2.3.1 Choosing Inventory Year

Click *Choose…* menu item to display the following dialog box.

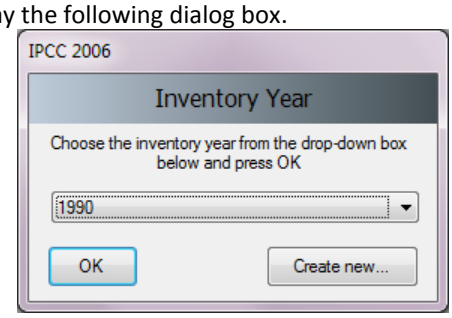


Figure 3.9 – Choose Inventory Year

After choosing the desired Inventory Year and pressing the OK button, all related software modules will update their current information and data corresponding to new Inventory Year.

3.2.3.2 Creating new Inventory Year

Click *Create new…* menu item to display the following dialog box.

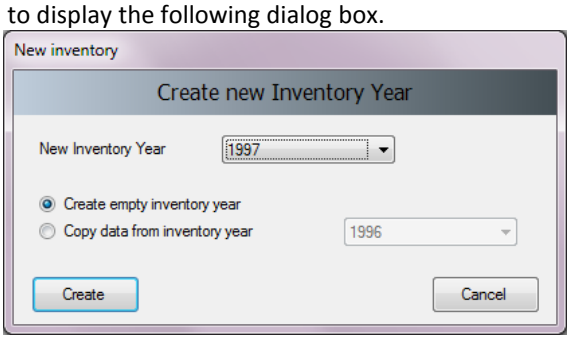


Figure 3.10 – Create new Inventory Year

Take the following steps to create new Inventory Year:

1) Choose available Inventory Year from the **New Inventory Year** list. The list does not contain years that were already created and interval is from **Start inventory year** to **End inventory year** as defined in *Application / Preferences / Inventory year* tab.
2) Decide whether to create empty inventory year or copy of existing inventory year using the appropriate radio button.
3) In case of copy, choose the source inventory year from the corresponding list of available inventory years.
4) Click **Create** button to create new inventory year. After creating new year it will be automatically set as current Inventory Year.

3.2.3.3 Efficient data entry using Inventory Year menu

The efficient and optimal way to enter data is:

1) Complete inventory for one basic year at first
2) Create additional years by copying data (see 3.2.3.2) from existing year containing completed inventory which created in Step 1
3) Use **time series data entry** to make adjustments to data across years

3.2.4 Worksheets menu

This menu item opens the Worksheets window containing worksheets as defined in *2006 IPCC Guidelines*[1]. See Chapter 3.3 for detailed information.

3.2.5 Reports menu

This menu item allows the user to calculate *2006 IPCC Guidelines* Reporting Tables. The reporting tables include the possibility to select number of decimal places of the emissions reported, the possibility to write and save text into documentation box of the report as well as function to export tables to Excel.

3.2.5.1 Summary table

This report displays all Greenhouse Gas emissions divided into *2006 IPCC Guidelines* Categories (up to level 3). The values are calculated from sectoral tables.

	Emissions (Gg)			Emissions CO2 Equivalents (Gg)				Emissions (Gg)				
Categories	Net CO2 (1)(2)	CH4	N2O	HFCs	PFCs	SF6	Other halogenated gases with CO2 equivalent conversion factors (3)	Other halogenated gases without CO2 equivalent conversion factors (4)	NOx	CO	NMVOCs	SO2
Total National Emissions and Removals	69927.972	1164.117	2.618	76124.414	204420.180	1034650.380	0.000	0.007	0.034	0.991	0.000	0.000
1 - Energy	54909.952	1507.496	58.274	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1.A - Fuel Combustion Activities	53217.218	12.049	2.214	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1.A.1 - Energy Industries	32955.271	0.479	0.481						0.000	0.000	0.000	0.000
1.A.2 - Manufacturing Industries and Construction	3516.442	1.203	0.160						0.000	0.000	0.000	0.000
1.A.3 - Transport	16745.506	10.367	1.573						0.000	0.000	0.000	0.000
1.A.4 - Other Sectors	0.000	0.000	0.000						0.000	0.000	0.000	0.000

Figure 3.11 – Example of Summary Table

3.2.5.2 Short Summary table

This reporting table displays all Greenhouse Gas emissions divided into *2006 IPCC Guidelines* Sub-sectors (up to level 2). The values are aggregated from Summary table.

	Emissions (Gg)			Emissions CO2 Equivalents (Gg)				Emissions (Gg)				
Categories	Net CO2 (1)(2)	CH4	N2O	HFCs	PFCs	SF6	Other halogenated gases with CO2 equivalent conversion factors (3)	Other halogenated gases without CO2 equivalent conversion factors (4)	NOx	CO	NMVOCs	SO2
Total National Emissions and Removals	69927.972	1164.117	2.618	76124.414	204420.180	1034650.380	0.000	0.007	0.034	0.991	0.000	0.000
1 - Energy	54909.952	1507.496	58.274	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1.A - Fuel Combustion Activities	53217.218	12.049	2.214						0.000	0.000	0.000	0.000
1.B - Fugitive emissions from fuels	1012.734	1495.447	56.060						0.000	0.000	0.000	0.000
1.C - Carbon dioxide Transport and Storage	680.000								0.000	0.000	0.000	0.000
2 - Industrial Processes and Product Use	2329.659	0.536	1390.625	76124.414	204420.180	1034650.380	0.000	0.007	0.000	0.000	0.000	0.000
2.A - Mineral Industry	7.809								0.000	0.000	0.000	0.000
2.B - Chemical Industry	53.215	0.221	0.740	49.134	0.000	0.000		0.007	0.000	0.000	0.000	0.000

Figure 3.12 – Example of Short summary table

3.2.5.3 Sectoral tables

This set of reporting tables is available for each sector and displays Greenhouse Gas emissions divided into detailed *2006 IPCC Guidelines* categorization (up to the most disaggregated level). The values are taken from the Background tables. Energy sectoral table contains additional functionality regarding **Precursors (NOx, CO, NMVOCs, SO2)**. These can be manually edited here.

	Emissions (Gg)						
Categories	CO2	CH4	N2O	NOx	CO	NMVOCs	SO2
1 - Energy	54909.952	1507.496	58.274	0.000	0.000	0.000	0.000
1.A - Fuel Combustion Activities	53217.218	12.049	2.214	0.000	0.000	0.000	0.000
1.A.1 - Energy Industries	32955.271	0.479	0.481	0.000	0.000	0.000	0.000
1.A.1.a - Main Activity Electricity and Heat Production	30202.577	0.360	0.457	0.000	0.000	0.000	0.000
1.A.1.a.i - Electricity Generation	27273.761	0.329	0.410	0.000	0.000	0.000	0.000
1.A.1.a.ii - Combined Heat and Power Generation (CHP)	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1.A.1.a.iii - Heat Plants	2928.816	0.031	0.046	0.000	0.000	0.000	0.000
1.A.1.b - Petroleum Refining	2752.694	0.119	0.024	0.000	0.000	0.000	0.000
1.A.1.c - Manufacture of Solid Fuels and Other Energy Industries	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1.A.1.c.i - Manufacture of Solid Fuels	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Figure 3.13 – Example of Energy Sectoral Table

[1] 2006 IPCC Guidelines for the National Greenhouse Gas Inventories

3.2.5.4 Background tables

This set of reporting tables displays activity rates, fuel types (if applicable) and Greenhouse Gas emissions divided into detailed *2006 IPCC Guidelines* categorization (up to the most disaggregated level). The values are taken from the Worksheets. There is a special **Reporting Table 1.4b** for category **1.C CO_2 transport and storage** which is editable.

Table 1.1 Energy Background Table: 1.A.1 - 1.A.2 | Table 1.2 Energy Background Table: 1.A.3 - 1.A.5 | Table 1.3 Energy Background Table: 1.B | Table 1.4b Energy Background Table: 1.C - Overview | Table 1.5 Energy Ba

IPCC 2006 Categories	Activity (TJ)						Emissions Solid (Gg)			Emissions Liquid (Gg)			Emissions Gas (Gg)	
	Solid	Liquid	Gas	Other Fossil Fuels	Peat	Biomass	CO2	CH4	N2O	CO2	CH4	N2O	CO2	CH4
1.A - Fuel Combustion Activities	327586.000	310685.000	0.000	40100.000	0.000	94950.000	28573.002	0.295	0.444	21127.775	10.552	1.610	0.000	0.000
1.A.1 - Energy Industries	299386.000	61550.000	0.000	0.000	0.000	94950.000	28573.002	0.295	0.444	4382.269	0.185	0.037	0.000	0.000
1.A.1.a - Main Activity Electricity and Heat Production	299386.000	21850.000	0.000	0.000	0.000	94950.000	28573.002	0.295	0.444	1629.575	0.066	0.013	0.000	0.000
1.A.1.a.i - Electricity Generation	268426.000	21850.000	0.000	0.000	0.000	0.000	25644.186	0.264	0.397	1629.575	0.066	0.013	0.000	0.000
1.A.1.a.ii - Combined Heat and Power Generation (CHP)	0.000	0.000	0.000	0.000	0.000	94950.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1.A.1.a.iii - Heat Plants	30960.000	0.000	0.000	0.000	0.000	0.000	2928.816	0.031	0.046	0.000	0.000	0.000	0.000	0.000
1.A.1.b - Petroleum Refining	0.000	39700.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2752.694	0.119	0.024	0.000	0.000

Figure 3.14 – Example of Energy Background Table 1.1

3.2.5.5 Reporting Table 7a – Uncertainties

This Reporting Table is an aggregated version of Uncertainty Analysis Table 3.2. The list of aggregated categories is based on Table 4.1 of Volume 1, Chapter 4 of *2006 IPCC Guidelines*. Uncertainties from disaggregated levels are combined by multiplication according to Equation 3.1 of Volume 1, Chapter 3 of *2006 IPCC Guidelines*.

Reporting Table 7a - Uncertainties

Base Year 1990 Year T 1994

IPCC 2006 Categories	Gas	Base Year emissions or removals (Gg CO2 equivalent)	Year T emissions or removals (Gg CO2 equivalent)	Activity Data Uncertainty (%)	Emission Factor Uncertainty (%)	Combined Uncertainty (%)	Contribution to Variance by Category in Year T	Inventory trend in national emissions for year t increase with respect to base year (% of base year)
1 - Energy								
1.A.1 - Energy Industries - Liquid Fuels	CO2	4382.269	3387.944	7.071	8.678	11.194	0.000	77.310
	CH4	3.878	3.021	7.071	323.555	323.632	0.000	77.904
	N2O	11.448	8.919	7.071	323.555	323.632	0.000	77.904
1.A.1 - Energy Industries - Solid Fuels	CH4	6.192	6.468	7.071	200.062	200.187	0.000	104.468
	N2O	137.541	157.296	7.071	222.278	222.391	0.000	114.363
1.A.1 - Energy Industries - Biomass	CH4	197.889	0.000	5.000	5.000	7.071	0.000	0.000
	N2O	80.743	0.000	5.000	5.000	7.071	0.000	0.000
1.A.1 - Energy Industries - Solid Fuels	CO2	2928.816	0.000	5.000	5.000	7.071	0.000	0.000

Figure 3.15 – Example of Reporting Table 7a - Uncertainties

3.2.6 Tools

3.2.6.1 Uncertainty Analysis

This menu item allows creating uncertainty Reporting Table 3.2 as defined in the *2006 IPCC Guidelines*. The values are entered in each Worksheet. User should enter uncertainty values for every activity and Emission Factor. Default uncertainty values are applied when the user does not enter any uncertainty values.

There is no limit and no check for uncertainty range, i.e. it is the responsibility of the user to define the appropriate values. Default uncertainty values presented in the *2006 IPCC Guidelines* for almost all the default EFs and AD are preloaded as default upper and lower limits.

The procedure of calculation uncertainty in Table 3.2 is explained on page 3.29 of Chapter 3 in Volume 1 of the *2006 IPCC Guidelines*. More information on how to enter Uncertainties within each type of worksheet can be found in Chapter 3.3 of this document.

To perform Uncertainty Analysis, click the **Refresh Data** button.

Uncertainty Analysis - Approach 1 (Table 3.2)

Base year for assessment of uncertainty in trend 1990 Year T 1994

A	B	C	D	E	F	G
IPCC 2006 Categories	Gas	Base Year emissions or removals (Gg CO2 equivalent)	Year T emissions or removals (Gg CO2 equivalent)	Activity Data Uncertainty (%)	Emission Factor Uncertainty (%)	Combined Uncertainty (%)
1.A - Fuel Combustion Activities						
1.A.1.a.i - Electricity Generation - Liquid Fuels	CO2	1193.979	635.250	5.000	6.136	7.915
	CH4	1.461	0.520	5.000	228.788	228.843
	N2O	4.314	1.535	5.000	228.788	228.843
1.A.1.a.i - Electricity Generation - Solid Fuels	CO2	18345.840	29743.850	5.000	12.412	13.381
	CH4	3.891	6.468	5.000	200.000	200.062
	N2O	88.937	157.296	5.000	222.222	222.278

Number of decimal places 3 Zero padding Refresh Data Export to Excel

Figure 3.16 – Example of Ucertainty Analysis table

3.2.6.2 Reference Approach

The Reference Approach is a top-down approach, using a country's energy supply data to calculate the emissions of CO_2 from combustion of mainly fossil fuels. The Reference Approach is a straightforward method that can be applied on the basis of relatively easily available energy supply statistics.

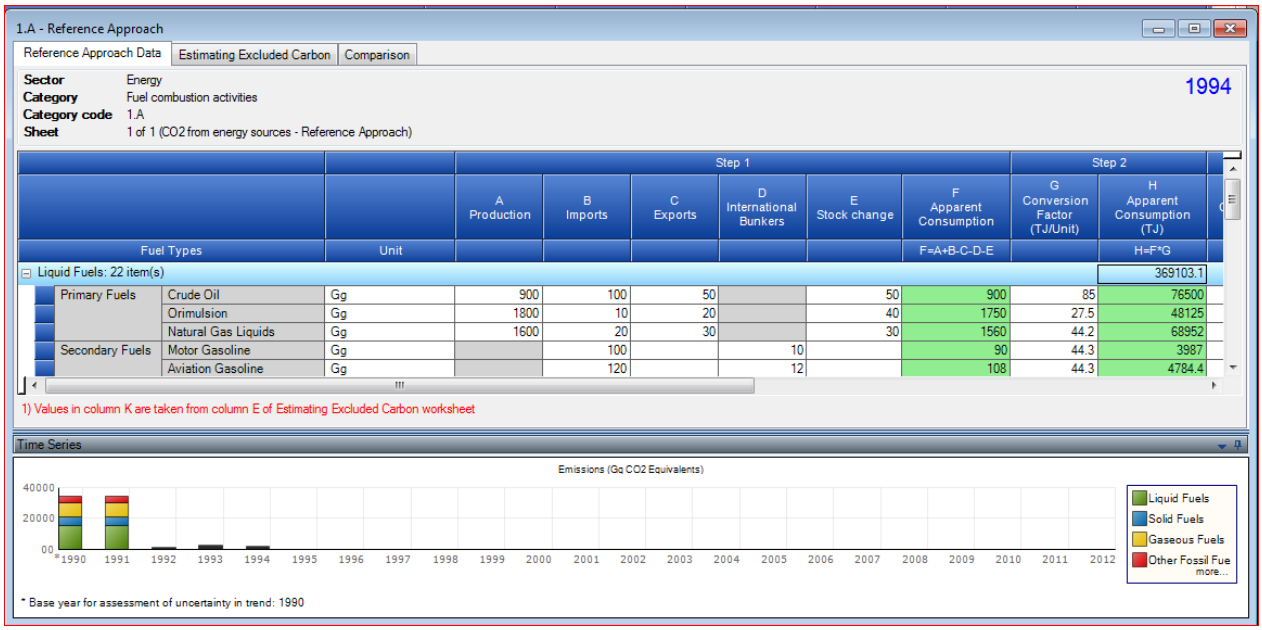
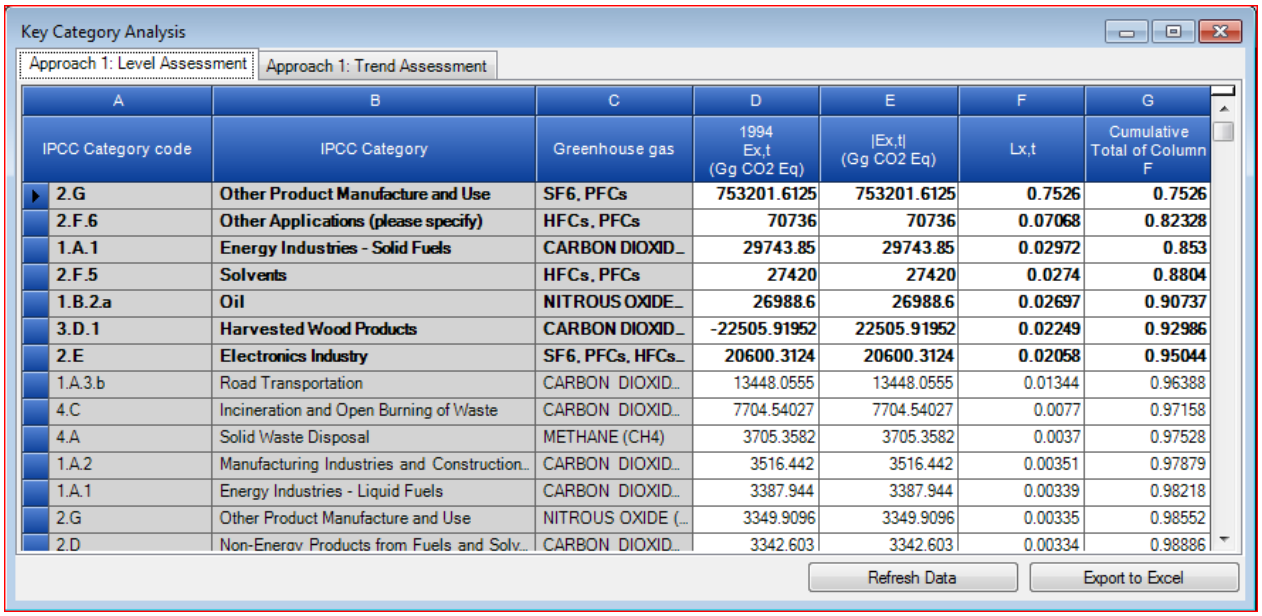


Figure 3.17 – Example of Reference Approcah table

3.2.6.3 Key Category Analysis

It is *good practice* for each country to identify its national *key categories* in a systematic and objective manner, by performing a quantitative analysis of the relationships between the level and the trend of each category's emissions and removals and total national emissions and removals. Two Approaches for performing the key category analysis have been developed. Both Approaches identify *key categories* in terms of their contribution to the absolute level of national emissions and removals and to the trend of emissions and removals. The methods are described in Chapter 4.3, Volume 1 of *2006 IPCC Guidelines*. To perform Key Category Analysis, click the **Refresh Data** button.



A	B	C	D	E	F	G
IPCC Category code	IPCC Category	Greenhouse gas	1994 Ex,t (Gg CO2 Eq)	|Ex,t| (Gg CO2 Eq)	Lx,t	Cumulative Total of Column F
2.G	**Other Product Manufacture and Use**	**SF6, PFCs**	**753201.6125**	**753201.6125**	**0.7526**	**0.7526**
2.F.6	**Other Applications (please specify)**	**HFCs, PFCs**	**70736**	**70736**	**0.07068**	**0.82328**
1.A.1	**Energy Industries - Solid Fuels**	**CARBON DIOXID...**	**29743.85**	**29743.85**	**0.02972**	**0.853**
2.F.5	**Solvents**	**HFCs, PFCs**	**27420**	**27420**	**0.0274**	**0.8804**
1.B.2.a	**Oil**	**NITROUS OXIDE...**	**26988.6**	**26988.6**	**0.02697**	**0.90737**
3.D.1	**Harvested Wood Products**	**CARBON DIOXID...**	**-22505.91952**	**22505.91952**	**0.02249**	**0.92986**
2.E	**Electronics Industry**	**SF6, PFCs, HFCs...**	**20600.3124**	**20600.3124**	**0.02058**	**0.95044**
1.A.3.b	Road Transportation	CARBON DIOXID...	13448.0555	13448.0555	0.01344	0.96388
4.C	Incineration and Open Burning of Waste	CARBON DIOXID...	7704.54027	7704.54027	0.0077	0.97158
4.A	Solid Waste Disposal	METHANE (CH4)	3705.3582	3705.3582	0.0037	0.97528
1.A.2	Manufacturing Industries and Construction...	CARBON DIOXID...	3516.442	3516.442	0.00351	0.97879
1.A.1	Energy Industries - Liquid Fuels	CARBON DIOXID...	3387.944	3387.944	0.00339	0.98218
2.G	Other Product Manufacture and Use	NITROUS OXIDE (...	3349.9096	3349.9096	0.00335	0.98552
2.D	Non-Energy Products from Fuels and Solv...	CARBON DIOXID...	3342.603	3342.603	0.00334	0.98886

Figure 3.18 – Key Category Analysis

3.2.7 Export/Import

3.2.7.1 Export Worksheet Data

This menu item opens dialog box that allows selecting and exporting part of the current inventory year, i.e. one or more sectors, sub-sectors or categories into an XML file.

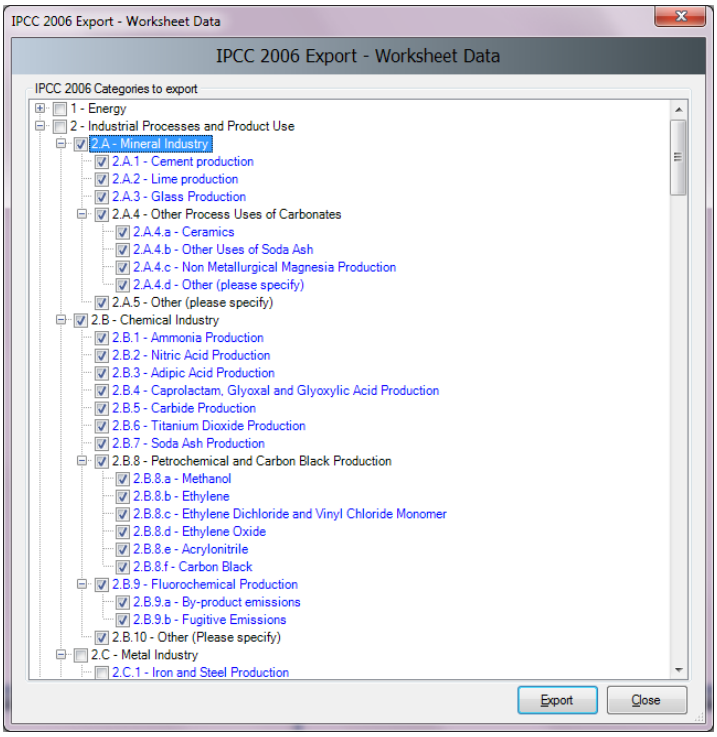


Figure 3.19 – Exporting worksheet data

Take the following steps to export part of an inventory year:

1) Select one or more category of interest. Categories containing worksheets (data) are marked blue.

2) Click the **Export** button and supply the destination XML file when asked.

3.2.7.2 Export CO_2 Equivalents

This menu item opens dialog box that allows exporting of custom (not fixed) CO_2 Equivalents into an XML file. The structure of hierarchy is: *Custom CO_2 Equivalent Type / Gas groups / Gases*.

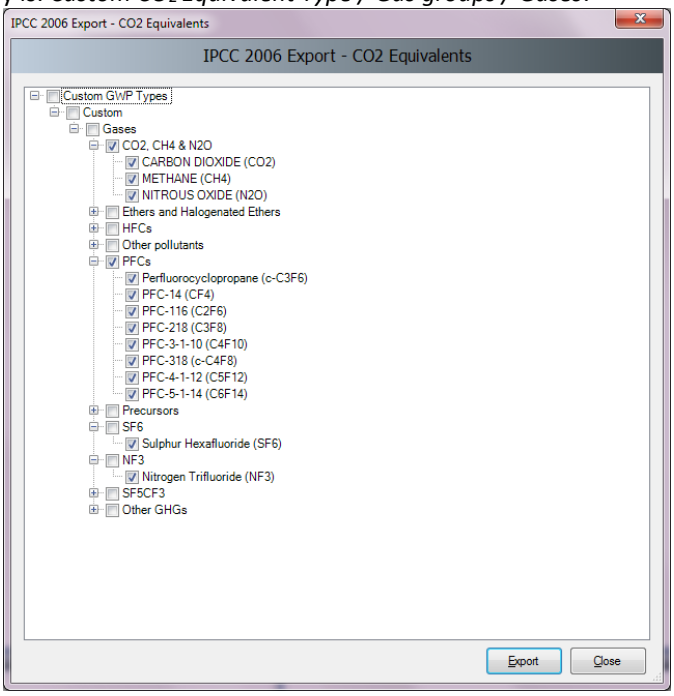


Figure 3.20 – Exporing custom CO_2 Equivalents

Take the following steps to export custom CO_2 Equivalents:

1) Select the desired Custom GWP type of interest or just the particular Gases within gas groups.
2) Click the **Export** button and supply the destination XML file when asked.

3.2.7.3 Export F-Gases data

This menu item opens the dialog box that allows exporting of F-Gases country specific data (year of introduction, etc.) into an XML file. The structure of hierarchy is: *Region / Country / Gas group / Gases*. Currently active country (as indicated in the status bar of the main software window) is automatically preselected.

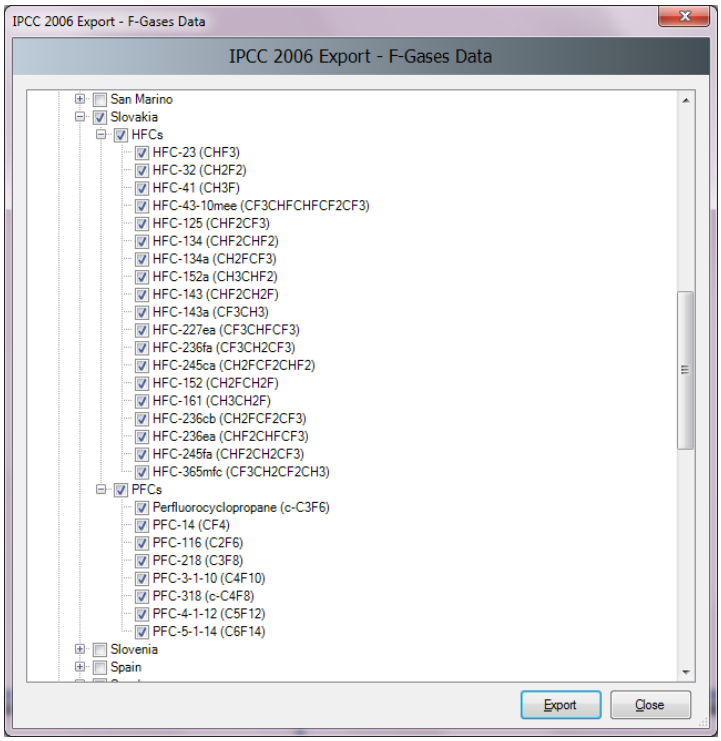


Figure 3.21 – Exporting F-Gases data

Take the following steps to export F-Gases data:

1) Select one or more countries of interest to export all F-Gases data or just select the particular F-Gases of interest.
2) Click the **Export** button and supply the destination XML file when asked.

3.2.7.4 Export NAI Reporting Tables

This menu item opens the window that allows calculating and exporting of the national communication table for Parties not included in Annex I to the Convention. Annex 1 to this user manual contains the details on mapping of the emission estimations based on 2006 IPCC Guidelines to the NAI reporting tables in the software.

Greenhouse gas source and sink categories	CO2 Emissions (Gg)	CO2 Removals (Gg)	CH4 (Gg)	N2O (Gg)	CO Gg	NOx (Gg)	NMVOCs (Gg)	SOx (Gg)
Total National Emissions and Removals	69927.972		1164.117	2.618	0.991	0.034	0.000	0.000
1 - Energy	54909.952		1507.496	58.274	0.000	0.000	0.000	0.000
1A - Fuel Combustion Activities	53217.218		12.049	2.214	0.000	0.000	0.000	0.000
1A1 - Energy Industries	32955.271		0.479	0.481	0.000	0.000	0.000	0.000
1A2 - Manufacturing Industries and Construction (ISIC)	3516.442		1.203	0.160	0.000	0.000	0.000	0.000
1A3 - Transport	16745.506		10.367	1.573	0.000	0.000	0.000	0.000
1A4 - Other Sectors	0.000		0.000	0.000	0.000	0.000	0.000	0.000
1A5 - Other	0.000		0.000	0.000	0.000	0.000	0.000	0.000

Figure 3.22 – Example of NAI Reporting Table

3.2.7.5 Import Worksheet Data

This menu item opens the dialog window that allows importing an XML file containing a part of an inventory, i.e. one or more sectors, sub-sectors or categories into the currently open database and currently chosen Inventory Year.

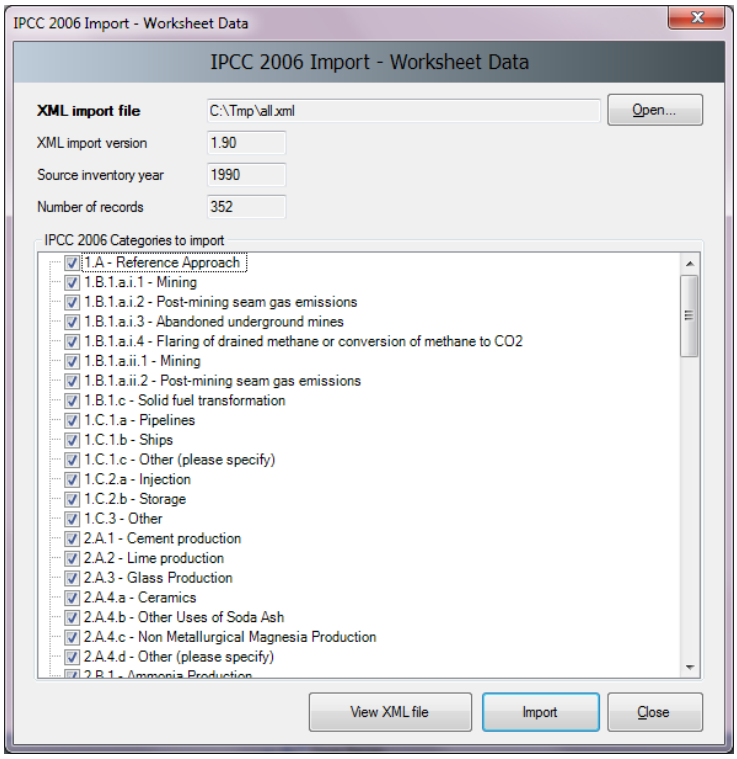


Figure 3.23 – Importing Worksheet Data

Take the following steps to import worksheet data:

1) Click the **Open** button to browse for XML file to be imported.
2) Check the details such as **XML Import Version**, **Source inventory year**, **Number of records** and decide whether this import file suits your needs.
3) Section **Categories to import** contains the list of all categories included in the source XML file. Select the categories of interest to be imported. All categories are selected by default.
4) Click the **Import** button to begin import. Progress bar will be shown to indicate the progress of import.

TIP: Button **Vie XML file** can be used to display the contents of the source XML file in Internet browser.

3.2.7.6 Import CO_2 Equivalents

This menu item opens the dialog window that allows importing of custom CO_2 Equivalents from an XML file.

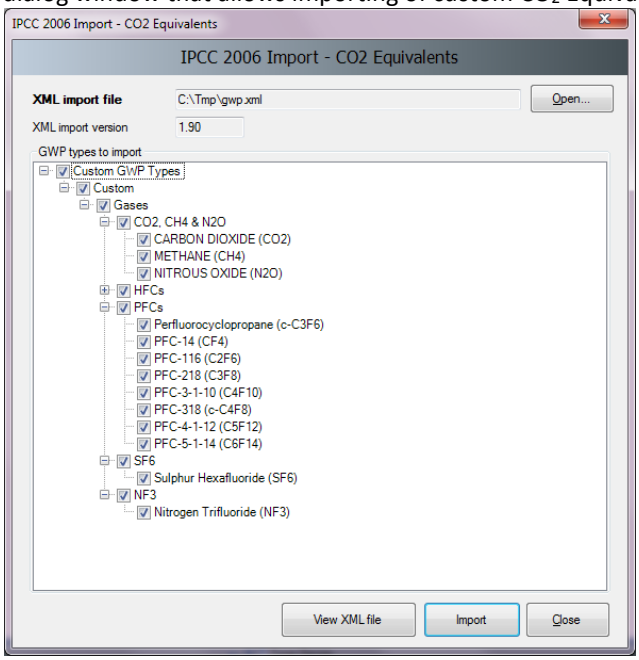


Figure 3.24 – Importing custom CO_2 Equivalents

Take the following steps to import custom CO_2 Equivalents:

1) Click the **Open** button to browse for XML file to be imported.
2) Section **GWP Types to import** contains the list of all custom GWP types included in the source XML file. Select the custom GWP type of interest or just particular gases of interest to be imported.
3) Click the **Import** button to begin import. Progress bar will be shown to indicate the progress of import.

TIP: Button **Vie XML file** can be used to display the contents of the source XML file in Internet browser.

3.2.7.7 Import F-Gases Data

This menu item opens the dialog window that allow importing of country specific F-Gases Data.

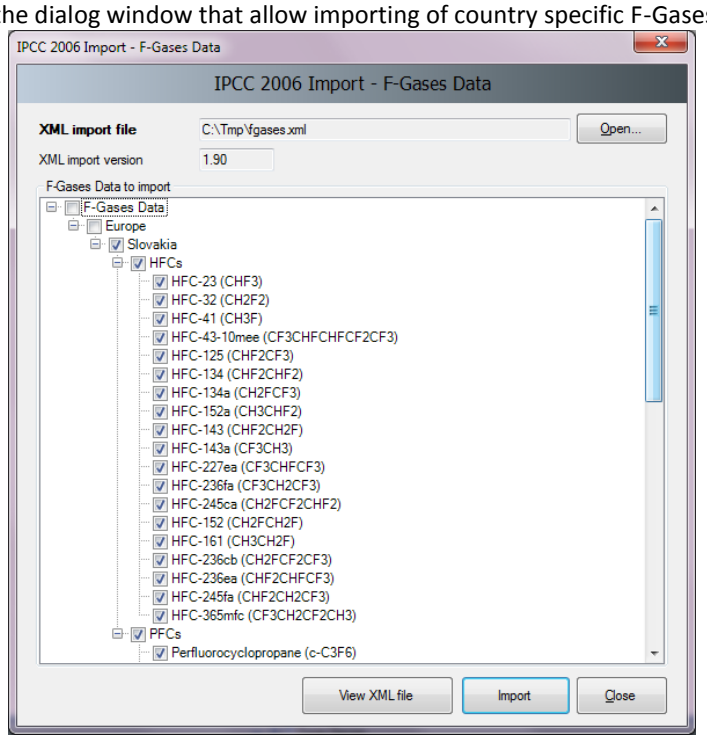


Figure 3.25 – Importing F-Gases Data

Take the following steps to import country specific F-Gases Data:

1) Click the **Open** button to browse for XML file to be imported.
2) Section **F-Gases Data to import** contains the list of all country specific F-Gases included in the source XML file. Select the F-Gases of interest to be imported.
3) Click the **Import** button to begin import. Progress bar will be shown to indicate the progress of import.

TIP: Button **Vie XML file** can be used to display the contents of the source XML file in Internet browser.

3.2.8 Administrate

Functions in this menu section are available to administrators (Superusers) only.

3.2.8.1 Users

This menu item opens dialog window that allows managing login names, passwords and rights to work with particular worksheets. See Chapter 2.4 for detailed information.

3.2.8.2 CO_2 Equivalents

This menu item opens the dialog window that allows the administrator to manage CO_2 Equivalents. Except for predefined SAR, TAR and AR4 Equivalents, it is possible to define custom types. Default type of CO_2 Equivalents currently selected is indicated in the status bar and also in *Database Properties* dialog box. See Chapter 2.3 for detailed information.

3.2.8.3 Delete inventory

This menu item opens the dialog window that allows deleting existing inventories. **USE THIS FUNCTION WITH CAUTION!**

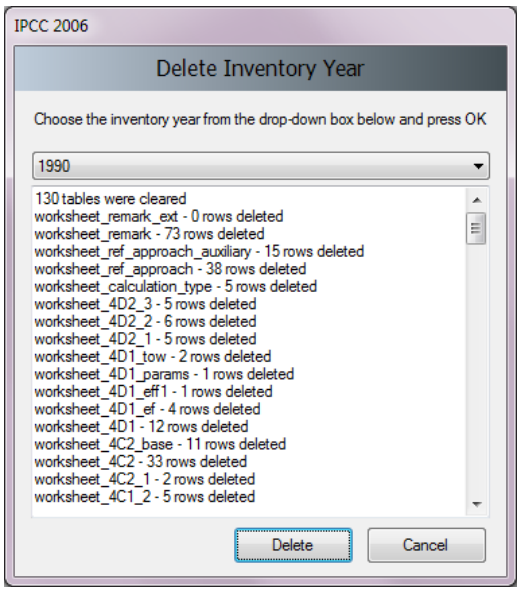


Figure 3.26 – Deleting inventory

3.2.8.4 AFOLU Land Type Manager

This menu item opens a dialog window which allows managing Land Use Subcategories for AFOLU category 3.B – Land. This window is also accessible from relevant worksheets under category 3.B – Land. Parameters defined here are used in all relevant worksheets.

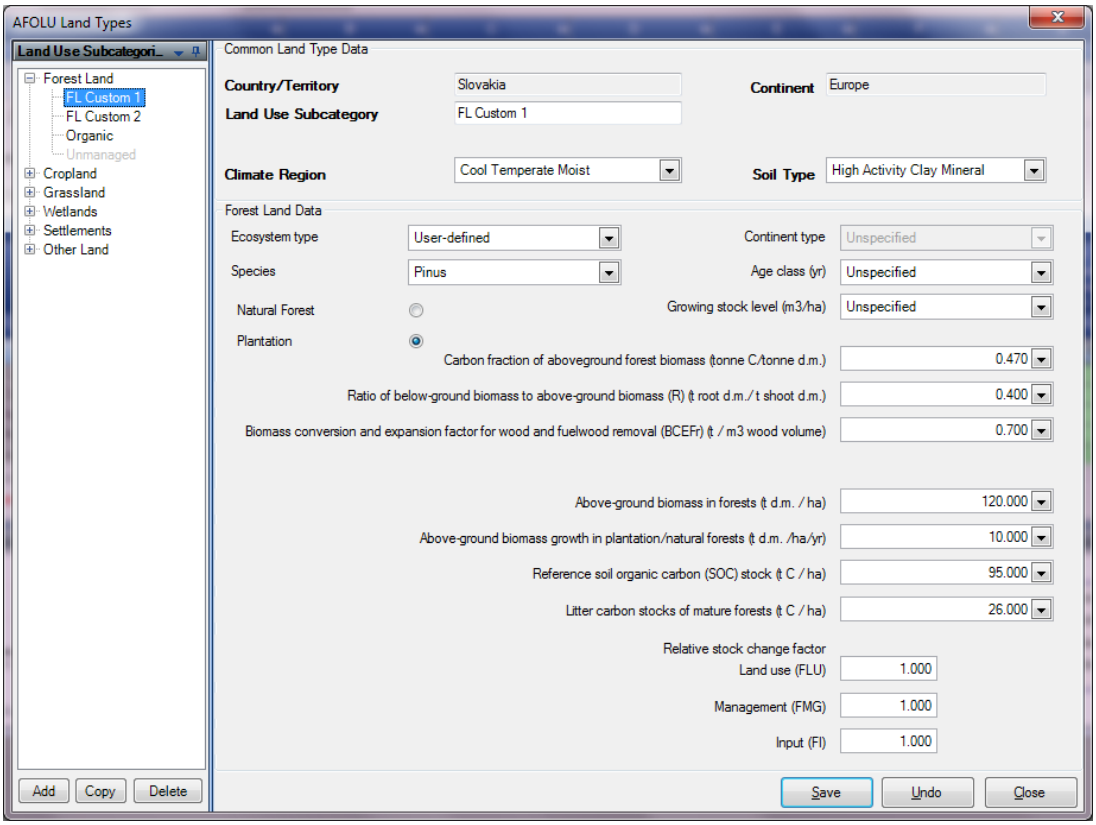


Figure 3.27 – Land Type Manager

Land Type Manager window consists of the following sections:

- **Navigation section** – contains the list of Land Use Subcategories divided into corresponding main Land Type categories (Forest, Cropland, …). Activation of the particular Land Use Subcategory shows relevant details.
- **Common Land Type Data** – contains data that is common for all Land Types (Country, Climate Region, …)
- **Particular Land Use Subcategory data** – contains details of the particular Land Use Subcategory that is selected in the navigation section.

Adding new Land Use Subcategory

Take the following steps to define new Land Use Subcategory:

1) Select one of the main Land Use Categories in the Navigation section.
2) Click the **Add** button located at the bottom of the navigation section. New Land Use Subcategory will be created with the default name.
3) Enter desired details of the new Land Use Subcategory
4) Click the **Save** button to save new Land Use Subcategory into database

Editing existing Land Use Subcategory

Take the following steps to edit existing Land Use Subcategory:

1) Select the Land Use Subcategory of interest in the navigation section
2) Edit data as desired
3) Click the **Save** button to save changes into database or click the **Undo** button to discard all changes.

Making copy of existing Land Use Subcategory

It is possible to make a copy of existing Land Use Subcategory. Follow the next steps:

1) Select the Land Use Subcategory of interest in the navigation section
2) Click the **Copy** button located at the bottom of the navigation section.
3) New copy of selected Land Use Subcategory will be created with the new name
4) Edit data as desired
5) Click the **Save** button to save new Land Use Subcategory into database.

Deleting existing Land Use Subcategory

1) Select the Land Use Subcategory of interest in the navigation section
2) Click the **Delete** button located at the bottom of the navigation section
3) Confirm or cancel deletion when prompted

3.2.8.5 AFOLU Livestock Manager

This menu item opens a dialog window which allows managing Livestock for AFOLU category 3.A – Livestock. This window is also accessible from relevant worksheets under category 3.A – Livestock. Livestock manager is divided into several tabs. Parameters defined here are used in all relevant worksheets.

Geographical zones

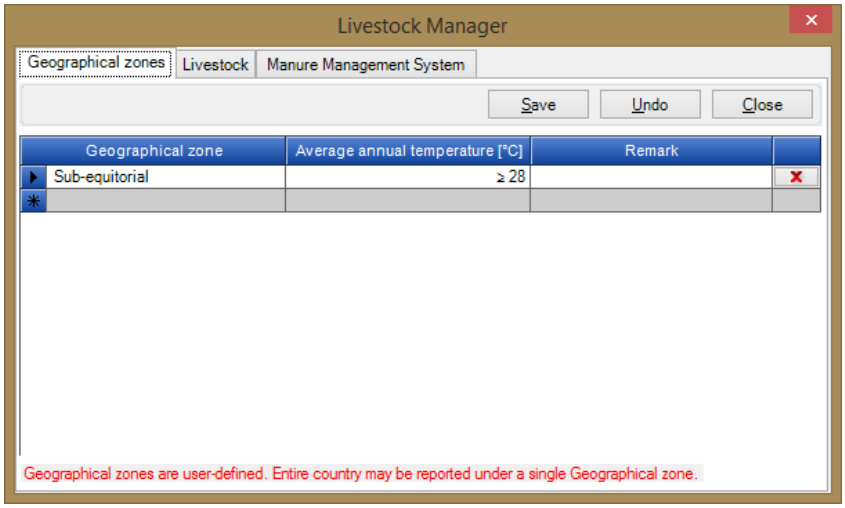


Figure 3.28 – Geographical zones

This tab allows defining geographical zones and thus dividing country into smaller parts which differ by average temperature.

- **Adding new Geographical zone**
  1) Use last (add template) row to define new Geographical zone. Enter zone name, average temperature and optionally remark. Repeat to add more zones.
  2) Click the **Save** button to save new zones into database

- **Editing existing Geographical zone**
  1) Click on the existing Geographical zone
  2) Edit name, average temperature, remark. Repeat for other existing zones as necessary.
  3) Click the **Save** button to save changes into database; or click the **Undo** button to discard all changes.

- **Deleting existing Geographical zone**
  1) Click on the existing Geographical zone
  2) Click the iconic delete button located in the last cell of active row. Repeat for other zones if necessary.
  3) Click the **Save** button to commit delete operation into database or click **Undo** to undelete all zones marked for deletion.

Livestock

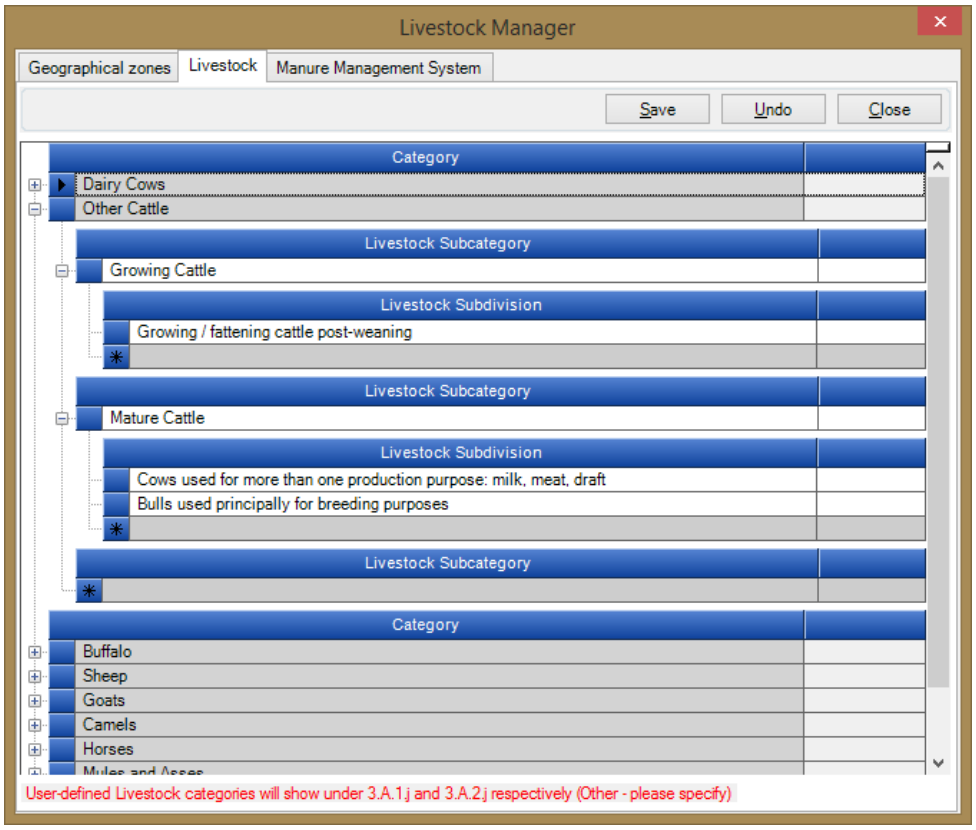


Figure 3.29 – Livestock Subcategories

This tab allows defining custom livestock subcategories and subdivisions under each *2006 IPCC Guidelines* main Livestock categories or under additional user-defined "Other" Livestock categories.

- **Adding new user-defined "Other" Livestock Category**
  1) Use last (add template) row of top-level band to define new Livestock Category. Enter Livestock Category name. Repeat to add more categories.
  2) Click the **Save** button to save new categories into database
- **Editing existing user-defined "Other" Livestock Category**
  1) Click on the existing Livestock Category of interest.
  2) Edit name. Repeat for other Livestock Categories as desired.

3) Click the **Save** button to save changes into database; or click the **Undo** button to discard all changes.

- **Deleting existing user-defined "Other" Livestock Category**
  1) Click on the existing Livestock Category of interest.
  2) Click the iconic delete button located in the last cell of active row. Repeat for other categories if necessary.
  3) Click the **Save** button to commit delete operation into database or click **Undo** to undelete all categories marked for deletion.

- **Adding new Livestock Subcategory**
  1) Expand the desired main Livestock Category (or user-defined "Other" category)
  2) Use last (add template) row to add new Livestock Subcategory. Enter Livestock Subcategory name. Repeat for other main categories as desired.
  3) Click the **Save** button to save new defined Livestock Subcategories into database
- **Editing existing Livestock Subcategory**
  4) Click on the existing Livestock Subcategory under main Livestock Category (or user-defined "Other" category) of interest.
  5) Edit name. Repeat for other Livestock Subcategories as desired.
  6) Click the **Save** button to save changes into database; or click the **Undo** button to discard all changes.
- **Deleting existing Livestock Subcategory**
  1) Click on the existing Livestock Subcategory under main Category (or user-defined "Other" category) of interest.
  2) Click the iconic delete button located in the last cell of active row. Repeat for other subcategories if necessary.
  3) Click the **Save** button to commit delete operation into database or click **Undo** to undelete all subcategories marked for deletion.

- **Adding new Livestock Subdivision**
  4) Expand the desired Livestock Subcategory
  5) Use last (add template) row to add new Livestock Subdivision. Enter Livestock Subdivision name. Repeat for other subcategories as desired.
  6) Click the **Save** button to save new defined Livestock Subdivisions into database
- **Editing existing Livestock Subdivision**
  7) Click on the existing Livestock Subdivision under Livestock Subcategory of interest.
  8) Edit name. Repeat for other Livestock Subdivisions as desired.
  9) Click the **Save** button to save changes into database; or click the **Undo** button to discard all changes.
- **Deleting existing Livestock Subdivision**
  1) Click on the existing Livestock Subdivision under Subcategory of interest.
  2) Click the iconic delete button located in the last cell of active row. Repeat for other subdivisions if necessary.
  3) Click the **Save** button to commit delete operation into database or click **Undo** to undelete all subdivisions marked for deletion.

Manure Management System

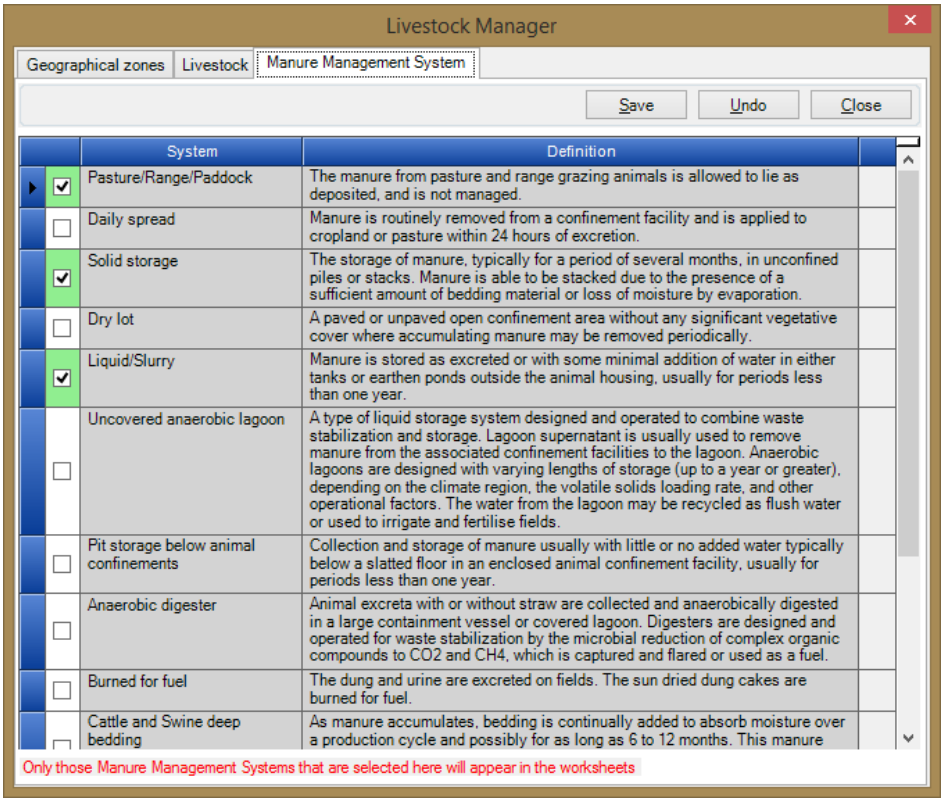


Figure 3.30 – Manure Management Systems

This tab allows choosing manure management systems to be used in computation of N_2O emissions from Manure Management Systems. The list contains the predefined set of default Manure Management Systems as defined in the *2006 IPCC Guidelines* Additionally it allows the user to define user-defined Manure Management Systems.

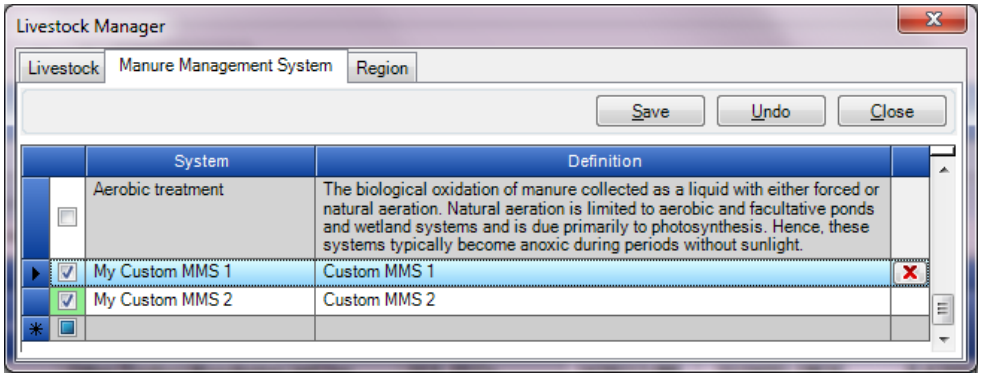
- **Choosing the Manure Management Systems**
  1) Use left column containing checkboxes to mark all desired Manure Management Systems that are relevant for your case and that will be used for computation of N_2O emissions from Manure Management Systems
  2) Chosen Manure Management Systems are highlighted green for better visual feedback

- **Adding new user-defined Manure Management System**
  1) Use last (add template) row to add new user-defined Manure Management System. Enter System and optionally Definition. Repeat for other user-defined Manure Management Systems as desired.
  2) Click the **Save** button to save new defined user-defined Manure Management Systems into database

- **Editing existing user-defined Manure Management System**
  1) Click on the existing user-defined Manure Management System.
  2) Edit System and Definition as desired. Repeat for other user-defined Manure Management Systems as desired.
  3) Click the **Save** button to save changes into database; or click the **Undo** button to discard all changes.

Only user-defined Manure Management Systems can be modified

- **Deleting existing user-defined Manure Management System**
  1) Click on the existing user-defined Manure Management System.
  2) Click the iconic delete button located in the last cell of active row. Repeat for other user-defined Manure Management Systems if necessary.
  3) Click the **Save** button to commit delete operation into database or click **Undo** to undelete all user-defined Manure Management Systems marked for deletion.



Only user-defined Manure Management Systems can be deleted

3.2.8.6 Guidelines Information Texts

This menu item opens a special dialog where rich-text can be edited for each of the *2006 IPCC Guidelines* Categories. Such texts will then be displayed for currently active *2006 IPCC Guidelines* Category in the "*IPCC 2006 Guidelines* Window" within Worksheets window.

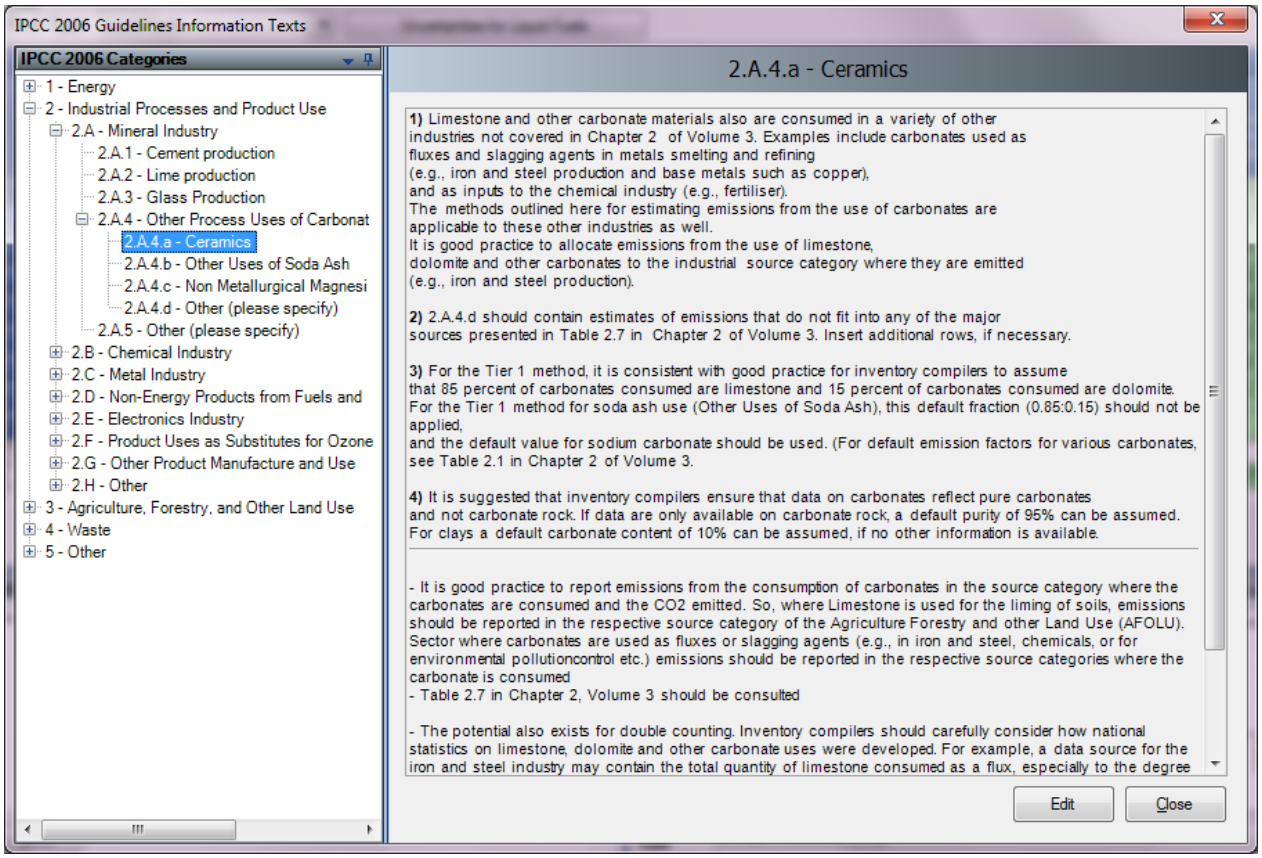


Figure 3.31 – Guidelines Information Texts

Editing text for particular Category

1) Use „IPCC 2006 Categories" navigation window to select desired IPCC 2006 Category. Text mapped to this category will be displayed in the large text area on the right

2) Click **Edit** button to open rich-text editor and edit text as necessary. Use formatting options (font, color, ...) of rich-text editor as desired

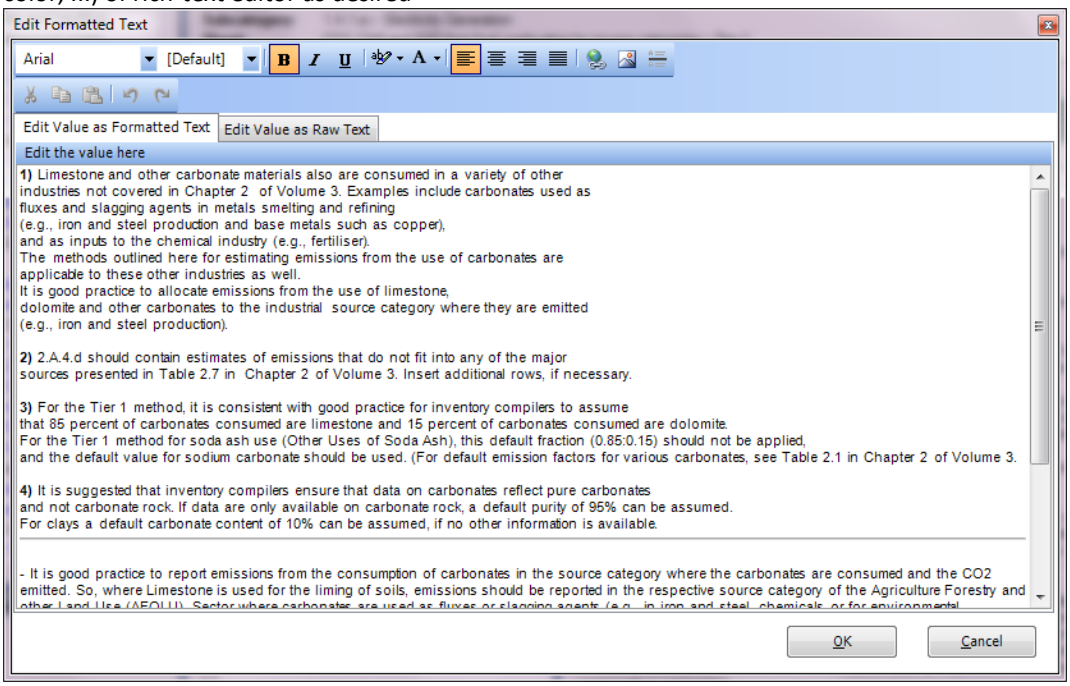


Figure 3.32 – Rich-text editor

3) Click **OK** to save changes or **Cancel** to discard all changes. In both cases the editor will close itself automatically.

Defined texts will be automatically displayed in the "IPCC 2006 Guidelines Window" for IPCC 2006 Category that is currently activated in the IPCC 2006 Categories navigation tree.

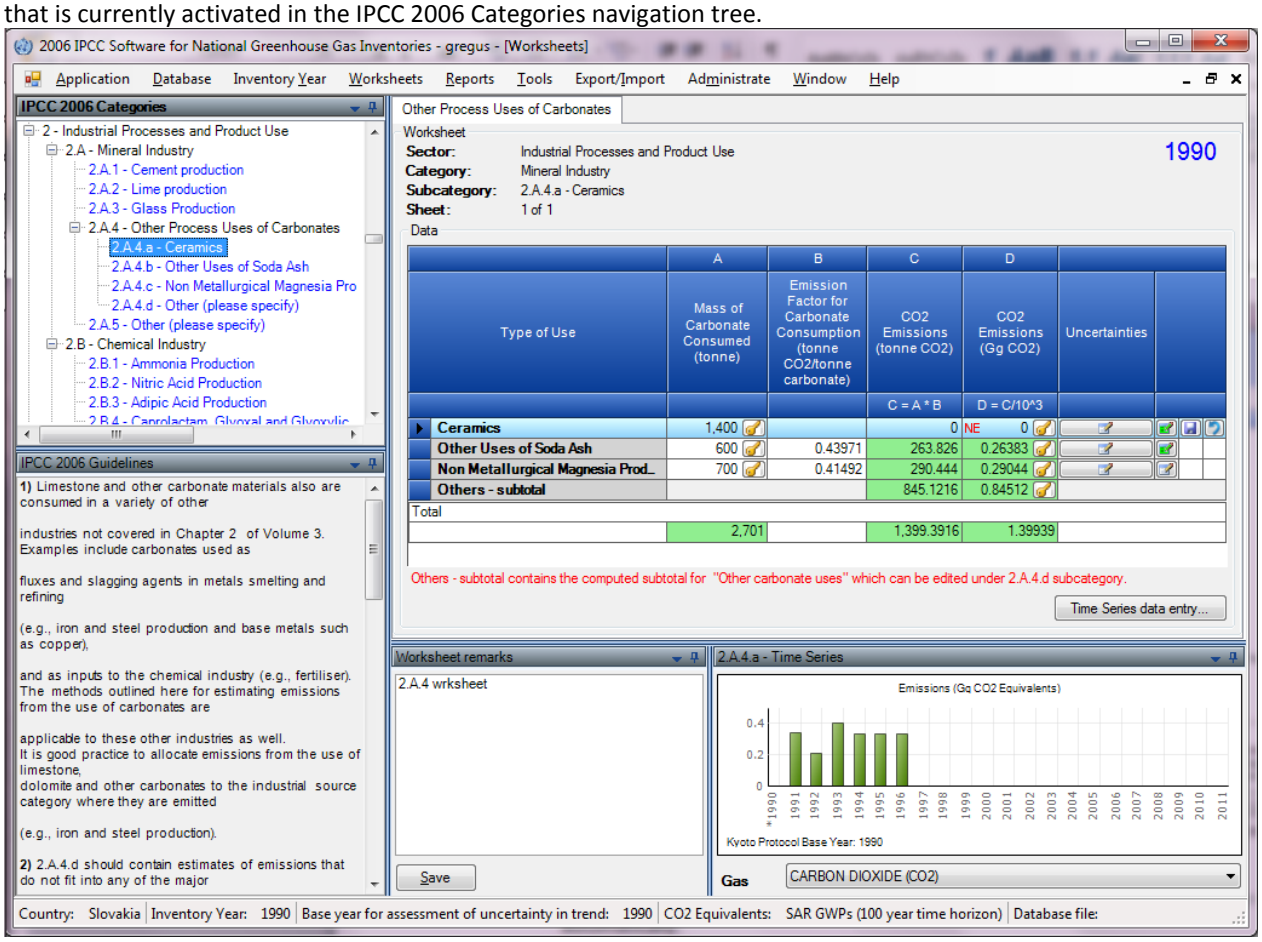


Figure 3.33 – Example of IPCC 2006 Guildelines Window content

3.2.9 Window

Use this menu to:

- **Minimize all** – minimizes all windows to display main working area.
- **Close all** – closes all open windows
- **Windows list** – quickly activate the particular window by selecting it from the window list

3.2.10 Help

User manual - this file

About - Important information about the Version of IPCC Inventory Software installed.

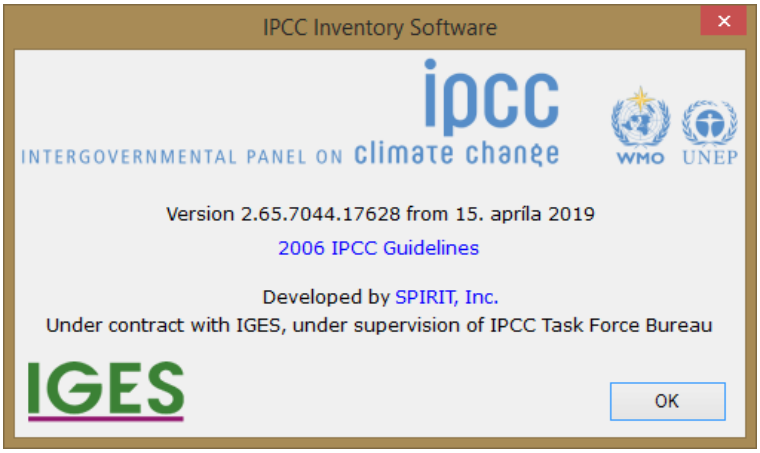


Figure 3.34 – About Box

4 Working with the Worksheets

4.1 Basic layout of the working area

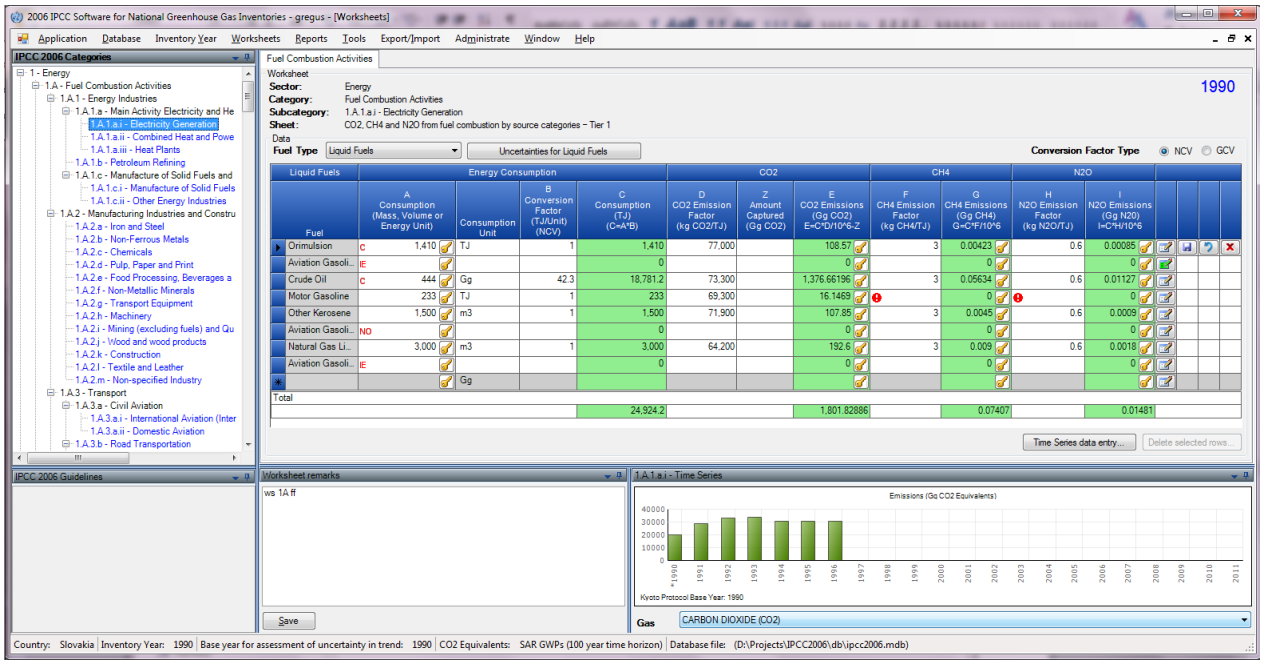


Figure 4.1 - Basic layout of the screen

- **Navigation window** top - left enabling browsing the IPCC 2006 Category structure
- **Worksheet grid** area top - right enabling editing the activity and emission factor data
- **IPCC 2006 Guidelines** area below - left providing current information from the *Guidelines*

- **Worksheet Remarks** area below - middle enabling to edit and save Worksheet remarks
- **Time Series chart** area below - right displaying CO_2 equivalent time series for selected category

4.2 Working with windows and areas

Windows containing top bar with "pin" and "down-arrow" icons are dockable windows. It is possible to reorder such windows and completely change the layout of the screen to suit users' needs or preferences. In the next chapters, information on how to use dockable windows is provided.

4.2.1 Undocking windows

Dockable windows can be undocked. Undocked window is called "floating window". Floating window can be placed anywhere within the screen and it always stays on top of other forms within the application. There are several ways to make docked window floating:

1. Double-clicking the top bar of the dockable window
2. Holding the left mouse button down over top bar and moving it to the desired location
3. Clicking on down-arrow icon in the top bar displays the menu containing "Floating" menu item. Clicking this item undocks window. (Figure 4.2)

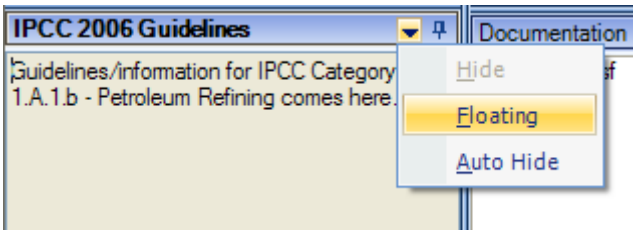


Figure 4.2 - Dockable window menu

HINT: Double-click on the top bar of floating window docks the window to the place where it was docked previously.

4.2.2 Docking floating windows

While dragging the floating window, docking indicators appear within each docking area guiding the user to choose where to dock the window. It is necessary to place mouse cursor over one of the arrows within docking indicator. The box then will be displayed to show the user where the window being dragged will be placed after releasing the mouse.

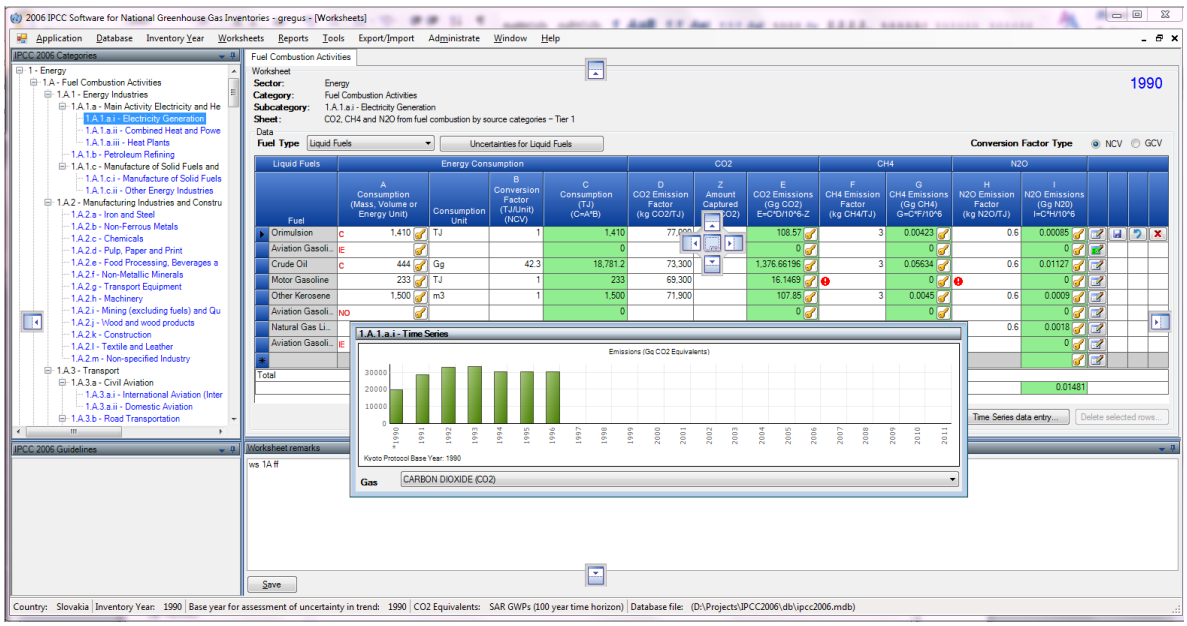


Figure 4.3 - Docking the floating window

4.2.3 Auto-hiding docking windows

Docking windows can be switched to auto-hide mode using the "pin" icon located in top bar. This is useful if there is a need for more space for main working area. Windows switched to auto-hide mode hide themselves when inactive.

HINT: Placing the mouse cursor over "strip" containing the name of the hidden window automatically scrolls window into view.

Clicking the "pin" icon of auto-hidden window switches the auto-hide mode off.

4.2.4 IPCC 2006 Categories Navigation Window (tree)

This window contains full *2006 IPCC Guidelines* Category tree structure (Figure 4.4). The navigation tree is useful to select the worksheet to work with. Worksheets are available within IPCC categories marked blue. The worksheet relevant to selected IPCC Category will be displayed in the main working area on the right. If there are more worksheets available within selected IPCC Category, they are organized in the "tabbed" working area where each tab represents the particular worksheet.

Clicking on the "Sector/ Sub-sector" level of the tree which is marked with gray color, will show the CO_2 equivalent time series graph of the "Sector/ Sub-sector".

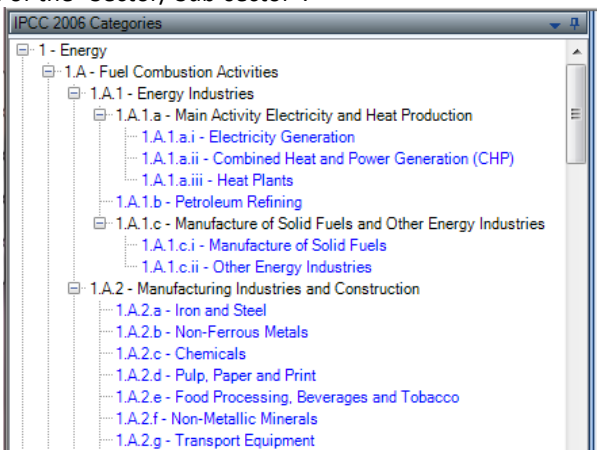


Figure 4.4 - IPCC 2006 Category tree

4.2.5 IPCC 2006 Guidelines window

This window contains the information relevant to currently selected IPCC 2006 Category. Such information can be defined using "*Guidelines* Information Texts" dialog accessible from Administrate menu (Chapter 3.2.8.6)

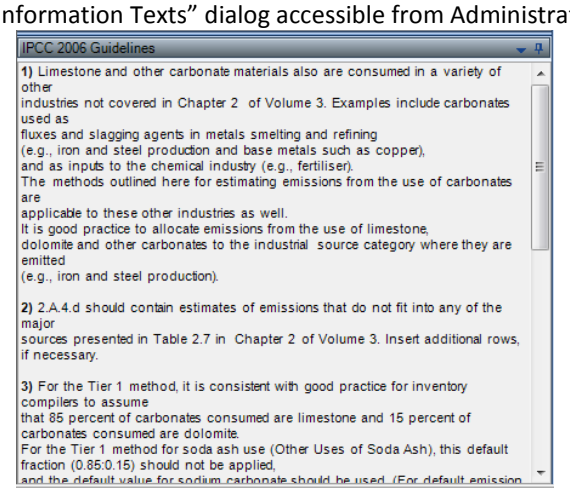


Figure 4.5 - IPCC 2006 Guidelines window

4.2.6 Worksheet Remarks window

This bottom - middle window can be used to enter additional textual information or reference for whole selected worksheet within currently chosen inventory year.

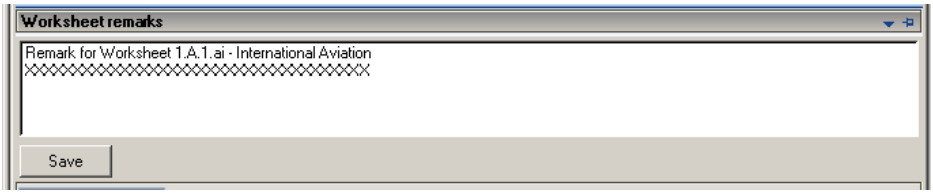


Figure 4.6 - Remark window

4.2.7 Time series window

This window contains the chart with emission time series across all inventory years for the particular gas expressed in Gg CO_2 Equivalents calculated according to CO_2 Equivalent type that is set as default.

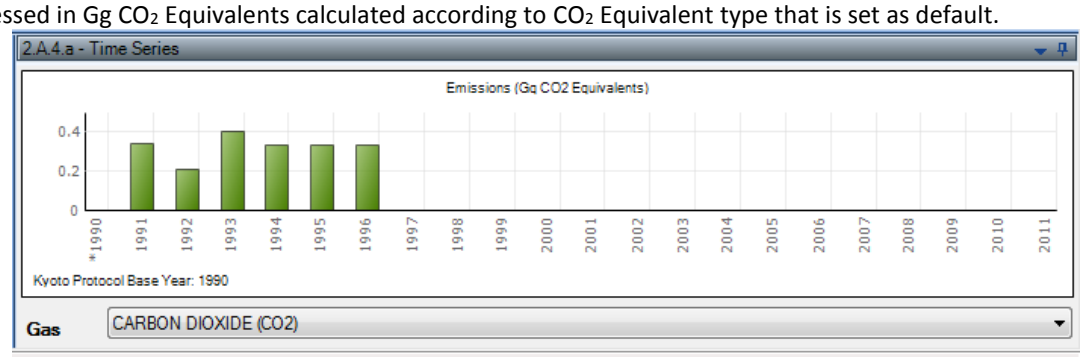
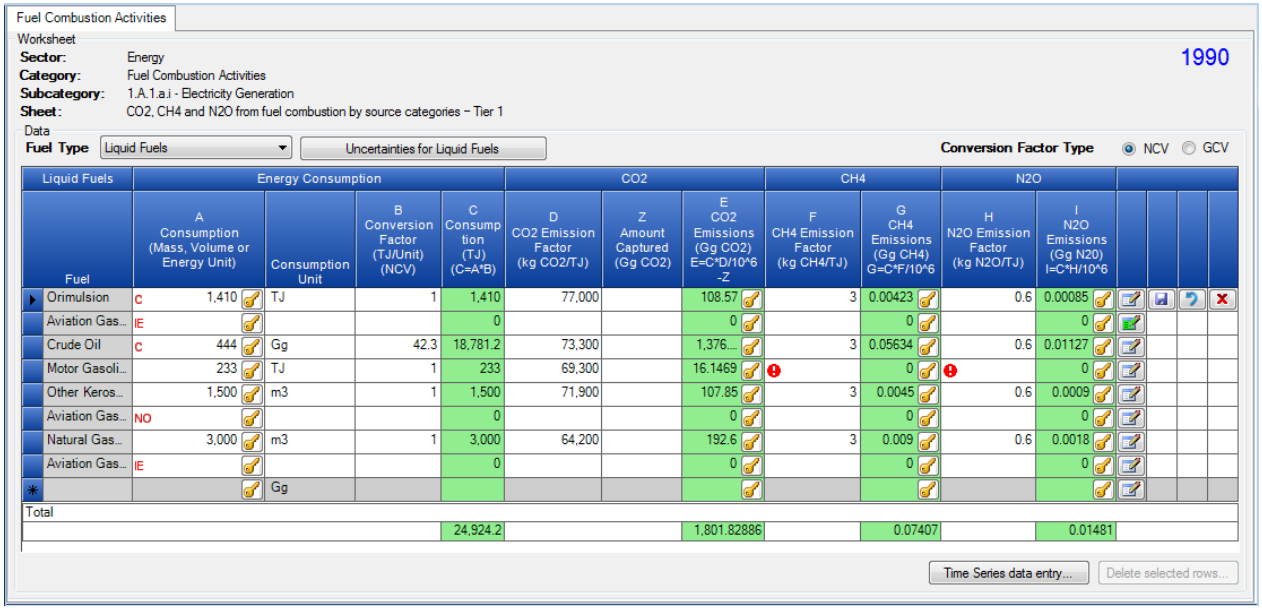


Figure 4.7 – Time Series window

4.3 Working with the grid



Liquid Fuels	Energy Consumption				CO2			CH4		N2O	
Fuel	A Consumption (Mass, Volume or Energy Unit)	Consumption Unit	B Conversion Factor (TJ/Unit) (NCV)	C Consumption (TJ) (C=A*B)	D CO2 Emission Factor (kg CO2/TJ)	Z Amount Captured (Gg CO2)	E CO2 Emissions (Gg CO2) E=C*D/10^6 -Z	F CH4 Emission Factor (kg CH4/TJ)	G CH4 Emissions (Gg CH4) G=C*F/10^6	H N2O Emission Factor (kg N2O/TJ)	I N2O Emissions (Gg N2O) I=C*H/10^6
Orimulsion	C 1,410	TJ	1	1,410	77,000		108.57	3	0.00423	0.6	0.00085
Aviation Gas...	IE			0			0		0		0
Crude Oil	C 444	Gg	42.3	18,781.2	73,300		1,376...	3	0.05634	0.6	0.01127
Motor Gasoli...	233	TJ	1	233	69,300		16.1469		0		0
Other Keros...	1,500	m3	1	1,500	71,900		107.85	3	0.0045	0.6	0.0009
Aviation Gas...	NO			0			0		0		0
Natural Gas...	3,000	m3	1	3,000	64,200		192.6	3	0.009	0.6	0.0018
Aviation Gas...	IE			0			0		0		0
		Gg									
Total				24,924.2			1,801.82886		0.07407		0.01481

Figure 4.8 - Worksheet grid

The worksheet grid represents a powerful tabular tool comprising of:

- Worksheet identification text on top with indication of currently chosen Inventory Year (top-right)
- Worksheet specific parameters (Gas, fuel type, calculation type, parameters, etc.).
- Top header of the grid - column headers are not editable by user.
- Navigation/Row status column (left-most) – indicates the active row that is selected and its status if it is in edit mode, if it is a new row, or if it is just selected.
- Rows of the grid containing data (e.g. activity data, emission factors, emissions, …). Each row represents one particular activity. There are different types of cells in the row like editable cells, calculated value cells and text cells. The different types of cells are distinguished by different color. There could be additional icon placed in the cell to highlight some warning to the user.
- Small button with the key icon which allows setting the Notation Key for related parameter.

- Editable cells (white background) - fields enabling to edit activity data, emission factors and other parameters.
- Calculated cells (green background) – e.g. emissions calculated from activity data and emission factors using the relevant formula. These are not editable but automatically calculated.
- Column containing iconic action buttons:
    - - this action button can be used to edit remark for currently selected record. If record already contains some remark, the action button will be coloured green .
    - - this action button saves current row changes into database.
    - - this action button undoes all current row changes.
    - - this action button deletes current row from database.
- Summary row on the bottom showing totals of activity data and emissions in the worksheet where applicable.

4.3.1 Row Status column

Left-most column of the grid is the Row Status column that indicates the current activity being performed within selected row. There are several icons indicating the status as follows:

- - indicates active row. This row is just selected - not in edit mode.
- - Currently selected row is in edit mode. Edit mode is activated as soon as a value in any cell is changed by user.
- - indicates that the row is an "add-new" row that is used as a "template" for new row.
- - "add-new" row in edit mode. Edit mode is activated as soon as user starts to enter values into cells of "add-new" row.

4.3.2 Adding new row

If the worksheet allows the user to add new rows, the "add-new" row can be found as the last row of the grid marked with Status Row icon. This row acts as a "template" for the new row.
As soon as the user starts entering data in cells of an "add-new" row, edit mode is activated and Status Row icon changes to . After filling all the required cells, new row is saved into database automatically after navigating to another row or after pressing the button or after grid looses focus. Validation of entered data is performed before the new row is stored into database. In case of any error in the supplied data, user will be informed to correct it.

4.3.3 Canceling adding new row

Adding of new row can be canceled anytime using the ESC (Escape) key or or action buttons.

In case of using ESC key the behavior is as follows:

- If the active cell is in edit mode, hitting ESC cancels editing of that cell and undoes changes on that cell. New row remains in edit mode.
- Pressing ESC again (while none of the cells is in edit mode) cancels adding new row removing it from the worksheet.

In case of using iconic action buttons the new row will be cancelled immediately no matter if any cell is in edit mode.

4.3.4 Editing existing row

Edit mode ( ) is activated as soon as the user starts modifying data in editable cells. Modified row is saved into database as soon as the user leaves the row being edited or by pressing the button or after grid looses focus. Validation of entered data is performed before the row is updated in the database. In case of any error in the supplied data, user will be informed to correct it.

4.3.5 Canceling editing existing row / Undoing cell changes

ESC key or action button can be used to undo row changes.

In case of using ESC key the behavior is as follows:

- If the active cell is in edit mode, hitting ESC cancels edit mode of that cell and undoes changes made to cell data (if any).
    - If there are no more cells changed in edited row this also cancels row editing.
    - If there are more cells that have been changed while editing row hitting ESC again undoes changes in all changed cells and cancels row editing returning it to its original state.

In case of using action button changes in all cells will be undone automatically at once and edit operation on row will be canceled.

4.3.6 Deleting rows

Pressing the **Delete selected rows** button or hitting the DEL key deletes all rows selected. More rows can be selected at the same time using mouse or Shift key function within Row Status column of the gird. **Iconic action button at row level can be used to delete just the corresponding row**.
In all cases user is provided with the confirmation dialog.

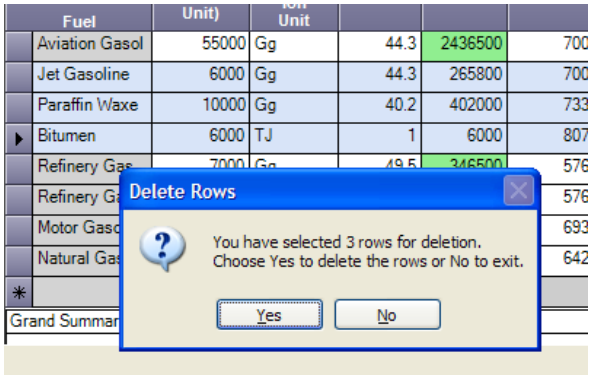


Figure 4.9 - Deleting multiple rows

4.3.7 Value List cells

Some of the cells contain Value List where user can choose from the predefined set of values or nomenclature data (e.g. emission factors). Such cells have the Value List indicator which when clicked will provide the user with the predefined set of nomenclature data. Some of the Value Lists are fixed and user cannot enter data other than that in the list (e.g. Fuels). Some are editable (e.g. emission factors Value Lists) and user is able to enter custom data that are not contained in the value list.

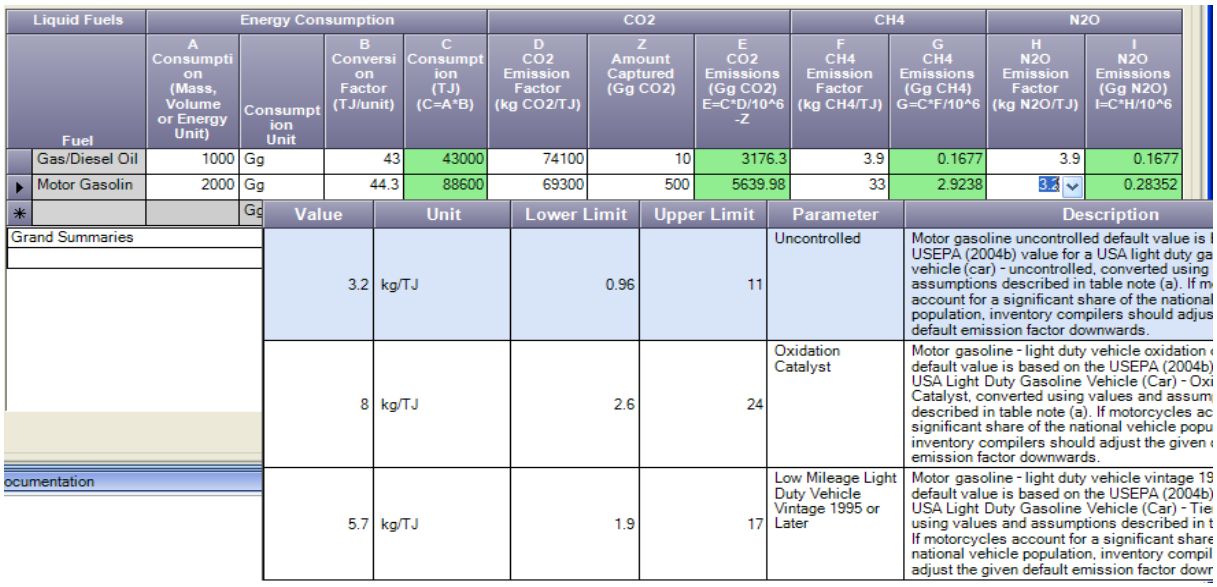


Figure 4.10 - Value List containing emission factors

4.3.8 Notation Keys

Notation Keys can be set by clicking the button of the particular cell. This enables to set Activity Data and Emissions Notation Keys.

Activity Data Notation Keys

Can be one of: **IE, NO, C**

- IE – Activity is included elsewhere: all Activity Data and Emission Factor related columns will be blank and not editable in this case.
- NO – Activity is not occurring: the same as for IE
- C – Activity data are confidential: they will not be exposed in reporting tables.

Emissions Notation Keys

Can be **NE**: this means that emissions are not estimated. All Emission Factor related cells will be blank and not editable. Activity Data remain editable.

4.4 Time Series Data Entry

Majority of worksheets supports time series data entry. This means that parameters of worksheets can be edited across existing inventory years. Time series data entry worksheet can be activated by pressing the **Time Series Data Entry** button located under the grid. This will open the following window.

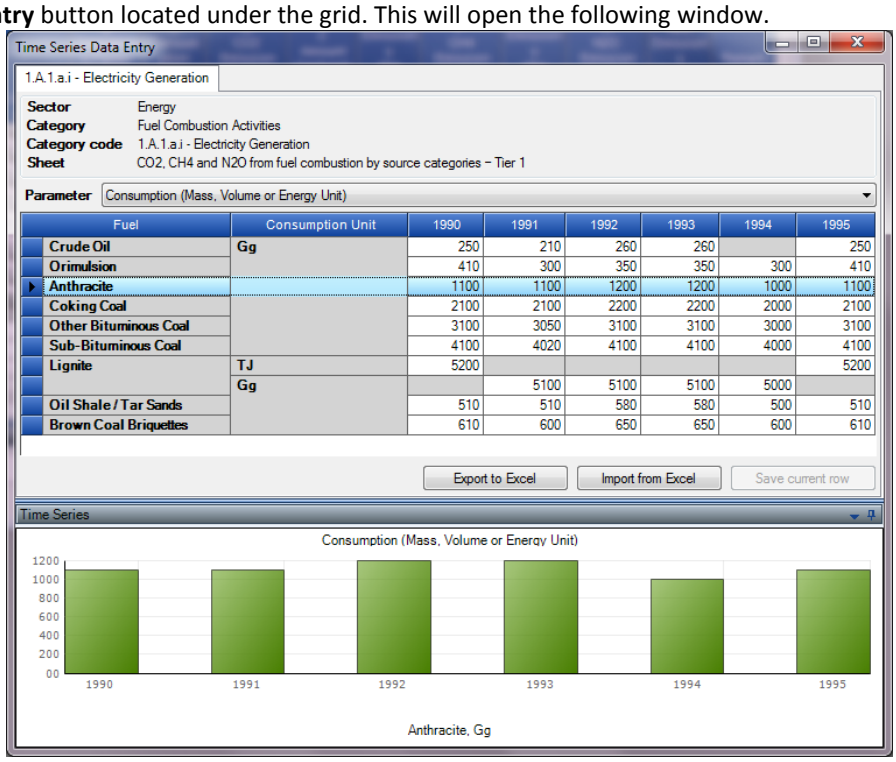


Figure 4.11 – Time Series Data Entry

4.4.1 Parameters

Parameter list contains the list of all editable parameters contained in the worksheet. By choosing the particular parameter the grid wil display the selected parameter values across existing inventory years grouped by all available combinations of row identifiers. Values in white cells are editable.

4.4.2 Row Indentifiers

Grid columns preceding years are so called „Row Identifiers“ that uniquely identify the Worksheet rows across all existing years representing all existing combinations of identifiers across years. In case parameter value is not editable within the particular row (shaded), this means that the combination of relevant row identifiers does not occur in that particular year. For example, according to Figure 4.11, there is no existing record for combination of **Lignite** and Consumption unit **Gg** in years 1990 and 1995.

4.4.3 Export to Excel

It is possible to export the selected parameter data into Excel by clicking the **Export to Excel** button. Data for that parameter then can be modified in Excel and imported back into the software. Example of exported XLS is in the following figure.

	A	B	C	D	E	F	G	H
1	**Sector:**	Energy						
2	**Category:**	Fuel Combustion Activities						
3	**Subcategory:**	1.A.1.a.i - Electricity Generation						
4	**Sheet:**	CO2, CH4 and N2O from fuel combustion by source categories – Tier 1						
5	**Parameter:**	Consumption (Mass, Volume or Energy Unit)						
6								
7	**Fuel**	**Consumption Unit**	**1990**	**1991**	**1992**	**1993**	**1994**	**1995**
8	Crude Oil	Gg	250	210	260	260		250
9	Orimulsion	Gg	410	300	350	350	300	410
10	Anthracite	Gg	1100	1100	1200	1200	1000	1100
11	Coking Coal	Gg	2100	2100	2200	2200	2000	2100
12	Other Bituminous Coal	Gg	3100	3050	3100	3100	3000	3100
13	Sub-Bituminous Coal	Gg	4100	4020	4100	4100	4000	4100
14	Lignite	TJ	5200					5200
15	Lignite	Gg		5100	5100	5100	5000	
16	Oil Shale / Tar Sands	Gg	510	510	580	580	500	510
17	Brown Coal Briquettes	Gg	610	600	650	650	600	610

Figure 4.12 – Exported parameter in Excel

4.4.4 Import from Excel

Pressing the **Import from Excel** button allows importing of previously exported parameter back into the software. Software asks for the input XLS file and if it meets the conditions it will be imported. The format of data as Excel file can be obtained by exporting Excel file. See Chapter 4.4.3.

4.4.5 Copy and Paste functions

Time Series Data Entry table implements the Copy and Paste functions which can be used to transfer data from/to table between the IPCC Inventory Software and other third party software (e.g. Microsoft Excel).

Copy function

Data can be copied into the clipboard by highlighting desired cells and pressing **Ctrl+C** keys. Data stored in the clipboard can than be pasted into any third-party software that supports data pasting. There are 2 ways of highlighting cells to be copied:

- **Using mouse** – use left-most column to highlight cells by rows or column headers to highlight cells by columns
- **Using keyboard** – click the starting cell from which you want to start highlighting the region. If the cell is editable it will switch to edit mode disabling the highlighting function. Therefore it is necessary to press **ESC** to exit edit mode. While cell is not in edit mode but selected, use **Shift+keyboard** arrows to highlight the desired region of cells.

Paste function

Data can be pasted from clipboard into the Time Series Data Entry table in case the structure of data is tabular – e.g. copied from **Microsoft Excel**.

1) Select the starting cell for which data paste should start.
2) If the cell is editable it will switch to edit mode. It is necessary to exit edit mode using **ESC** key before pasting data.
3) If you decide to define a paste region by highlighting cells using the **Shift+keyboard** arrows be sure your region matches the structure stored in the clipboard – number of columns and rows must match.
4) Use **Ctrl+V** to paste data. Cells that are read-only (automatically calculated green cells or other non-editable cells) will be ignored.

Important: only existing rows can be updated by pasting data. If source data in clipboard contains more rows or columns than Time Series Data Entry table, those will not be created. Creating of new rows by pasting data is not supported, thus not possible.

4.4.6 Chart

Chart at the bottom of the Time Series Data Entry window contains the visual representation of selected parameter values for the selected grid row across all years. It can be used for visual checking of value variations across all years.

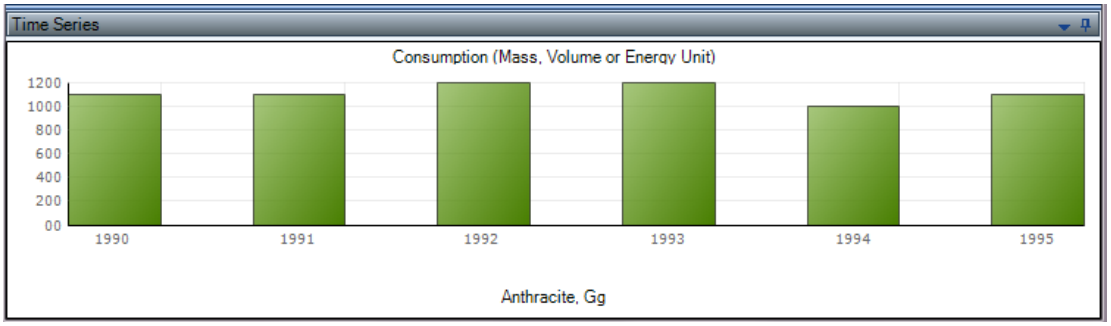


Figure 4.13 – Time Series Chart

5 Worksheet types

5.1 Multi-Tier support

As of version 2.54, software introduces support for multiple Tier methodologies. Multiple Tiers are available in case default (Tier 1) worksheet is not suitable for more advanced higher Tier calculations (e.g. in case methodologies for default and higher Tiers differ significantly). The Tiers can be set at IPCC category level provided given IPCC category has multiple Tiers implemented (e.g. some categories in Energy and IPPU sectors in version 2.54). The software is capable of maintaining independent sets of the worksheets for each Tier available at IPCC category level. Compiler can decide which set of the worksheets to work with by choosing a Tier of interest. Dropdown box for choosing Tier is available at the top of the worksheet (if applicable) as shown in the Figure 5.1.

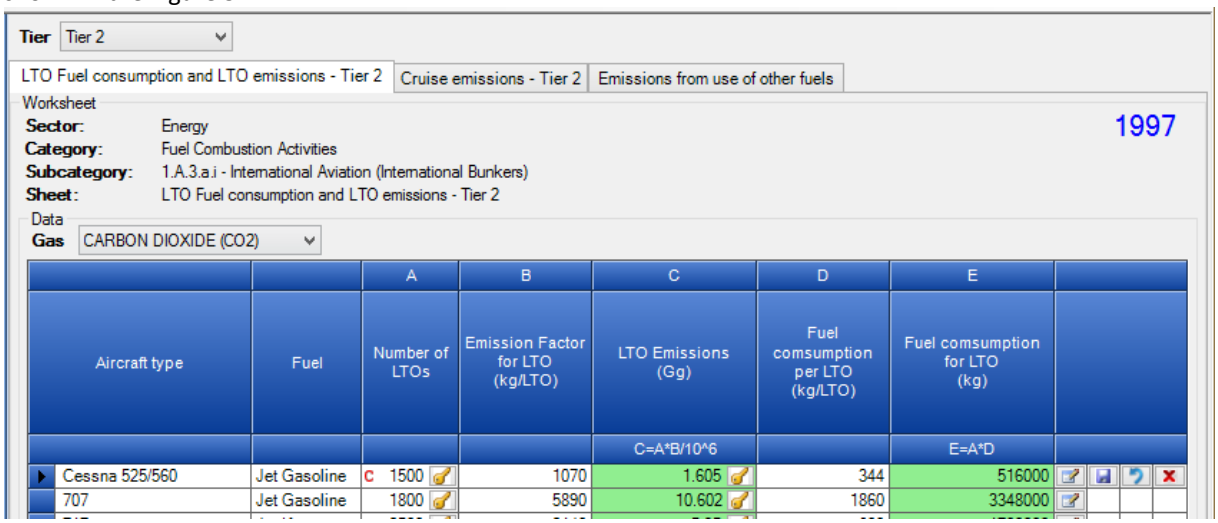


Figure 5.1 – Example of IPCC category having multiple Tiers implemented

After choosing Tier of interest, the worksheets set will automatically get updated thus only worksheets relevant for currently chosen Tier are visible. There is also support for Tier-independent worksheets which are always visible regardless which Tier is currently selected.

The following rules apply

- Chosen Tier applies across time series (applies to all of the inventory years) to maintain consistency across time series. It is not possible to use different Tiers in different years
- Emission calculations and reporting are performed for the worksheets belonging to currently chosen Tier + Tier-independent worksheets (this means, from all the visible worksheets)
- Emission calculations and reporting will not be performed for worksheets belonging to other than currently chosen Tier even if they contain data
- XML Export function exports data for all the Tiers
- XML Import functions imports data for all the Tiers plus it automatically sets the current Tier that was active during export

5.2 Single-activity worksheet with dynamic rows

This type of worksheet represents one particular activity. It can consist of one or multiple rows of data where each row represents the part of activity based on stratification of distinct parameters (e.g. Fuel for 1.A – Fuel Combustion Activities). It is dynamic in that additional rows can be added or existing rows can be deleted.

5.2.1 Uncertainties

Uncertainties can be entered at worksheet level using the corresponding **Uncertainties** button located at the bottom of the worksheet.

5.2.2 Example IPCC categories

- 1.A – Fuel Combustion Activities
- 1.B.1.a.i.3 – Abandoned Underground Mines

- 1.B.1.b – Uncontrolled combustion and burning coal dumps
- 1.B.2 – Oil and Natural Gas

5.3 Single-activity worksheet with static row(s)

This type of worksheet represents one particular activity and contains only single static row of data or set of multiple static rows describing the particular single activity. Additional rows cannot be added and existing rows cannot be deleted.

5.3.1 Uncertainties

Uncertainties can be entered at worksheet level using the corresponding **Uncertainties** button located within the last column or at the bottom of the Worksheet.

5.3.2 Example IPCC categories

- 1.B.1.a.i.4 – CO_2 Emissions from CH_4 Flaring
- 1.B.1.c – Solid fuel transformation
- 2.G.2.a – Military applications

5.4 Multi-activity worksheet

This type of worksheet represents multiple independent (but related) activities that fall within one particular IPCC category and can contain static or dynamic sets of data rows. If dynamic, it is possible to add additional rows and delete existing rows.

5.4.1 Uncertainties

Uncertainties apply at worksheet level using the corresponding **Uncertainties** button located at the bottom of the Worksheet.

5.4.2 Example IPCC categories

- 2.A.1 – 2.A.3
- 2.B
- 2.C
- 2.D
- 2.E
- 2.F
- 2.G.1, 2.G.2.b, 2.G.2.c
- 3.C.2 – 3.C.7
- 4.B
- 4.C
- 4.D

5.5 Multi-category worksheet

This type of worksheet deals with more than one IPCC category at once where each row represents the particular *2006 IPCC Guidelines* Subcategory. Rows are static - additional rows cannot be added and existing rows cannot be deleted.

5.5.1 Uncertainties

Uncertainties can be entered at row level using the corresponding **Uncertainties** button located within the last column of grid.

5.5.2 Example IPCC categories

- 1.B.1.a.i – Underground mines
- 1.C – Carbon Dioxide Transport and Storage

5.6 Worksheets missing notation keys

There are several IPCC categories where notation keys functionality has not been implemented. These include:

- 3.A – Livestock
- 3.B – Land
- 3.C.1 – Emissions from biomass burning
- 3.D.1 – Harvested Wood Products
- 4.A – Solid Waste Disposal on Sites

Applicability and use of notation keys in these categories needs to be further examined/discussed.

5.7 Worksheets missing uncertainties

There are several worksheets where uncertainties have not been implemented. These include:

- 3.D.1 – Harvested Wood Products
- 4.A – Solid Waste Disposal on Sites

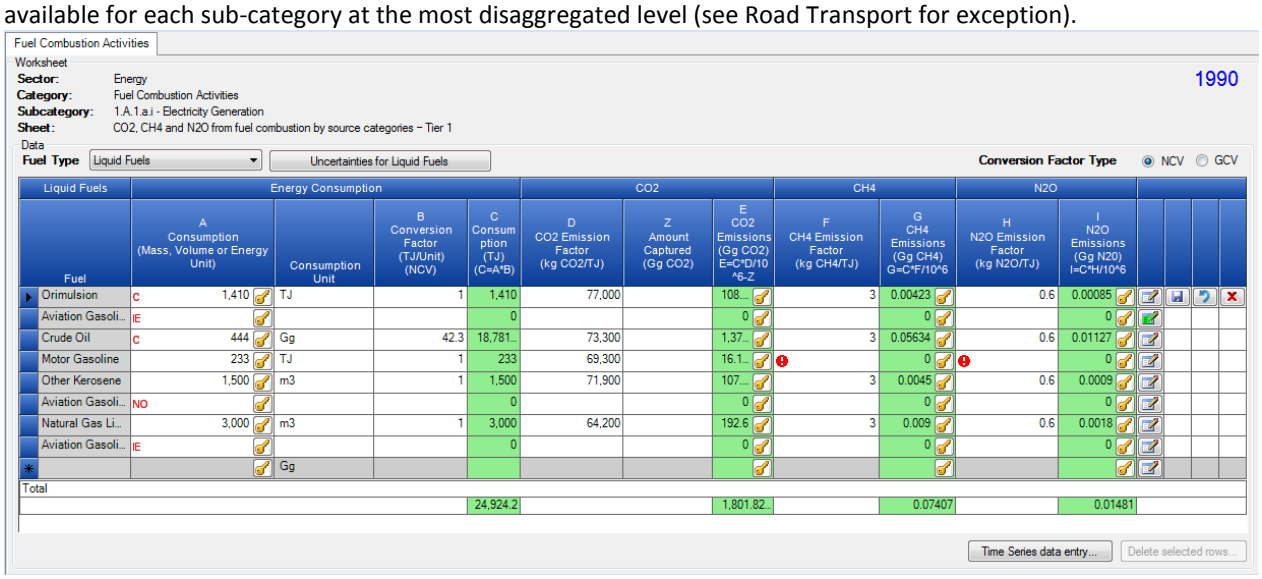
Applicability and use of uncertainties in these categories needs to be further examined/discussed

6 Example Worksheets

This chapter contains the examples of several worksheets.

6.1 Fuel Combustion Activities

This worksheet covers all categories within the category 1.A – Fuel Combustion Activities. Worksheet is available for each sub-category at the most disaggregated level (see Road Transport for exception).



Fuel Combustion Activities

Worksheet

Sector: Energy
Category: Fuel Combustion Activities
Subcategory: 1.A.1.a.i - Electricity Generation
Sheet: CO2, CH4 and N2O from fuel combustion by source categories – Tier 1

1990

Data

Fuel Type Liquid Fuels | Uncertainties for Liquid Fuels | **Conversion Factor Type** NCV GCV

Liquid Fuels	Energy Consumption				CO2			CH4		N2O	
Fuel	A Consumption (Mass, Volume or Energy Unit)	Consumption Unit	B Conversion Factor (TJ/Unit) (NCV)	C Consumption (TJ) (C=A*B)	D CO2 Emission Factor (kg CO2/TJ)	Z Amount Captured (Gg CO2)	E CO2 Emissions (Gg CO2) E=C*D/10^6-Z	F CH4 Emission Factor (kg CH4/TJ)	G CH4 Emissions (Gg CH4) G=C*F/10^6	H N2O Emission Factor (kg N2O/TJ)	I N2O Emissions (Gg N2O) I=C*H/10^6
Orimulsion	C 1,410	TJ	1	1,410	77,000		108...	3	0.00423	0.6	0.00085
Aviation Gasoli...	IE			0			0		0		0
Crude Oil	C 444	Gg	42.3	18,781...	73,300		1,37...	3	0.05634	0.6	0.01127
Motor Gasoline	233	TJ	1	233	69,300		16.1...		0		0
Other Kerosene	1,500	m3	1	1,500	71,900		107...	3	0.0045	0.6	0.0009
Aviation Gasoli...	NO			0			0		0		0
Natural Gas Li...	3,000	m3	1	3,000	64,200		192.6	3	0.009	0.6	0.0018
Aviation Gasoli...	IE			0			0		0		0
		Gg									
Total				24,924.2			1,801.82...		0.07407		0.01481

Time Series data entry... | Delete selected rows...

Figure 6.1 – Example of Fuel Combustion Activities worksheet

6.1.1 Fuel Type

Fuel Type selection box can be used to choose the desired Fuel Type to work with. After selecting the Fuel Type only the list of fuels of the selected type is available in the **Fuel** column in the grid to choose from and the worksheet will contain only rows with fuels of the selected type.

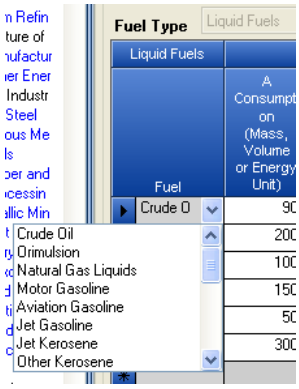


Figure 6.2 – Expanded list of available Liquid fuels

It is possible to display all fuels in the **Fuel** list by selecting the last item in the **Fuel Type** selection box labeled **(All)**. In this case, worksheet will contain rows with fuels of any type.

6.1.2 Uncertainties for Fuel Type

Button **Uncertainties for Fuel Type** can be used to enter Activity Data and Emission Factor uncertainties at the fuel type level that is currently selected. User will be provided with the dialog box where uncertainties can be defined.

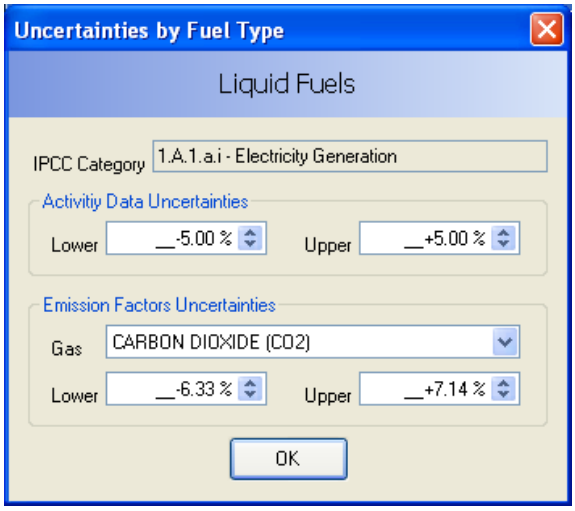


Figure 6.3 – Uncertainties for Liquid Fuels

Default Activity Data uncertainties are prefilled according to *2006 IPCC Guidelines*. Default Emission Factor uncertainties are computed from default values for selected IPCC Category, Fuel Type and Gas. Default values can be changed and are stored into database automatically after pressing the **OK** button.

6.1.3 Conversion Factor Type

User can choose from either NCV or GCV conversion factor type. When choosing NCV, value in column B of the grid will be prefilled according to selected fuel. When choosing GCV user will always be prompted to enter custom conversion factor.

6.1.4 Entering data

Column Fuel

This column contains the selection box where user can choose the desired fuel available within the selected Fuel Type. If conversion factor type is set to NCV, column B will be prefilled with the corresponding factor after leaving the Fuel column.

Column A – Consumption

This column is designed to enter Consumption value as a decimal number representing the Energy Consumption for the selected Fuel. It also contains button which enables user to choose one of the available notation keys: IE, C, NO. Selecting NO or IE disables all editable cells in current row meaning that the

Activity Data/Emissions for particular fuel are either Not Occurring or are Included Elsewhere. Selecting C means that Activity Data are Confidential and will not be exposed in reporting tables.

Column Consumption Unit
This column is designed for entering consumption unit. It contains the selection box where one of: Gg, TJ can be chosen. User can manually type in any arbitrary unit of interest. Choosing TJ automatically sets conversion factor value (column B) to 1.

Column B – Conversion Factor
This column is designed for entering conversion factor to convert consumption expressed in activity unit to consumption expressed in energy unit.

Column C – Consumption
This is a calculated column. Value is calculated automatically using the formula: C = A * B where A represents value entered in Column A and B value entered in Column B.

Column D – CO_2 Emission Factor
This column contains the selection list of default values where appropriate emission factor for CO_2 can be chosen. It is also possible to manually enter custom value if needed.

Column Z – CO_2 Amount Captured
It is possible to enter the amount of CO_2 emissions captured in this column. This amount will be subtracted from total CO_2 emissions in the current row (record).

Column E – CO_2 Emissions
This is a calculated column. Value is calculated automatically using the formula: E = C * D / 10^6 – Z. This column also contains button which enables user to choose NE notation key indicating that the emissions were Not Estimated for CO_2.

Column F – CH_4 Emission Factor
This column contains the selection list of default values where appropriate emission factor for CH_4 can be chosen. It is also possible to manually enter custom value if needed.

Column G – CH_4 Emissions
This is a calculated column. Value is calculated automatically using the formula: G = C * F / 10^6. This column also contains button which enables user to choose NE notation key indicating that the emissions were Not Estimated for CH_4.

Column H – N_2O Emission Factor
This column contains the selection list of default values where appropriate emission factor for N_2O can be chosen. It is also possible to manually enter custom value if needed.

Column I – N_2O Emissions
This is a calculated column. Value is calculated automatically using the formula: I = C * H / 10^6. This column also contains button which enables user to choose NE notation key indicating that the emissions were "Not Estimated" for N_2O.

Column with action buttons
This column contains iconic action buttons which can be used to perform Save, Undo, Delete of row and to define Remark for row.

6.1.5 Road Transport

There was a specific request for the 1.A.3b Road transport category to enable Worksheets editable not only for the most disaggregated level such as "1.A.3.b.i.1" (Tier 2) but also Tier 1 calculation implemented at the more aggregated level of category such as "1.A.3.b.i" or even "1.A.3.b".

The user starts entering data at the desired level taking into account the following conditions. Entering data at higher levels will be available only if no data within lower levels exist yet. If there are already data at lower levels, user will be informed by means of message box, that it is not possible to enter data at the current level,

because data already exist at the lower level(s). Time series chart will be displayed instead of Worksheet in this case. And vice versa - in case user will choose the lower level and data already exist at the higher level he will be informed by means of message box, that it is not possible to enter data at that level because there are already data at the higher level.

6.2 CH_4 and CO_2 Emissions from Coal Mining and handling

This worksheet covers categories:

- 1.B.1.a.i.1 – Underground Mining
- 1.B.1.a.i.2 – Underground Post-mining
- 1.B.1.a.i.4 – Emissions of drained Gas (CH_4)
- 1.B.1.a.ii.1 – Surface Mining
- 1.B.1.a.ii.2 – Surface Post-mining

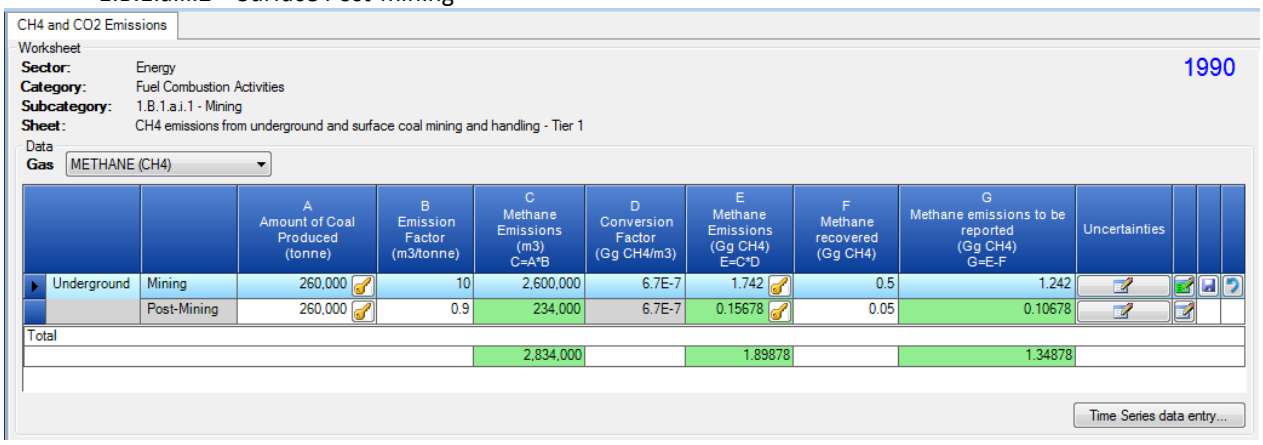


Figure 6.4 – Example of CH_4 & CO_2 Emissions from Coal Mining and handling worksheet

6.2.1 Gas

Selection box labeled **Gas** is available and enables user to choose the appropriate gas (CH_4 or CO_2). Grid header information will be appropriately adjusted according to selected Gas.

6.2.2 Entering data

Column A – Amount of Coal Produced

This column enables user to enter decimal value representing the amount of coal produced in tones. **Amount of coal produced is the same for Mining and Post-Mining subcategory. Changing the value in any row automatically changes value in all rows.** It also contains button which enables user to choose one of the available notation keys: IE, C, NO. Selecting NO or IE disables all editable cells in current row meaning that the activity data/emissions for current category are either Not Occurring or are Included Elsewhere. Selecting C means that activity data are Confidential and will not be exposed in reporting tables.

Column B – Emission Factor

This column contains the selection list of default values where appropriate Emission Factor for selected category and gas can be chosen. It is also possible to manually enter custom value if needed.

Column C – CH_4 or CO_2 Emissions expressed in m^3

This is a calculated column. Value is calculated automatically using the formula: C = A * B.

Column D – Conversion Factor

This is a non-editable constant. The value depends on selected Gas and is 0.67 * 10^-6 for CH_4 and 1.83 * 10^-6 for CO_2 as defined in *2006 IPCC Guidelines*.

Column E – CH_4 or CO_2 Emissions expressed in Gg

This is a calculated column. Value is calculated automatically using the formula: E = C * D. This column also contains button which enables user to choose NE notation key indicating that the emissions were "Not Estimated" for the selected gas.

Column F – Methane Recovered
This column is available just in case of CH_4. It enables user to enter decimal value representing the amount of methane recovered.

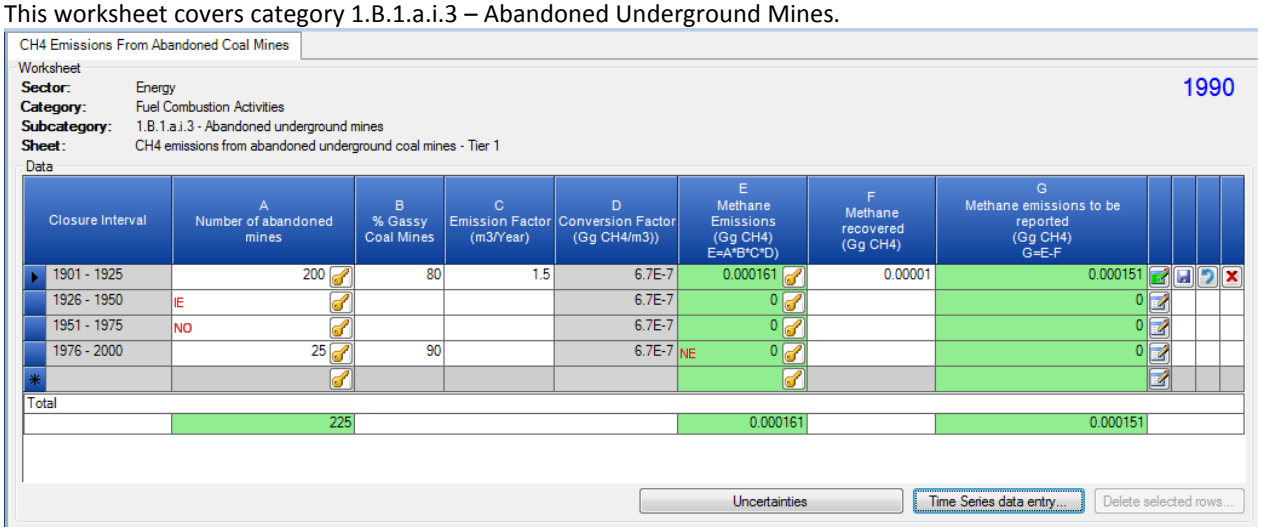
Column G – Methane Emissions to be reported
This column is available just in case of CH_4 and it is a calculated column. Value is calculated automatically using the formula: G = E – F.

Column Uncertainties
Clicking this button will open dialog box that can be used to enter Activity Data and Emission Factor uncertainties for active row (category). Default AD uncertainties are prefilled according to *2006 IPCC Guidelines* Category. Default EF uncertainties are computed from default values for selected IPCC Category and Gas. Default values can be changed and are stored into database automatically after pressing the **OK** button.

Column with action buttons
This column contains iconic action buttons which can be used to perform Save, Undo of row and to define Remark for row.

6.3 CH_4 Emissions from Abandoned Underground Coal Mines

This worksheet covers category 1.B.1.a.i.3 – Abandoned Underground Mines.



Closure Interval	A Number of abandoned mines	B % Gassy Coal Mines	C Emission Factor (m3/Year)	D Conversion Factor (Gg CH4/m3))	E Methane Emissions (Gg CH4) E=A*B*C*D)	F Methane recovered (Gg CH4)	G Methane emissions to be reported (Gg CH4) G=E-F
1901 - 1925	200	80	1.5	6.7E-7	0.000161	0.00001	0.000151
1926 - 1950	IE			6.7E-7	0		0
1951 - 1975	NO			6.7E-7	0		0
1976 - 2000	25	90		6.7E-7	NE 0		0
Total	225				0.000161		0.000151

Figure 6.5 – Example of Abandoned Underground Mines worksheet

6.3.1 Entering data

Column Closure Interval
This column contains the selection list where closure interval can be selected. It is editable enabling user to type in custom interval if needed. Selecting one of the predefined closure intervals automatically fills the Column C – Emission Factor with appropriate default value as defined in *2006 IPCC Guidelines*.

Column A – Number of Abandoned Mines
This column is editable and can contain integer value representing the number of abandoned mines for selected closure interval. It also contains button which enables user to choose one of the available notation keys: IE, C, NO. Selecting NO or IE disables all editable cells in current row meaning that the Activity Data/emissions for particular closure interval are either Not Occurring or are Included Elsewhere. Selecting C means that activity data are Confidential and will not be exposed in reporting tables.

Column B - % Gassy Mines
This column is editable and can contain decimal value representing the percentage of gassy mines from the total number of mines specified in column A.

Column C – Emission Factor

This column represents the emission factor. It is filled automatically after choosing one of the predefined closure intervals in column A. It is also possible to manually enter custom value if needed.

Column D – Conversion Factor
This is a non-editable constant. The value is 0.67 * 10^-6 for CH_4 as defined in *2006 IPCC Guidelines*.

Column E – Methane Emissions
This is a calculated column. Value is calculated automatically using the formula: E = A* B * C * D.

Column F – Methane Recovered
This column enables user to enter decimal value representing the amount of methane recovered.

Column G – Methane Emissions to be reported
This column is a calculated column. Value is calculated automatically using the formula: G = E – F.

Column with action buttons
This column contains iconic action buttons which can be used to perform Save, Undo, Delete of row and to define Remark for row.

6.3.2 Uncertainties

Clicking the button labeled **Uncertainties** located at the bottom of the worksheet opens dialog box that can be used to enter Activity Data and Emission Factor uncertainties for category. Default AD uncertainties are prefilled according to *2006 IPCC Guidelines*. Default EF uncertainties are computed from default values for selected Closure Interval. Default values can be changed and are stored into database automatically after pressing the **OK** button.

6.4 CO_2 Emissions from CH_4 Flaring

This worksheet covers the category 1.B.1.a.i.4 – Underground Mines – Flaring of drained methane or conversion of methane to CO_2.

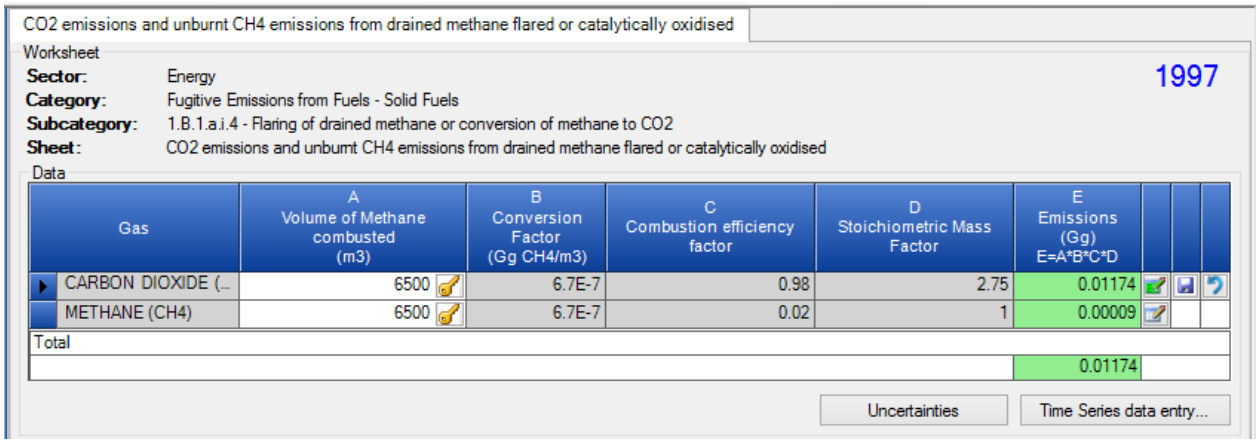


Figure 6.6 – Example of CO_2 Emissions from CH4 Flaring worksheet

6.4.1 Entering data

Column Gas
Represents a Gas to which the particular row relates to.

Column A – Volume of Methane Combusted
This column is editable and can store a decimal value representing the volume of methane combusted expressed in m^3 unit. It also contains button which enables user to choose one of the available notation keys: IE, C, NO, NE. Selecting NO, IE or NE disables all editable cells in current row meaning that the activity data/emissions for current category are either: Not Occurring, Included Elsewhere or Not Estimated. Selecting C means that activity data are Confidential and will not be exposed in reporting tables.

Column B – Conversion Factor
This is a non-editable constant. The value is 0.67 * 10^-6 for CH_4 as defined in *2006 IPCC Guidelines*.

Column C – Combustion efficiency factor
This is a non-editable constant. The value is 0.98 for CO_2 and 0.02 for CH_4 as defined in *2006 IPCC Guidelines*.

Column D – Stoichiometric Mass Factor
This is a non-editable constant. The value is 2.75 for CO_2 and 1 for CH_4 as defined in *2006 IPCC Guidelines*.

Column E – CO_2 Emissions
This is a calculated column. Value is calculated automatically using the formula: E = A* B * C * D.

Column with action buttons
This column contains iconic action buttons which can be used to perform Save, Undo of row and to define Remark for row.

6.4.2 Uncertainties

Clicking the button labeled **Uncertainties** located at the bottom of the worksheet opens dialog box that can be used to enter Activity Data uncertainties for category. Default AD uncertainties are prefilled according to *2006 IPCC Guidelines*.

6.5 Uncontrolled Combustion and Burning Coal Dumps

This worksheet covers the category 1.B.1.b – Uncontrolled combustion and burning coal dumps and its functionality is basically the same as for Fuel Combustion Activities with restriction to enter Solid Fuels only.

6.6 Oil and Natural Gas

This worksheet covers all categories within the category 1.B.2 – Oil and Natural Gas. Worksheet is available for each sub-category at the most disaggregated level.

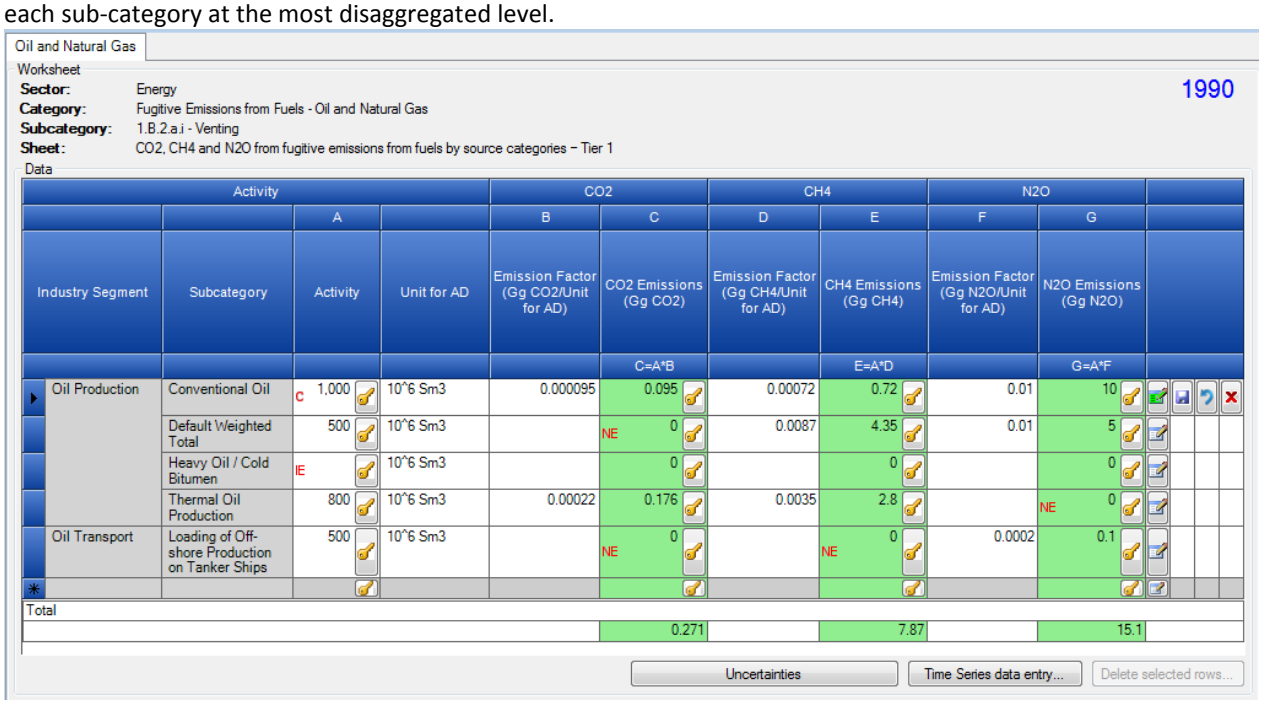


Figure 6.7 – Example of Oil and Natural Gas worksheet

6.6.1 Entering data

Columns Industry Segment and Subcategory
Subcategory column contains the selection list where Subcategory and corresponding Industry Segment can be chosen according to selected category.

Column A – Activity

This column is editable and can store decimal value representing the activity data related to the selected Subcategory and Industry Segment. It also contains button which enables user to choose one of the available notation keys: IE, C, NO. Selecting NO or IE disables all editable cells in current row meaning that the activity data/emissions for particular industry segment/subcategory are either Not Occurring or are Included Elsewhere. Selecting C means that activity data are Confidential and will not be exposed in reporting tables.

Column Unit for AD
This column can store the unit for Activity Data. Default value is taken from Table 4.2.7, Volume 2 of *2006 IPCC Guidelines*. User is allowed to enter own unit if necessary.

Column B – CO_2 Emission Factor
This column contains the selection list of default values where appropriate emission factor for selected Subcategory/Industry Segment and gas can be chosen. It is automatically filled with the default value as defined in *2006 IPCC Guidelines*. It is possible to manually enter custom value if needed.

Column C – CO_2 Emissions
This is a calculated column. Value is calculated automatically using the formula: C = A * B. This column also contains button which enables user to choose NE notation key indicating that the CO_2 emissions were Not Estimated.

Column D – CH_4 Emission Factor
This column contains the selection list of default values where appropriate emission factor for selected Subcategory/Industry Segment and gas can be chosen. It is automatically filled with the default value as defined in *2006 IPCC Guidelines*. It is possible to manually enter custom value if needed.

Column E – CH_4 Emissions
This is a calculated column. Value is calculated automatically using the formula: C = A * D. This column also contains button which enables user to choose NE notation key indicating that the CH_4 emissions were Not Estimated.

Column F – N_2O Emission Factor
This column contains the selection list of default values where appropriate emission factor for selected Subcategory/Industry Segment and gas can be chosen. It is automatically filled with the default value as defined in *2006 IPCC Guidelines*. It is possible to manually enter custom value if needed.

Column G – N_2O Emissions
This is a calculated column. Value is calculated automatically using the formula: G = A * F. This column also contains button which enables user to choose NE notation key indicating that the N_2O emissions were Not Estimated.

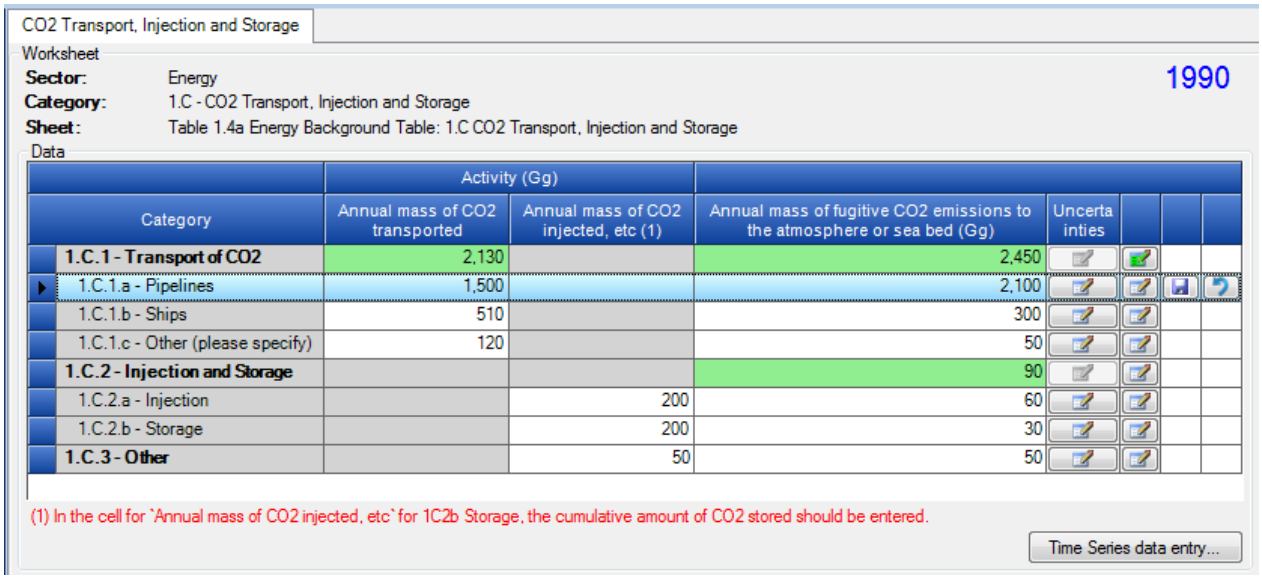
Column with action buttons
This column contains iconic action buttons which can be used to perform Save, Undo, Delete of row and to define Remark for row.

6.6.2 Uncertainties

Clicking the button labeled **Uncertainties** located at the bottom of the worksheet opens dialog box that can be used to enter Activity Data and Emission Factor uncertainties for category. Default Activity Data uncertainties are prefilled according to *2006 IPCC Guidelines*. Default Emission Factor uncertainties are computed from default values for selected category. Default values can be changed and are stored into database automatically after pressing the **OK** button.

6.7 CO_2 Transport, Injection and Storage

This Worksheet covers all categories within the category 1.C – Carbon Dioxide Transport and Storage. Worksheet is available for each sub-category at the most disaggregated level.



CO2 Transport, Injection and Storage

Worksheet

Sector: Energy

Category: 1.C - CO2 Transport, Injection and Storage

Sheet: Table 1.4a Energy Background Table: 1.C CO2 Transport, Injection and Storage

1990

Data

Category	Activity (Gg)			
	Annual mass of CO2 transported	Annual mass of CO2 injected, etc (1)	Annual mass of fugitive CO2 emissions to the atmosphere or sea bed (Gg)	Uncertainties
1.C.1 - Transport of CO2	2,130		2,450	
1.C.1.a - Pipelines	1,500		2,100	
1.C.1.b - Ships	510		300	
1.C.1.c - Other (please specify)	120		50	
1.C.2 - Injection and Storage			90	
1.C.2.a - Injection		200	60	
1.C.2.b - Storage		200	30	
1.C.3 - Other		50	50	

(1) In the cell for `Annual mass of CO2 injected, etc` for 1C2b Storage, the cumulative amount of CO2 stored should be entered.

Time Series data entry...

Figure 6.8 – Example of CO_2 Transport, Injection and Storage worksheet

6.7.1 Entering data

Column Annual Mass of CO_2 Transported

This column is relevant for categories 1.C.1.a, 1.C.1.b and 1.C.1.c. It is editable and can store decimal value representing the annual mass of CO_2 transported.

Column Annual Mass of CO_2 Injected

This column is relevant for categories 1.C.2.a, 1.C.2.b and 1.C.3. It is editable and can store decimal value representing the annual mass of CO_2 injected.

Column Annual Mass of fugitive CO_2 emissions to the atmosphere or sea bed

This column is relevant for all categories. It is editable and can store decimal value representing annual mass of fugitive CO_2 emissions to the atmosphere or sea bed expressed in Gg unit.

Column Uncertainties

Clicking this button will open dialog box that can be used to enter Activity Data uncertainties for active row (category). Default AD uncertainties are prefilled according to *2006 IPCC Guidelines*. Default values can be changed and are stored into database automatically after pressing the **OK** button.

Column with action buttons

This column contains iconic action buttons which can be used to perform Save, Undo of row and to define Remark for row.

7 Special Worksheets

7.1 Worksheet for Other Categories

There are many *2006 IPCC Guidelines* Categories labeled “Other (please, specify)” where user can provide additional Activity data, emission factors and calculate emissions for activities that do not fit into any of the specific *2006 IPCC Guidelines* Categories.

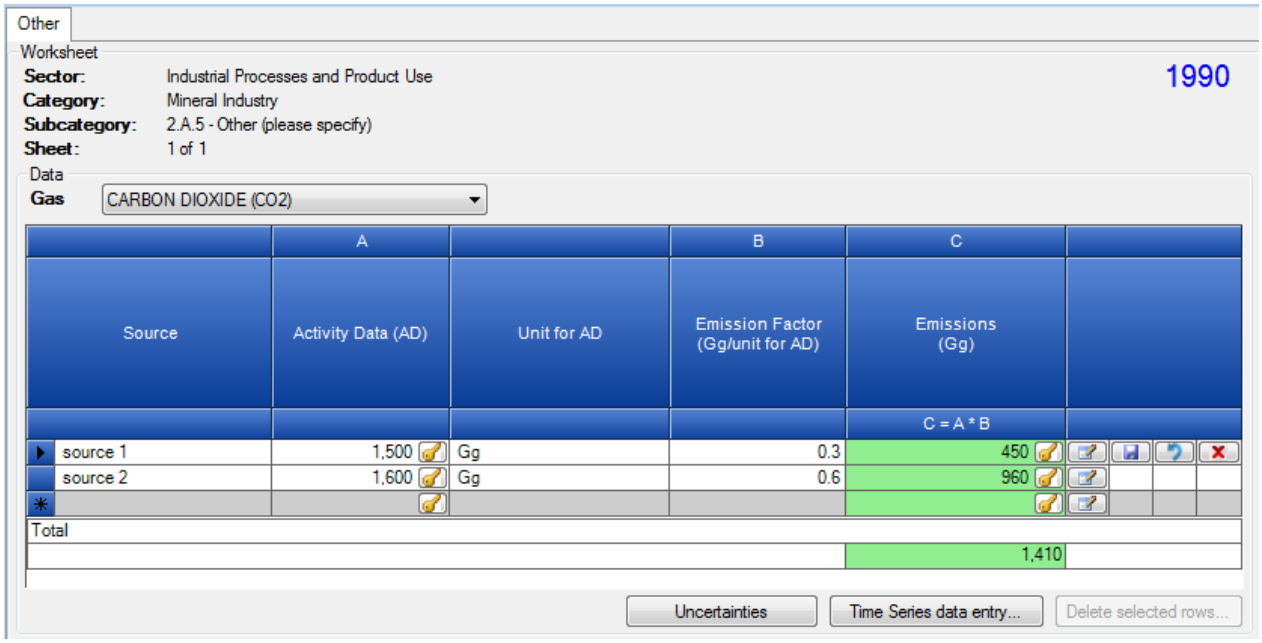


Figure 7.1 – Example of „worksheet for other categories"

7.1.1 Entering data

Column Source

Description of activity should be specified in this column. Descriptions must be unique within IPCC Category and Gas selected.

Column A - Activity Data (AD)

This column is editable and can store decimal value representing the activity data related to defined source. It also contains button which enables user to choose one of the available notation keys: IE, C, NO. Selecting NO or IE disables all editable cells in current row meaning that the activity data/emissions for particular source are either Not Occurring or are Included Elsewhere. Selecting C means that activity data are Confidential and will not be exposed in reporting tables.

Column Unit for AD

This column can store the unit for Activity Data. User is allowed to enter own unit if necessary.

Column B - Emission Factor

This column can store decimal value representing the emission factor for specified source and gas.

Column C - Emissions

This is a calculated column. Value is calculated automatically using the formula: C = A * B. This column also contains button which enables user to choose NE notation key indicating that the emissions were Not Estimated for specified source and gas.

Column with action buttons

This column contains iconic action buttons which can be used to perform Save, Undo, Delete of row and to define Remark for row.

7.2 AFOLU Area Entry Table

This worksheet is available in all 3.B – Land categories. It is designated for defining 20-year Land Area Transitions between Land Use Subcategories defined in Land Type Manager (see Chapter 3.2.8.4).

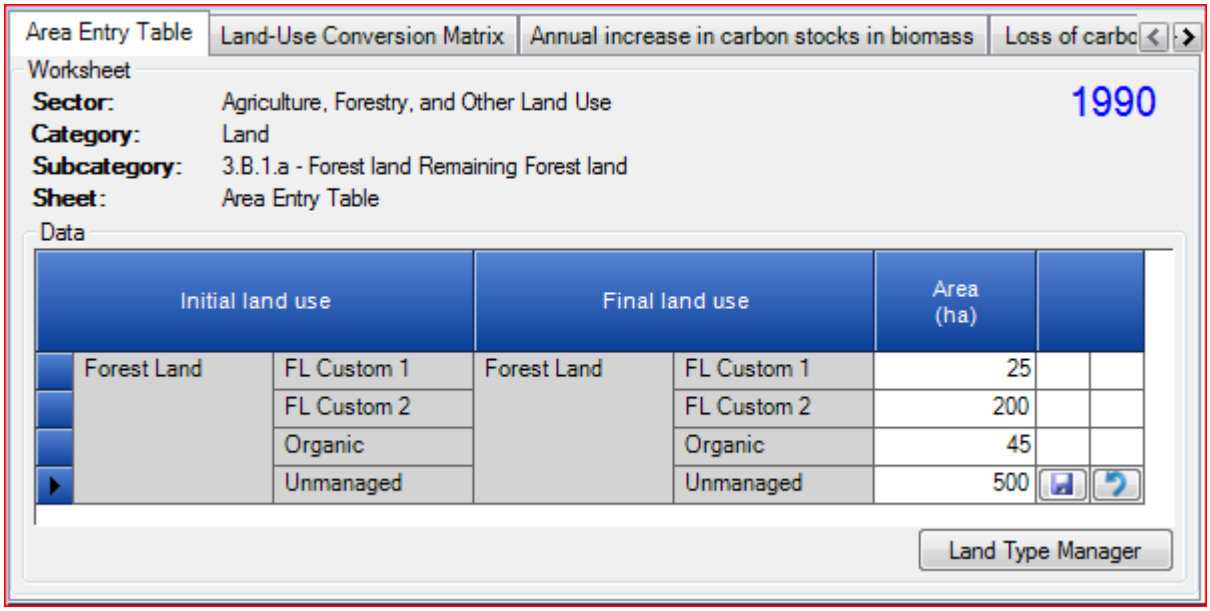


Figure 7.2 – AFOLU Area Entry Table

The user needs to enter land areas for *Land remaining in a Land-use category* and for *Land converted to other Land Use Subcategories* (in the 20 year sense). At a minimum, data for the year currently chosen is needed. Land stays in a conversion subcategory for 20 years (default transition time period provided in the *2006 IPCC Guidelines*) unless reconverted into some other Land-use category except for peatlands where it remains in the conversion subcategory for a default period of 5 years. This data can then be used by the software to complete the Land Use Matrix and fill in the "20 year" land areas in all the relevant worksheets.

The software applies some basic rules on the Land Use Subcategory combinations to restrict the number of "possible" transitions appearing in the table such as:

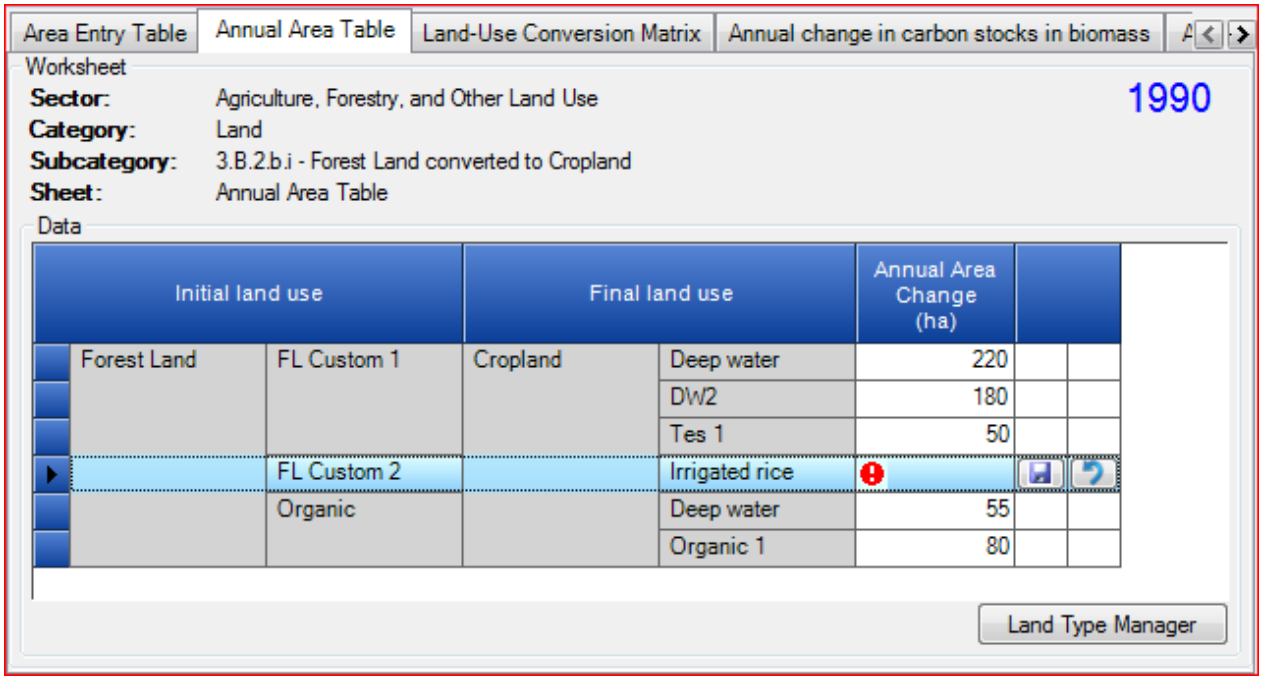
a) A Land Use Subcategory cannot change from one "climate-soil" combination to a different "climate-soil" combination. For example, a Land Use Subcategory defined in the Land Type Manager as "Boreal-Organic soil" cannot change to "Warm Temperate-Mineral Soil" no matter how the land use change occurs; its post-conversion land type will always be restricted to "Boreal-Organic soil".

b) There can be no conversions from „Unmanaged" to „Managed" meaning that land as soon as it is converted will be „Managed" and the conversion will therefore be categorized as „Managed" to „Managed".

c) Areas of „Unmanaged Land" remaining „Unmanaged Land" are also entered in the Area entry Table to maintain area consistency between years although these are not used in any Worksheet.

7.3 AFOLU Annual Area Table

This worksheet is available in all 3.B – Land categories which contain worksheets based on "annual area change". It is used for defining annual land area changes between Land Use Subcategories defined in Land Type Manager (see Chapter 3.2.8.4).



Area Entry Table | Annual Area Table | Land-Use Conversion Matrix | Annual change in carbon stocks in biomass

Worksheet

Sector: Agriculture, Forestry, and Other Land Use

Category: Land

Subcategory: 3.B.2.b.i - Forest Land converted to Cropland

Sheet: Annual Area Table

1990

Data

Initial land use		Final land use		Annual Area Change (ha)
Forest Land	FL Custom 1	Cropland	Deep water	220
			DW2	180
			Tes 1	50
	FL Custom 2		Irrigated rice	
	Organic		Deep water	55
			Organic 1	80

Land Type Manager

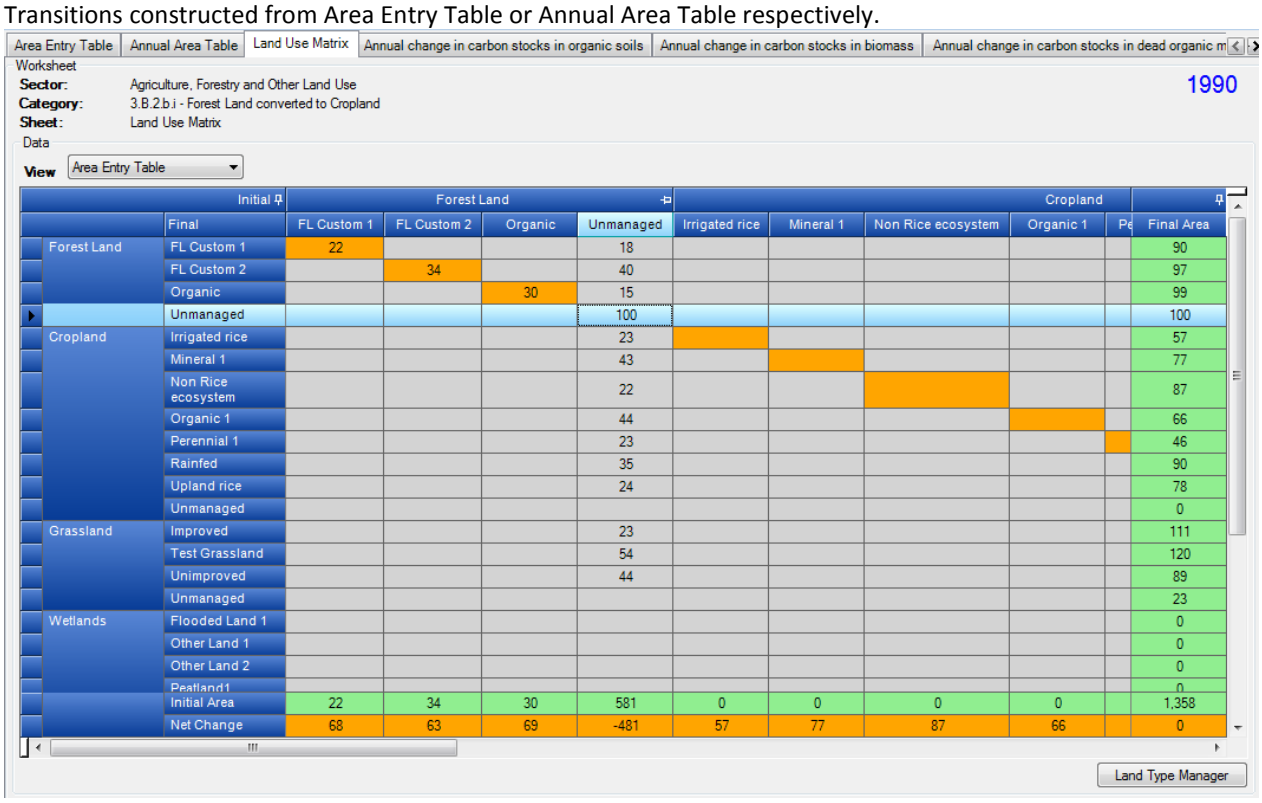
Figure 7.3 – AFOLU Annual Area Table

The user needs to enter the annual land conversions in the year T. **Here only the conversions involving land type conversions (e.g., Forestland converted to Cropland etc.) will be displayed and not those involving strata within the same land type (e.g., Natural forests converted to plantations).** This data can then be used by the software to complete the Land Use Matrix and fill in the "annual" land areas in all the relevant worksheets.

It is important to note here that the areas entered here are the annually converted areas and therefore a part of the "20 year" areas entered into the Area Entry Table.

Regarding Land Use Subcategory combinations - the same restriction rules apply as in Area Entry Table. AFOLU Land Use Matrix

This worksheet is available in all 3.B – Land categories. It is a complete view of Land Use Subcategory Transitions constructed from Area Entry Table or Annual Area Table respectively.



Area Entry Table | Annual Area Table | Land Use Matrix | Annual change in carbon stocks in organic soils | Annual change in carbon stocks in biomass | Annual change in carbon stocks in dead organic m

Worksheet

Sector: Agriculture, Forestry and Other Land Use

Category: 3.B.2.b.i - Forest Land converted to Cropland

Sheet: Land Use Matrix

1990

Data

View: Area Entry Table

Initial		Forest Land				Cropland					
	Final	FL Custom 1	FL Custom 2	Organic	Unmanaged	Irrigated rice	Mineral 1	Non Rice ecosystem	Organic 1	Pe	Final Area
Forest Land	FL Custom 1	22			18						90
	FL Custom 2		34		40						97
	Organic			30	15						99
	Unmanaged				100						100
Cropland	Irrigated rice				23						57
	Mineral 1				43						77
	Non Rice ecosystem				22						87
	Organic 1				44						66
	Perennial 1				23						46
	Rainfed				35						90
	Upland rice				24						78
	Unmanaged										0
Grassland	Improved				23						111
	Test Grassland				54						120
	Unimproved				44						89
	Unmanaged										23
Wetlands	Flooded Land 1										0
	Other Land 1										0
	Other Land 2										0
	Peatland1										0
	Initial Area	22	34	30	581	0	0	0	0		1,358
	Net Change	68	63	69	-481	57	77	87	66		0

Land Type Manager

Figure 7.4 – Land Use Matrix

Columns of the Land Use Matrix represent the Initial land use during inventory period. Summary row **Initial Area** at the bottom of the matrix gives the total initial area for each Land Use Subcategory in the beginning of the inventory period.

Rows of the Land Use matrix represent the final land use at the end of inventory period. Last Summary column **Final Area** gives the total final area for each Land Use Subcategory at the end of inventory period.

Net change represents the total net change in each Land Use Subcategory area during the inventory period.

7.4 Organic N applied to Managed Soils

This worksheet is available under *2006 IPCC Guidelines* Category 3.C.4 – Direct N_2O Emissions from managed soils. It is used for computation of organic N applied to Managed Soils to be used in all relevant worksheets under 3.C category.

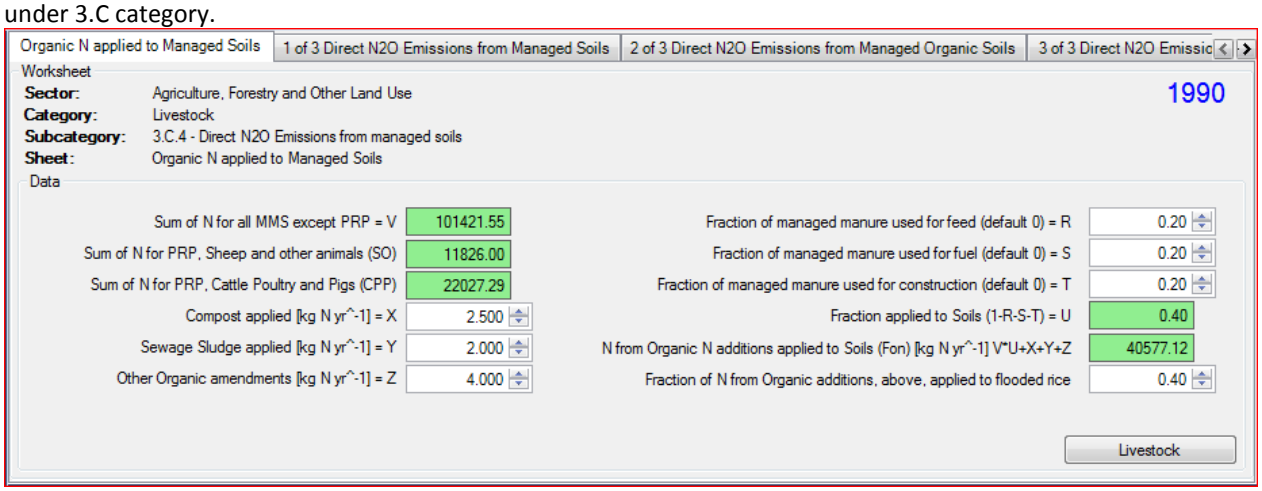


Figure 7.6– Organic N applied to Managed Soils

The green cells are computed from the worksheets under category 3.A.2 – Manure Management. The white cells are editable allowing to specify additional parameters needed for computation of total N applied.

Annex 1

The table below shows the details on mapping of the emission estimates based on the *2006 IPCC Guidelines* to the NAI reporting tables in this software. The format of these NAI reporting tables follows the Tables 1 and 2 of Annex to Decision 17/CP.8 of the UNFCCC (Guidelines for the preparation of national communications from Parties not included in Annex I to the Convention) which are based on the *Revised 1996 Guidelines* reporting structure, but some modifications have been made in order to help software users report emission estimates in a more transparent manner. Additional explanation is provided in the column "Note" of the table blow for some categories where mapping is not straightforward.

The function of exporting to NAI reporting tables in this software is intended to help software users report emission estimates in accordance with Annex to Decision 17/CP.8 of the UNFCCC, but is not intended to prescribe the way of mapping between categories under the *Revised 1996 IPCC Guidelines* and those under the *2006 IPCC Guidelines*. Software users may wish to use different mapping approach for some categories.

2006 Category most disaggregated level (Emissions are calculated at this level.)		1996 Category Second Level (Emissions are reported at this level in NAI table.)	Note
1.A.1	Energy Industries	1A1	
1.A.2	Manufacturing Industries and Construction	1A2	
1.A.3	Transport	1A3	The emissions under 1.A.3.b.vi (Urea-based catalysts) is excluded, since they are already reported under 2B of 1996 GLs. See note for category 2.B.1.
1.A.4	Other Sectors	1A4	
1.A.5	Non-Specified	1A5	The emissions under 1.A.5.c (Multilateral Operations) is included under Memo Item.
1.B.1	Solid Fuels	1B1	
1.B.2	Oil and Natural Gas	1B2	
1.B.3	Other emissions from Energy Production	7	
1.C	Carbon dioxide Transport and Storage	7	
2.A.1	Cement Production	2A	
2.A.2	Lime Production	2A	
2.A.3	Glass Production	2A	
2.A.4.a	Ceramics	2A	
2.A.4.b	Other Uses of Soda Ash	2A	
2.A.4.c	Non Metallurgical Magnesia Production	2A	
2.A.4.d	Other (please specify)	2A	According to the 2006GLs, CO2 emissions calculated in this category (2.A.4.d) should be reported in other relevant categories where the carbonates are used. This allocation to other categories is implemented in the second tab in the worksheet for this category. However, this allocation to other categories is not necessary according to the 1996GLs, therefore for the purposes of mapping back to 1996GLs reporting tables, all the CO2 emissions calculated in the first tab are included in 2A of 1996GLs.

2006 Category most disaggregated level (Emissions are calculated at this level.)		1996 Category Second Level (Emissions are reported at this level in NAI table.)	Note
2.A.5	Other (please specify)	2A	
2.B.1	Ammonia Production	2B	According to the 2006GLs, CO2 emissions subsequently used for urea production should be deducted. Later emissions of CO2 from such urea should be reported in the other categories like 1.A.3.b.vi (Urea-based catalyst), 3.C.3 (Urea application). For the purposes of mapping back to 1996GLs reporting tables, CO2 emissions before subtracting CO2 used for urea production are included in 2B1 of 1996GLs.
2.B.2	Nitric Acid Production	2B	
2.B.3	Adipic Acid Production	2B	
2.B.4	Caprolactam, Glyoxal and Glyoxylic Acid Production	2B	
2.B.5	Carbide Production	2B	
2.B.6	Titanium Dioxide Production	2B	
2.B.7	Soda Ash Production	2A	
2.B.8.a	Methanol	2B	
2.B.8.b	Ethylene	2B	
2.B.8.c	Ethylene Dichloride and Vinyl Chloride Monomer	2B	
2.B.8.d	Ethylene Oxide	2B	
2.B.8.e	Acrylonitrile	2B	
2.B.8.f	Carbon Black	2B	
2.B.9.a	By-product emissions	2E	Details are the same as the instructions for 2F shown below.
2.B.9.b	Fugitive Emissions	2E	
2.B.10	Other (Please specify)	2B	
2.C.1	Iron and Steel Production	2C	
2.C.2	Ferroalloys Production	2C	
2.C.3	Aluminium production	2C	CO2 is included in Table 1. CF4 and C2F6 are included in Table 2.
2.C.4	Magnesium production	2C	CO2 is included in Table 1. SF6 is included in Table 2.
2.C.5	Lead Production	2C	
2.C.6	Zinc Production	2C	
2.C.7	Other (please specify)	2C	
2.D.1	Lubricant Use	2G	
2.D.2	Paraffin Wax Use	2G	
2.D.3	Solvent Use	3	
2.D.4	Other (please specify)	2G	

2006 Category most disaggregated level (Emissions are calculated at this level.)		1996 Category Second Level (Emissions are reported at this level in NAI table.)	Note
2.E.1	Integrated Circuit or Semiconductor	2F	CHF3 (HF-C23), CHF2CHF2 (HFC-134), CF4, C2F6 and SF6 are reported in the respective columns in Table 2. NF3 is NOT included in either Table 1 or Table 2. Other HFCs are aggregated in terms of Gg-CO2 eq and included in the column "Other (Gg-CO2)" under "HFC" in Table 2. Other PFCs are aggregated in terms of Gg-CO2 eq and included in the column "Other (Gg-CO2)" under "PFC" in Table 2. CO2, CH4 and N2O from 2.E.5 are reported in the row "7 - Other (please specify)" in Table 1.
2.E.2	TFT Flat Panel Display	2F	
2.E.3	Photovoltaics	2F	
2.E.4	Heat Transfer Fluid	2F	
2.E.5	Other (please specify)	2F	
2.F.1.a	Refrigeration and Stationary Air Conditioning	2F	
2.F.1.b	Mobile Air Conditioning	2F	
2.F.2	Foam Blowing Agents	2F	
2.F.3	Fire Protection	2F	
2.F.4	Aerosols	2F	
2.F.5	Solvents	2F	
2.F.6	Other Applications (please specify)	2F	
2.G.1.a	Manufacture of Electrical Equipment	2F	
2.G.1.b	Use of Electrical Equipment	2F	
2.G.1.c	Disposal of Electrical Equipment	2F	
2.G.2.a	Military Applications	2F	
2.G.2.b	Accelerators	2F	
2.G.2.c	Other (please specify)	2F	
2.G.3.a	Medical Applications	3	
2.G.3.b	Propellant for pressure and aerosol products	3	
2.G.3.c	Other (Please specify)	3	
2.G.4	Other (Please specify)	3	For CO2, CH4, N2O
		2F	For HFC, PFC, SF6 (Details are the same for 2F as shown above.)
2.H.1	Pulp and Paper Industry	2D	
2.H.2	Food and Beverages Industry	2D	
2.H.3	Other (please specify)	2G	
3.A.1.a.i	Dairy Cows	4A	
3.A.1.a.ii	Other Cattle	4A	
3.A.1.b	Buffalo	4A	
3.A.1.c	Sheep	4A	
3.A.1.d	Goats	4A	
3.A.1.e	Camels	4A	
3.A.1.f	Horses	4A	
3.A.1.g	Mules and Asses	4A	
3.A.1.h	Swine	4A	
3.A.1.j	Other (please specify)	4A	
3.A.2.a.i	Dairy Cows	4B	
3.A.2.a.ii	Other Cattle	4B	
3.A.2.b	Buffalo	4B	
3.A.2.c	Sheep	4B	
3.A.2.d	Goats	4B	
3.A.2.e	Camels	4B	
3.A.2.f	Horses	4B	
3.A.2.g	Mules and Asses	4B	
3.A.2.h	Swine	4B	
3.A.2.i	Poultry	4B	

2006 Category most disaggregated level (Emissions are calculated at this level.)		1996 Category Second Level (Emissions are reported at this level in NAI table.)	Note
3.A.2.j	Other (please specify)	4B	
3.B.1.a	Forest land Remaining Forest land	5A	For Above-ground Biomass, Below-ground Biomass, Dead Organic Matter
		5D	For Soil
3.B.1.b.i	Cropland converted to Forest Land	5A	For Above-ground Biomass, Below-ground Biomass, Dead Organic Matter, when the user did NOT choose "This is caused by abandonment of managed land."
		5C	For Above-ground Biomass, Below-ground Biomass, Dead Organic Matter, when the user chose "This is caused by abandonment of managed land."
		5D	For Soil
3.B.1.b.ii	Grassland converted to Forest Land	5A	For Above-ground Biomass, Below-ground Biomass, Dead Organic Matter, when the user did NOT choose "This is caused by abandonment of managed land."
		5C	For Above-ground Biomass, Below-ground Biomass, Dead Organic Matter, when the user chose "This is caused by abandonment of managed land."
		5D	For Soil
3.B.1.b.iii	Wetlands converted to Forest Land	5A	For Above-ground Biomass, Below-ground Biomass, Dead Organic Matter, when the user did NOT choose "This is caused by abandonment of managed land."
		5C	For Above-ground Biomass, Below-ground Biomass, Dead Organic Matter, when the user chose "This is caused by abandonment of managed land."
		5D	For Soil
3.B.1.b.iv	Settlements converted to Forest Land	5A	For Above-ground Biomass, Below-ground Biomass, Dead Organic Matter, when the user did NOT choose "This is caused by abandonment of managed land."
		5C	For Above-ground Biomass, Below-ground Biomass, Dead Organic Matter, when the user chose "This is caused by abandonment of managed land."
		5D	For Soil

2006 Category most disaggregated level (Emissions are calculated at this level.)		1996 Category Second Level (Emissions are reported at this level in NAI table.)	Note
3.B.1.b.v	Other Land converted to Forest Land	5A	For Above-ground Biomass, Below-ground Biomass, Dead Organic Matter, when the user did NOT choose "This is caused by abandonment of managed land."
		5C	For Above-ground Biomass, Below-ground Biomass, Dead Organic Matter, when the user chose "This is caused by abandonment of managed land."
		5D	For Soil
3.B.2.a	Cropland Remaining Cropland	5A	For Above-ground Biomass, Below-ground Biomass, Dead Organic Matter
		5D	For Soil
3.B.2.b.i	Forest Land converted to Cropland	5B	For Above-ground Biomass, Below-ground Biomass, Dead Organic Matter
		5D	For Soil
3.B.2.b.ii	Grassland converted to Cropland	5B	For Above-ground Biomass, Below-ground Biomass, Dead Organic Matter
		5D	For Soil
3.B.2.b.iii	Wetlands converted to Cropland	5E	For Above-ground Biomass, Below-ground Biomass, Dead Organic Matter
		5D	For Soil
3.B.2.b.iv	Settlements converted to Cropland	5E	For Above-ground Biomass, Below-ground Biomass, Dead Organic Matter
		5D	For Soil
3.B.2.b.v	Other Land converted to Cropland	5E	For Above-ground Biomass, Below-ground Biomass, Dead Organic Matter
		5D	For Soil
3.B.3.a	Grassland Remaining Grassland	5A	For Above-ground Biomass, Below-ground Biomass, Dead Organic Matter
		5D	For Soil
3.B.3.b.i	Forest Land converted to Grassland	5B	For Above-ground Biomass, Below-ground Biomass, Dead Organic Matter
		5D	For Soil
3.B.3.b.ii	Cropland converted to Grassland	5E	For Above-ground Biomass, Below-ground Biomass, Dead Organic Matter
		5D	For Soil
3.B.3.b.iii	Wetlands converted to Grassland	5E	For Above-ground Biomass, Below-ground Biomass, Dead Organic Matter
		5D	For Soil

2006 Category most disaggregated level (Emissions are calculated at this level.)		1996 Category Second Level (Emissions are reported at this level in NAI table.)	Note
3.B.3.b.iv	Settlements converted to Grassland	5E	For Above-ground Biomass, Below-ground Biomass, Dead Organic Matter
		5D	For Soil
3.B.3.b.v	Other Land converted to Grassland	5E	For Above-ground Biomass, Below-ground Biomass, Dead Organic Matter
		5D	For Soil
3.B.4.a.i	Peatlands remaining peatlands	5A	For Above-ground Biomass, Below-ground Biomass, Dead Organic Matter
		5D	For Soil
3.B.4.a.ii	Flooded land remaining flooded land	5A	For Above-ground Biomass, Below-ground Biomass, Dead Organic Matter
		5D	For Soil
3.B.4.b.i	Land converted for peat extraction	5B	For Above-ground Biomass, Below-ground Biomass, Dead Organic Matter, for Forest Land converted for peat extraction
		5E	For Above-ground Biomass, Below-ground Biomass, Dead Organic Matter, for other than Forest Land converted for peat extraction
		5D	For Soil
3.B.4.b.ii	Land converted to flooded land	5B	For Above-ground Biomass, Below-ground Biomass, Dead Organic Matter, for Forest Land converted for peat extraction
		5E	For Above-ground Biomass, Below-ground Biomass, Dead Organic Matter, for other than Forest Land converted for peat extraction
		5D	For Soil
3.B.4.b.iii	Land converted to other wetlands	5B	For Above-ground Biomass, Below-ground Biomass, Dead Organic Matter, for Forest Land converted for peat extraction
		5E	For Above-ground Biomass, Below-ground Biomass, Dead Organic Matter, for other than Forest Land converted for peat extraction
		5D	For Soil

2006 Category most disaggregated level (Emissions are calculated at this level.)		1996 Category Second Level (Emissions are reported at this level in NAI table.)	Note
3.B.5.a	Settlements Remaining Settlements	5A	For Above-ground Biomass, Below-ground Biomass, Dead Organic Matter
		5D	For Soil
3.B.5.b.i	Forest Land converted to Settlements	5B	For Above-ground Biomass, Below-ground Biomass, Dead Organic Matter
		5D	For Soil
3.B.5.b.ii	Cropland converted to Settlements	5E	For Above-ground Biomass, Below-ground Biomass, Dead Organic Matter
		5D	For Soil
3.B.5.b.iii	Grassland converted to Settlements	5E	For Above-ground Biomass, Below-ground Biomass, Dead Organic Matter
		5D	For Soil
3.B.5.b.iv	Wetlands converted to Settlements	5E	For Above-ground Biomass, Below-ground Biomass, Dead Organic Matter
		5D	For Soil
3.B.5.b.v	Other land converted to Settlements	5E	For Above-ground Biomass, Below-ground Biomass, Dead Organic Matter
		5D	For Soil
3.B.6.a	Other land Remaining Other land	5A	For Above-ground Biomass, Below-ground Biomass, Dead Organic Matter
		5D	For Soil
3.B.6.b.i	Forest Land converted to Other Land	5B	For Above-ground Biomass, Below-ground Biomass, Dead Organic Matter
		5D	For Soil
3.B.6.b.ii	Cropland converted to Other Land	5E	For Above-ground Biomass, Below-ground Biomass, Dead Organic Matter
		5D	For Soil
3.B.6.b.iii	Grassland converted to Other Land	5E	For Above-ground Biomass, Below-ground Biomass, Dead Organic Matter
		5D	For Soil
3.B.6.b.iv	Wetlands converted to Other Land	5E	For Above-ground Biomass, Below-ground Biomass, Dead Organic Matter
		5D	For Soil
3.B.6.b.v	Settlements converted to Other Land	5E	For Above-ground Biomass, Below-ground Biomass, Dead Organic Matter
		5D	For Soil
3.C.1.a	Biomass burning in forest lands	5E	

2006 Category most disaggregated level (Emissions are calculated at this level.)		1996 Category Second Level (Emissions are reported at this level in NAI table.)	Note
3.C.1.b	Biomass burning in croplands	4F	When the user chose "This is caused by agricultural residue burning."
		5B	When the user did not choose "This is caused by agricultural residue burning.", and this is on Forest land converted to Cropland or on Grassland converted to Cropland.
		5E	Otherwise
3.C.1.c	Biomass burning in grasslands	4E	When the user chose "This is caused by prescribed burning of savannas."
		5B	When the user did not choose "This is caused by prescribed burning of savannas.", and this is on Grassland converted to Cropland.
		5E	Otherwise
3.C.1.d	Biomass burning in all other land	5B	For Forest land converted to other land-use category or for Grassland converted to other land-use category.
		5E	Otherwise
3.C.2	Liming	5D	
3.C.3	Urea application	N.A.	The emissions under 3.C.3 (Urea application) is excluded, since they are already reported under 2B of 1996 GLs. See note for category 2.B.1.
3.C.4	Direct N2O Emissions from managed soils	4D	For Cropland & Grassland
		5B	For Forest land converted to non-Forestland, and Grassland converted to non-Grassland
		5E	Otherwise
3.C.5	Indirect N2O Emissions from managed soils	4D	For Cropland & Grassland
		5B	For Forest land converted to non-Forestland, and Grassland converted to non-Grassland
		5E	Otherwise
3.C.6	Indirect N2O Emissions from manure management	4B	
3.C.7	Rice cultivations	4C	
3.C.8	Other (please specify)	5E	
3.D.1	Harvested Wood Products	5E	
3.D.2	Other (please specify)	5E	
4.A	Solid Waste Disposal	6A	
4.A.1	Managed Waste Disposal Sites	6A1	
4.A.2	Unmanaged Waste Disposal Sites	6A2	
4.A.3	Uncategorised Waste Disposal Sites	6A3	

2006 Category most disaggregated level (Emissions are calculated at this level.)		1996 Category Second Level (Emissions are reported at this level in NAI table.)	Note
4.B	Biological Treatment of Solid Waste	6D	
4.C	Incineration and Open Burning of Waste	6C	
4.C.1	Waste Incineration	6C	
4.C.2	Open Burning of Waste	6C	
4.D	Wastewater Treatment and Discharge	6B	
4.D.1	Domestic Wastewater Treatment and Discharge	6B2	
4.D.2	Industrial Wastewater Treatment and Discharge	6B1	
4.E	Other (please specify)	6D	