Task Force on
National Greenhouse Gas Inventories

ipcc
INTERGOVERNMENTAL PANEL ON climate change

WMO UNEP

IPCC Inventory Software

User Manual Version 2.96

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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, Tier2 and Tier 3 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

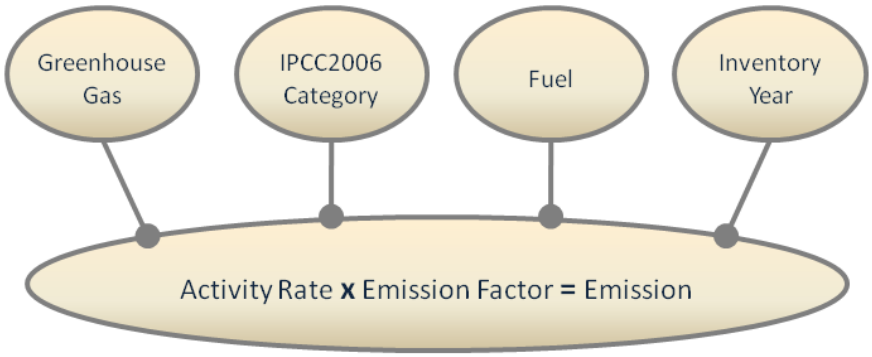


Figure 1.1 - Basic data relations

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 in Figure 1.2.

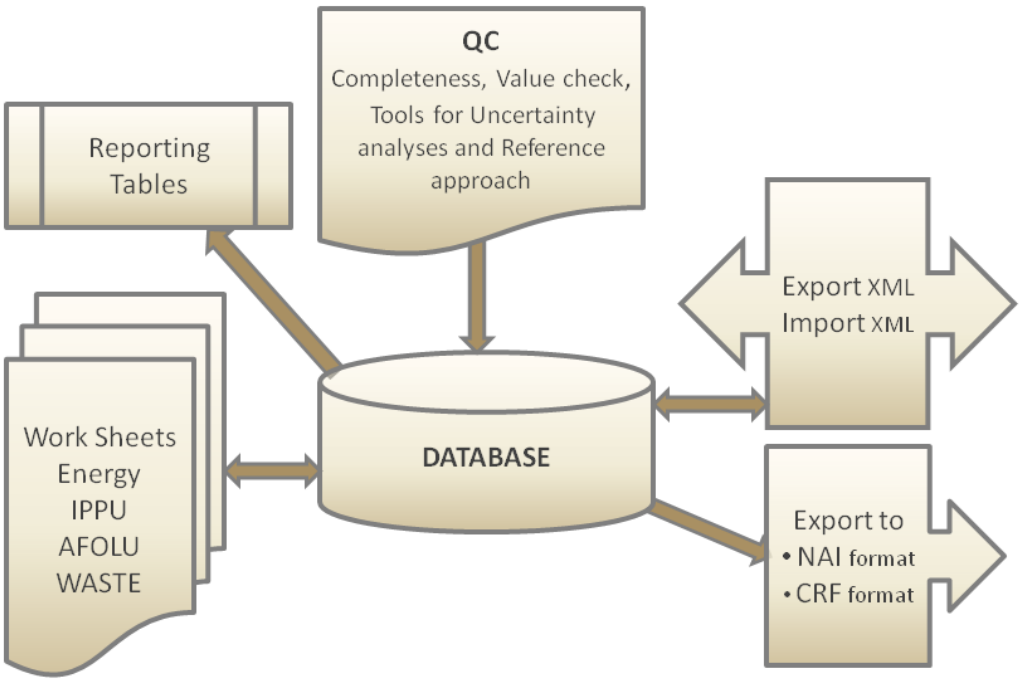


Figure 1.2 - Basic software modules

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).

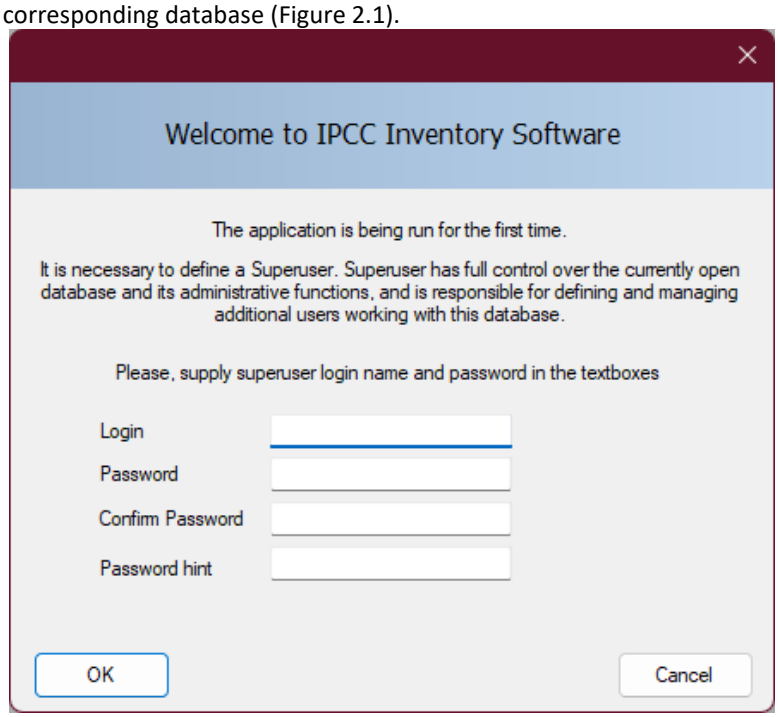


Figure 2.1- Define Super User

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.

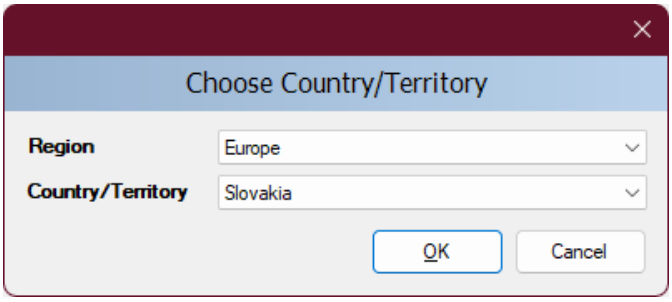


Figure 2.2 - Choose Country

2.1.3 Create Inventory Year

In this step it is necessary to create an 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.

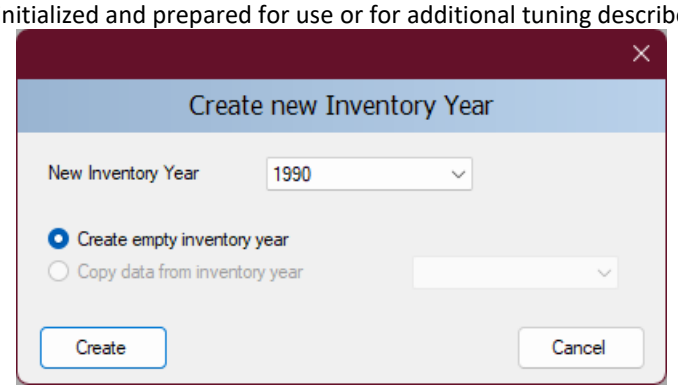


Figure 2.3 – Creating Inventory Year

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.

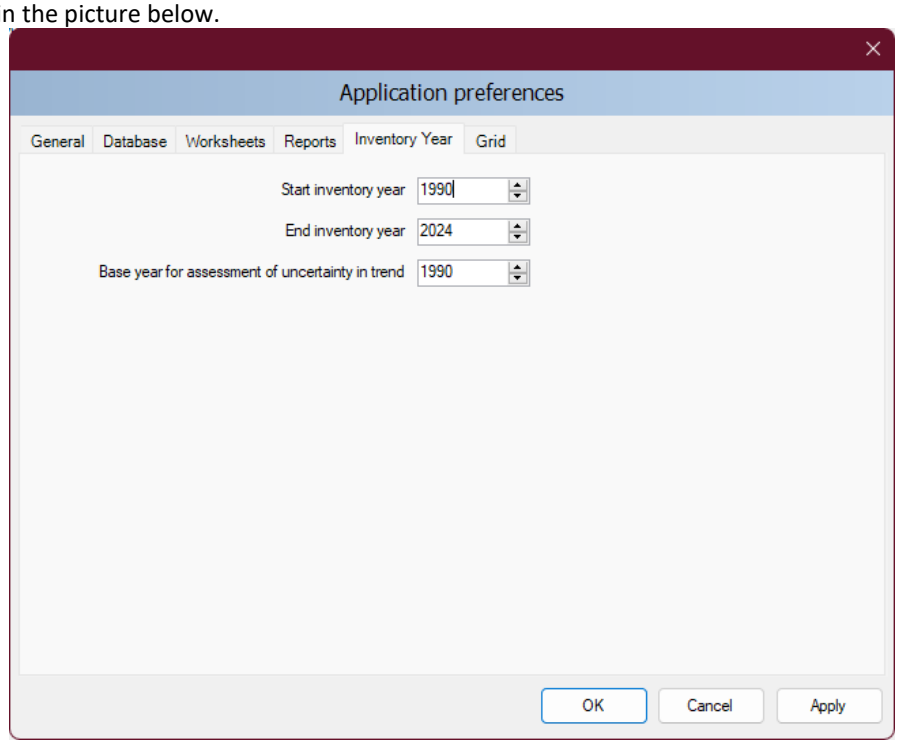


Figure 2.4 – Setting Inventory Preferences

Check and modify the following values, if necessary:

1) Use **Start inventory year** numeric box to set starting inventory year. The 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. The 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 to work with the worksheets (menu *Inventory Year / Create New…*) or before distributing the database to other compilers.

After lowering the 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.

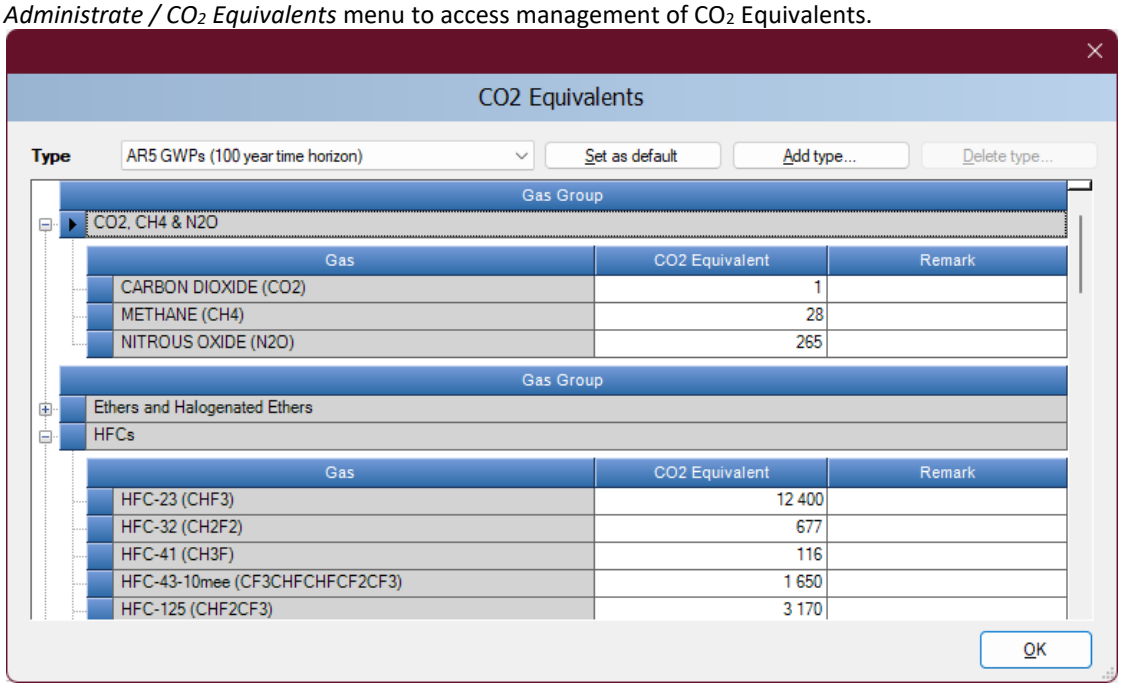


Figure 2.5 – CO_2 Equivalents

2.3.1 Fixed CO_2 Equivalent types

The **Type** list contains 4 fixed types with fixed CO_2 Equivalent values, that cannot be changed or deleted:

- SAR GWPs
- TAR GWPs
- AR4 GWPs
- AR5 GWPs – these are set as default

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.

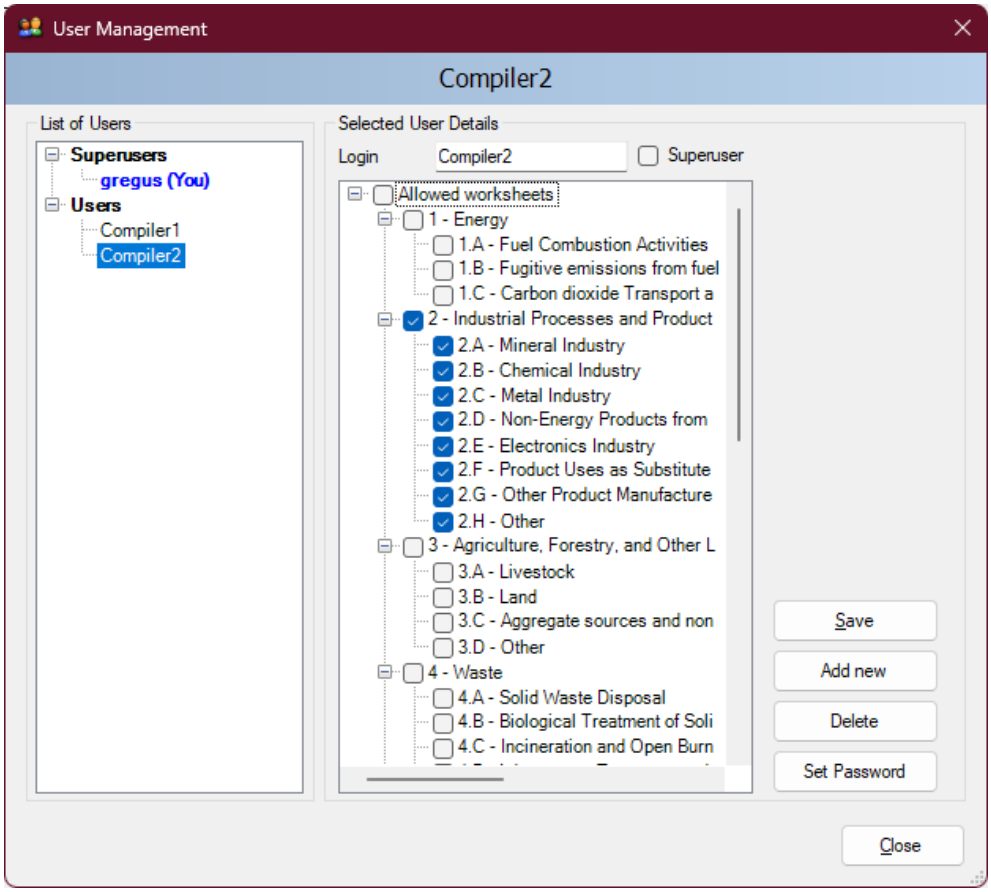


Figure 2.6 – User Management

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. The 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. The 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 specific 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 the 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 the 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 in 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 the 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 dataflow 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 (ACCDB 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.

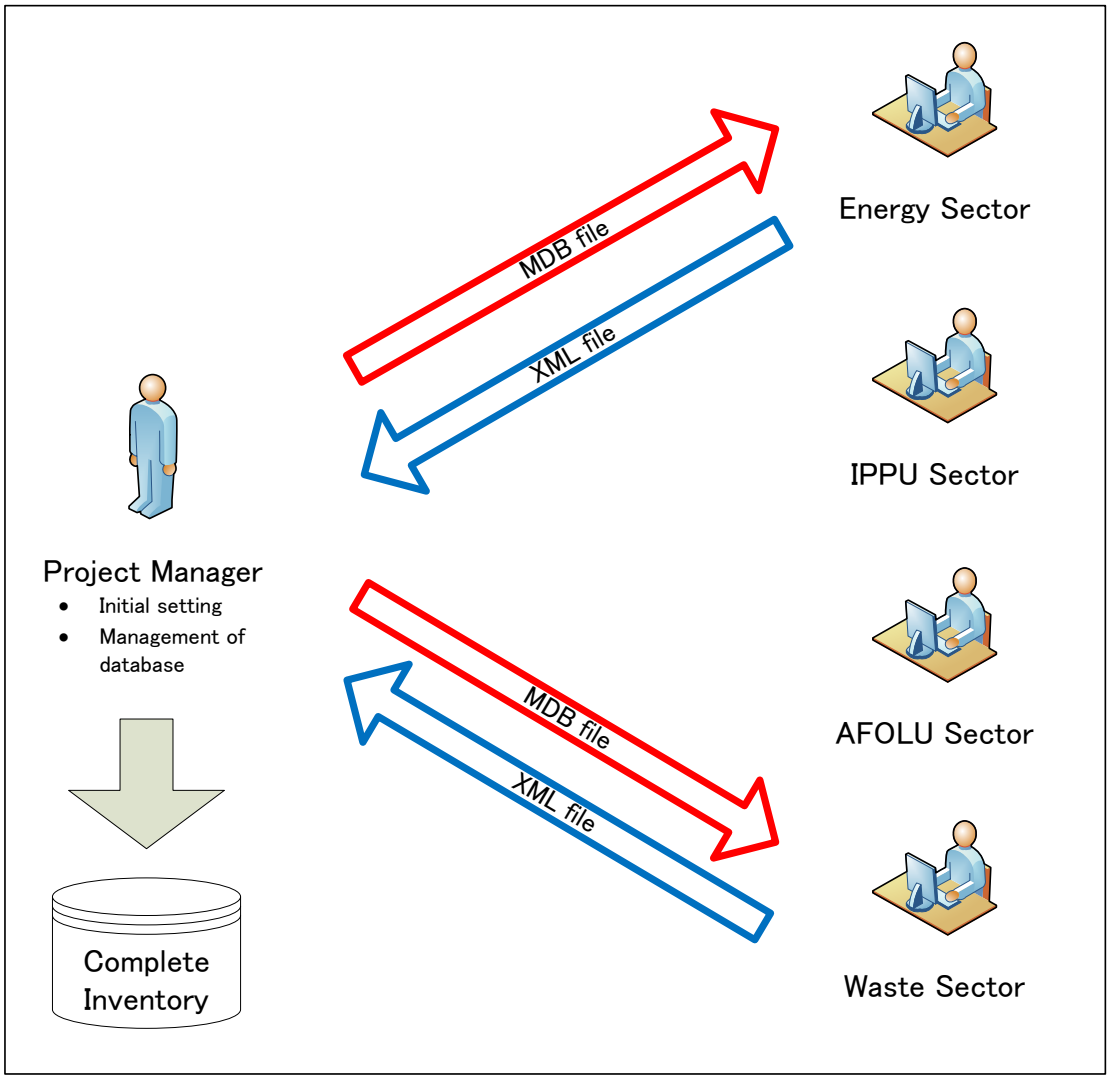


Figure 2.7 – Using the software in an inventory team

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

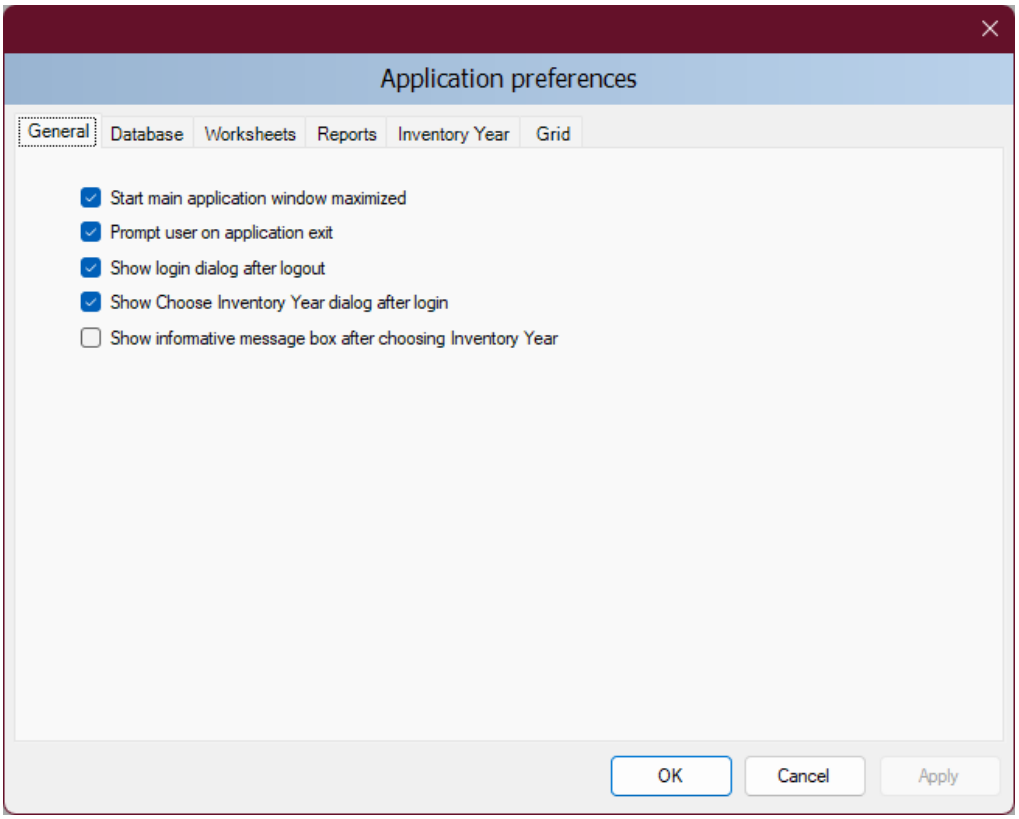


Figure 3.2 – General preferences

- **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, the 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 specific Inventory Year (activated automatically or by user action).

Database

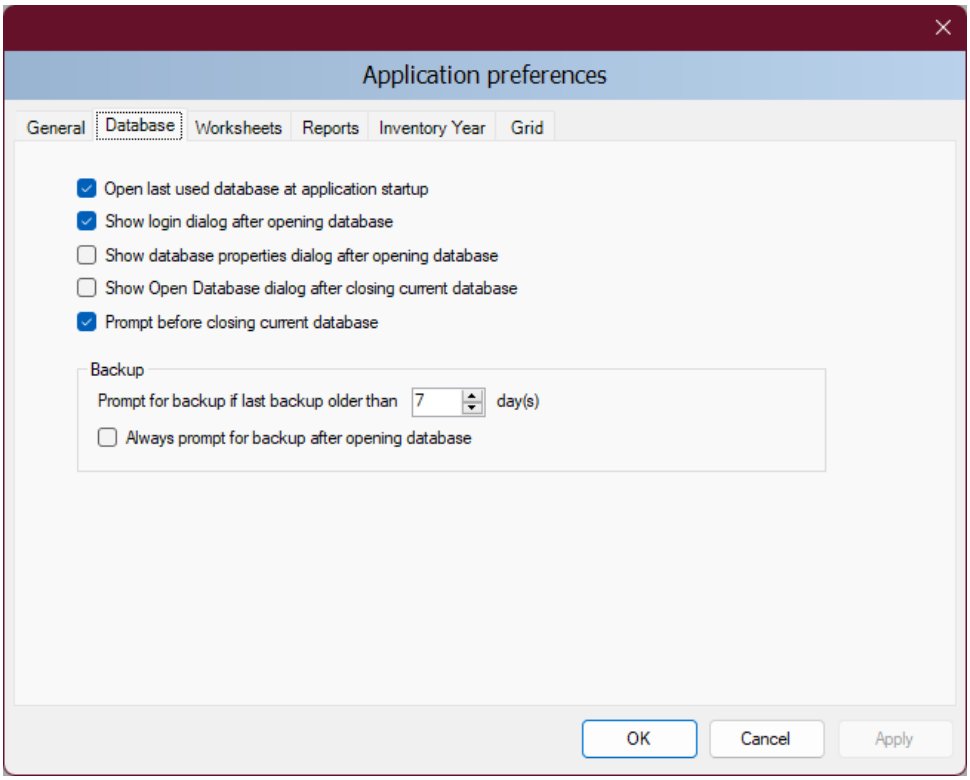


Figure 3.3 – Database preferences

- **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 is.

Worksheets

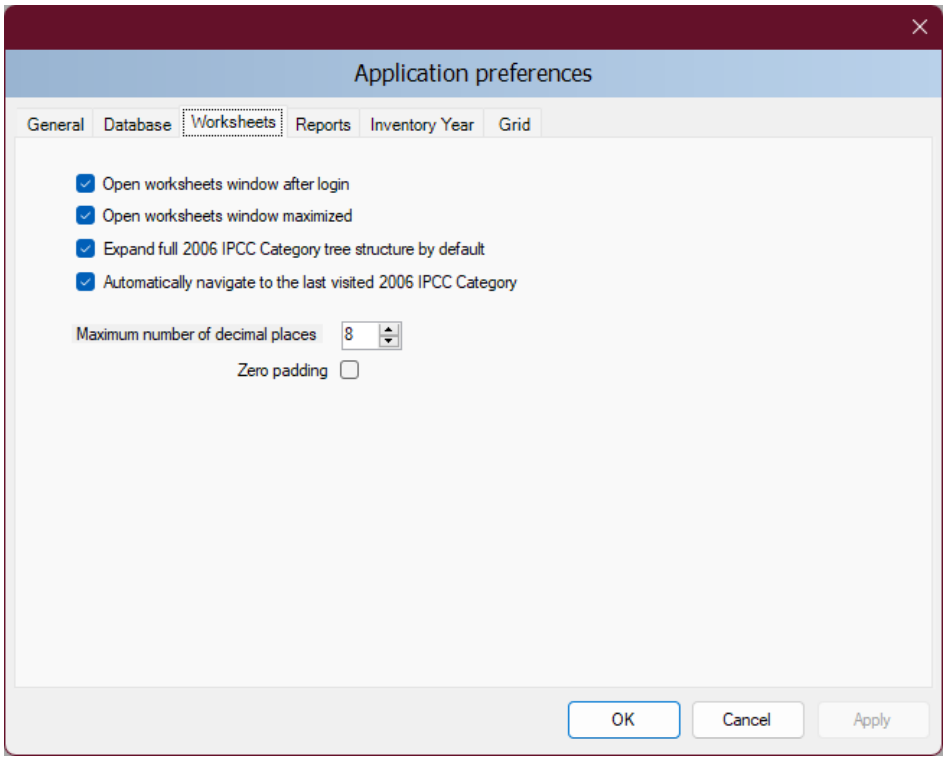


Figure 3.4 – Worksheet preferences

- **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 2006 IPCC Category tree 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 2006 IPCC 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 0.10000000 - padded with zeros up to the maximum number of decimal places – 8 in this case.

Reports

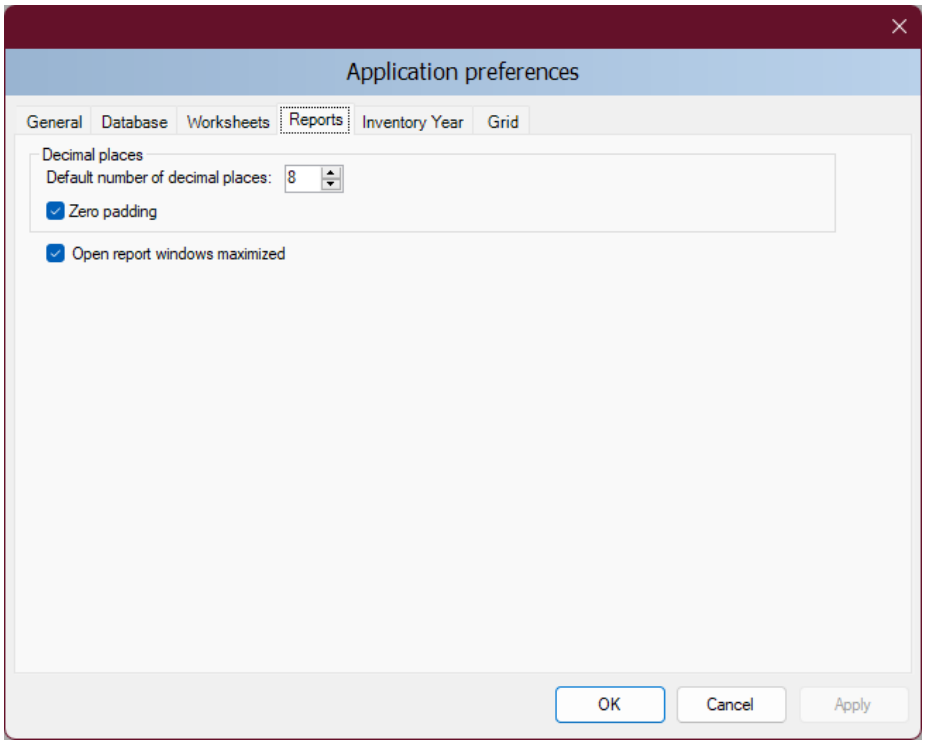


Figure 3.5 – Reports preferences

- **Default number of decimal places** – numbers in reports will be automatically rounded according to the 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 0.10000000 - padded with zeros up to the maximum number of decimal places – 8 in this case
- **Open report windows maximized** - if checked, reporting windows will automatically scale to fit main application window.

Inventory Year

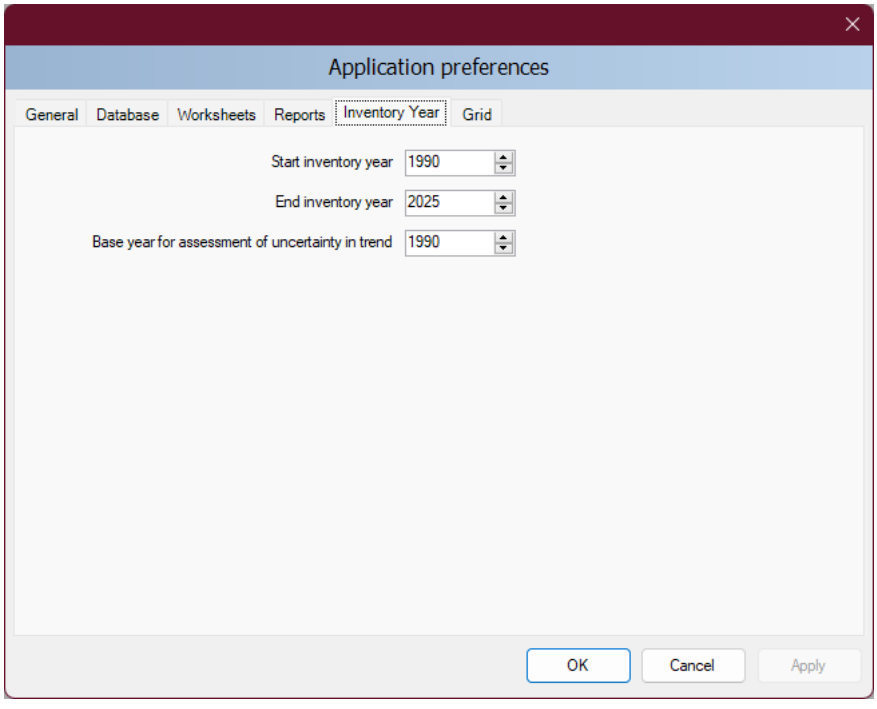


Figure 3.6 – Inventory Year preferences

- **Start inventory year** – defines starting inventory year. The 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. The default is 1990.

Grid

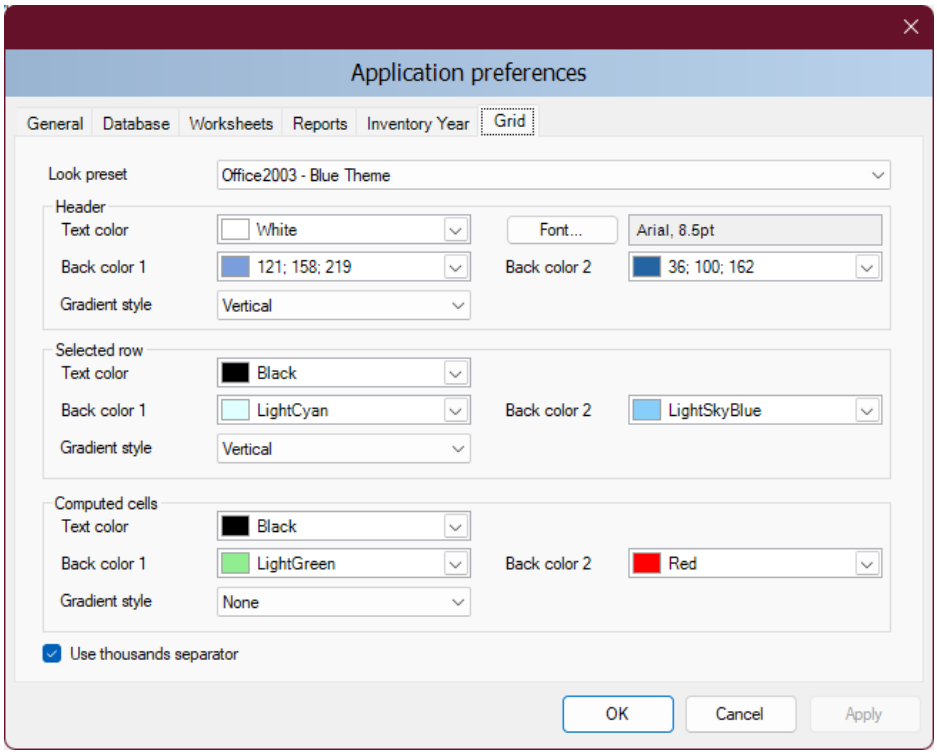


Figure 3.7 – Grid

- **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

Closes the software.

3.2.2 Database menu

3.2.2.1 Open/Close Database

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

Automatic database upgrade
Starting from version 2.10, the software supports automatic conversion of databases coming from previous versions of the software (versions 2.00 and later are supported). This means users can comfortably import their existing databases (version 2.00 or later) without additional effort. When a database from an older version of the software is open in the new version, the user will be prompted to start automatic database conversion. **NOTE that it is strongly recommended to make a backup version of the original database prior to this conversion. Although data loss is not expected during the upgrade process, maintaining a backup version ensures that information can be recovered.** After the 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.

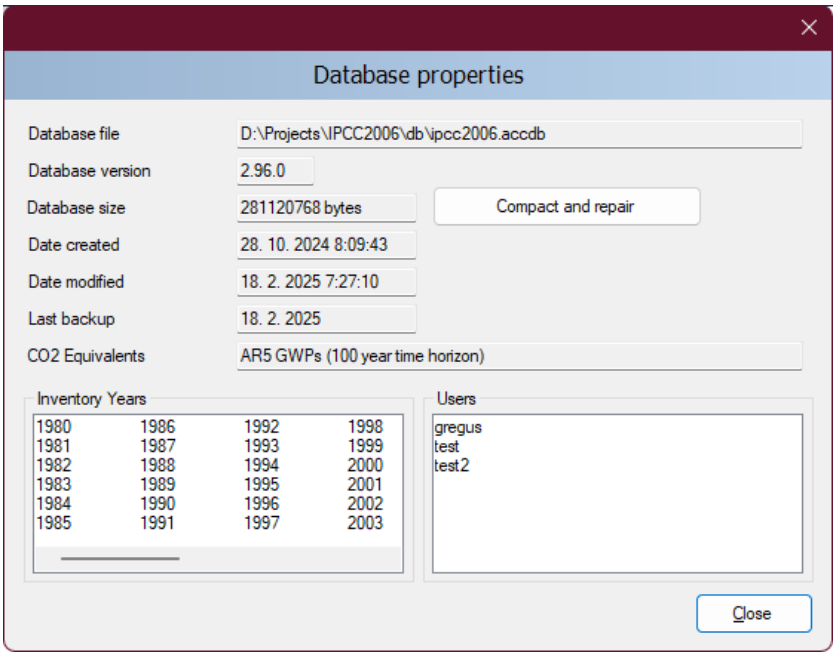


Figure 3.8 – Database properties

The following information is available:

- **Database file** – full path to currently open database file (ACCDB)
- **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 the 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.

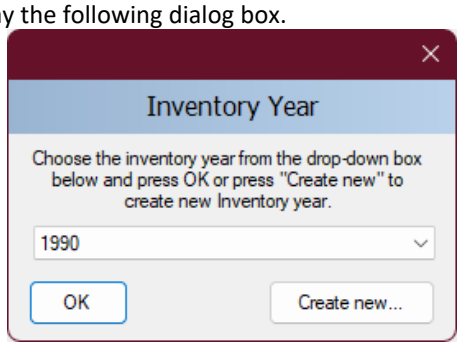


Figure 3.9 – Choose Inventory Year

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.

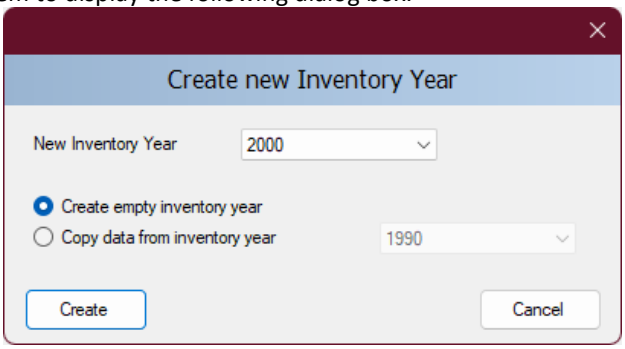


Figure 3.10 – Create new Inventory Year

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 *Administrate*

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

3.2.4.1 *Users*

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

3.2.4.2 *Country/Territory*

This menu item opens a dialog window that allows choosing current region and country or territory. Data on all levels will automatically reflect the country/territory change.

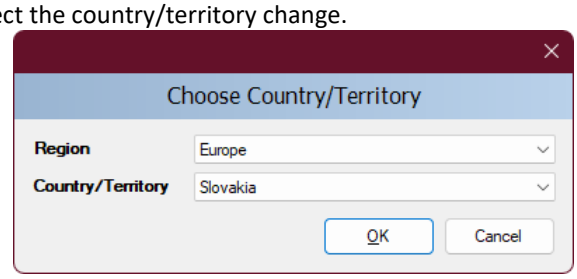


Figure 3.11 – Choosing Country/Territory

3.2.4.3 *CO_2 Equivalents*

This menu item opens a dialog window that allows the administrator to manage CO_2 Equivalents. Except for predefined SAR, TAR, AR4 and AR5 Equivalents, it is possible to define custom types. The default type of CO_2 Equivalents currently selected is indicated in the status bar and in *Database Properties* dialog box. See Chapter 2.3 for detailed information.

3.2.4.4 *Energy – Fuel Manager*

This menu item opens a dialog window that allows managing Fuels used mainly in Energy sector. Except for managing parameters of default 2006 IPCC Guidelines fuels, users can insert their own user-defined Fuels with their own parameters.

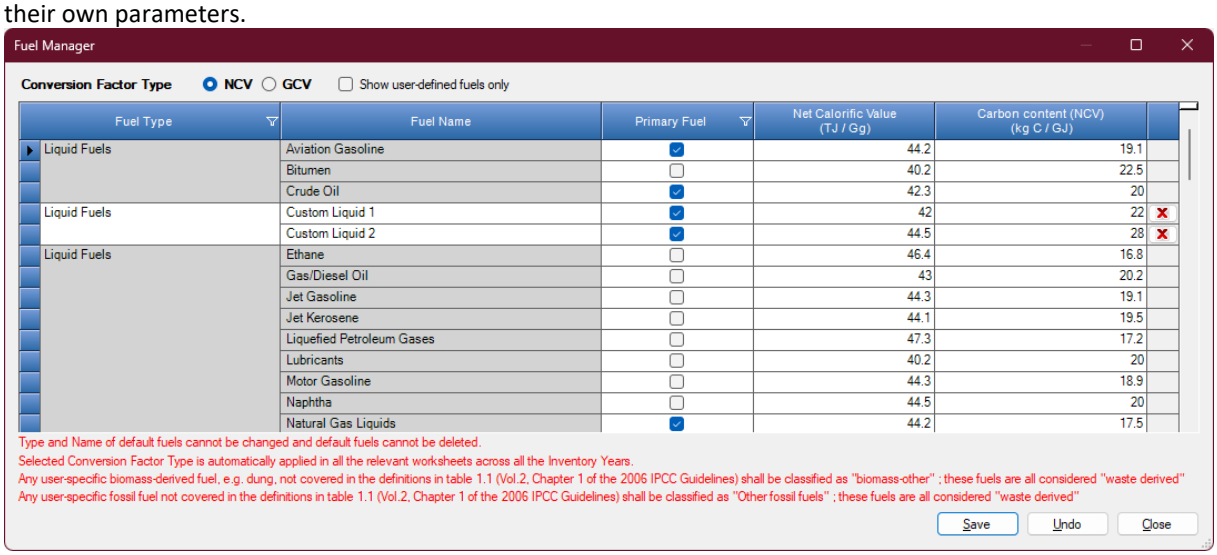


Figure 3.12 – Fuel Manager

3.2.4.5 IPPU – F-Gases Manager – Chemicals

This menu item opens a dialog window that allows managing F-Gases used in Industrial Processes and Product Use sector. Here, the user can specify which of the F-Gases are applicable within selected Country/Territory. Only the selected list of F-Gases will be available for Emission calculations at IPCC Category (worksheets) level and for the reporting.

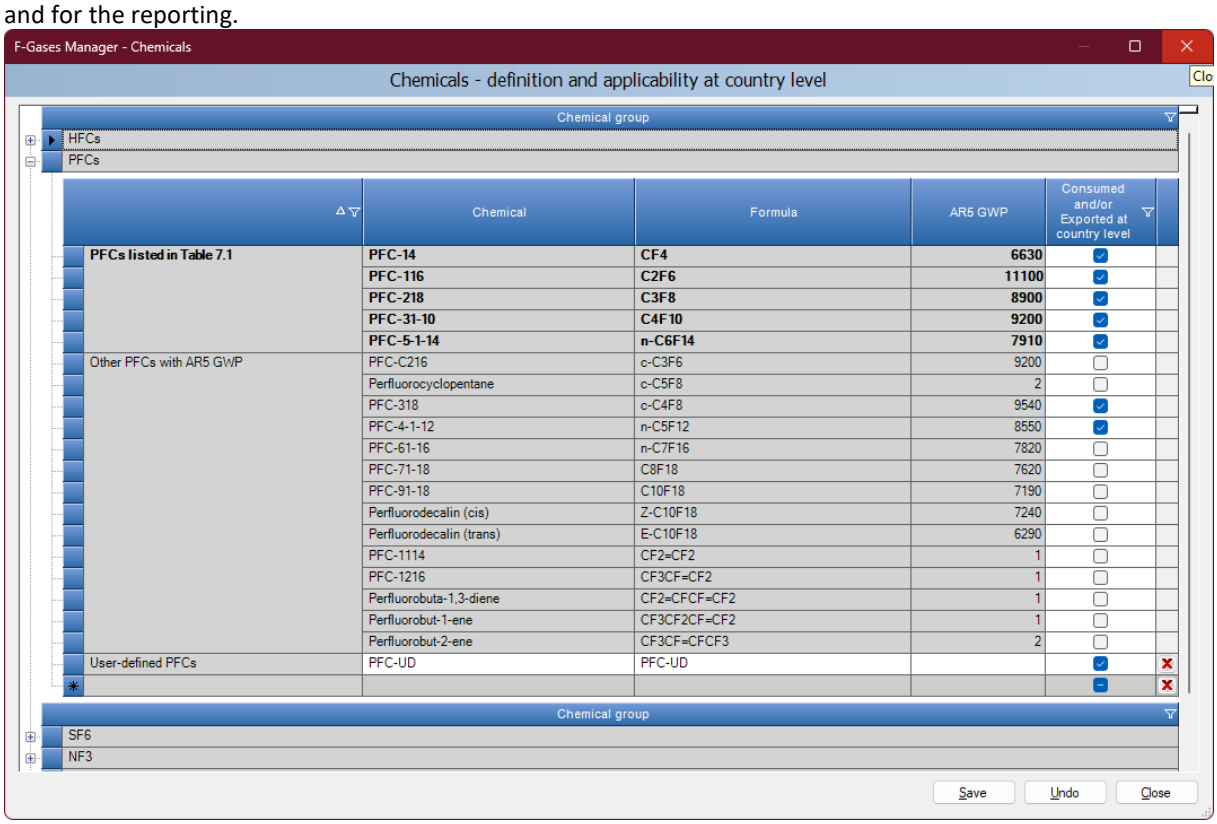


Figure 3.13 – F-Gases Manager – Chemicals

Applicability of F-Gases at specific IPCC Category level can further be adjusted using IPCC Category specific F-Gases manager which can be open from within any relevant worksheet that handles calculations of F-Gases emissions or other parameters. IPCC Category specific F-Gases manager contains only such chemicals and blends that were enabled at country level.

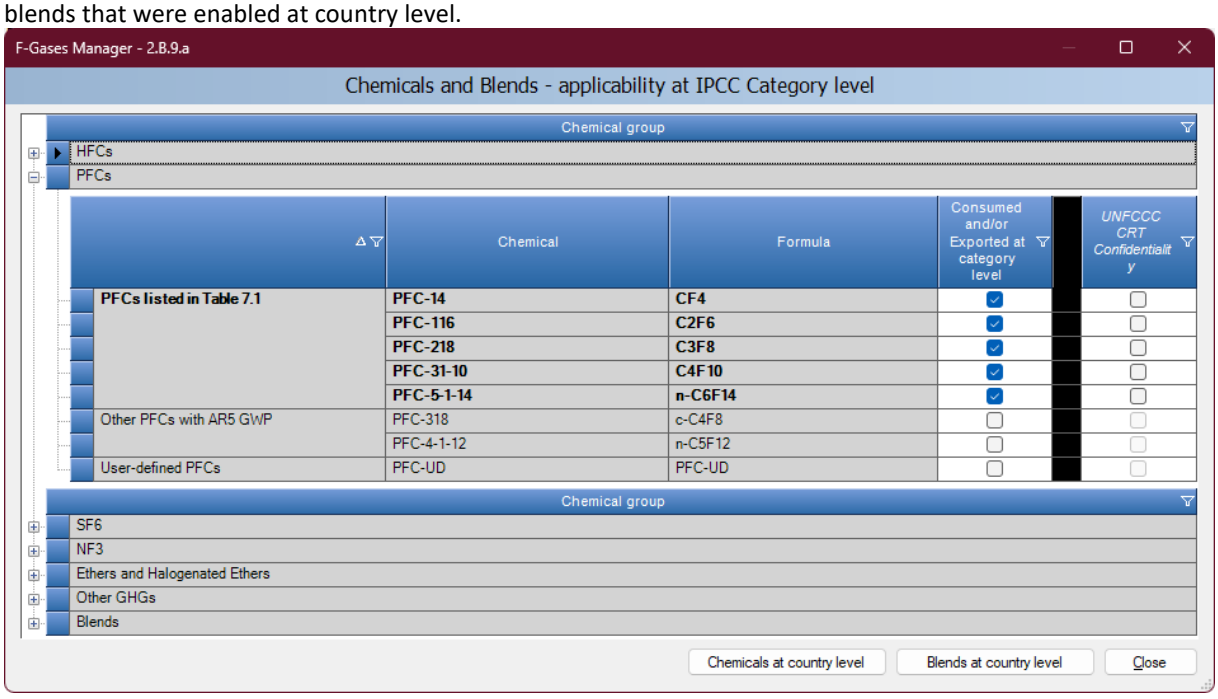


Figure 3.14 – F-Gases Manager – applicability at IPCC Category 2.B.9.a

UNFCCC CRT Confidentiality flag is an UNFCCC CRT specific feature that defines whether Activity Data and Emissions should be treated as confidential when compiling CRT Table 2(II).B-H.

Note on F-Gases specific worksheets

Note, that any worksheet used solely for calculation of emissions or other parameters related to F-Gases takes into account applicability of F-Gases selected for Country and IPCC Category that worksheet belongs to. In case there are no relevant F-Gases applicable for such worksheet due to Country or IPCC Category inapplicability, the worksheet is rendered empy and is restricted from user input, which means it does not allow user interaction, but yet remains visible for transparency purpose.

3.2.4.6 IPPU – F-Gases Manager – Blends

This menu item opens a dialog window for managing Blends. Blends are special chemicals that consist of multiple F-Gas constituents. For each F-Gas constituent, % of composition defines proportion of that F-Gas in blend. When Emissions are calculated or reported for blends, those are broken down into constituents and thus emissions are calculated and reported for each constituent in blend according to its % of composition. E.g., when emissions are calculated or reported for blend R-410A (figure below), 50% of emissions will be calculated and reported for HFC-32 and another 50% for HFC-125.

Applicability of blends at country level and IPCC Category level can be selected the same way as in case of standard Chemicals described in the previous chapters.

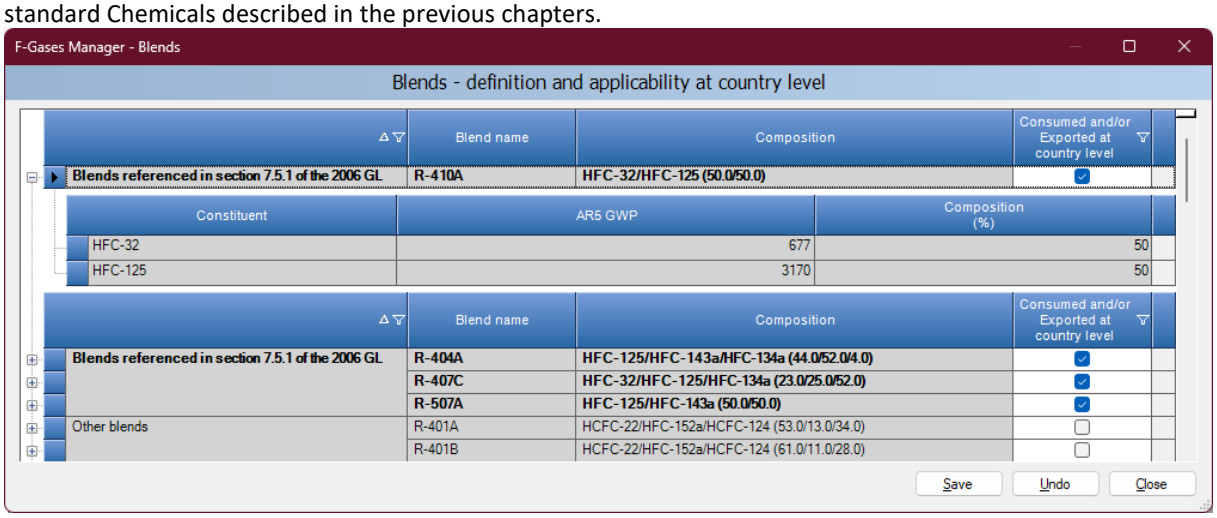


Figure 3.15 – F-Gases Manager – Blends

3.2.4.7 AFOLU - Land Use Manager

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

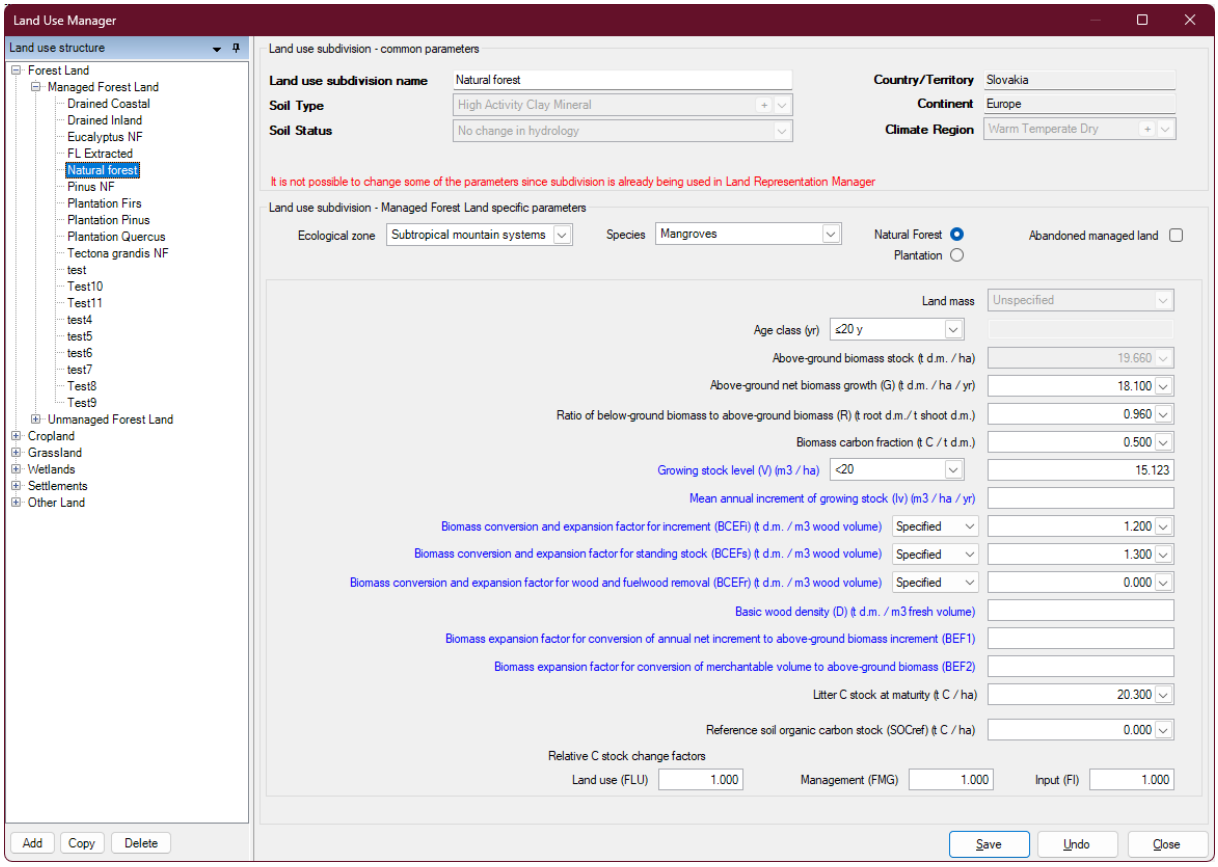


Figure 3.16 – Land Use Manager

Land Use Manager window consists of the following sections:

- **Navigation section** – contains the list of Land Use Subdivisions divided into corresponding main Land Use Subcategories and Categories (Managed Forest Land, Perennial Cropland, …). Activation of the Land Use Subdivision shows relevant details.
- **Common parameters** – contains data that is common for all Land Uses (Country, Climate Region, …)
- **Land Use Subdivision specific parameters** – contains details of the Land Use Subdivision that is selected in the navigation section.

Adding new Land Use Subdivision

Take the following steps to define new Land Use Subdivision:

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

Editing existing Land Use Subdivision

Take the following steps to edit existing Land Use Subdivision:

1) Select the Land Use Subdivision 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 Subdivision

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

1) Select the Land Use Subdivision 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 Subdivision will be created with the new name
4) Edit data as desired
5) Click the **Save** button to save new Land Use Subdivision into database.

Deleting existing Land Use Subdivision

1) Select the Land Use Subdivision 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

3.2.4.8 AFOLU - Land Representation Manager

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

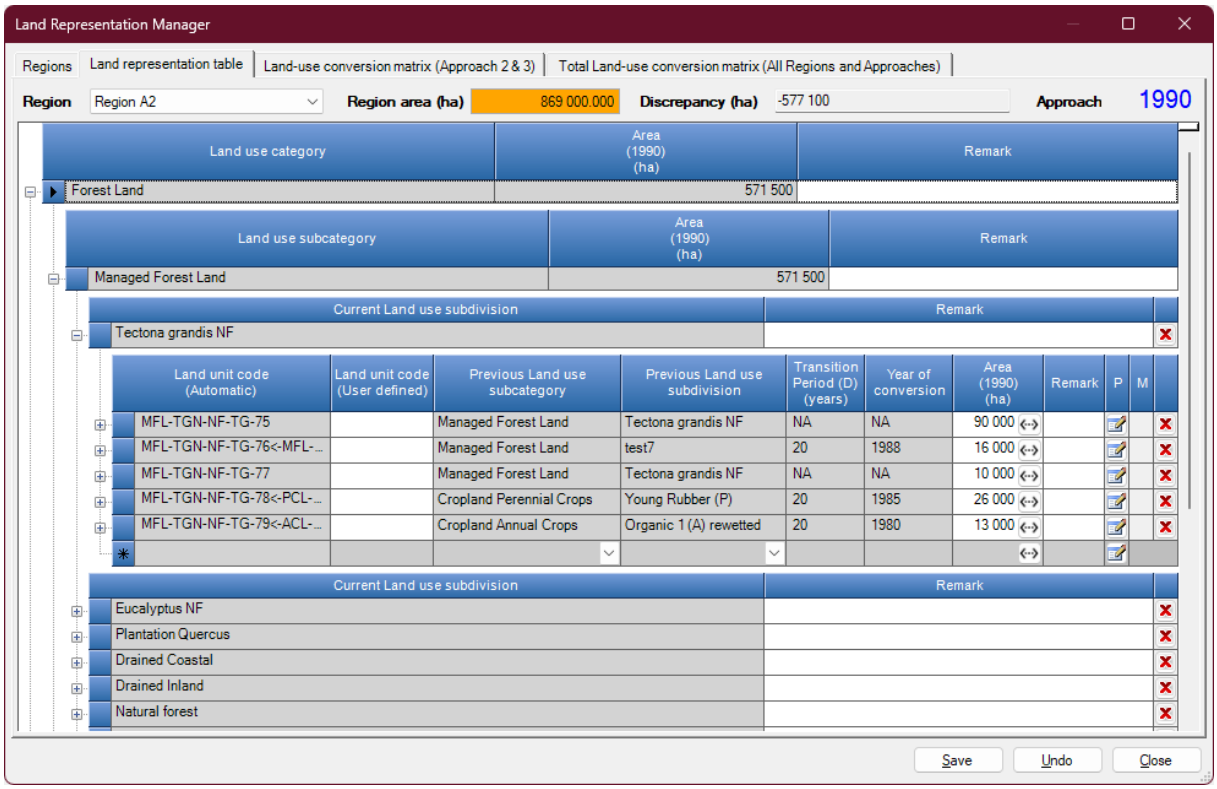


Figure 3.17 – Land Representation Manager

3.2.4.9 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

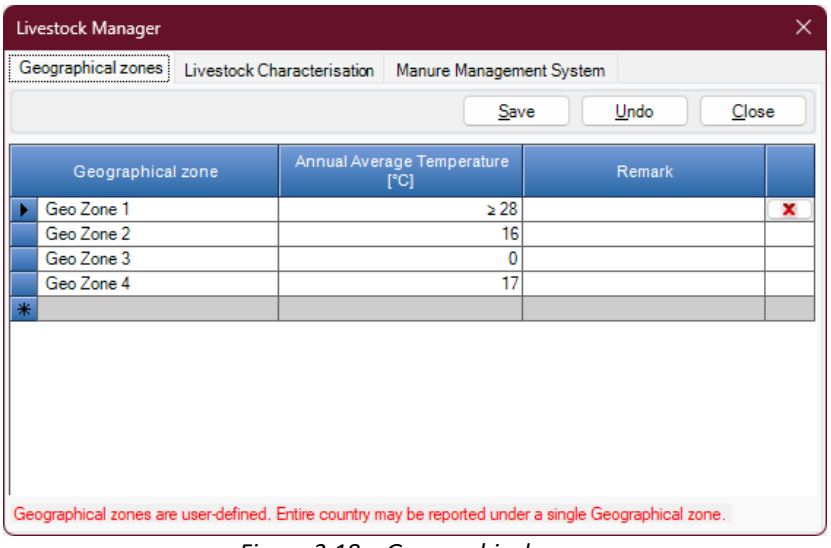


Figure 3.18 – Geographical zones

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

- **Adding new Geographical zone**
  1) Use last (add template) row to define new Geographical zone. Enter zone name, annual 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, annual 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

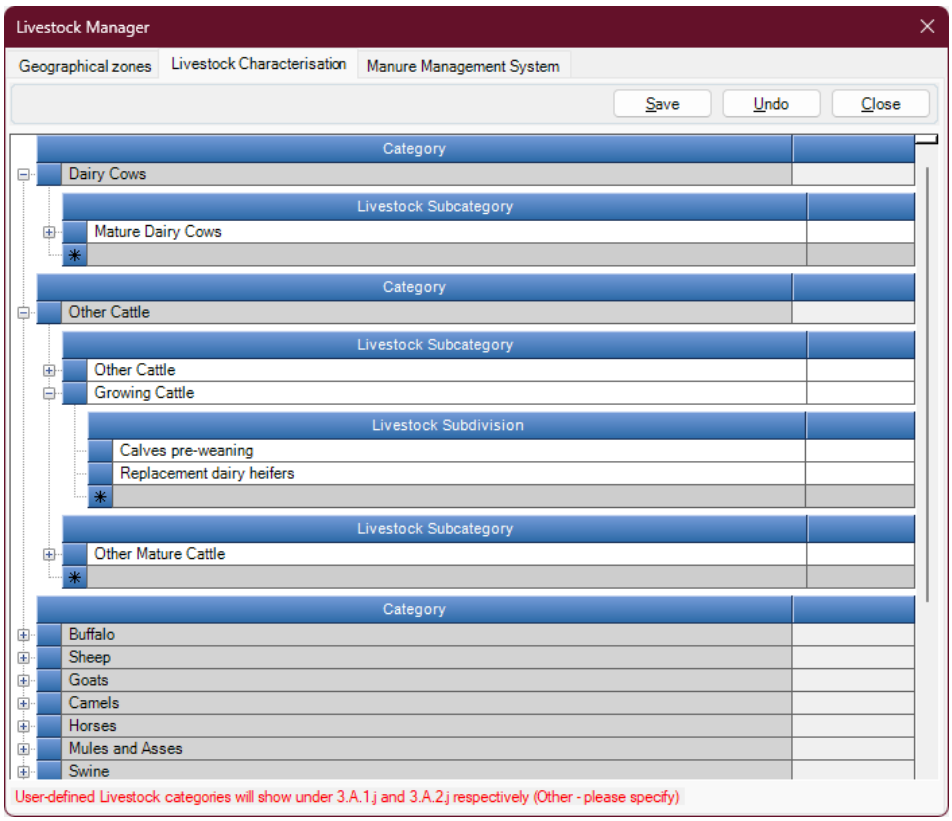


Figure 3.19 – Livestock Subcategories

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

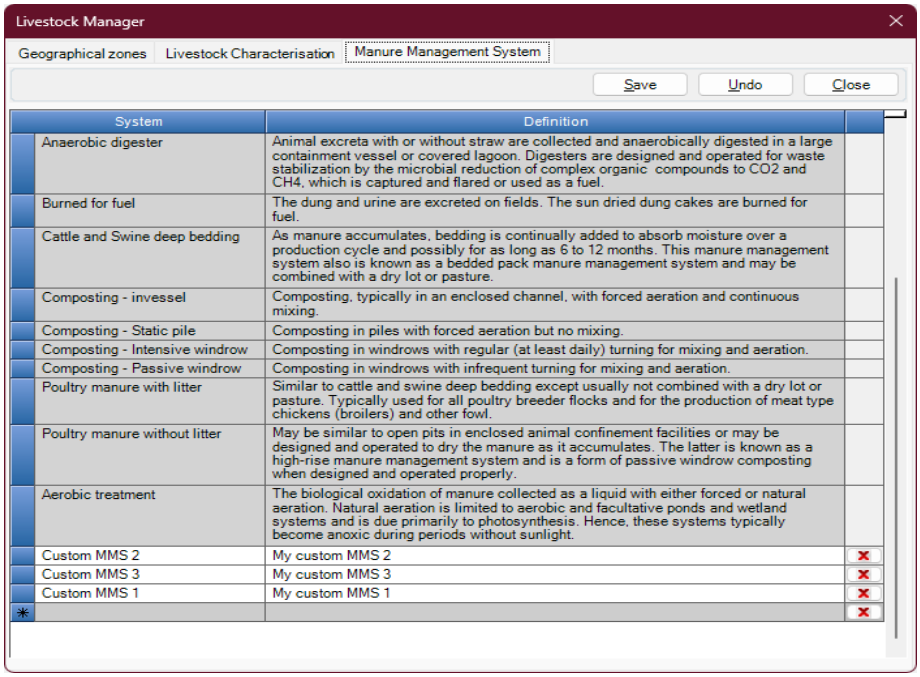


Figure 3.20 – Manure Management Systems

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.

- **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.

3.2.4.10 Waste – Waste Type Manager

This menu item opens a dialog window that allows managing Waste Types used in the Waste sector. Except for managing parameters of default 2006 IPCC Guidelines Waste Types, users can insert their own user-defined Waste Types with their own parameters.

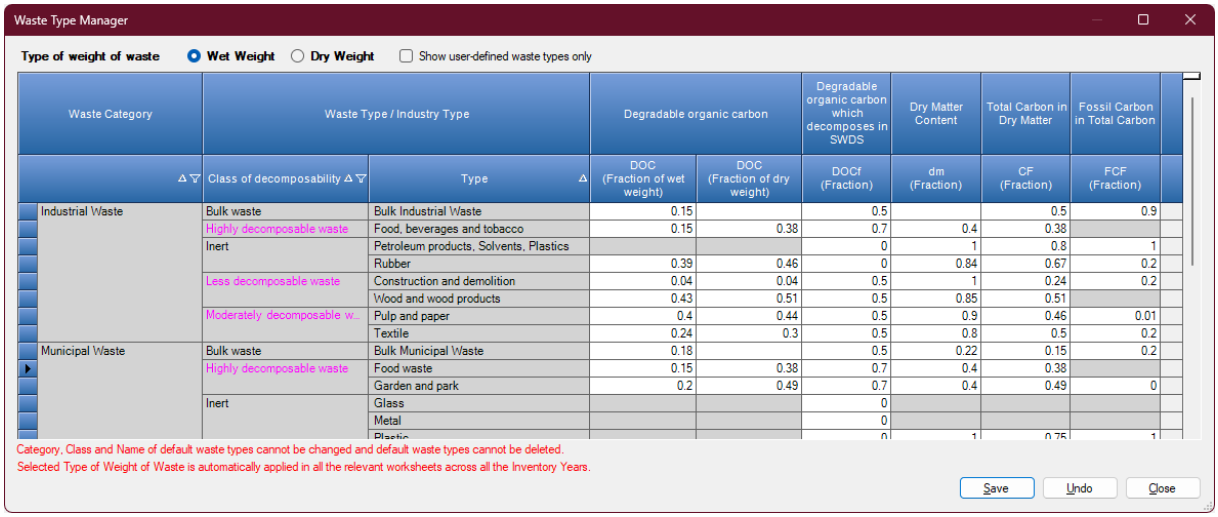


Figure 3.21 – Waste Type Manager

3.2.4.11 Delete inventory

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

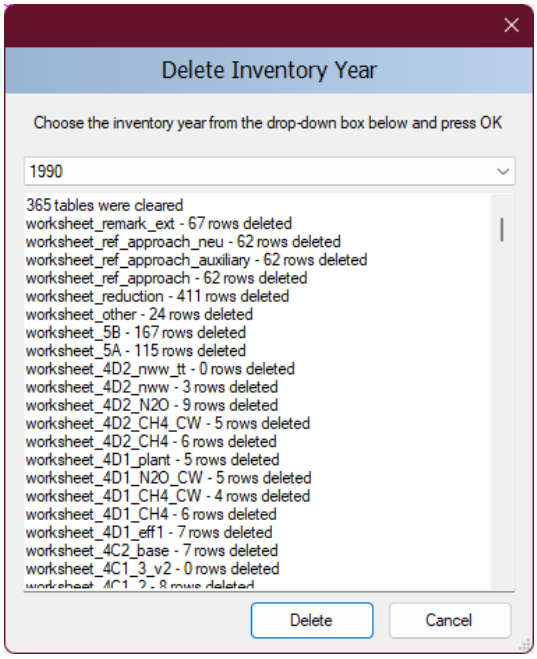


Figure 3.22 – Deleting inventory

3.2.5 Worksheets menu

This menu item opens the Worksheets window containing worksheets as defined in *2006 IPCC Guidelines*[1]. See Chapter 4 for detailed information.

3.2.6 Tools

3.2.6.1 Uncertainty Analysis

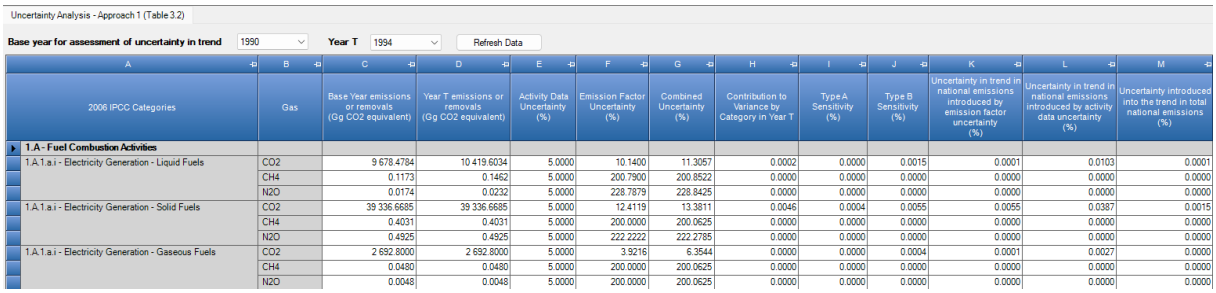
This menu item allows creating uncertainty Reporting Table 3.2 as defined in the *2006 IPCC Guidelines*. The values are entered in each Worksheet. A user should enter uncertainty values for every activity and Emission Factor. Default uncertainty values are applied when the user does not enter any uncertainty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

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

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)

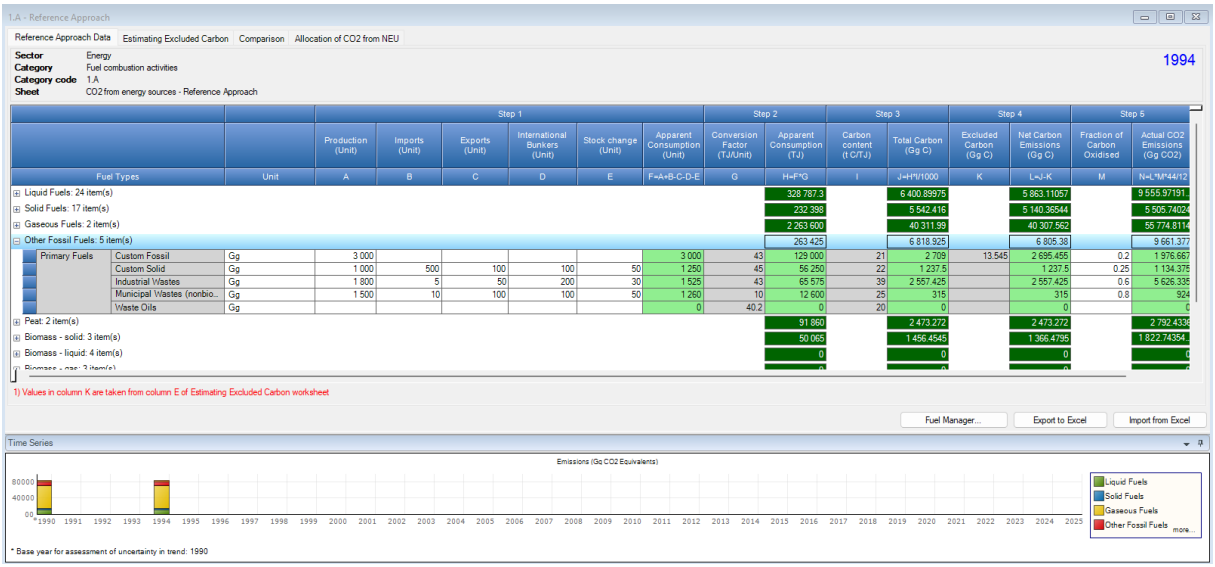
Base year for assessment of uncertainty in trend 1990 **Year T** 1994 Refresh Data

2006 IPCC 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	Type A Sensitivity (%)	Type B Sensitivity (%)	Uncertainty in trend in national emissions introduced by emission factor uncertainty (%)	Uncertainty in trend in national emissions introduced by activity data uncertainty (%)	Uncertainty introduced into the trend in total national emissions (%)
1.A - Fuel Combustion Activities												
1.A.1.a.i - Electricity Generation - Liquid Fuels	CO2	9 678.4784	10 419.6034	5.0000	10.1400	11.3057	0.0002	0.0000	0.0015	0.0001	0.0103	0.0001
	CH4	0.1173	0.1462	5.0000	200.7900	200.8522	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	N2O	0.0174	0.0232	5.0000	228.7879	228.8425	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
1.A.1.a.i - Electricity Generation - Solid Fuels	CO2	39 336.6685	39 336.6685	5.0000	12.4119	13.3811	0.0046	0.0004	0.0055	0.0055	0.0387	0.0015
	CH4	0.4031	0.4031	5.0000	200.0000	200.0625	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	N2O	0.4925	0.4925	5.0000	222.2222	222.2785	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
1.A.1.a.i - Electricity Generation - Gaseous Fuels	CO2	2 692.8000	2 692.8000	5.0000	3.9216	6.3544	0.0000	0.0000	0.0004	0.0001	0.0027	0.0000
	CH4	0.0480	0.0480	5.0000	200.0000	200.0625	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	N2O	0.0048	0.0048	5.0000	200.0000	200.0625	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Figure 3.23 – 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 based on relatively easily available energy supply statistics.



1.A - Reference Approach

Reference Approach Data | Estimating Excluded Carbon | Comparison | Allocation of CO2 from NEU

Sector Energy
Category Fuel combustion activities
Category code 1.A
Sheet CO2 from energy sources - Reference Approach

1994

			Step 1						Step 2		Step 3		Step 4		Step 5	
Fuel Types		Unit	Production (Unit)	Imports (Unit)	Exports (Unit)	International Bunkers (Unit)	Stock change (Unit)	Apparent Consumption (Unit)	Conversion Factor (TJ/Unit)	Apparent Consumption (TJ)	Carbon content (t C/TJ)	Total Carbon (Gg C)	Excluded Carbon (Gg C)	Net Carbon Emissions (Gg C)	Fraction of Carbon Oxidised	Actual CO2 Emissions (Gg CO2)
			A	B	C	D	E	F=A+B-C-D-E	G	H=F*G	I	J=H*I/1000	K	L=J-K	M	N=L*M*44/12
Liquid Fuels: 24 item(s)										328 787.3		6 400.89975		5 863.11057		9 555.97191
Solid Fuels: 17 item(s)										232 398		5 542.416		5 140.36544		5 505.7402
Gaseous Fuels: 2 item(s)										2 263 600		40 311.99		40 307.562		55 774.811
Other Fossil Fuels: 5 item(s)										263 425		6 818.925		6 805.38		9 661.377
Primary Fuels	Custom Fossil	Gg	3 000					3 000	43	129 000	21	2 709	13.545	2 695.455	0.2	1 976.667
	Custom Solid	Gg	1 000	500	100	100	50	1 250	45	56 250	22	1 237.5		1 237.5	0.25	1 134.375
	Industrial Wastes	Gg	1 800	5	50	200	30	1 525	43	65 575	39	2 557.425		2 557.425	0.6	5 626.335
	Municipal Wastes (nonbio...	Gg	1 500	10	100	100	50	1 260	10	12 600	25	315		315	0.8	924
	Waste Oils	Gg						0	40.2	0	20	0		0		0
Peat: 2 item(s)										91 860		2 473.272		2 473.272		2 792.433
Biomass - solid: 3 item(s)										50 065		1 456.4545		1 366.4795		1 822.74354
Biomass - liquid: 4 item(s)										0		0		0		0
Biomass - gas: 3 item(s)										0		0		0		0

1) Values in column K are taken from column E of Estimating Excluded Carbon worksheet

Fuel Manager... | Export to Excel | Import from Excel

Time Series

Emissions (Gg CO2 Equivalents)

80000
40000
00
1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024 2025

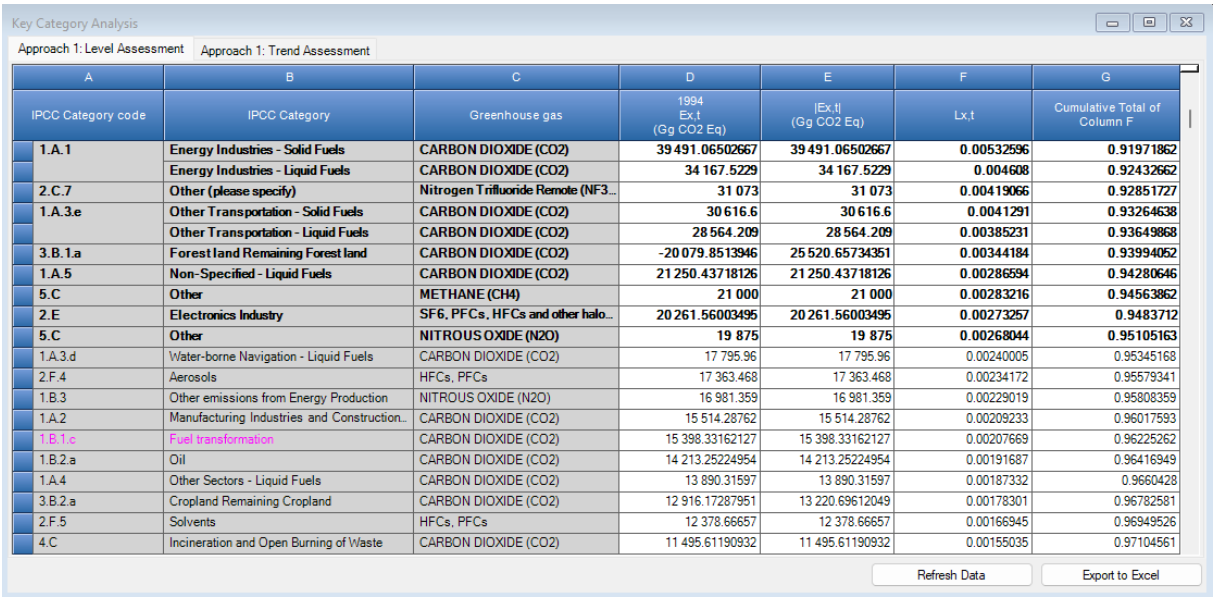
Liquid Fuels
Solid Fuels
Gaseous Fuels
Other Fossil Fuels
more...

* Base year for assessment of uncertainty in trend: 1990

Figure 3.24 – 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
1.A.1	Energy Industries - Solid Fuels	CARBON DIOXIDE (CO2)	39 491.06502667	39 491.06502667	0.00532596	0.91971862
	Energy Industries - Liquid Fuels	CARBON DIOXIDE (CO2)	34 167.5229	34 167.5229	0.004608	0.92432662
2.C.7	Other (please specify)	Nitrogen Trifluoride Remote (NF3...	31 073	31 073	0.00419066	0.92851727
1.A.3.e	Other Transportation - Solid Fuels	CARBON DIOXIDE (CO2)	30 616.6	30 616.6	0.0041291	0.93264638
	Other Transportation - Liquid Fuels	CARBON DIOXIDE (CO2)	28 564.209	28 564.209	0.00385231	0.93649868
3.B.1.a	Forest land Remaining Forest land	CARBON DIOXIDE (CO2)	-20 079.8513946	25 520.65734351	0.00344184	0.93994052
1.A.5	Non-Specified - Liquid Fuels	CARBON DIOXIDE (CO2)	21 250.43718126	21 250.43718126	0.00286594	0.94280646
5.C	Other	METHANE (CH4)	21 000	21 000	0.00283216	0.94563862
2.E	Electronics Industry	SF6, PFCs, HFCs and other halo...	20 261.56003495	20 261.56003495	0.00273257	0.9483712
5.C	Other	NITROUS OXIDE (N2O)	19 875	19 875	0.00268044	0.95105163
1.A.3.d	Water-borne Navigation - Liquid Fuels	CARBON DIOXIDE (CO2)	17 795.96	17 795.96	0.00240005	0.95345168
2.F.4	Aerosols	HFCs, PFCs	17 363.468	17 363.468	0.00234172	0.95579341
1.B.3	Other emissions from Energy Production	NITROUS OXIDE (N2O)	16 981.359	16 981.359	0.00229019	0.95808359
1.A.2	Manufacturing Industries and Construction...	CARBON DIOXIDE (CO2)	15 514.28762	15 514.28762	0.00209233	0.96017593
1.B.1.c	Fuel transformation	CARBON DIOXIDE (CO2)	15 398.33162127	15 398.33162127	0.00207669	0.96225262
1.B.2.a	Oil	CARBON DIOXIDE (CO2)	14 213.25224954	14 213.25224954	0.00191687	0.96416949
1.A.4	Other Sectors - Liquid Fuels	CARBON DIOXIDE (CO2)	13 890.31597	13 890.31597	0.00187332	0.9660428
3.B.2.a	Cropland Remaining Cropland	CARBON DIOXIDE (CO2)	12 916.17287951	13 220.69612049	0.00178301	0.96782581
2.F.5	Solvents	HFCs, PFCs	12 378.66657	12 378.66657	0.00166945	0.96949526
4.C	Incineration and Open Burning of Waste	CARBON DIOXIDE (CO2)	11 495.61190932	11 495.61190932	0.00155035	0.97104561

Figure 3.25 – Key Category Analysis

3.2.7 Export/Import

3.2.7.1 Export Worksheet Data

This menu item opens a dialog box that allows exporting worksheet data of one or more 2006 IPCC Categories for one or multiple Inventory Years into an XML file.

Take the following steps to create XML export of worksheet data:

1) Select one or more 2006 IPCC Categories of interest. Data of all the worksheets within selected 2006 IPCC Categories will be exported

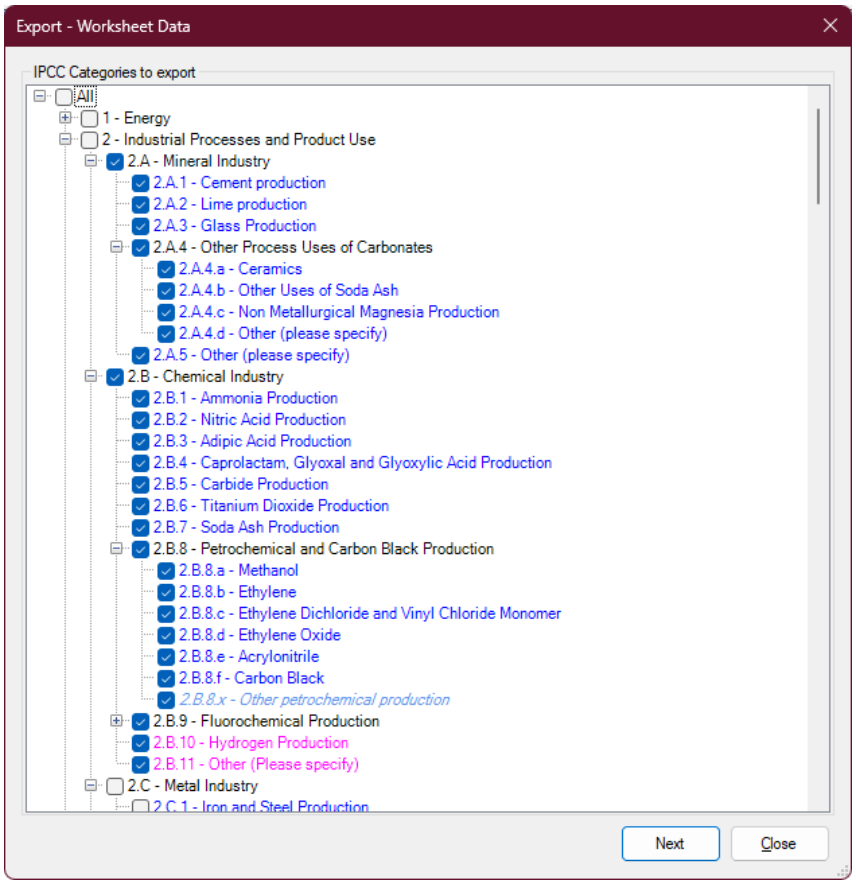


Figure 3.26 – Choosing 2006 IPCC Categories

2) Click the **Next** button to proceed to selecting Inventory Years

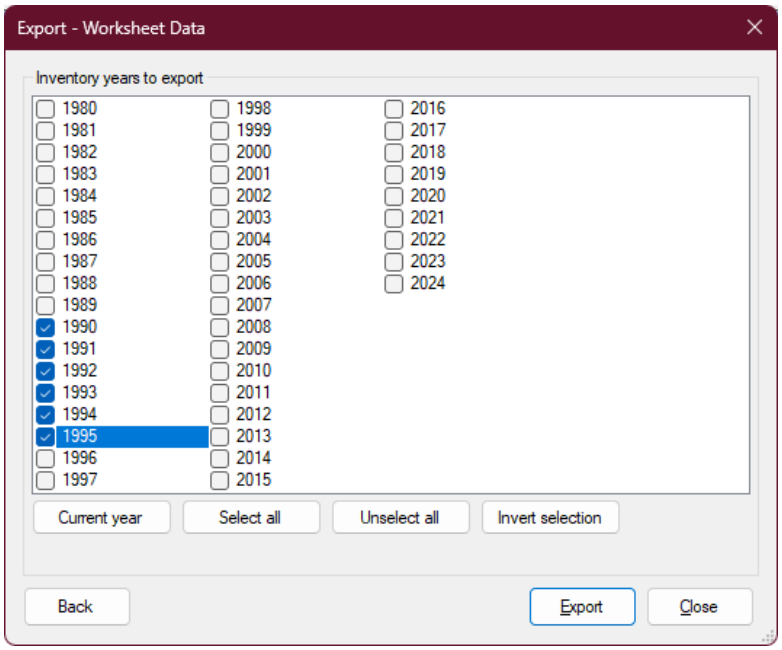


Figure 3.27 – Choosing Inventory Years to export

3) Click the **Export** button to create XML export of worksheet data for selected 2006 IPCC Categories and Inventory Years.

3.2.7.2 Export CO_2 Equivalents

This menu item opens a 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*.

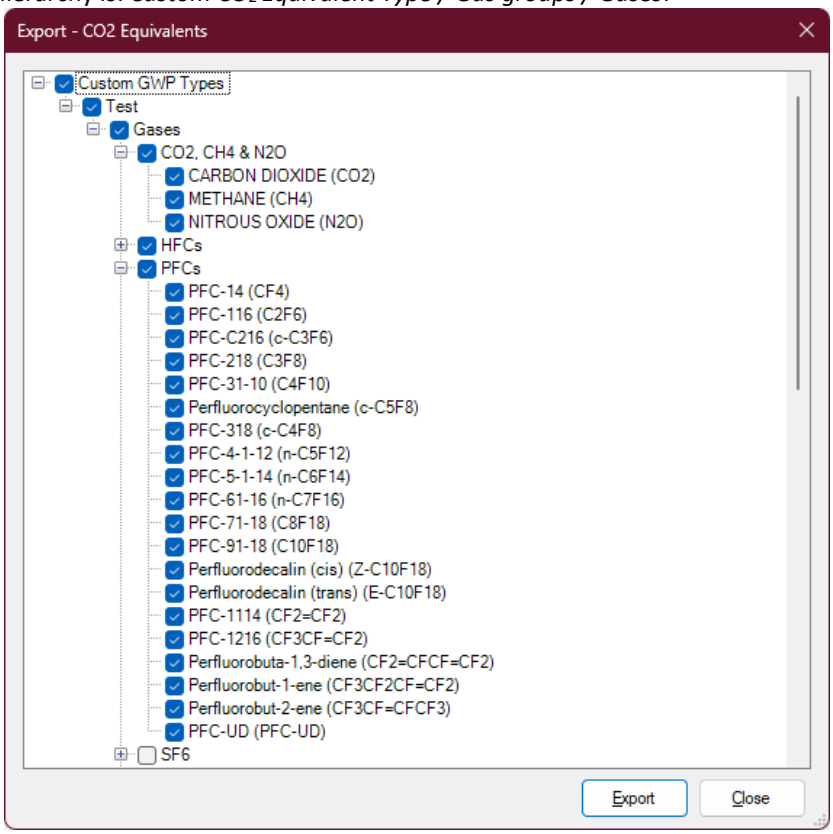


Figure 3.28 – Exporing custom CO_2 Equivalents

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 Import Worksheet Data

This menu item opens a dialog window that allows importing XML file containing worksheet data of one or more 2006 IPCC Categories for one or multiple Inventory Years, into the currently open database.

Note: It is strongly advised to make a fresh backup of the database before doing any bulk-data operations, such as XML Import of worksheet data.

Take the following steps to import worksheet data:

1) Click the **Open** button to browse for XML file to be imported. **IPCC Categories to import** section contains the list of all 2006 IPCC Categories for which worksheet data exist in the source XML file. Select 2006 IPCC categories of interest (all 2006 IPCC Categories are selected by default).
Note: All the worksheets of selected 2006 IPCC Categories will be imported.

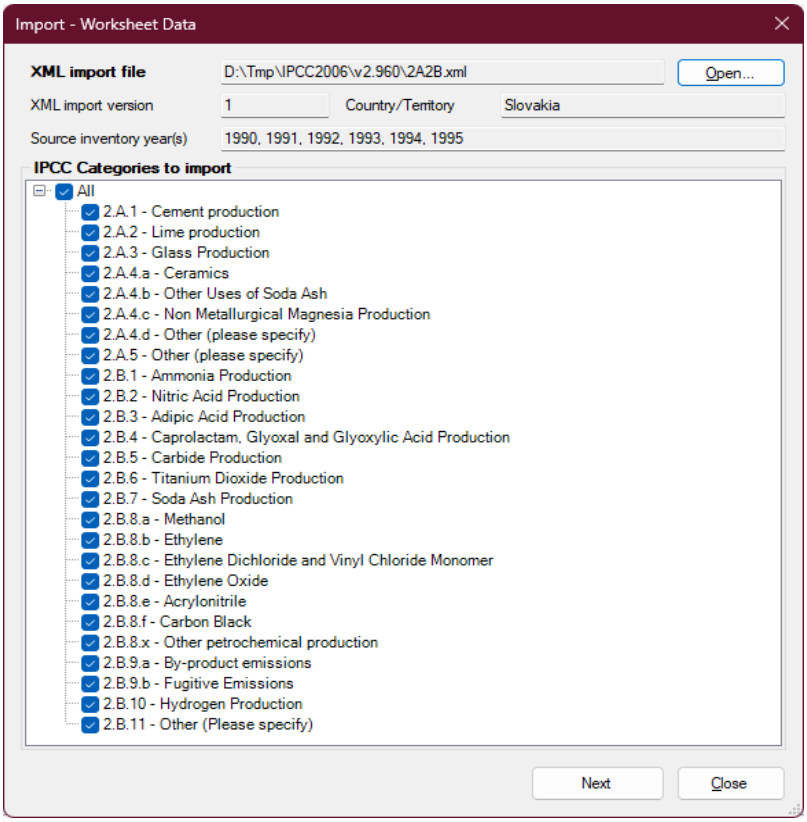
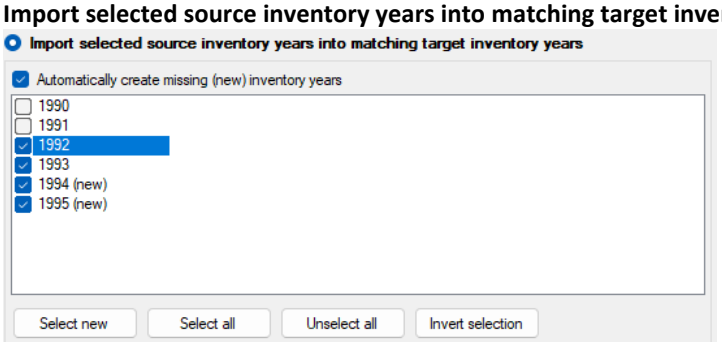


Figure 3.29 – Choosing 2006 IPCC Categories to import

2) Click the **Next** button to proceed to selecting Inventory Years to import. There are two modes available:

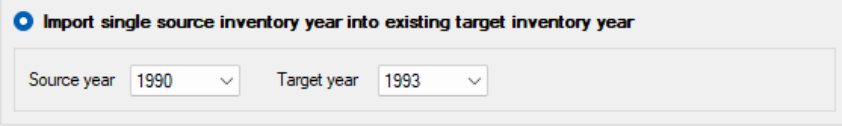
- **Import selected source inventory years into matching target inventory years**



Worksheet data of selected source inventory years will be imported into matching inventory years

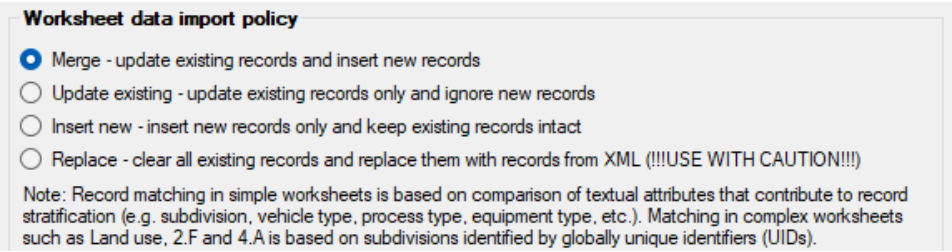
of target databse. If **Automatically create missing (new) inventory years** is checked then selected years that do not exist in target database (having *(new)* suffix) will be created automatically during import.

- **Import single source inventory year into existing target inventory year**



Worksheet data of selected source inventory year will be imported into any existing target inventory year. This mode allows e.g. to “copy” data from one year into a different year.

3) Click the **Next** button to proceed to selecting worksheet data import policy



Worksheet data import policy allows specifying how existing and new data will be handled during import:

- **Merge** -this import policy will update all existing records and insert new (non-existing) records within selected IPCC categories of target inventory year(s).
- **Update existing** - this import policy will update existing records only within selected IPCC categories of target inventory year(s) and will ignore all the new (non-existing) records.
- **Insert new** - this import policy will insert new (non-existing) records only within selected IPCC categories of target inventory year(s) and will keep all the existing records intact.
- **Replace** - this import policy will clear all the existing records in the database within selected IPCC categories of target inventory year(s) and replace them with the records from XML. !!!USE WITH CAUTION!!!

Note: Record matching in simple worksheets is based on comparison of textual attributes that contribute to record stratification (e.g. subdivision, vehicle type, process type, equipment type, etc.). Matching in complex worksheets such as Land use, 2.F and 4.A is based on subdivisions identified by globally unique identifiers (UIDs).

4) Click the **Import** button to begin import. A progress bar will be shown to indicate the progress of import.

3.2.7.4 Import CO_2 Equivalents

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

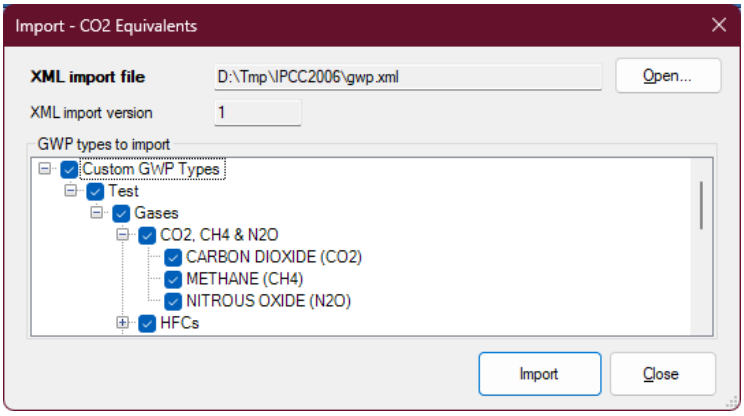


Figure 3.30 – Importing custom CO_2 Equivalents

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 importing. A progress bar will be shown to indicate the progress of import.

3.2.7.5 UNFCCC CRT

Refer to chapter 6 - UNFCCC CRT for detailed information.

3.2.8 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.

3.2.8.1 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.

Table A Summary Table

	Emissions (Gg)			Emissions CO2 Equivalents (Gg)					Emissions (Gg)				
Categories	Net CO2 (1)(2)	CH4	N2O	HFCs	PFCs	SF6	NF3	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	2 060 965.2847	64 837.9326	1 307.6017	535 704.9478	676 362.4965	1 817 860.4884	127 493.65	12 352.8118	0	547.8851	475.3859	470.8	505
1 - Energy	1 997 284.5911	12 346.9457	1 140.7296	0	0	0	0	0	0	37.0087	62.295	101	96
1.A - Fuel Combustion Activities	1 959 099.128	2 103.0243	863.4942	0	0	0	0	0	0	37	59	86	66
1.A.1 - Energy Industries	83 394.1879	1.5181	0.6917							21	27	38	45
1.A.2 - Manufacturing Industries and Construction	24 407.8676	7.3848	0.3714							16	32	48	21
1.A.3 - Transport	1 808 904.9843	2 091.009	860.2296							0	0	0	0
1.A.4 - Other Sectors	21 141.116	1.9026	1.94							0	0	0	0

Figure 3.31 – Example of Summary Table

3.2.8.2 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 the Summary table.

Table B Short Summary Table

Categories	Emissions (Gg)			Emissions CO2 Equivalents (Gg)					Emissions (Gg)				
	Net CO2 (1)(2)	CH4	N2O	HFCs	PFCs	SF6	NF3	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	2 060 965.2847	64 837.9326	1 307.6017	535 704.9478	676 362.4965	1 817 860.4884	127 493.6500	12 352.8118	0.0000	547.8851	475.3859	470.8000	505.0000
1 - Energy	1 997 284.5911	12 346.9457	1 140.7296	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	37.0087	62.2950	101.0000	96.0000
1.A - Fuel Combustion Activities	1 959 099.1280	2 103.0243	863.4942							37.0000	59.0000	86.0000	66.0000
1.B - Fugitive emissions from fuels	35 429.0631	10 243.9214	277.2355							0.0087	3.2950	15.0000	25.0000
1.C - Carbon dioxide Transport and Storage	2 756.4000									0.0000	0.0000	0.0000	5.0000
2 - Industrial Processes and Product Use	11 652.9248	4 459.2770	-15.2318	535 704.9478	676 362.4965	1 817 860.4884	127 493.6500	12 352.8118	0.0000	57.0000	47.0000	32.0000	37.0000
2.A - Mineral Industry	1 719.1013	0.0000	-0.3000							15.0000	20.0000	0.0000	0.0000
2.B - Chemical Industry	2 757.3069	1.2542	1.7985	3 813.6249	0.2658	9.4000	57 960.0000	285.6568	0.0000	26.0000	8.0000	10.0000	12.0000

Figure 3.32 – Example of Short summary table

3.2.8.3 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. Sectoral tables contain additional functionality regarding **Precursors (NOx, CO, NMVOCs, SO2)**. The pale-yellow cells are editable.

Table 1 Energy Sectoral Table | Memo and Information Items

Categories	Emissions (Gg)						
	CO2	CH4	N2O	NOx	CO	NMVOCs	SO2
1 - Energy	1 997 284.5911	12 346.9457	1 140.7296	37.0087	62.2950	101.0000	96.0000
1.A - Fuel Combustion Activities	1 959 099.1280	2 103.0243	863.4942	37.0000	59.0000	86.0000	66.0000
1.A.1 - Energy Industries	83 394.1879	1.5181	0.6917	21.0000	27.0000	38.0000	45.0000
1.A.1.a - Main Activity Electricity and Heat Production	55 771.4469	0.6974	0.5340	10.0000	15.0000	25.0000	16.0000
1.A.1.a.i - Electricity Generation	55 771.4469	0.6974	0.5340				5.0000
1.A.1.a.ii - Combined Heat and Power Generation (CHP)	0.0000	0.0000	0.0000				6.0000
1.A.1.a.iii - Heat Plants				10.0000	15.0000	25.0000	5.0000
1.A.1.b - Petroleum Refining	3 394.5936	0.1469	0.0294	11.0000	12.0000	13.0000	14.0000
1.A.1.c - Manufacture of Solid Fuels and Other Energy Industri...	24 228.1474	0.6738	0.1283				15.0000
1.A.1.c.i - Manufacture of Solid Fuels	153.7965	0.0002	0.0000				5.0000

Figure 3.33 – Example of Energy Sectoral Table

3.2.8.4 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.

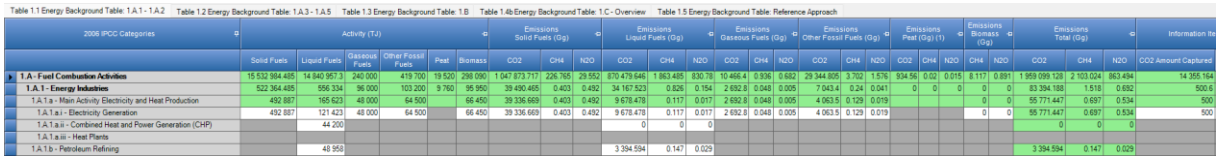


Figure 3.34 – Example of Energy Background Table 1.1

3.2.8.5 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 for assessment of uncertainty in trend 1990 **Year T** 1994 Refresh Data

2006 IPCC 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)	Uncertainty introduced into the trend in total national emissions (%)
1 - Energy									
1.A.1 - Energy Industries - Liquid Fuels	CO2	34 167.5229	34 908.6479	8.6603	13.3463	15.9099	0.0007	102.1691	0.0004
	CH4	0.8263	0.8552	8.6603	380.7944	380.8929	0.0000	103.4944	0.0000
	N2O	0.1538	0.1595	8.6603	396.2722	396.3669	0.0000	103.7559	0.0000
1.A.1 - Energy Industries - Solid Fuels	CO2	39 336.6685	39 336.6685	5.0000	12.4119	13.3811	0.0046	100.0000	0.0015
	CH4	0.4031	0.4031	5.0000	200.0000	200.0625	0.0000	100.0000	0.0000
	N2O	0.4925	0.4925	5.0000	222.2222	222.2785	0.0000	100.0000	0.0000
1.A.1 - Energy Industries - Gaseous Fuels	CO2	2 692.8000	2 692.8000	5.0000	3.9216	6.3544	0.0000	100.0000	0.0000
	CH4	0.0480	0.0480	5.0000	200.0000	200.0625	0.0000	100.0000	0.0000
	N2O	0.0048	0.0048	5.0000	200.0000	200.0625	0.0000	100.0000	0.0000

Figure 3.35 – Example of Reporting Table 7a - Uncertainties

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.

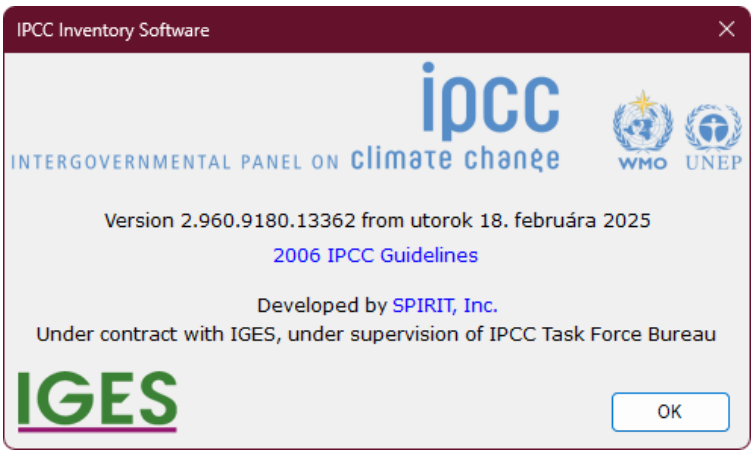


Figure 3.36 – About Box

4 Working with the Worksheets

4.1 Basic layout of the working area

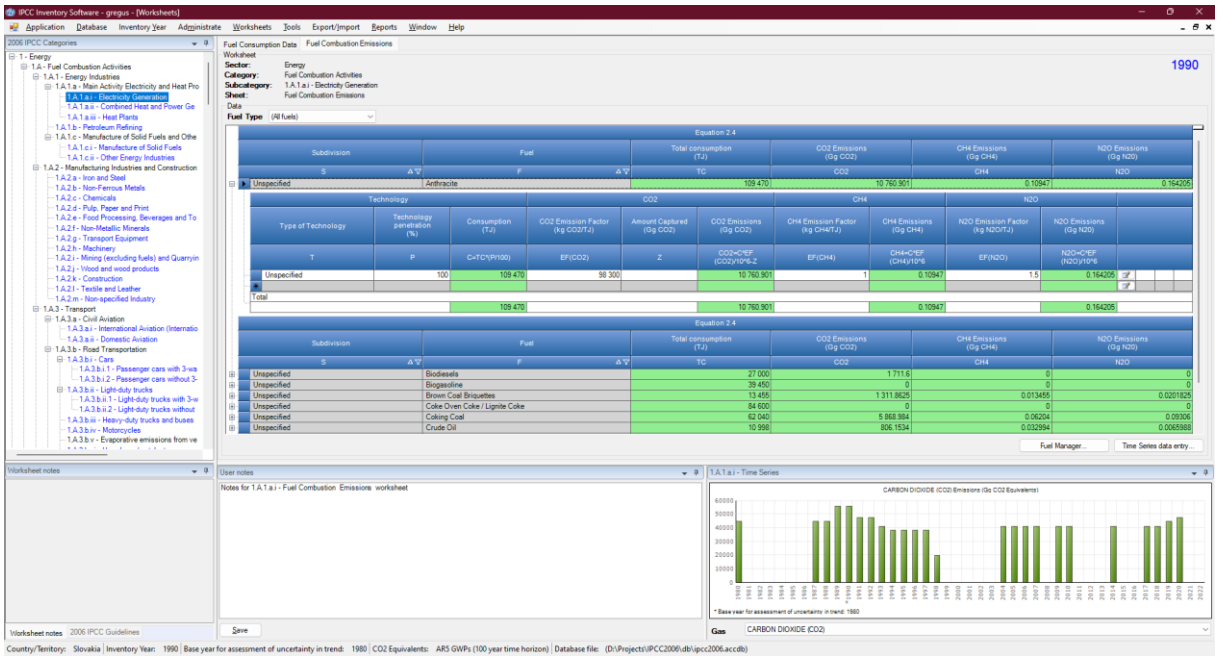


Figure 4.1 - Basic layout of the screen

- **Navigation window** - top-left enabling browsing the IPCC 2006 Category structure
- **Worksheet grid** area - top-right enabling editing the activity and emission factor data
- **Worksheet notes** area - bottom-left containing notes/guidance related to currently open worksheet
- **2006 IPCC Guidelines** area - bottom-left providing current information from the *Guidelines*
- **User notes** area - bottom-middle enabling to edit and save user remarks related to currently open worksheet
- **Time Series chart** area - bottom-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. An undocked window is called a „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 the down-arrow icon in the top bar displays the menu containing "Floating" menu item. Clicking this item undocks the 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.

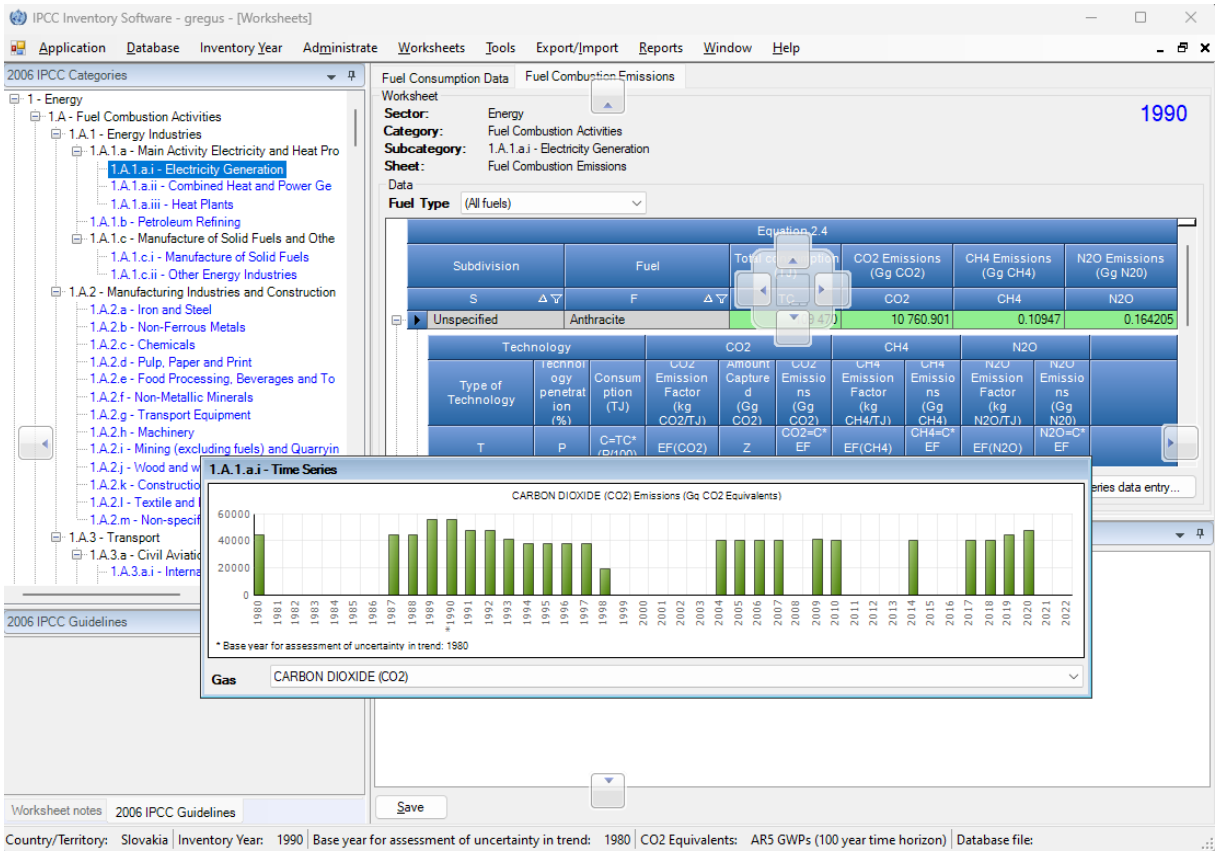


Figure 4.3 - Docking the floating window

4.2.3 Auto-hiding docking windows

Docking windows can be switched to auto-hide mode using the "pin" icon located in the top bar. This is useful if there is a need for more space for the 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 2006 IPCC Categories Navigation Window (tree)

This window contains the 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 all IPCC categories that are highlighted with blue color. The worksheets relevant to the 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 worksheet.

Clicking on the "Sector/ Sub-sector" level of the tree, shows the CO_2 equivalent time series graph of the "Sector/ Sub-sector".

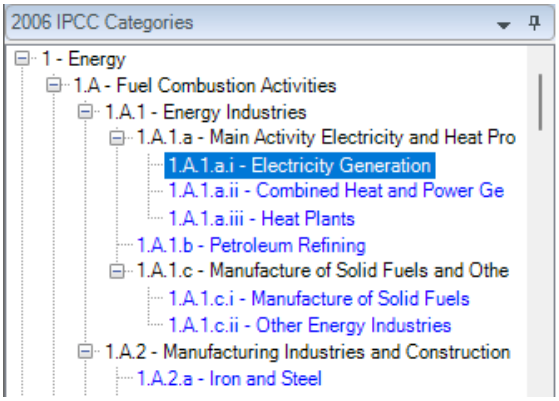


Figure 4.4 – 2006 IPCC Category tree

4.2.5 2006 IPCC Guidelines window

This window contains the information relevant to the currently selected IPCC 2006 Category.

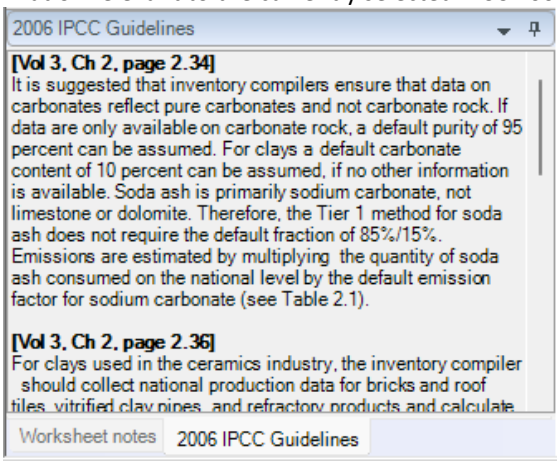


Figure 4.5 - IPCC 2006 Guidelines window

4.2.6 Worksheet notes window

This window contains additional information/guidance related to currently open worksheet.

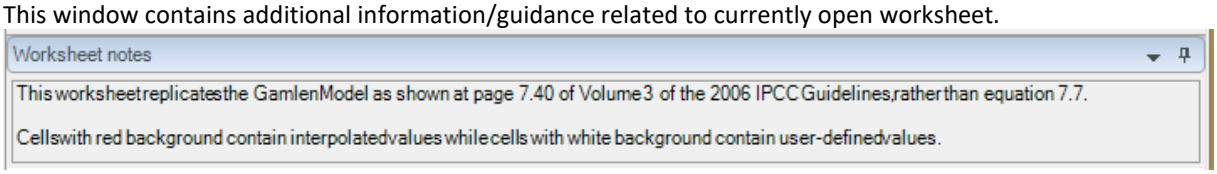


Figure 4.6 – Worksheet notes

4.2.7 User notes window

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

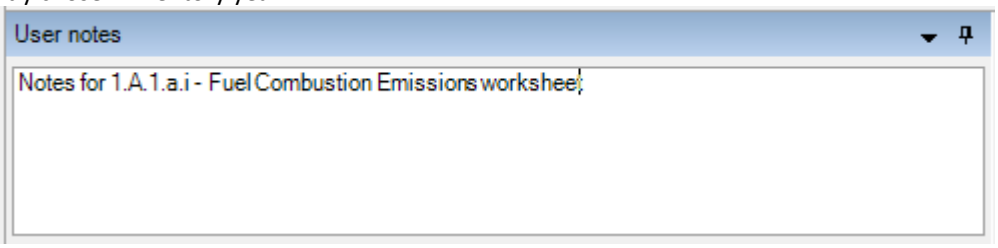


Figure 4.7 – User notes

4.2.8 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.

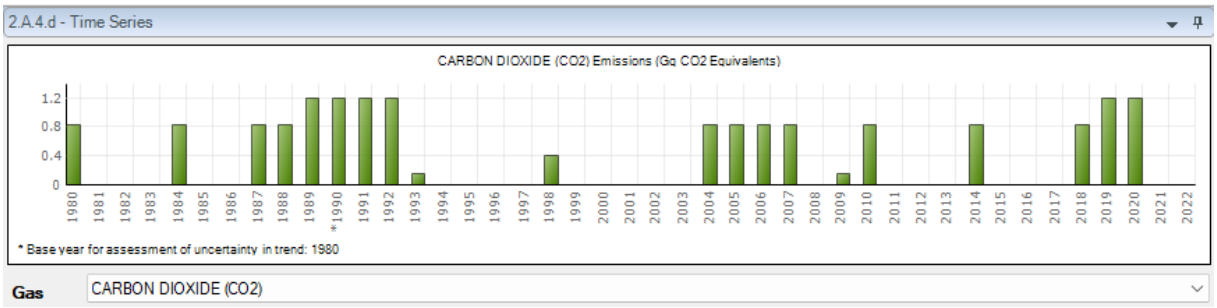


Figure 4.8 – Time Series window

4.3 Working with the grid

Figure 4.9 - 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.).
- The 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 specific 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 colors. There could be an additional icon placed in the cell to highlight some warning to the user.
- 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

The left-most column of the grid is the Row Status column that indicates the current activity being performed within the 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 the 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 the 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 loses focus. Validation of entered data is performed before the new row is stored into database. In case of any error in the supplied data, the 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. The 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 loses focus. Validation of entered data is performed before the row is updated in the database. In case of any error in the supplied data, the 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 the Shift key function within Row Status column of the grid. **Iconic action button** **at row level can be used to delete just the corresponding row**.

In all cases the user is provided with the confirmation dialog.

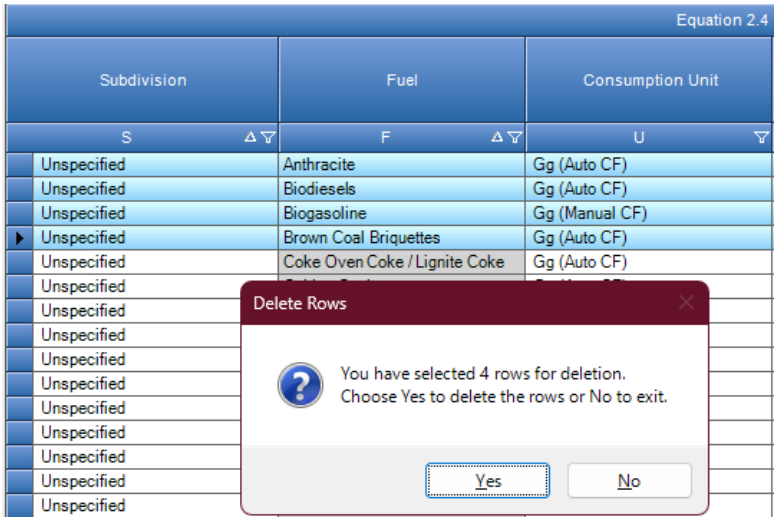


Figure 4.10 - Deleting multiple rows

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 the 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 is not contained in the value list.

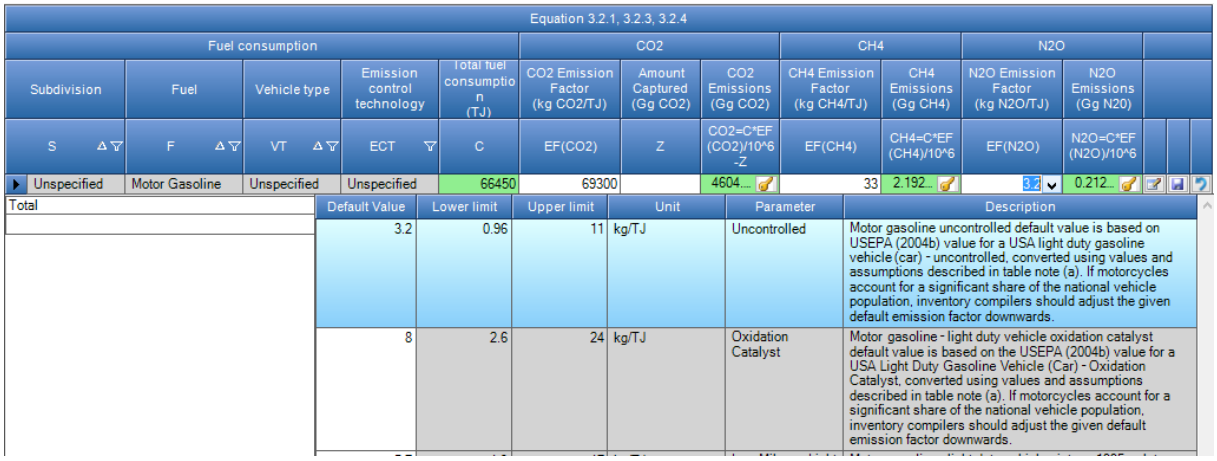


Figure 4.11 - Value List containing emission factors

4.3.8 Numeric values precision

All decimal values are stored as “double” type in the database. All calculations are performed with full precision relevant for “double” type (see table below). Presentation of numbers in the grids can be adjusted in the software preferences to e.g., limit number of displayed decimal places by rounding and/or show/hide thousands separator.

C# type/keyword	Approximate range	Precision	Size
double	$\pm 5.0 \times 10^{-324}$ to $\pm 1.7 \times 10^{308}$	~15-17 digits	8 bytes

4.4 Time Series Data Entry

Most worksheets support 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.

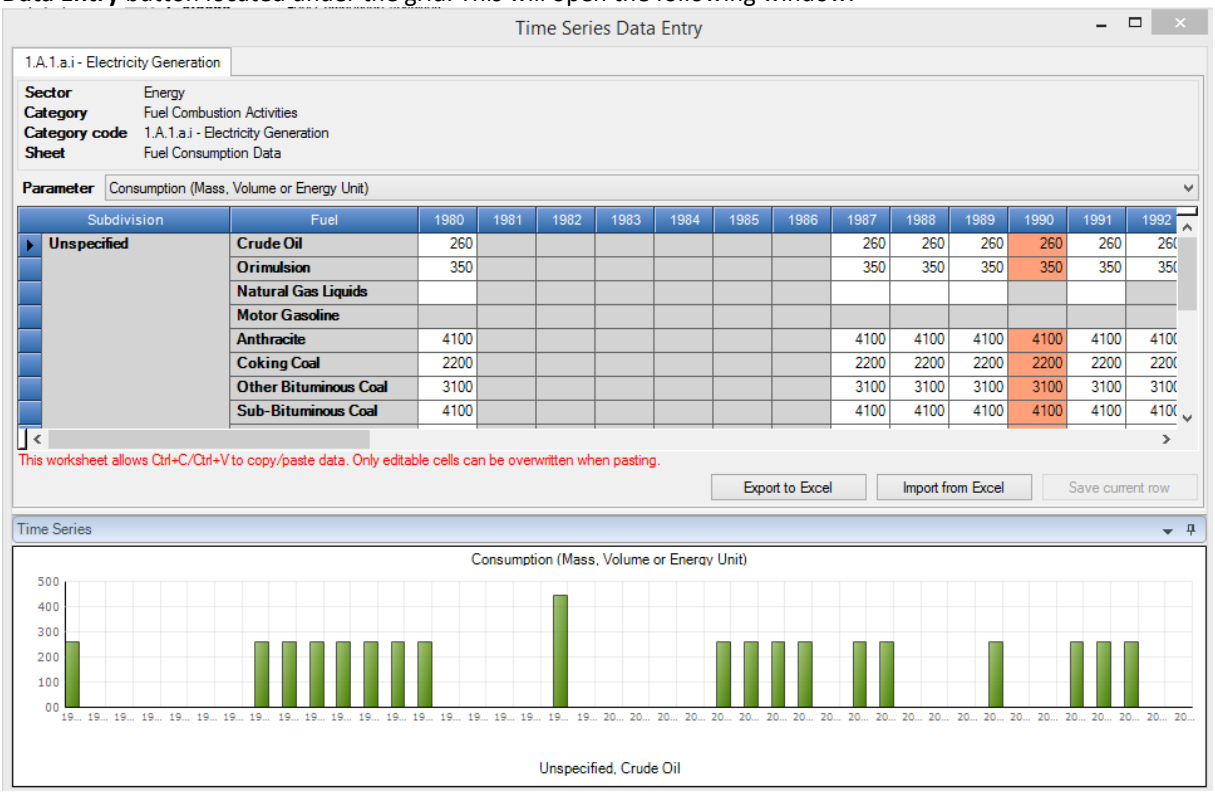


Figure 4.12 – Time Series Data Entry

4.4.1 Parameters

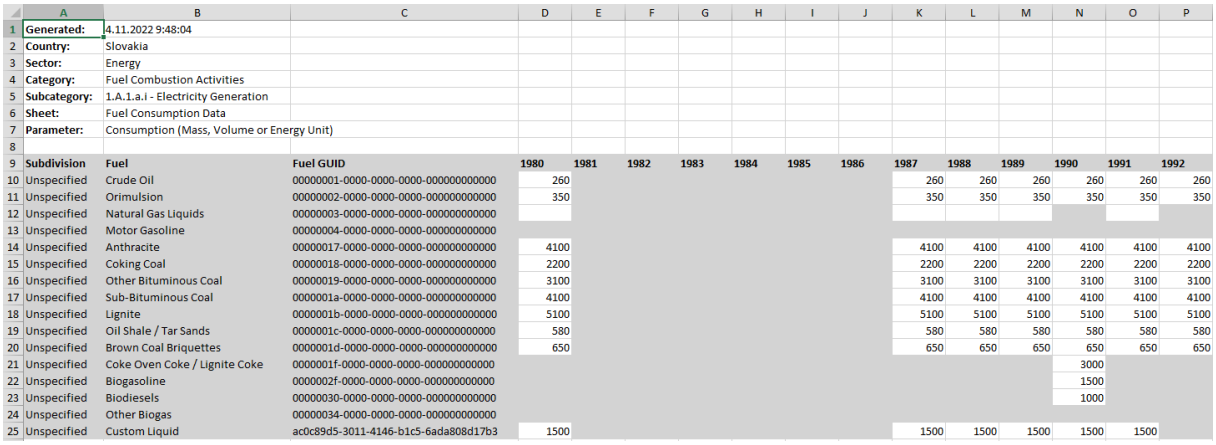
Parameter list contains the list of all editable parameters contained in the worksheet. By choosing the particular parameter the grid wil display the selected parameter values across existing inventory years grouped by all available combinations of row identifiers. Values in white cells are editable.

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 row (shaded), this means that the combination of relevant row identifiers does not occur in that particular year.

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	I	J	K	L	M	N	O	P
1	**Generated:**	4.11.2022 9:48:04														
2	**Country:**	Slovakia														
3	**Sector:**	Energy														
4	**Category:**	Fuel Combustion Activities														
5	**Subcategory:**	1.A.1.a.i - Electricity Generation														
6	**Sheet:**	Fuel Consumption Data														
7	**Parameter:**	Consumption (Mass, Volume or Energy Unit)														
8																
9	**Subdivision**	**Fuel**	**Fuel GUID**	**1980**	**1981**	**1982**	**1983**	**1984**	**1985**	**1986**	**1987**	**1988**	**1989**	**1990**	**1991**	**1992**
10	Unspecified	Crude Oil	00000001-0000-0000-0000-000000000000	260							260	260	260	260	260	260
11	Unspecified	Orimulsion	00000002-0000-0000-0000-000000000000	350							350	350	350	350	350	350
12	Unspecified	Natural Gas Liquids	00000003-0000-0000-0000-000000000000													
13	Unspecified	Motor Gasoline	00000004-0000-0000-0000-000000000000													
14	Unspecified	Anthracite	00000017-0000-0000-0000-000000000000	4100							4100	4100	4100	4100	4100	4100
15	Unspecified	Coking Coal	00000018-0000-0000-0000-000000000000	2200							2200	2200	2200	2200	2200	2200
16	Unspecified	Other Bituminous Coal	00000019-0000-0000-0000-000000000000	3100							3100	3100	3100	3100	3100	3100
17	Unspecified	Sub-Bituminous Coal	0000001a-0000-0000-0000-000000000000	4100							4100	4100	4100	4100	4100	4100
18	Unspecified	Lignite	0000001b-0000-0000-0000-000000000000	5100							5100	5100	5100	5100	5100	5100
19	Unspecified	Oil Shale / Tar Sands	0000001c-0000-0000-0000-000000000000	580							580	580	580	580	580	580
20	Unspecified	Brown Coal Briquettes	0000001d-0000-0000-0000-000000000000	650							650	650	650	650	650	650
21	Unspecified	Coke Oven Coke / Lignite Coke	0000001f-0000-0000-0000-000000000000											3000		
22	Unspecified	Biogasoline	0000002f-0000-0000-0000-000000000000											1500		
23	Unspecified	Biodiesels	00000030-0000-0000-0000-000000000000											1000		
24	Unspecified	Other Biogas	00000034-0000-0000-0000-000000000000													
25	Unspecified	Custom Liquid	ac0c89d5-3011-4146-b1c5-6ada808d17b3	1500							1500	1500	1500	1500	1500	

Figure 4.13 – 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. The 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 then 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 the 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 new rows by pasting data is not supported, thus not possible.

Note, that values from source Excel cells are copied to clipboard exactly as they are formatted. E.g., if they are rounded for display and real value stored in a cell has more precision, rounded value will be copied instead of full precision value. This is Excel's standard behavior.

4.4.6 Chart

The 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.

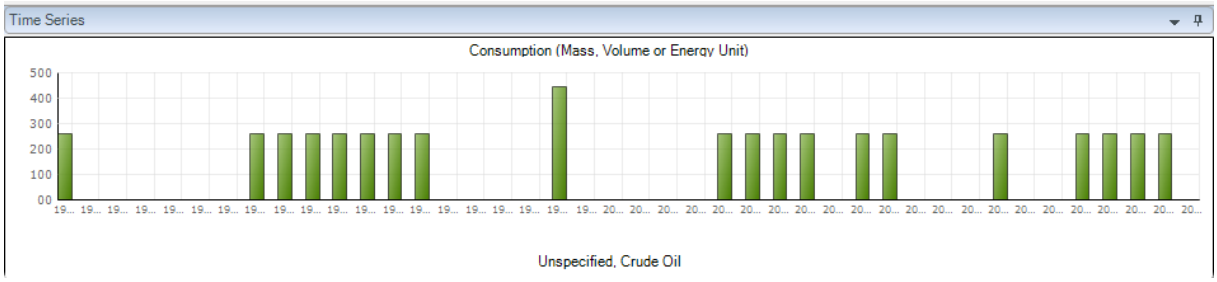


Figure 4.14 – Time Series Chart

5 Example Worksheets

5.1 Fuel Combustion Activities and Emissions

This set of worksheets covers all categories within category 1.A – Fuel Combustion Activities. Worksheets are available for each sub-category at the most disaggregated level.

Worksheet
Sector: Energy
Category: Fuel Combustion Activities
Subcategory: 1.A.1.a.i - Electricity Generation
Sheet: Fuel Consumption Data

1990

Data

Fuel Type (All fuels)

Equation 2.4

Subdivision	Fuel	Consumption Unit	Consumption (Mass, Volume or Energy Unit)	Conversion Factor (TJ/Unit) (NCV)	Total consumption (TJ)
S	F	U	C	CF	TC = C * CF
Unspecified	Anthracite	Gg (Auto CF)	4100	26.7	109470
Unspecified	Biodiesels	Gg (Auto CF)	1000	27	27000
Unspecified	Biogasoline	Gg (Manual CF)	1500	26.3	39450
Unspecified	Brown Coal Briquettes	Gg (Auto CF)	650	20.7	13455
Unspecified	Coke Oven Coke / Lignite Coke	Gg (Auto CF)	3000	28.2	84600
Unspecified	Coking Coal	Gg (Auto CF)	2200	28.2	62040
Unspecified	Crude Oil	Gg (Auto CF)	260	42.3	10998
Unspecified	Custom Liquid	Gg (Auto CF)	1500	43	64500
Unspecified	Lignite	Gg (Auto CF)	5100	11.9	60690
Unspecified	Oil Shale / Tar Sands	Gg (Auto CF)	580	8.9	5162
Unspecified	Orimulsion	Gg (Auto CF)	350	27.5	9625
Unspecified	Other Bituminous Coal	Gg (Auto CF)	3100	25.8	79980
Unspecified	Sub-Bituminous Coal	Gg (Auto CF)	4100	18.9	77490
Total					644460

Fuel Manager... Time Series data entry...

Figure 5.1 – Example of Fuel Combustion Activities – Activity Data

Worksheet
Sector: Energy
Category: Fuel Combustion Activities
Subcategory: 1.A.1.a.i - Electricity Generation
Sheet: Fuel Combustion Emissions

1990

Data

Fuel Type (All fuels)

Equation 2.4

Subdivision	Fuel	Total consumption (TJ)	CO2 Emissions (Gg CO2)	CH4 Emissions (Gg CH4)	N2O Emissions (Gg N20)
S	F	TC	CO2	CH4	N2O
Unspecified	Anthracite	109470	10760.901	0.10947	0.16421

Technology			CO2			CH4		N2O	
Type of Technology	Technology penetration (%)	Consumption (TJ)	CO2 Emission Factor (kg CO2/TJ)	Amount Captured (Gg CO2)	CO2 Emissions (Gg CO2)	CH4 Emission Factor (kg CH4/TJ)	CH4 Emissions (Gg CH4)	N2O Emission Factor (kg N2O/TJ)	N2O Emissions (Gg N20)
T	P	C=TC*(P/100)	EF(CO2)	Z	CO2=C*EF (CO2)/10^6-Z	EF(CH4)	CH4=C*EF (CH4)/10^6	EF(N2O)	N2O=C*EF (N2O)/10^6
Unspecified	100	109470	98300		10760.9...	1	0.10947	1.5	0.16421
Total		109470			10760.901		0.10947		0.16421

Equation 2.4

Subdivision	Fuel	Total consumption (TJ)	CO2 Emissions (Gg CO2)	CH4 Emissions (Gg CH4)	N2O Emissions (Gg N20)
S	F	TC	CO2	CH4	N2O
Unspecified	Biodiesels	27000	0	0	0
Unspecified	Biogasoline	39450	0	0	0
Unspecified	Brown Coal Briquettes	13455	1311.8625	0.01346	0.02018
Unspecified	Coke Oven Coke / Lignite Coke	84600	0	0	0
Unspecified	Coking Coal	62040	5868.984	0.06204	0.09306
Unspecified	Crude Oil	10998	806.1534	0.03299	0.0066

Fuel Manager... Time Series data entry...

Figure 5.2 – Example of Fuel Combustion Activities - Emissions

5.1.1 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.

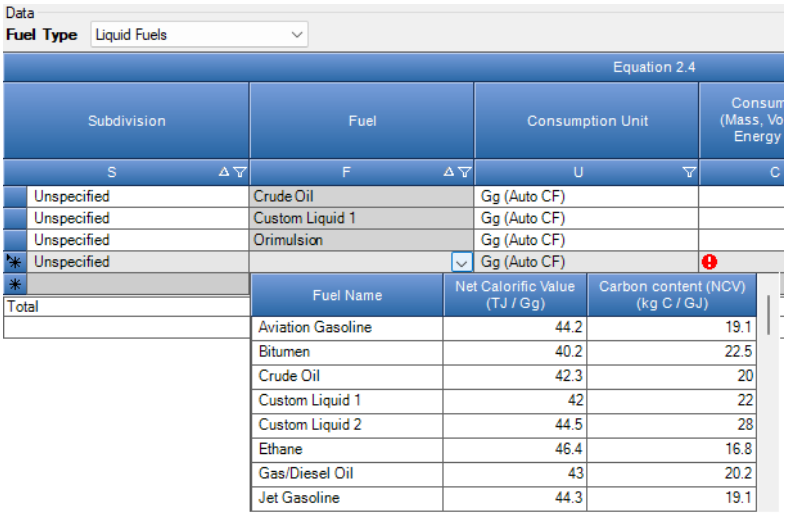


Figure 5.3 – Expanded list of available Liquid fuels

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

5.1.2 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. Users will be provided with the dialog box where uncertainties can be defined.

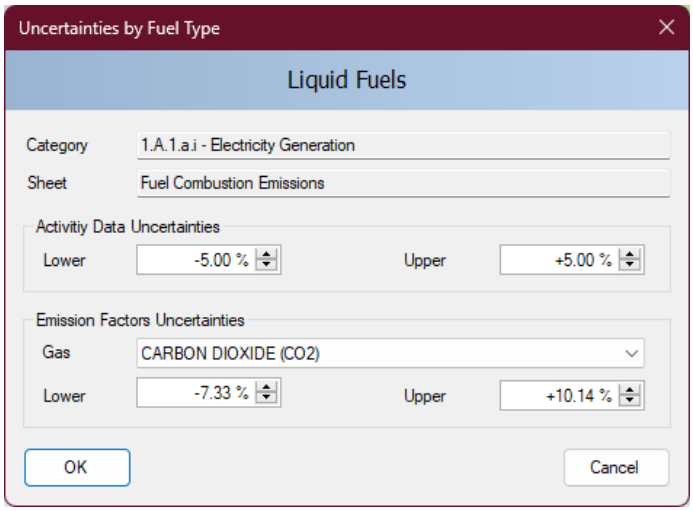


Figure 5.4 – Uncertainties for Liquid Fuels

Default Activity Data uncertainties are prefilled according to *2006 IPCC Guidelines*, where available. 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 UNFCCC CRT

6.1 Introduction

Since version v2.86, the IPCC Inventory Software is capable of exporting data into Common Reporting Tables format (CRT). Interface is accessible from the Main Menu / Export / UNFCCC CRT.

6.2 CRT Data Set management

6.2.1 What is CRT Data Set

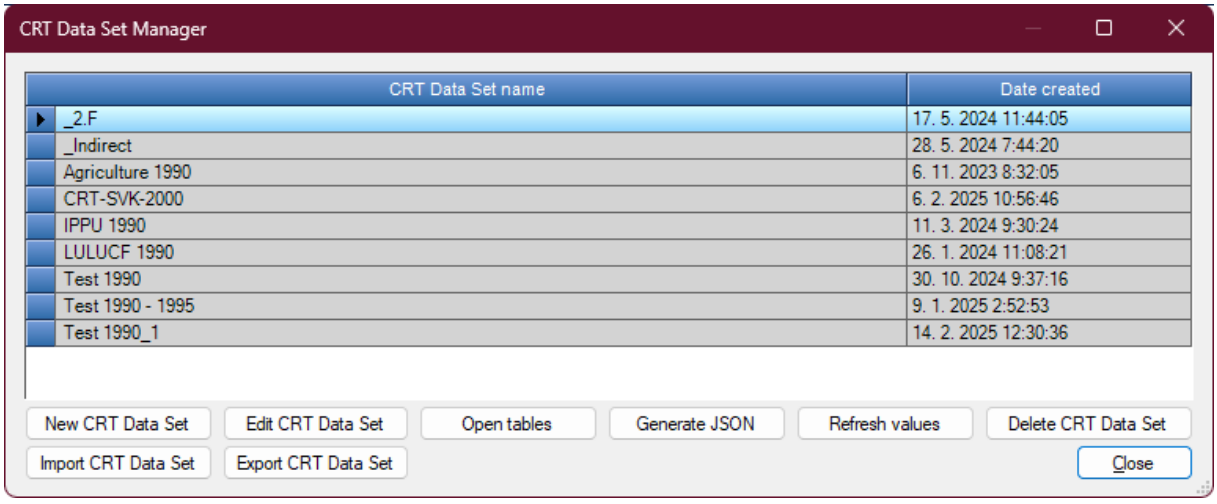
CRT Data Set represents a particular instance of CRT export which holds CRT Tables with data for the set of years that were selected during CRT Data Set creation. Software allows maintaining multiple CRT Data Sets that are independent of each other and thus can be managed and exported to JSON independently.

Note that CRT Data Set does not represent real-time data of IPCC Worksheets but rather is a snapshot of that data that was made at certain point in time (e.g., during creation of CRT Data Set, or later by manually refreshing values). This means that any changes made to data in IPCC Worksheets won't be automatically propagated to existing CRT Data Sets!

6.2.2 CRT Data Set management screen

This screen is designed for CRT Data Set management. It provides the following functionality:

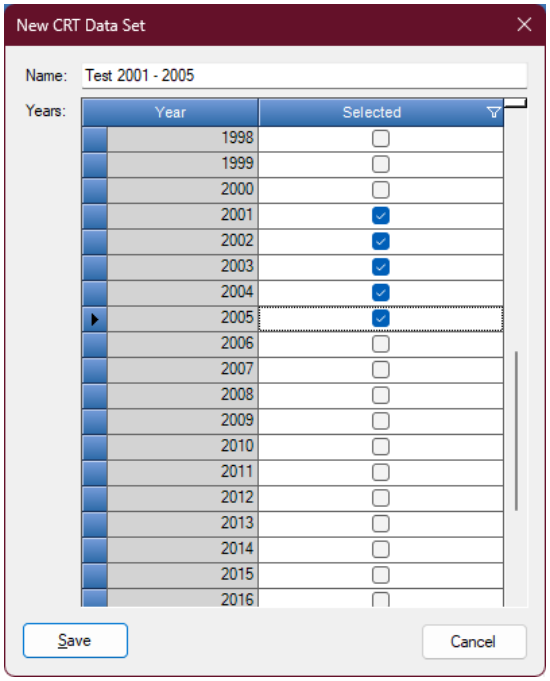
- Create new CRT Data Set
- Edit properties of existing CRT Data Set
- Open tables interface that allows managing data across sectors and years for selected CRT Data Set
- Generate JSON (export format) for selected CRT Data Set compatible with UNFCCC ETF Tool
- Refresh values – compile CRT Variable values from IPCC Inventory Software worksheet data for selected CRT Data Set
- Delete existing CRT Data Set
- Import CRT Data Set
- Export CRT Data Set



Except for "New CRT Data Set" and "Import CRT Data Set" buttons, all the action buttons at the bottom of the table always apply to currently selected (highlighted) CRT Data Set in the table.

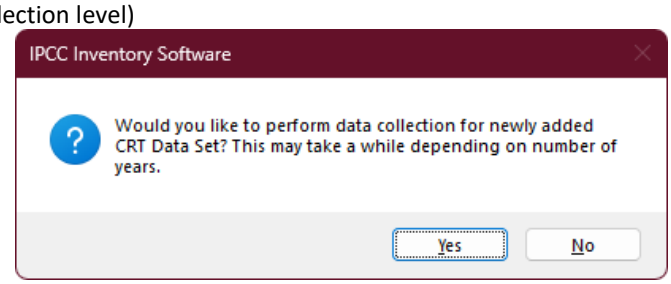
6.2.2.1 New CRT Data Set

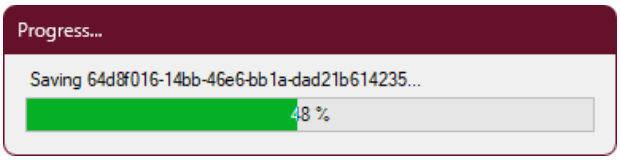
This action button opens the screen where properties of new CRT Data Set are specified.



- Name – name of new CRT Data Set
- Years – inventory years assigned to new CRT Data Set

After pressing Save, a new data set is created, and user is prompted whether to feed data into tables of new data set. This operation can be postponed and carried out later at various levels (at sector level, table level, cell level, cell selection level)

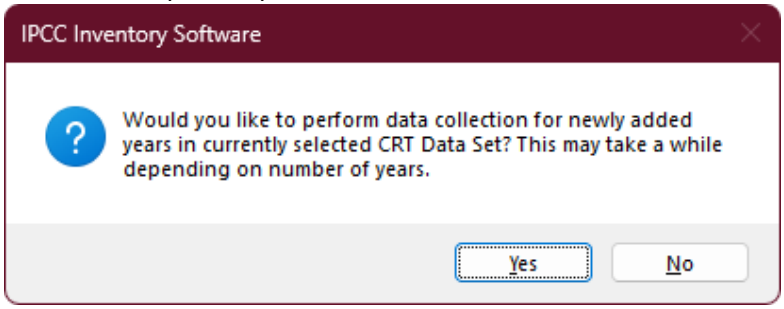




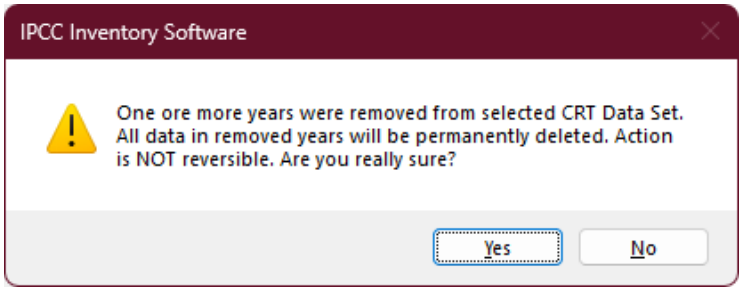
6.2.2.2 Edit CRT Data Set

This action button opens the screen where properties of existing CRT Data Set can be adjusted.

- Name – can be changed if necessary
- Years:
    - Adding additional years – the user can add additional years to the existing CRT Data Set. If **Copy data into newly added years from the closest existing year** is selected then newly added years will be filled with existing data from the closest existing year in the data set. After adding new years and saving data set user is prompted whether to feed data into CRT tables for newly added years and for all sectors.

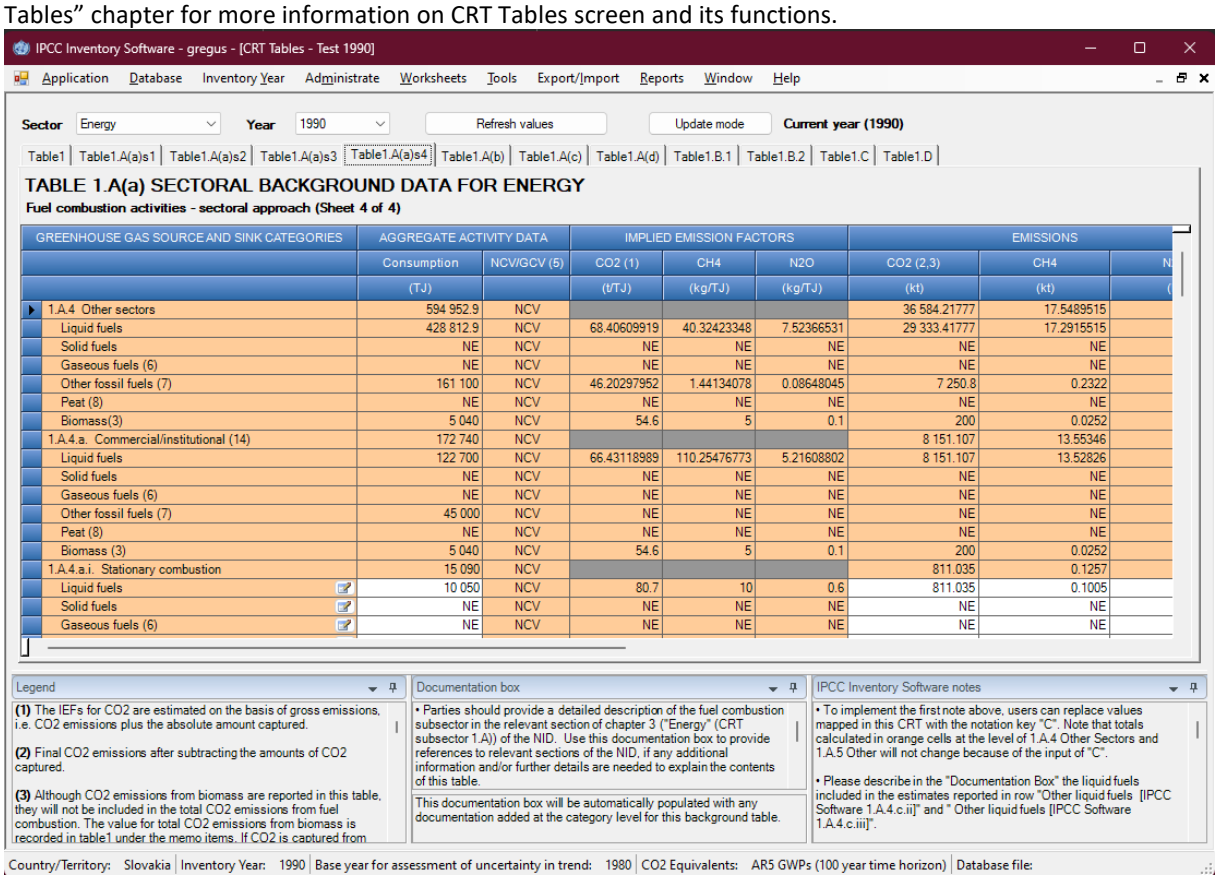


- Deleting existing years – user can remove existing years from edited data set. Note that all data belonging to removed years will be permanently deleted.



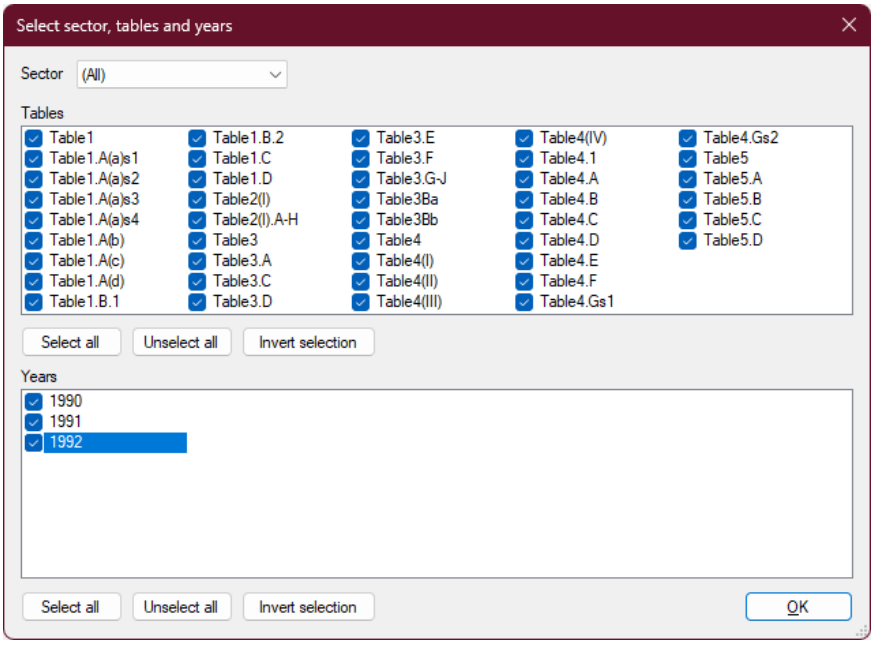
6.2.2.3 Open tables

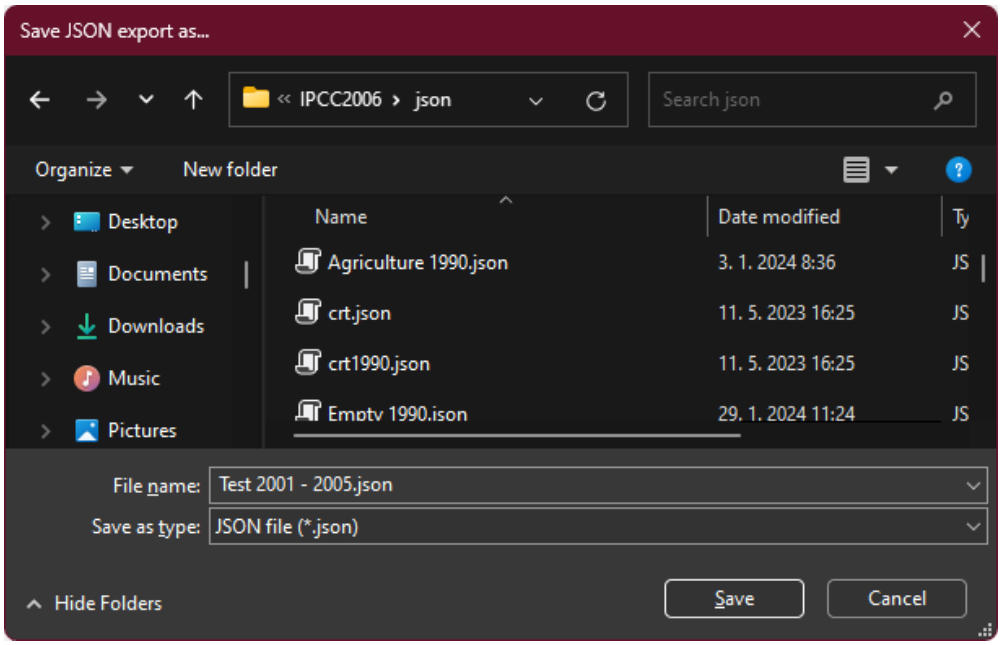
This action button opens the screen containing CRT Tables for currently selected CRT Data Set. This screen will open in a mode that allows the user to switch between CRT Tables screen and other software screens (e.g. Worksheets screen). Only one CRT Tables screen for one CRT Data Set can be open at a time. Refer to the "CRT Tables" chapter for more information on CRT Tables screen and its functions.

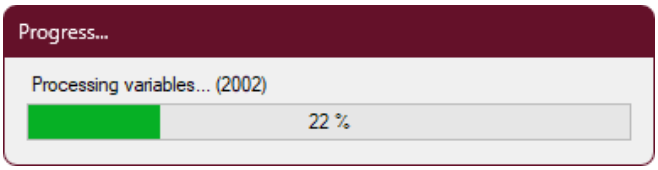


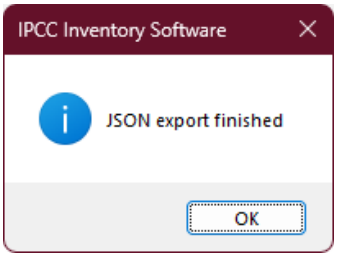
6.2.2.4 Generate JSON

This action button serves the purpose of generating export in JSON format compatible with UNFCCC ETF Tool. CRT data that belongs to the selected CRT Data Set will be serialized into JSON file for either all sectors or specific sector, for all or selected tables, and for selected years.





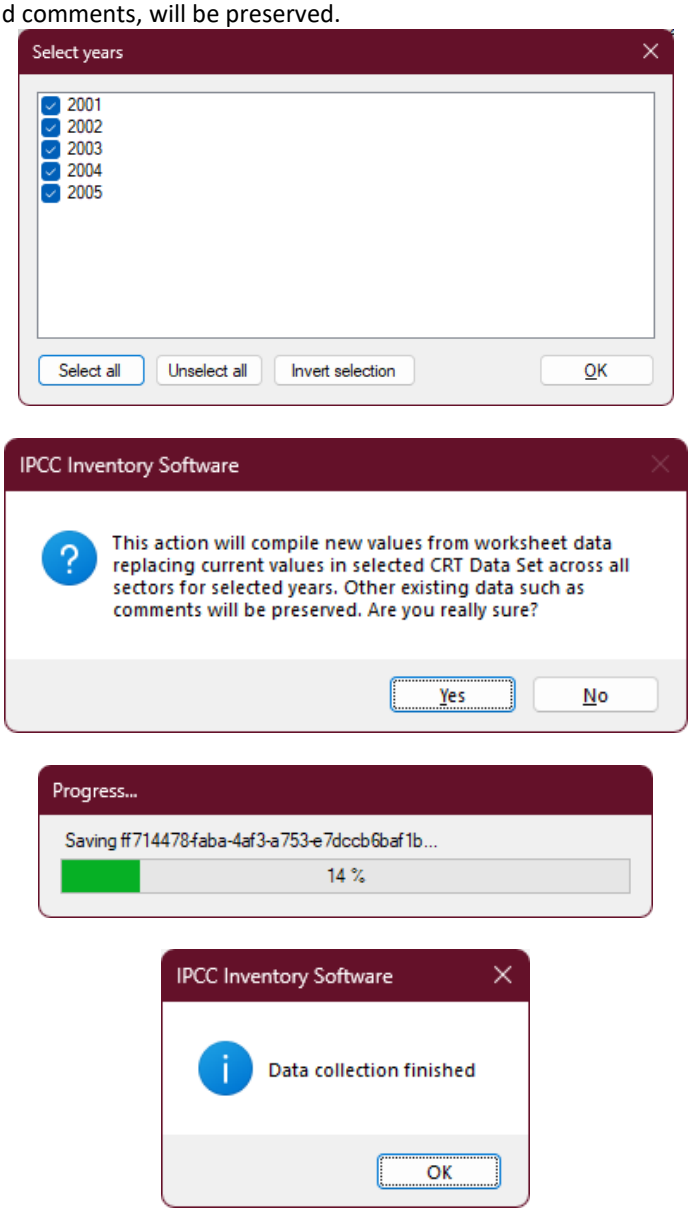




6.2.2.5 *Refresh values*

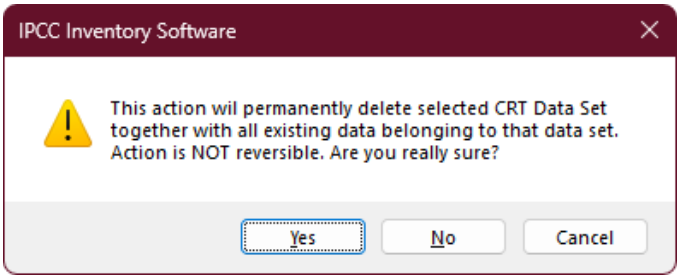
This action button allows refreshing all CRT Variable values within selected CRT Data Set for all sectors and selected years. Fresh values are compiled from the IPCC Inventory Software worksheets replacing current CRT

Variable values. Other information that was already added/modified by user such as Notation Keys, CRT Variable descriptions and comments, will be preserved.



6.2.2.6 *Delete CRT Data Set*

This action will permanently delete the existing CRT Data Set together with all data in all CRT Tables. This action is not reversible.

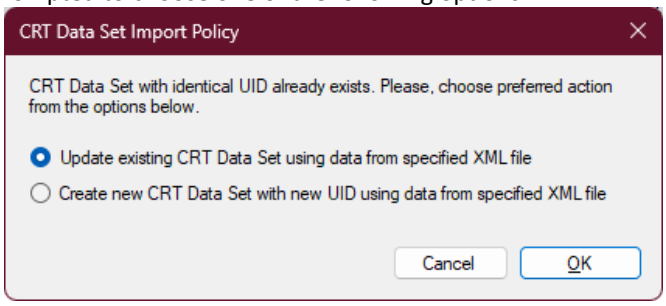


6.2.2.7 *Export CRT Data Set*

This action allows creating XML file with complete representation of single CRT Data Set that can be transferred and imported into any other IPCC Software database.

6.2.2.8 *Import CRT Data Set*

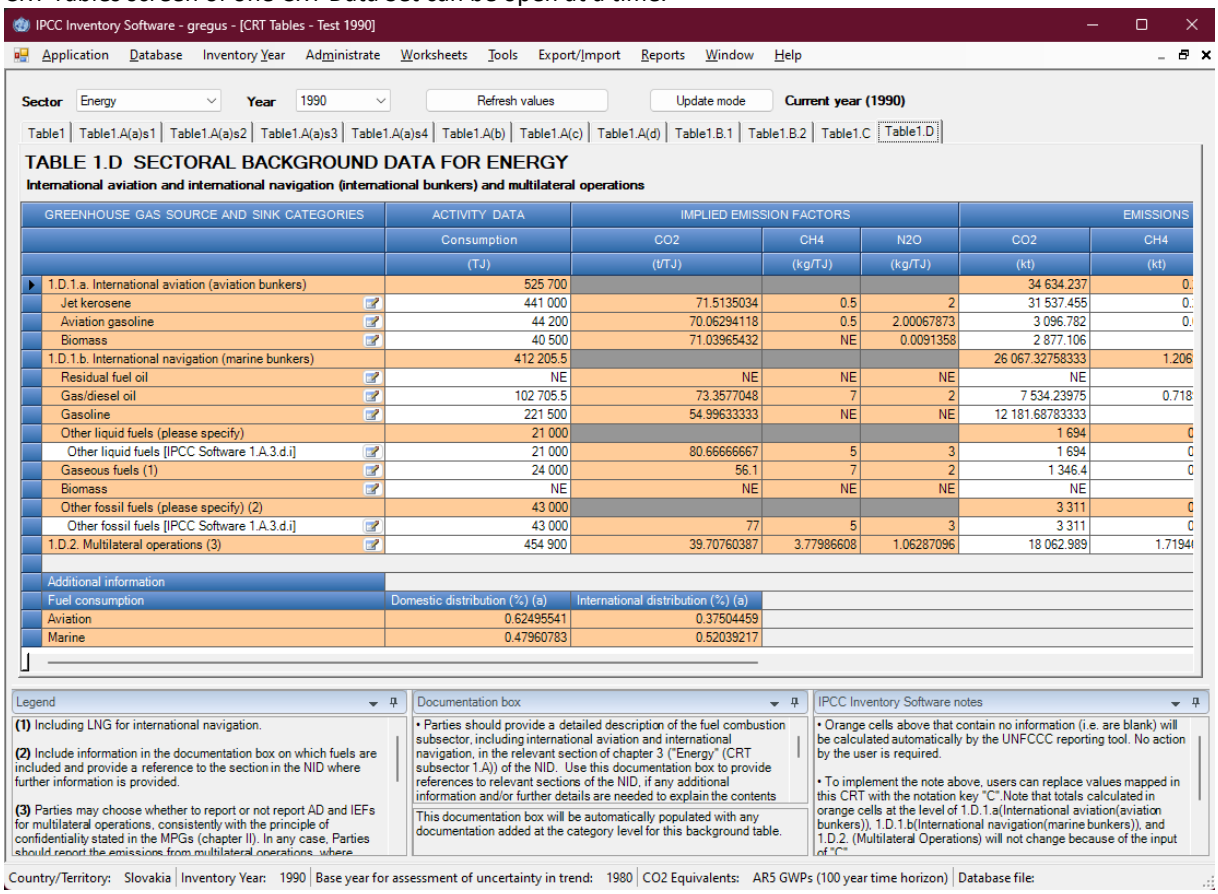
This action allows importing XML file containing full representation of single CRT Data Set that was created using export function described in the previous chapter. If CRT Data Set with the same UID already exists in the target database, user is prompted to choose one of the following options.



1) **Update existing CRT Data Set using data from specified XML file** – data of existing CRT data set will be updated using data from the XML file
2) **Create new CRT Data Set with new UID using data from specified XML file** – new CRT Data Set will be created with newly generated UID leaving the existing CRT Data Set intact.

6.3 CRT Tables

Screen containing CRT Tables can be open using "Open tables" button in CRT Data Set Manager for selected CRT Data Set. An alternative way is to double-click CRT Data Set row in CRT Data Set Manager table. Only one CRT Tables screen of one CRT Data Set can be open at a time.



CRT Tables screen consists of the following elements.

- Window title – contains the name of selected CRT Data Set
- Sector – currently selected sector. Set of tables is presented according to selected Sector
- Year – currently selected year from the list of years that belong to selected CRT Data Set
- Refresh values – allows refreshing values from the IPCC Inventory Software worksheets for all tables in selected sector and for years selected by user
- Update mode – specifies how changes to cell parameters such as Descriptions, Comments, Notation Keys, etc., are saved

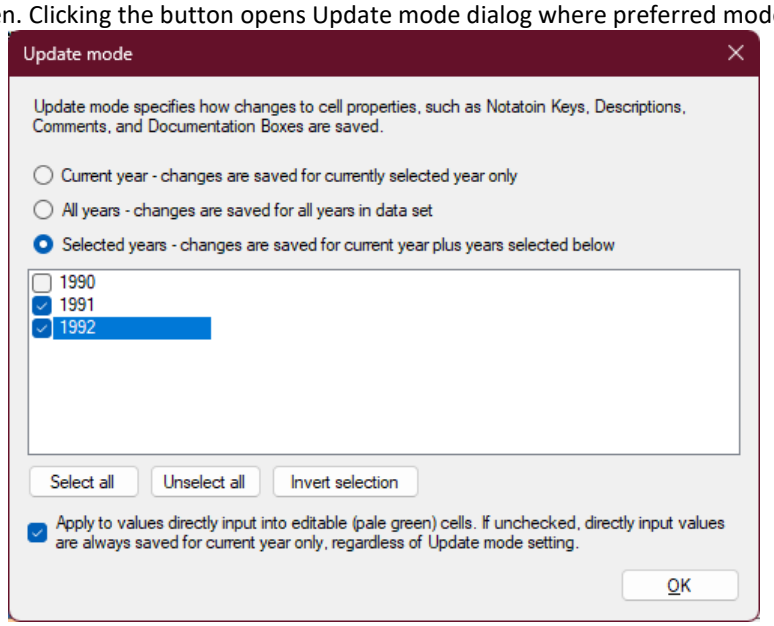
- Tabbed interface – allows switching between tables belonging to selected sector
- Documentation area – relevant for currently selected table. Contains Legend, Documentation box, IPCC Inventory software notes and other relevant info. Documentation area windows can be rearranged according to user preference.

6.3.1 CRT Table actions

For each CRT Variable in CRT Table there are several actions. Actions can be performed for a single cell as well as for selection of cells.

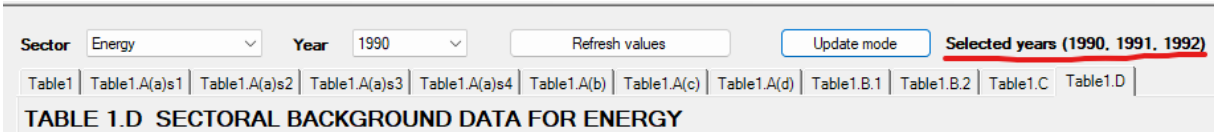
6.3.1.1 Update mode

Update mode specifies how changes to cell properties, such as Notation Keys, Descriptions, Comments, and Tables' Documentation Boxes are saved. Before starting to make changes to cell properties it is advised to check and adjust Update mode according to preference, by clicking **Update mode** button located at the top of the CRT Tables screen. Clicking the button opens Update mode dialog where preferred mode can be selected.



- **Current year** – changes are saved for year that is currently selected in Year dropdown at the top of the CRT Tables screen
- **All years** – changes are saved for all years in CRT Data Set
- **Selected years** – changes are saved for year currently selected in Year dropdown and additionally for other selected years
- **Apply to values directly input into editable (pale green) cells** – some cells allow direct input of values. When this option is checked, selected update mode also applies to values directly input into such editable cells. If unchecked, directly input values are always saved for currently selected year only, regardless of Update mode setting.

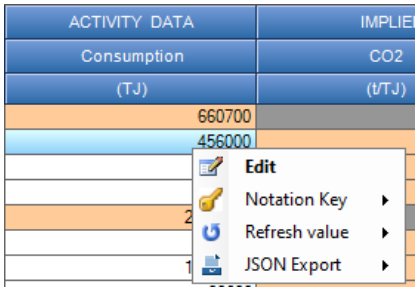
The currently selected Update mode setting is applied to and maintained for the current CRT Tables session only, and thus is reset back to default when CRT Tables screen is closed. The currently selected Update mode is indicated at the top of the CRT Tables screen, next to the **Update mode** button.



Note that in case of any multi-year update mode, changes are always applied contextually. E.g., if a cell has numeric value in year X while having Notation Key in year Y, changing Notation Key in year Y won't affect value in year X. In other words, changes to cells across years are applied only if they are applicable based on cell status in given year.

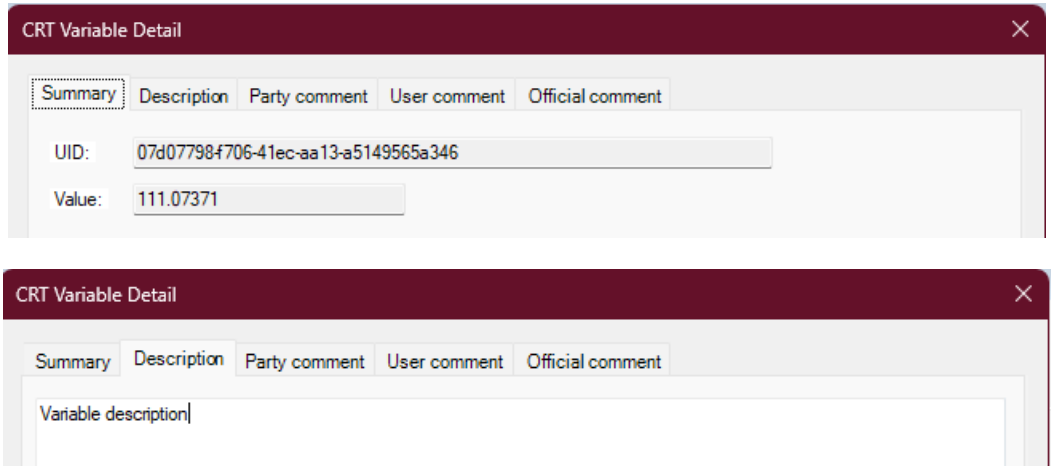
6.3.1.2 Single-cell actions

Right click on any cell that represents CRT Variable to open context menu with actions that are relevant for selected CRT Variable.



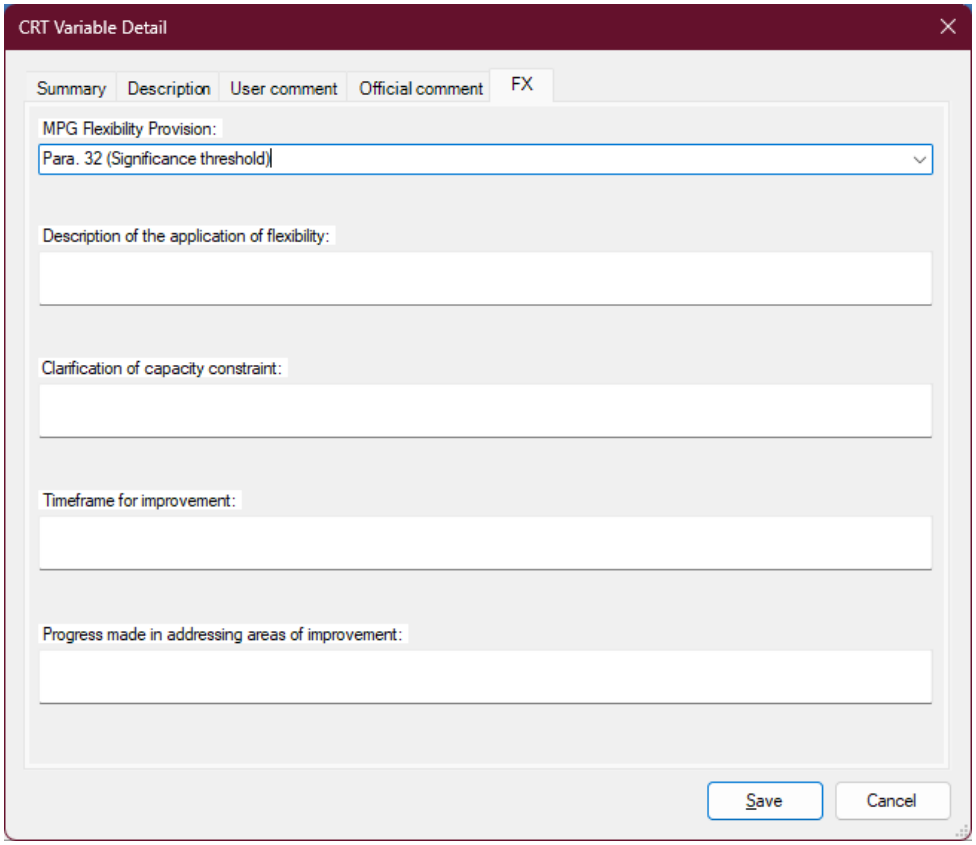
Edit

Opens CRT Variable detail dialog with all information relevant for the type of selected CRT Variable. Detail dialog can be alternatively open by double-clicking on a cell. Standard numeric variable detail dialog is shown below.

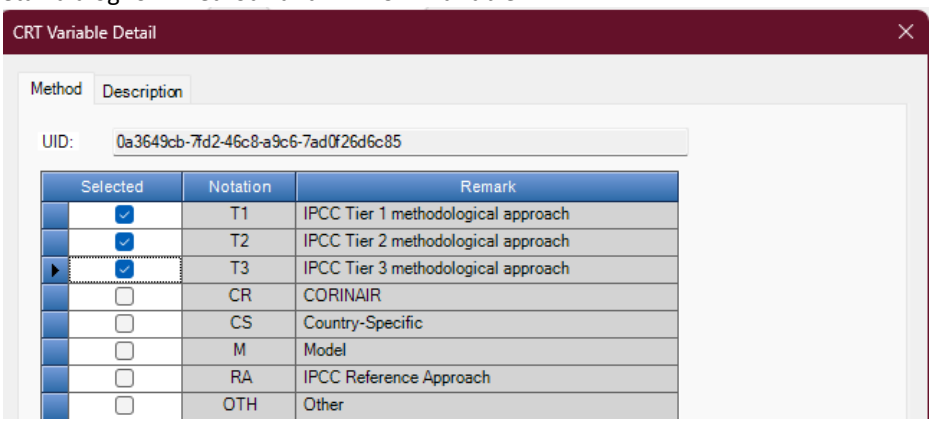


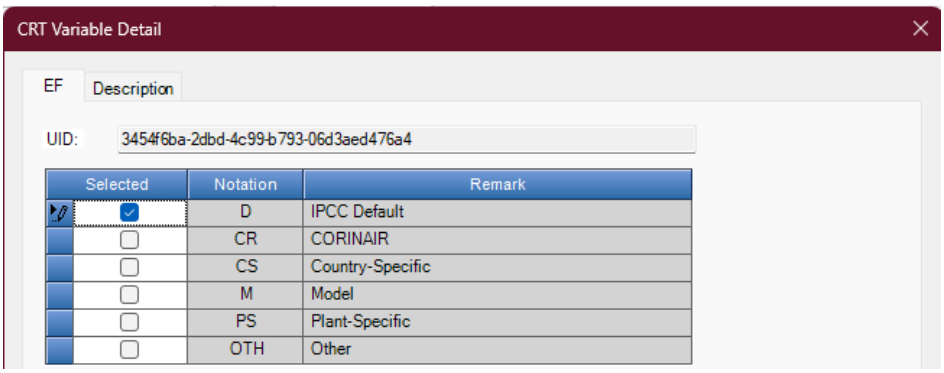
- Summary – contains basic information such as UID and current value
- Description – description of variable
- Party comment
- User comment
- Official comment

The user can enter this additional information independently for every CRT Variable cell in every CRT Table.
In case of CRT Variable that has Notation Key instead of numeric value, additional information that is relevant for selected Notation Key becomes available. Example for FX variable below.



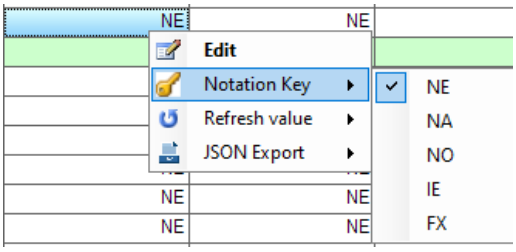
Example of detail dialog for “Method” and “EF” CRT Variable:



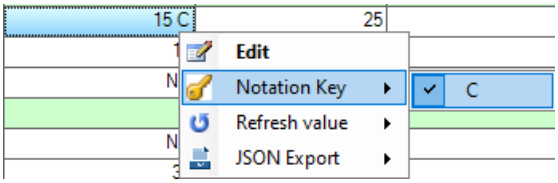


Notation Key

This menu item contains a list of applicable Notation Keys that can be set for CRT Variable. If cell already contains one of the notation keys instead of numeric value, then the list of applicable notation keys is as follows:



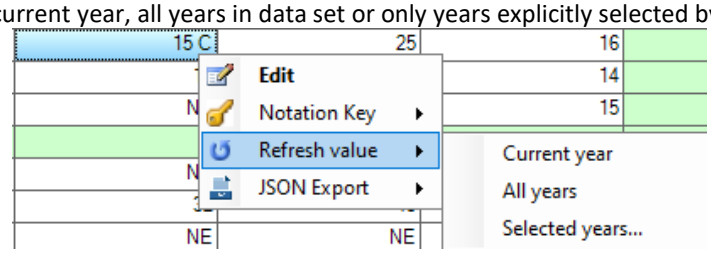
In case of cells that contain numeric value the list of notation keys contains only one item – C (Confidential) allowing a user to mark that CRT Variable as Confidential.



A "C" flag is added as suffix to numeric value. While value in confidential cell is still visible in the software it WILL NOT be exported in JSON. Choosing "C" on a cell that already has "C" flag will remove it.

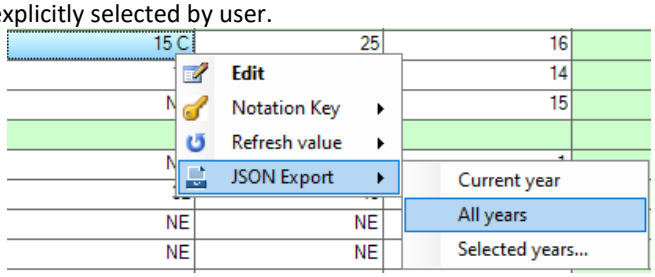
Refresh value

This action allows refreshing CRT Variable with relevant IPCC Inventory Software worksheet value. Action can be performed for the current year, all years in data set or only years explicitly selected by user.



JSON Export

This action allows exporting CRT Variable into JSON file. Action can be performed for the current year, all years in data set or only years explicitly selected by user.

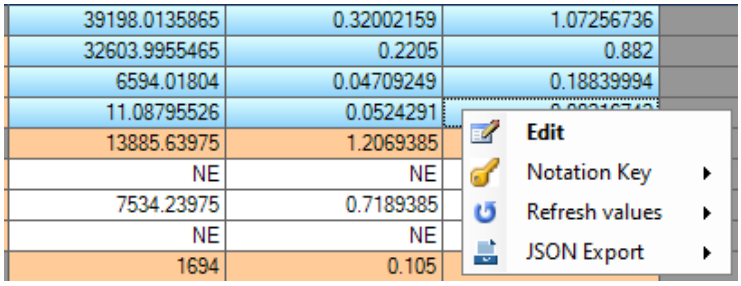


6.3.1.3 Multi-cell actions

CRT Table interface allows performing actions on multiple selected cells at once. This way it is possible to e.g. set the same documentation text for several cells without editing each cell individually.
Multiple cells can be selected utilizing various techniques.

- Left click and hold on starting cell and drag mouse pointer to select additional cells
- Left click on column header to select single column or left click, hold and drag to select multiple columns and all their cells
- Left click on row header to select single row or left click, hold and drag to select multiple rows and all their cells.
- Hold CTRL and left click on individual cells to be selected
- Click on start cell, hold SHIFT and then click on end cell to select area of cells

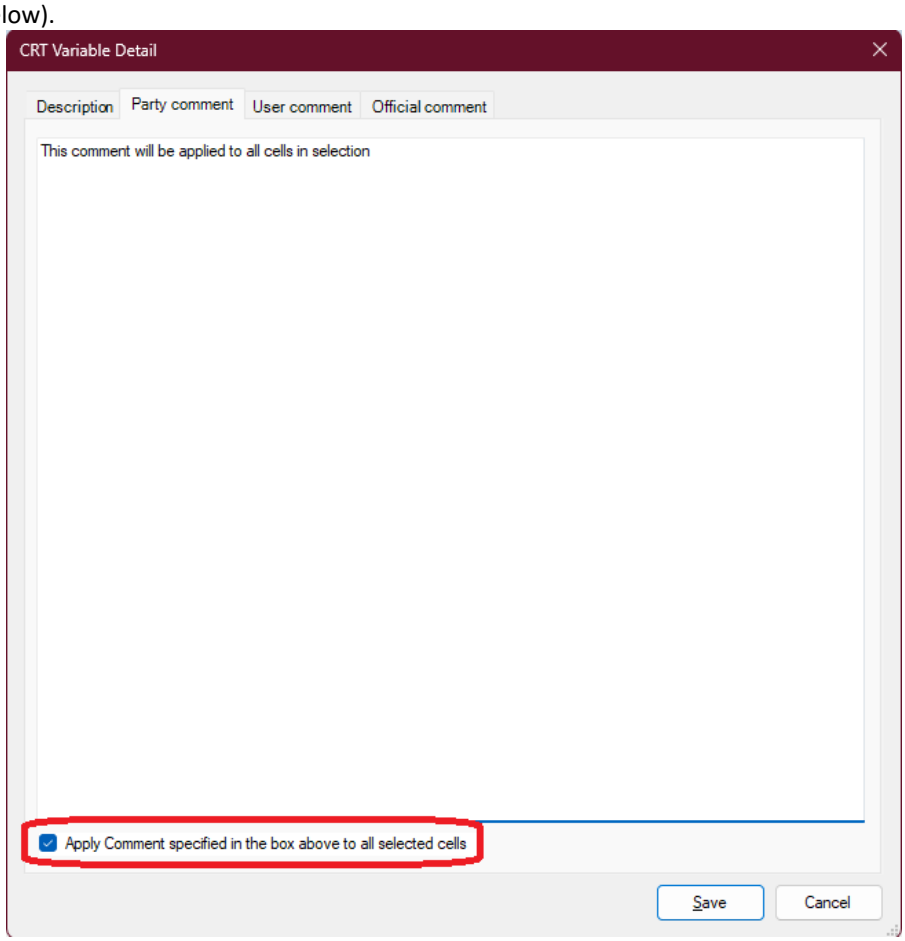
Selected cells are highlighted. In case selection contains at least one CRT Variable cell, right clicking anywhere within selection opens context menu that applies to selection.



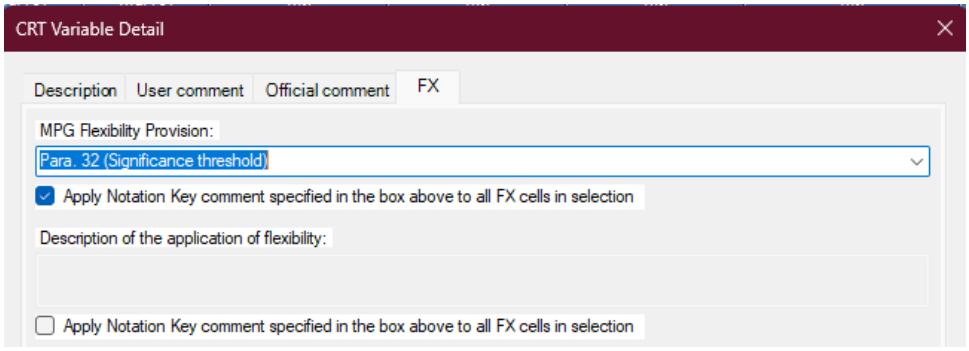
Edit

Opens detail dialog for selected cells in multi-cell mode. Detail dialog is constructed based on types of cells that are in selection. This means all relevant tabs will be shown within detail dialog. (e.g. if selection contains "Method" and "EF" cell, "Method" and "EF" tabs will become available).

User must explicitly flag which information entered in multi-cell detail dialog should be applied to selected cells. This way it is possible to bulk-update only specific type of information while leaving other information in selected cells intact. Example: If only "Party comment" should be updated in all selected cells then user explicitly marks that comment using a dedicated checkbox and then inputs new value for that comment (see screenshot below).



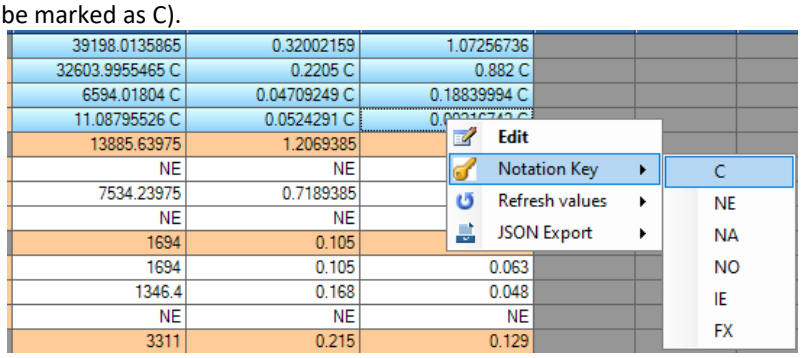
In multi-cell detail dialog, each piece of information has its dedicated "Apply" checkbox. Example for FX related comments below where only "MPG Flexibility Provision" was marked to be updated within all FX cells in the selection of cells.



Note that every piece of information will be applied to cell in selection only in case it is relevant for that cell. (e.g. FX comments will be applied only to those cells in selection that are FX).

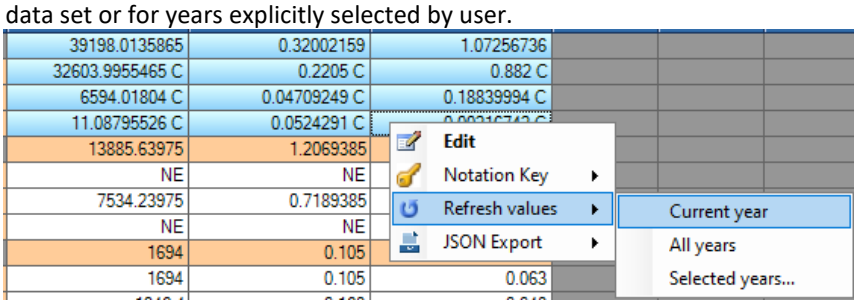
Notation key

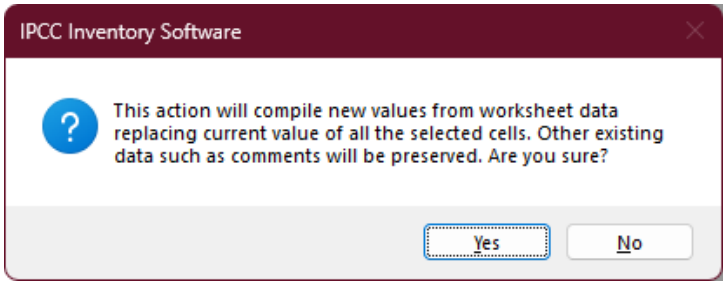
Allows to set the same Notation Key for all cells in selection. The rules are analogic to those in "Edit" action and thus selected Notation Key will be applied only to relevant cells. (e.g. if C is selected, only cells containing real numeric value will be marked as C).



Refresh values

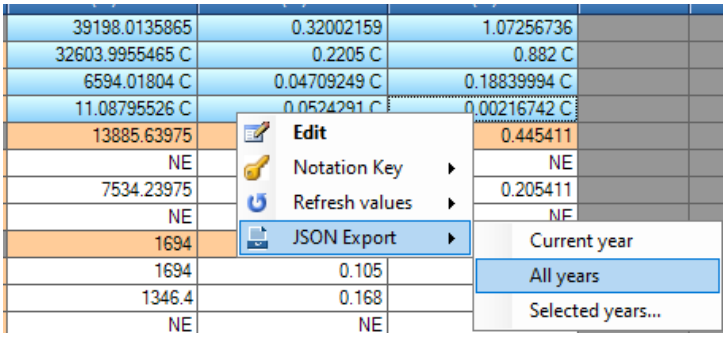
Allows refreshing values from the IPCC Inventory Software worksheets for all selected cells for either current year, all years in data set or for years explicitly selected by user.





JSON Export

Allows exporting selected cells into JSON file for either current year, all years in data set or for years explicitly selected by user.

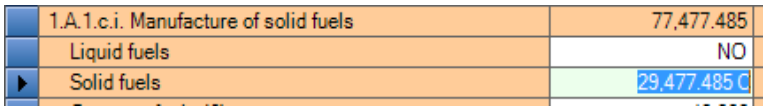


6.3.1.4 Editable cells

Some cells highlighted with pale green color allow direct editing of value. User is allowed to change value of such cells or set notation key by direct input.

- To enter numeric value – type in numeric value directly into cell. Value can be marked as confidential by entering "c" or "C" after numeric value

- To enter notation key – type in one of the relevant notation keys directly. Allowed notation keys: NE, NA, NO, IE, FX (can be typed lowercase in which case they will be automatically converted to upper case). Note that some of the cells do not allow to set these notation keys when there is value already present.



6.3.2 CRT Table Documentation Box

Allows to specify additional textual information at the lowest CRT category level. Each documentation box has its dedicated UID thus it is exported to JSON just like any other CRT Variable.

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	