Introduction to the tools and software available for facilitating reporting

16 – 19 April 2024
Belize

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CBIT-GSP

National GHG Inventory can be prepared by using

IPCC Inventory Software

- The IPCC Inventory Software implements the 2006 IPCC Guidelines for National Greenhouse Gas Inventories. It can also be used for reporting under the 1996 IPCC Guidelines
- It allows countries to utilize the improvements in the methodologies and default values since 1996
- The IPCC launched the IPCC Inventory Software in 2012
- Supported by the UNFCCC secretariat and the Technical Support Unit of the IPCC Task Force on National Greenhouse Gas Inventories.
- The latest officially published version is available from: http://www.ipcc-nggip.iges.or.jp/software/index.html

Go to the IPCC website to download the software:

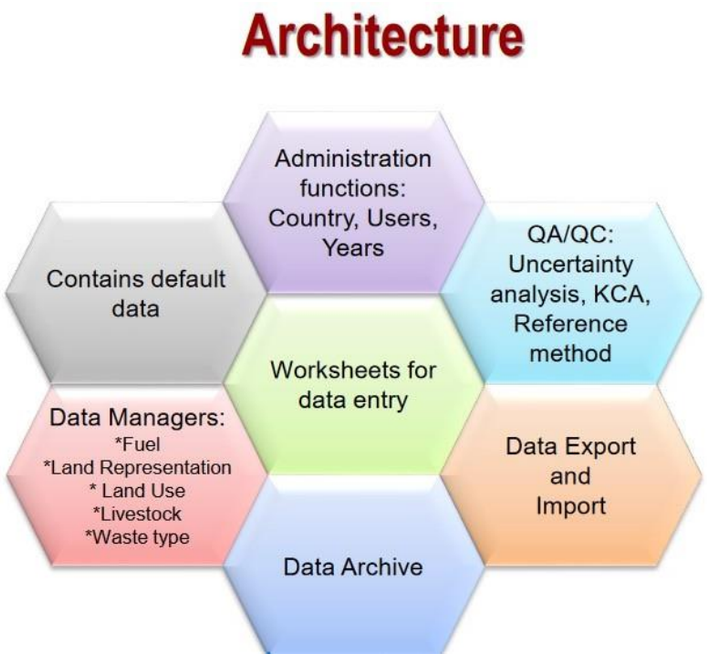
•http://www.ipcc-nggip.iges.or.jp/software/index.html

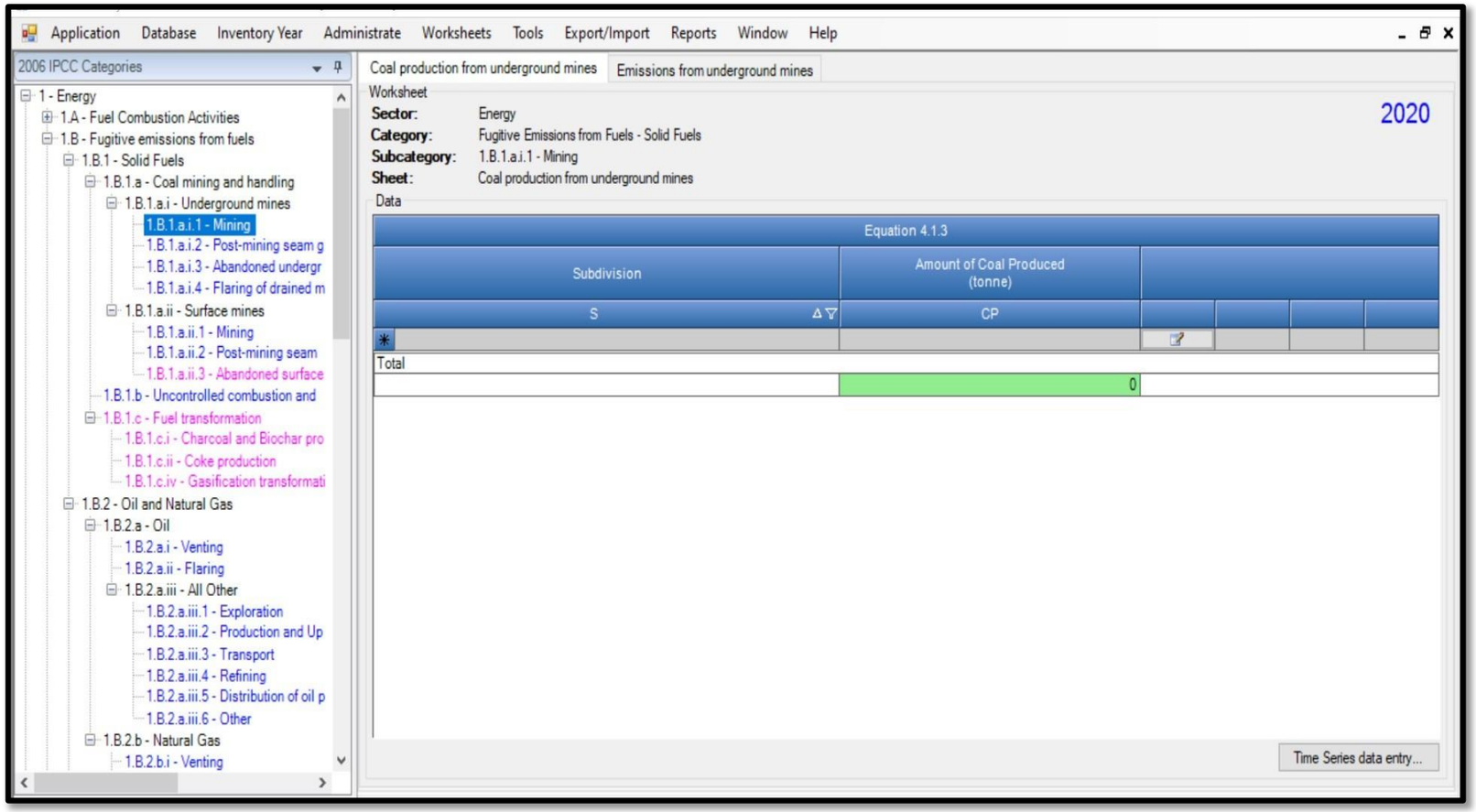
IPCC Software

The IPCC Inventory Software can assist inventory compilers in using the IPCC Guidelines

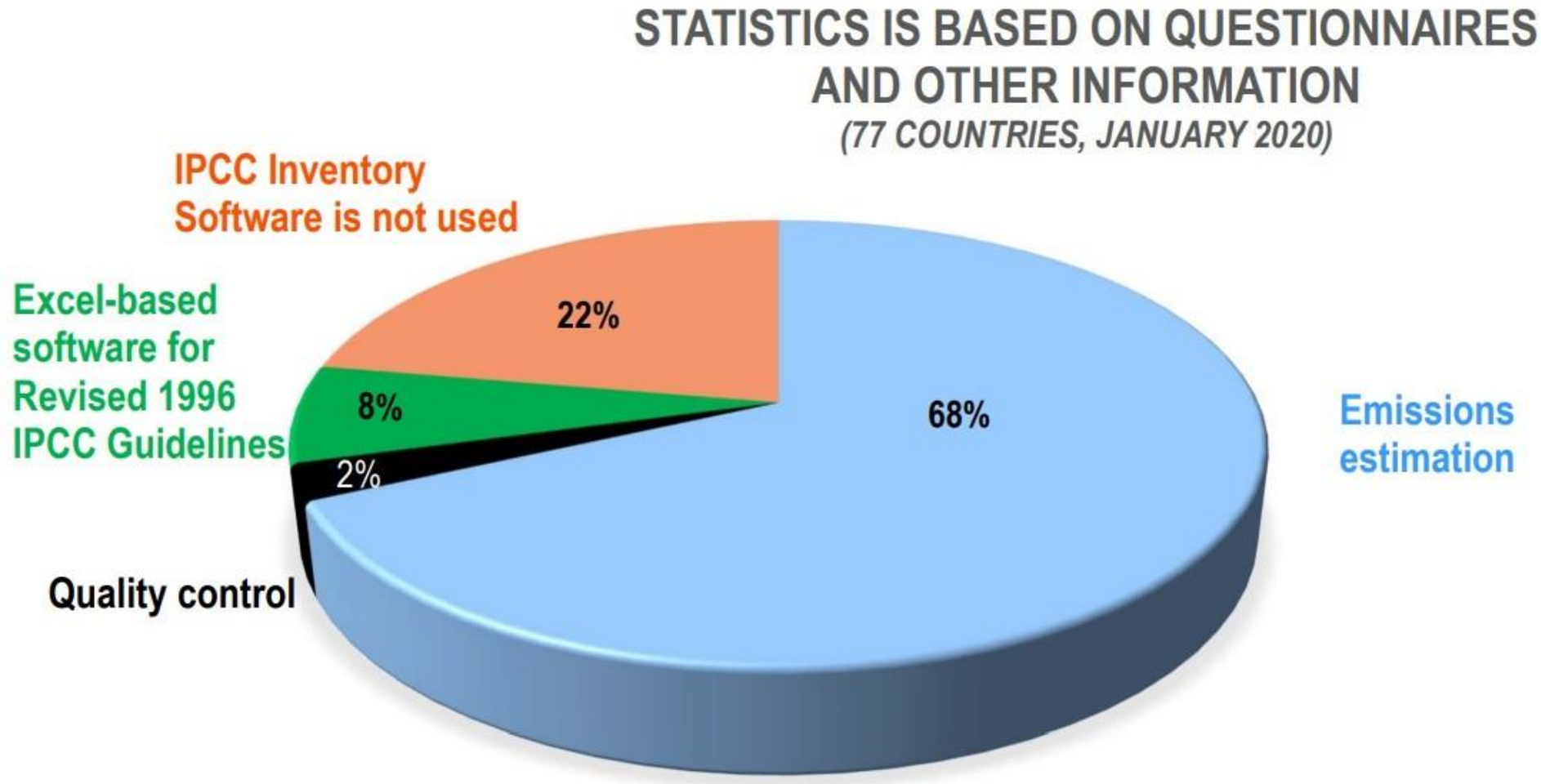
- Stand alone software with modest hardware requirements
- Data entry in worksheets following the 2006 IPCC guidelines for ease-of-use
- It can be used for the whole inventory or just individual categories
- Allows different parts of the inventory to be developed simultaneously
- Can be used when reporting 1996 or 2006 guidelines
- Provides default data from the 2006 IPCC guidelines but gives users the flexibility to use their own country-specific information
- Includes uncertainty and key category analysis
- Aids QA/QC
- Outputs in non-annex I national communications format
- **Free!**

IPCC Inventory Software





Use of the IPCC Software by Developing Countries



https://unfccc.int/sites/default/files/resource/Software_general_IPCC_(

New Features of IPCC Inventory Software

IPCC Inventory Software was first released in 2012. Initially, it was designed to be a simple tool implementing only Tier 1 methods according to the 2006 IPCC Guidelines

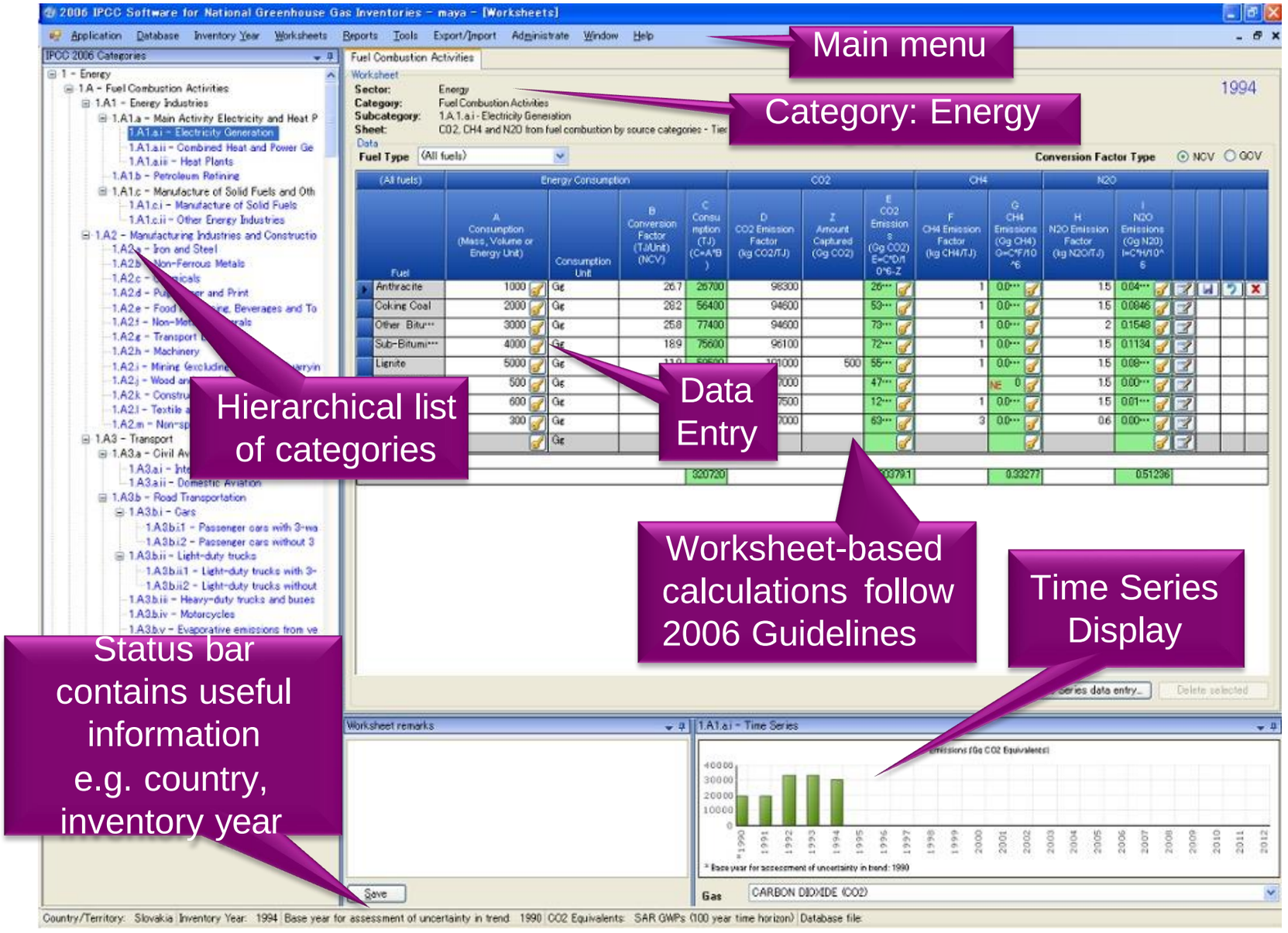
The latest version, 2.901, has been released on February 14, 2024

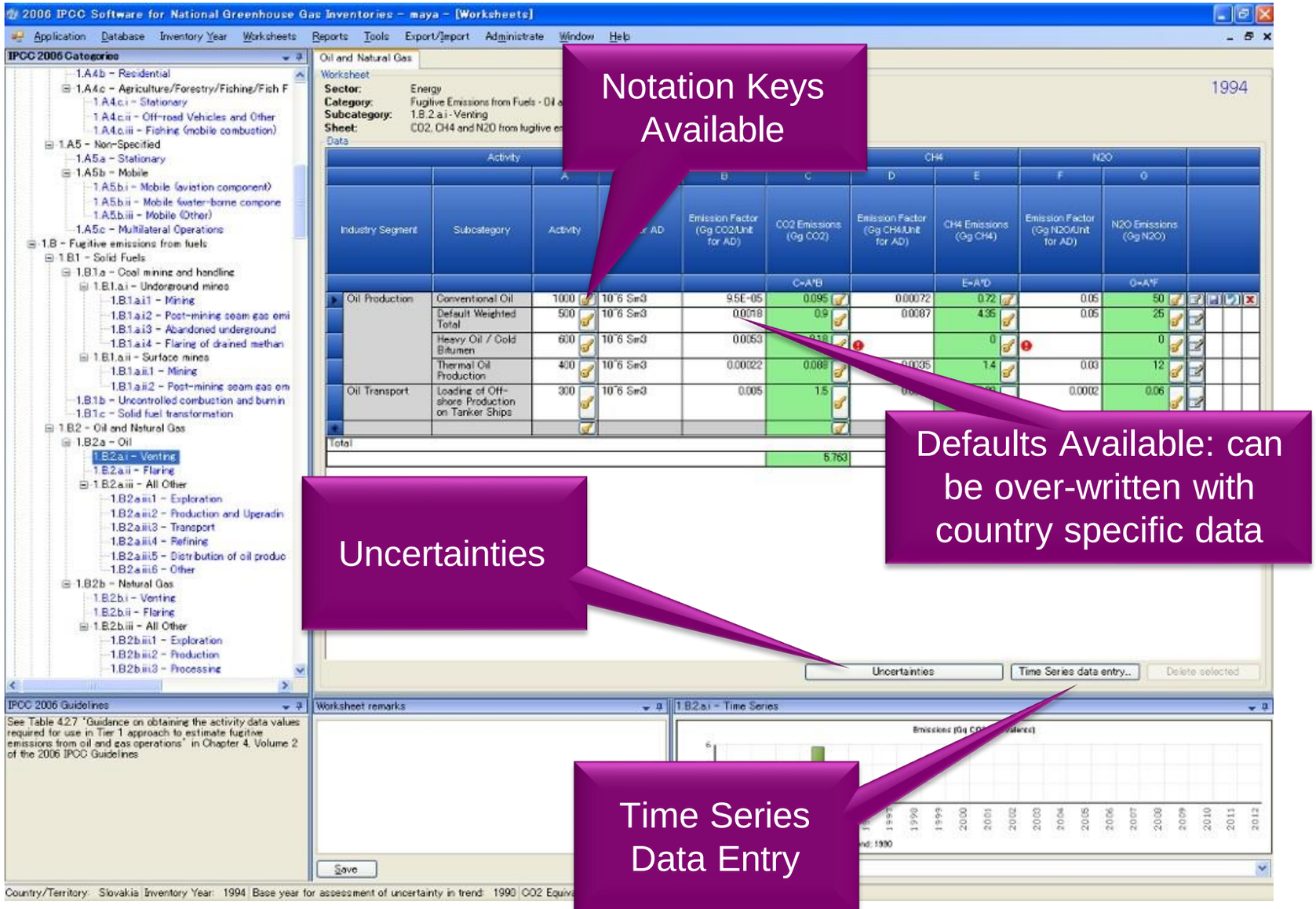
- ✓ All Methodological Tiers and approaches according to the 2006 IPCC Guidelines,
- ✓ Calculation of Indirect CO_2 and N_2O emissions according to the 2006 IPCC Guidelines and its 2019 Refinement
- ✓ Interoperability functionality with the UNFCCC CRT Reporting tool (Energy Sector, Waste sector, Agriculture categories)

More Features of IPCC Inventory Software

- Allows for each source/sink to use either a **single methodological Tier or a mix of Tiers**
- Allows, in each equation, to **input user-specific values for EFs and parameters**
- Allows different categories/sectors to be developed simultaneously
- Implements **AR5 GWP_{100}** values (and allows any other user-specific metric to be applied)
- Stores the **entire set of information of National GHG Inventory within a single database**

Interface of the IPCC Tool





Reference: UNFCCC CGE Training material

Reports

Report	Level	Contents
Summary	**1.A.1**	**Emissions**
Short summary	**1.A**	**Emissions**
Sectoral	**1.A.1.a.ii (most disaggregated level)**	**Emissions**
Background	**1.A.1.a.ii (most disaggregated level)**	**Activity data Emissions**

Note: *All reports can be exported as MS Excel file*

Reference: UNFCCC CGE Training material

Non-Annex I Reporting Table

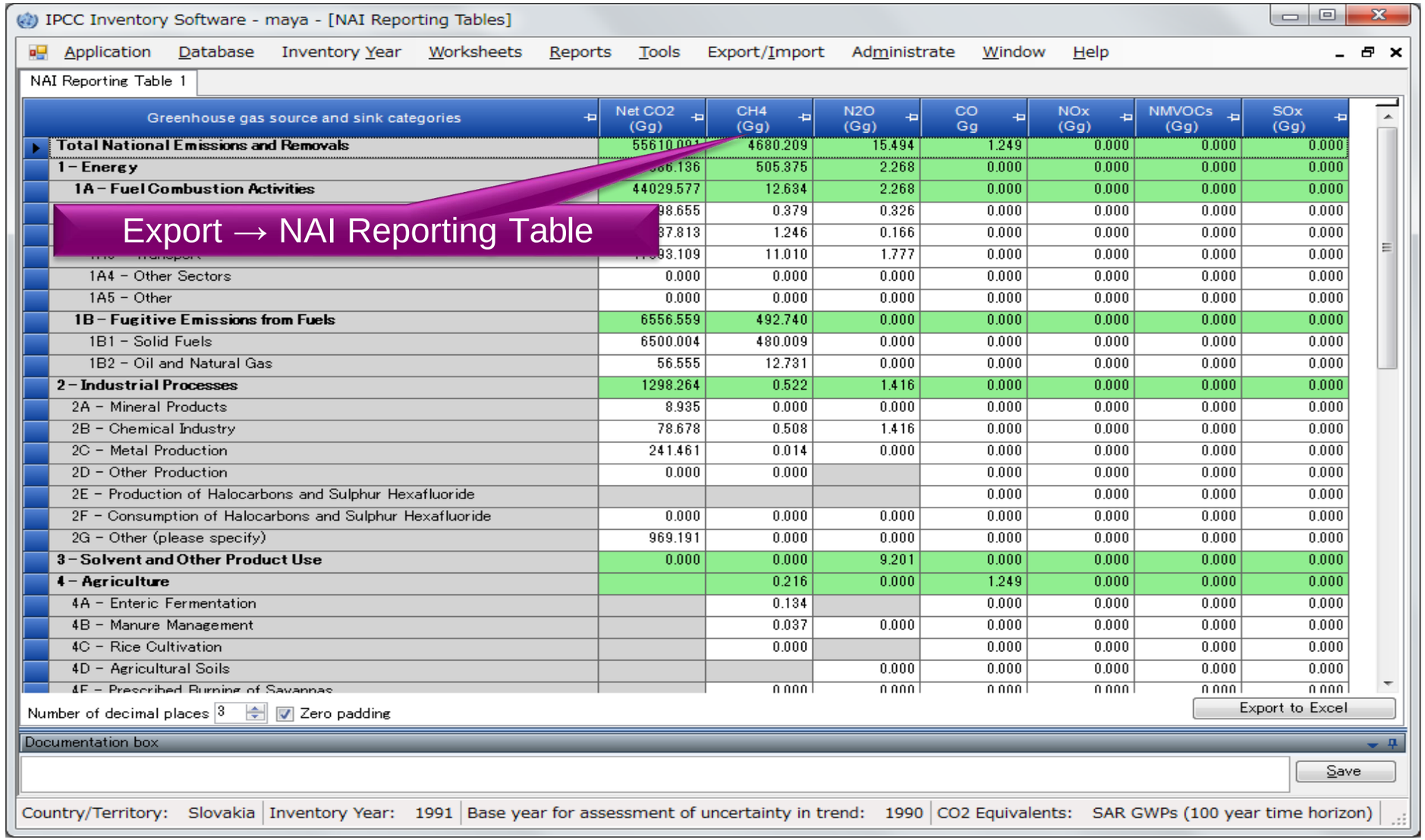
- **The IPCC Inventory Software follows the format of Tables in Annex to Decision 17/CP.8** (*Guidelines for the preparation of National Communications from Parties not included in Annex I to the Convention*)

- **Main Menu**

  → **Export/Import**

  → **NAI Reporting Tables**

Non-Annex I Reporting Table



Greenhouse gas source and sink categories	Net CO2 (Gg)	CH4 (Gg)	N2O (Gg)	CO Gg	NOx (Gg)	NMVOCs (Gg)	SOx (Gg)
Total National Emissions and Removals	55610.091	4680.209	15.494	1.249	0.000	0.000	0.000
1 – Energy	66.136	505.375	2.268	0.000	0.000	0.000	0.000
1A – Fuel Combustion Activities	44029.577	12.634	2.268	0.000	0.000	0.000	0.000
	98.655	0.379	0.326	0.000	0.000	0.000	0.000
	37.813	1.246	0.166	0.000	0.000	0.000	0.000
	93.109	11.010	1.777	0.000	0.000	0.000	0.000
1A4 – Other Sectors	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1A5 – Other	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1B – Fugitive Emissions from Fuels	6556.559	492.740	0.000	0.000	0.000	0.000	0.000
1B1 – Solid Fuels	6500.004	480.009	0.000	0.000	0.000	0.000	0.000
1B2 – Oil and Natural Gas	56.555	12.731	0.000	0.000	0.000	0.000	0.000
2 – Industrial Processes	1298.264	0.522	1.416	0.000	0.000	0.000	0.000
2A – Mineral Products	8.935	0.000	0.000	0.000	0.000	0.000	0.000
2B – Chemical Industry	78.678	0.508	1.416	0.000	0.000	0.000	0.000
2C – Metal Production	241.461	0.014	0.000	0.000	0.000	0.000	0.000
2D – Other Production	0.000	0.000		0.000	0.000	0.000	0.000
2E – Production of Halocarbons and Sulphur Hexafluoride				0.000	0.000	0.000	0.000
2F – Consumption of Halocarbons and Sulphur Hexafluoride	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2G – Other (please specify)	969.191	0.000	0.000	0.000	0.000	0.000	0.000
3 – Solvent and Other Product Use	0.000	0.000	9.201	0.000	0.000	0.000	0.000
4 – Agriculture		0.216	0.000	1.249	0.000	0.000	0.000
4A – Enteric Fermentation		0.134		0.000	0.000	0.000	0.000
4B – Manure Management		0.037	0.000	0.000	0.000	0.000	0.000
4C – Rice Cultivation		0.000		0.000	0.000	0.000	0.000
4D – Agricultural Soils			0.000	0.000	0.000	0.000	0.000
4F – Prescribed Burning of Savannas			0.000	0.000	0.000	0.000	0.000

Reference: UNFCCC CGE Training material

Tools

- **Uncertainty analysis**

- **Key category analysis**

When all values are entered in the worfisheet for each sector, these analysis can be performed by following steps:

<u>Main Menu</u>

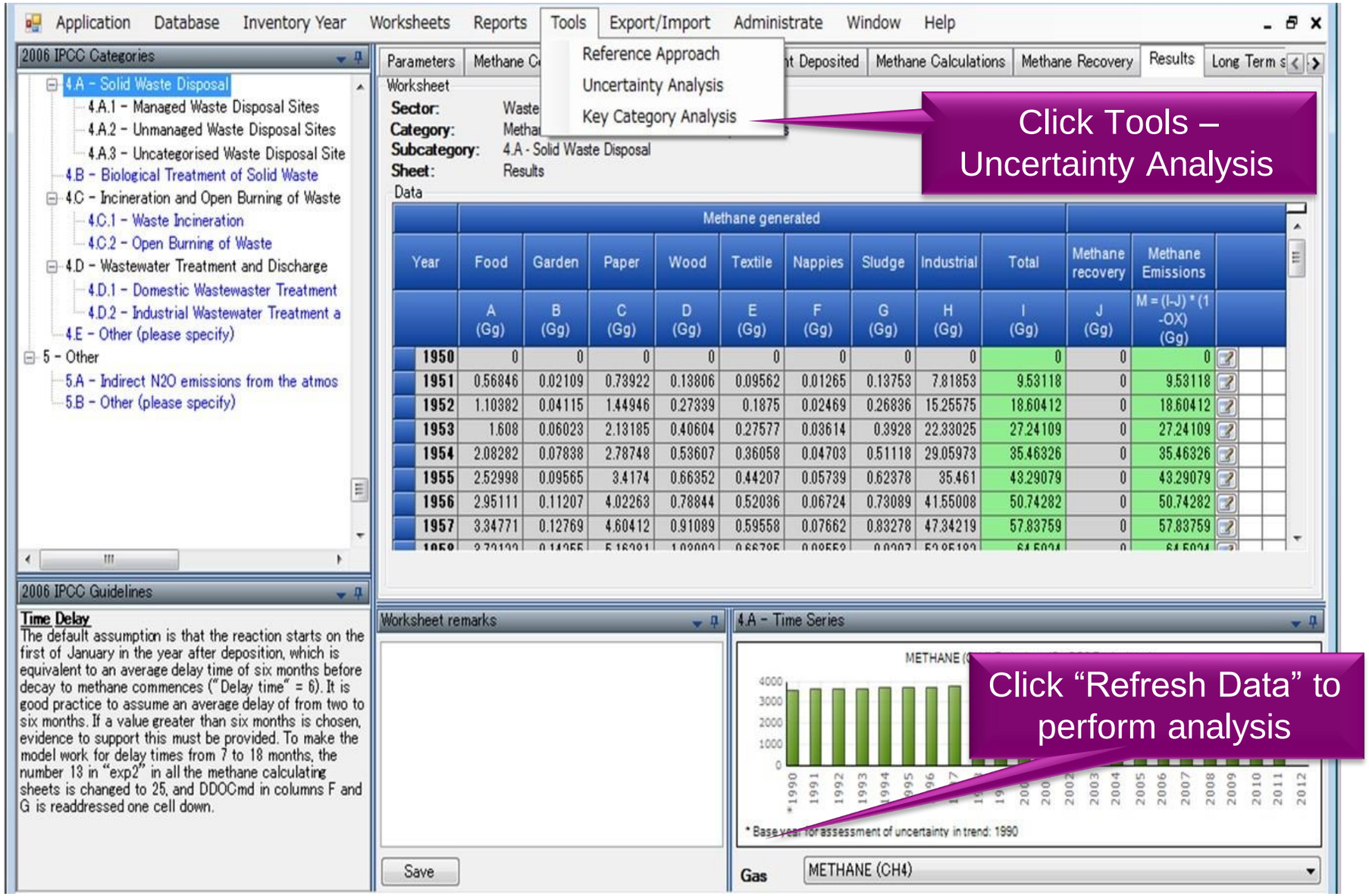
→ Export/Import

→ Uncertainty Analysis

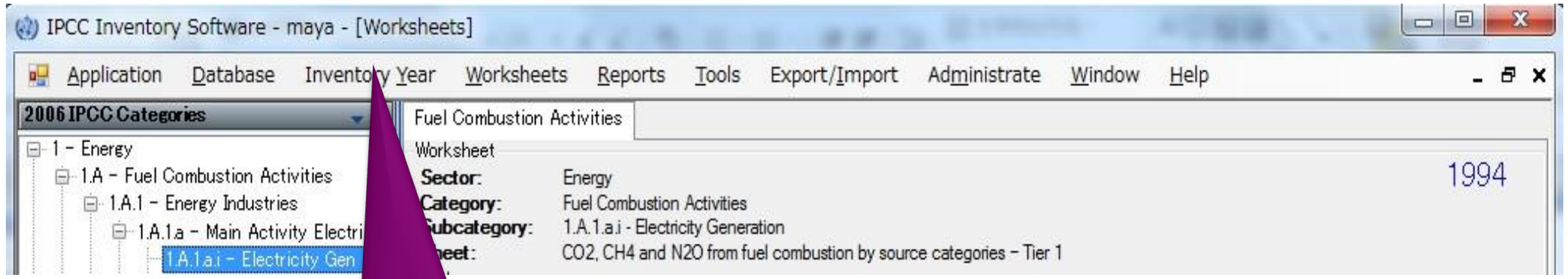
or Key Category Analysis

✓ *clicfi "Refresh" button*

Tools

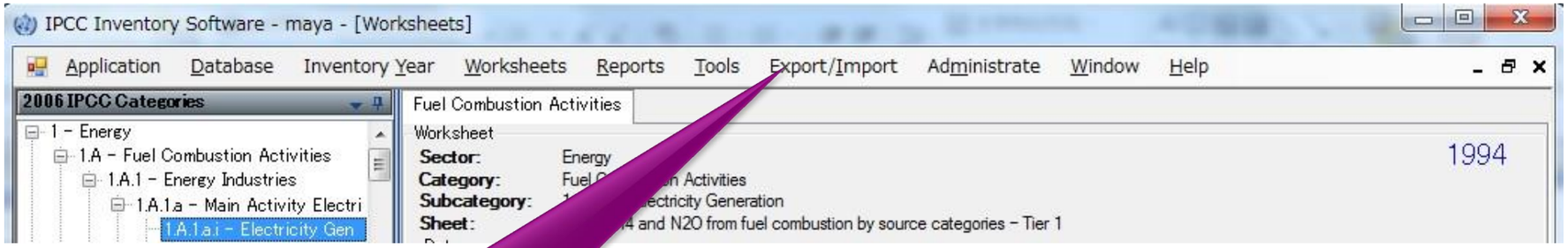

Application
Database
Inventory Year
Worksheets
Reports
Tools
Export/Import
Administrate
Window
Help
Reference Approach
Uncertainty Analysis
Key Category Analysis
Click Tools – Uncertainty Analysis
2006 IPCC Categories
4.A - Solid Waste Disposal
4.A.1 - Managed Waste Disposal Sites
4.A.2 - Unmanaged Waste Disposal Sites
4.A.3 - Uncategorised Waste Disposal Site
4.B - Biological Treatment of Solid Waste
4.C - Incineration and Open Burning of Waste
4.C.1 - Waste Incineration
4.C.2 - Open Burning of Waste
4.D - Wastewater Treatment and Discharge
4.D.1 - Domestic Wastewaster Treatment
4.D.2 - Industrial Wastewater Treatment a
4.E - Other (please specify)
5 - Other
5.A - Indirect N2O emissions from the atmos
5.B - Other (please specify)
Parameters
Methane Calculations
Methane Recovery
Results
Worksheet
Sector:
Category:
Subcategory: 4.A - Solid Waste Disposal
Sheet: Results
Data
Methane generated
Year
Food
Garden
Paper
Wood
Textile
Nappies
Sludge
Industrial
Total
Methane recovery
Methane Emissions
A (Gg)
B (Gg)
C (Gg)
D (Gg)
E (Gg)
F (Gg)
G (Gg)
H (Gg)
I (Gg)
J (Gg)
M = (I-J) * (1 -OX) (Gg)
1950 0 0 0 0 0 0 0 0 0 0 0
1951 0.56846 0.02109 0.73922 0.13806 0.09562 0.01265 0.13753 7.81853 9.53118 0 9.53118
1952 1.10382 0.04115 1.44946 0.27339 0.1875 0.02469 0.26836 15.25575 18.60412 0 18.60412
1953 1.608 0.06023 2.13185 0.40604 0.27577 0.03614 0.3928 22.33025 27.24109 0 27.24109
1954 2.08282 0.07838 2.78748 0.53607 0.36058 0.04703 0.51118 29.05973 35.46326 0 35.46326
1955 2.52998 0.09565 3.4174 0.66352 0.44207 0.05739 0.62378 35.461 43.29079 0 43.29079
1956 2.95111 0.11207 4.02263 0.78844 0.52036 0.06724 0.73089 41.55008 50.74282 0 50.74282
1957 3.34771 0.12769 4.60412 0.91089 0.59558 0.07662 0.83278 47.34219 57.83759 0 57.83759
2006 IPCC Guidelines
Time Delay
The default assumption is that the reaction starts on the first of January in the year after deposition, which is equivalent to an average delay time of six months before decay to methane commences ("Delay time" = 6). It is good practice to assume an average delay of from two to six months. If a value greater than six months is chosen, evidence to support this must be provided. To make the model work for delay times from 7 to 18 months, the number 13 in "exp2" in all the methane calculating sheets is changed to 25, and DDOCmd in columns F and G is readdressed one cell down.
Worksheet remarks
Save
4.A - Time Series
4000
3000
2000
1000
0
1990
1991
1992
1993
1994
1995
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
* Base year for assessment of uncertainty in trend: 1990
Click "Refresh Data" to perform analysis
Gas
METHANE (CH4)

Other basic operations - Year



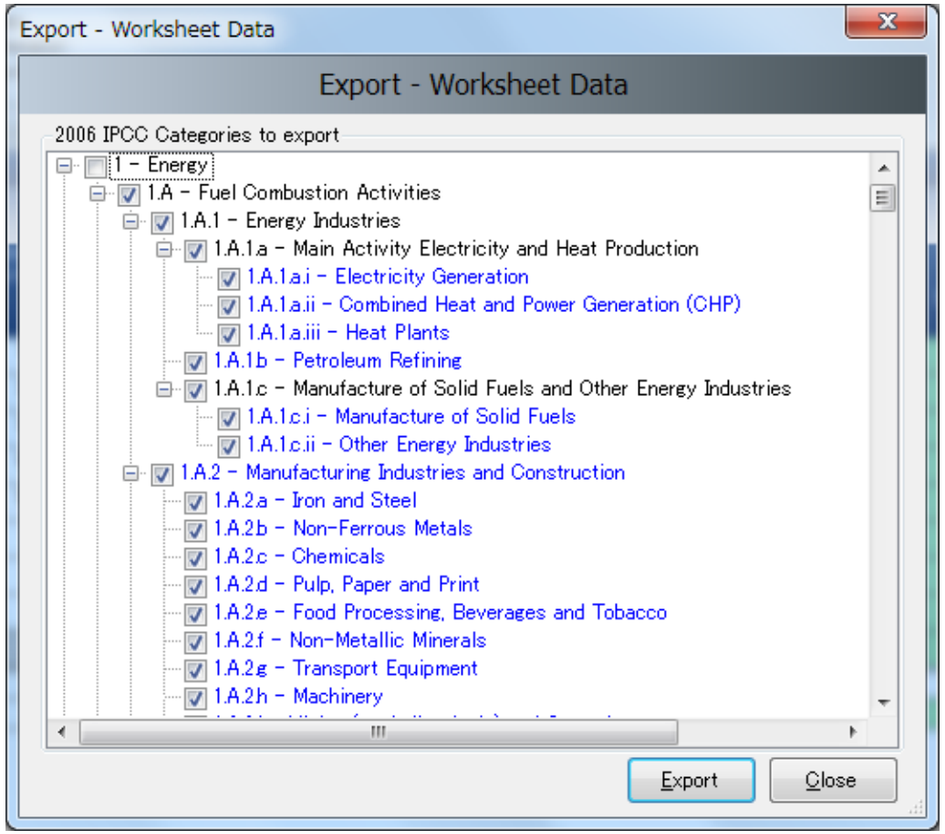
Inventory Year
- Create New year
- Select year

Other basic operations - Export



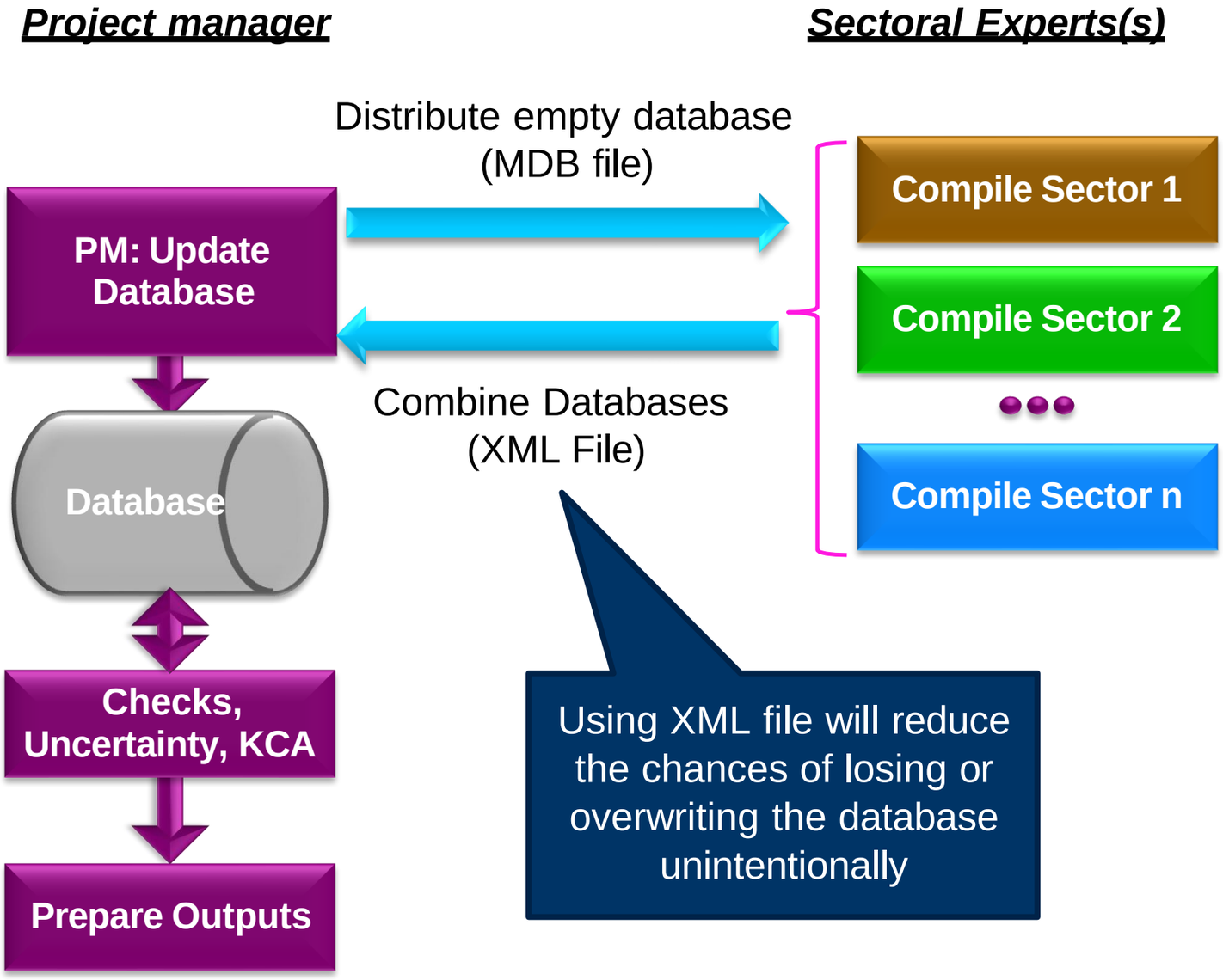
Export/Import worksheet data as XML file format.

In this example, Worksheet data for category 1A for year 1994 will be exported.



Reference: UNFCCC CGE Training material

Multiple Users



Reference: UNFCCC CGE Training material

Support

- **The TSU is supporting the IPCC Inventory Software:**
  - Help Desk E-mail: ipcc-software@iges.or.jp
  - Web Forum: https://discussions.zoho.com/ipccinventorysoftware/
    - ✓ *please, read the User Manual*
- **TSU will maintain the IPCC Inventory Software and is planning to implement the following:**
  - Tier 2 methods
    - ✓ from Version 2.54, the Software implements Tier 2 methods in the 2006 IPCC Guidelines for most categories under Energy, IPPU and Waste Sectors
    - ✓ livestock categories are under development
  - Wetlands Supplement

Various Tools – Inventory Supporting Materials

- GHG emissions database providing country-level estimates of emissions.
- Focuses on emissions from individual sources within the Agriculture and Land Use Inventory sectors.
- Utilizes FAOSTAT activity data and Tier 1 methods from the 2006 IPCC Guidelines.

FAOSTAT

IPCC Emission Factor Database

- Provides a library of emission factors, background documentation, and technical references to support the estimation of GHG emissions and removals. Supported by the Technical Support Unit of the IPCC Task Force on National Greenhouse Gas Inventories.

Collect Earth

- Used in conjunction with Google Earth, Bing Maps, and Google Earth Engine to provide high resolution satellite imagery that is customizable for specific data collection needs.
- International Energy Agency
- Database of national and global energy statistics.

International Energy Agency

- Database of national and global energy statistics.

https://unfccc.int/process-and-meetings/transparency-and-reporting/support-for-developing-countries/ghg-support#TOOLS-and-SOFTWARE-

Lets do an exercise

Download IPCC 2006 Software

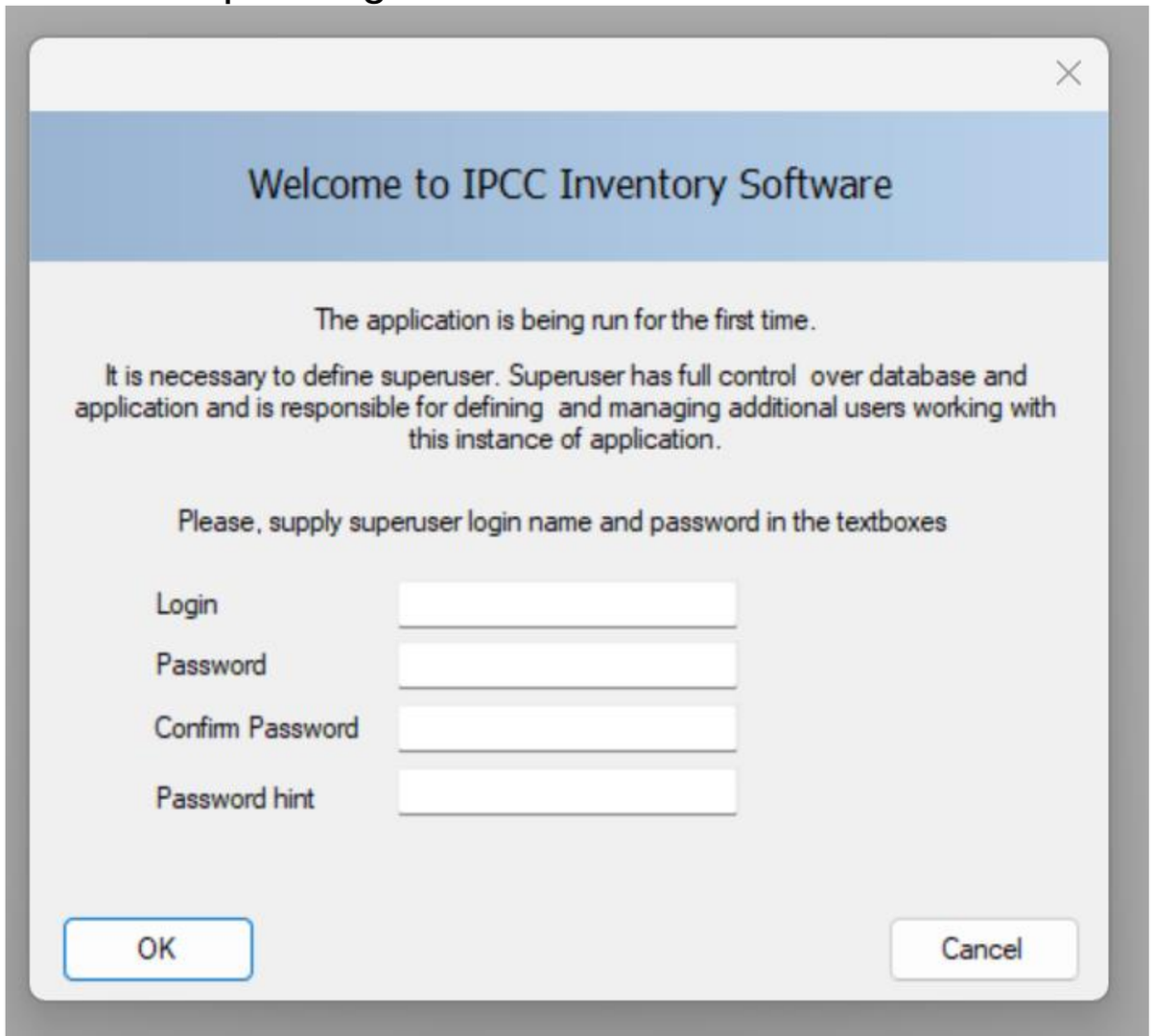
Contents

1. Share the Database
2. Export and Import Worksheets

1. Share the Database

Define Superuser

- Define a Superuser that is responsible for defining additional users and has full control over the application and corresponding database

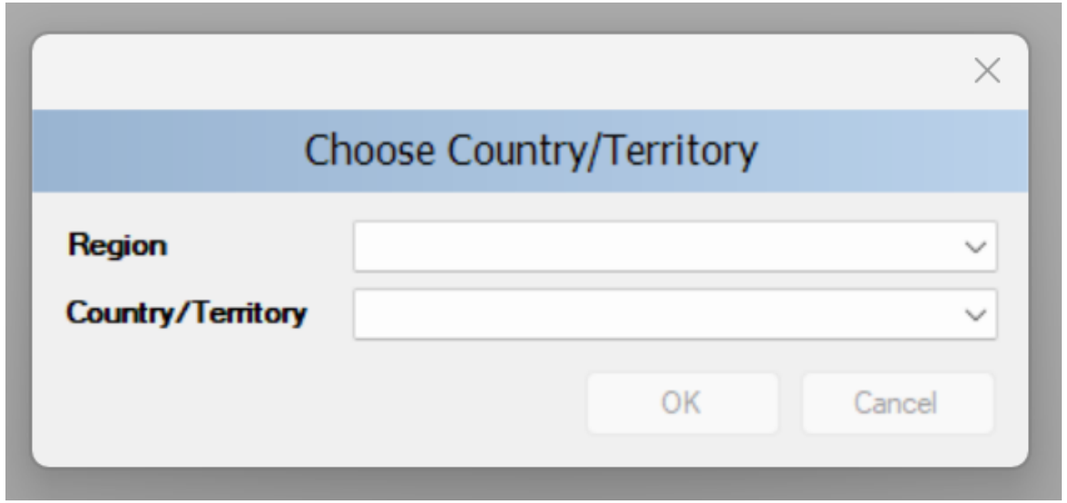


Login	Superuser_Belize
Password	Belize

Choose country

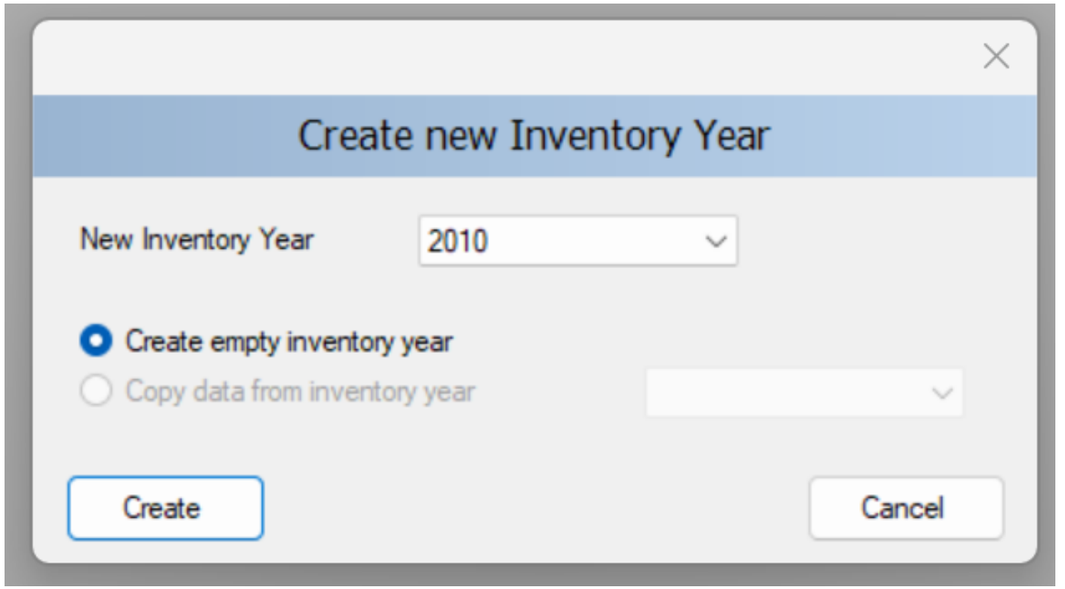
- It is necessary to choose desired Region and Country/Territory

Region	Latin America and Caribbean
Country/Territory	Belize



Create Inventory Year

- it is necessary to create an initial Inventory Year



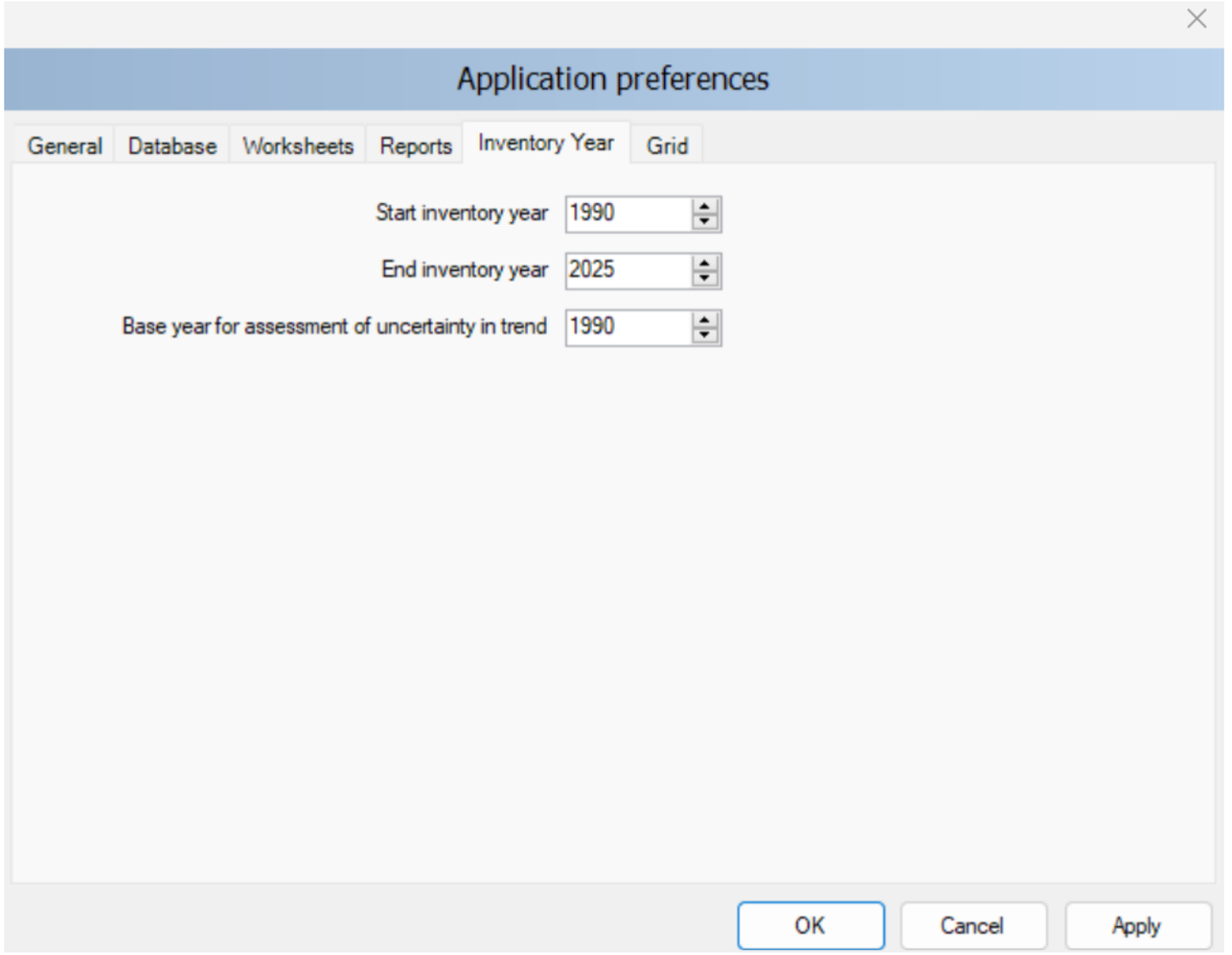
Check and modify Inventory Preferences

- Use the Application / Preferences menu to access Application preferences
- Check and modify the following values, if necessary:

1) Use the Start inventory year numeric box to set the starting inventory year. The default is 1990.

2) Use the End inventory year numeric box to set the ending inventory year. The default is the 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.

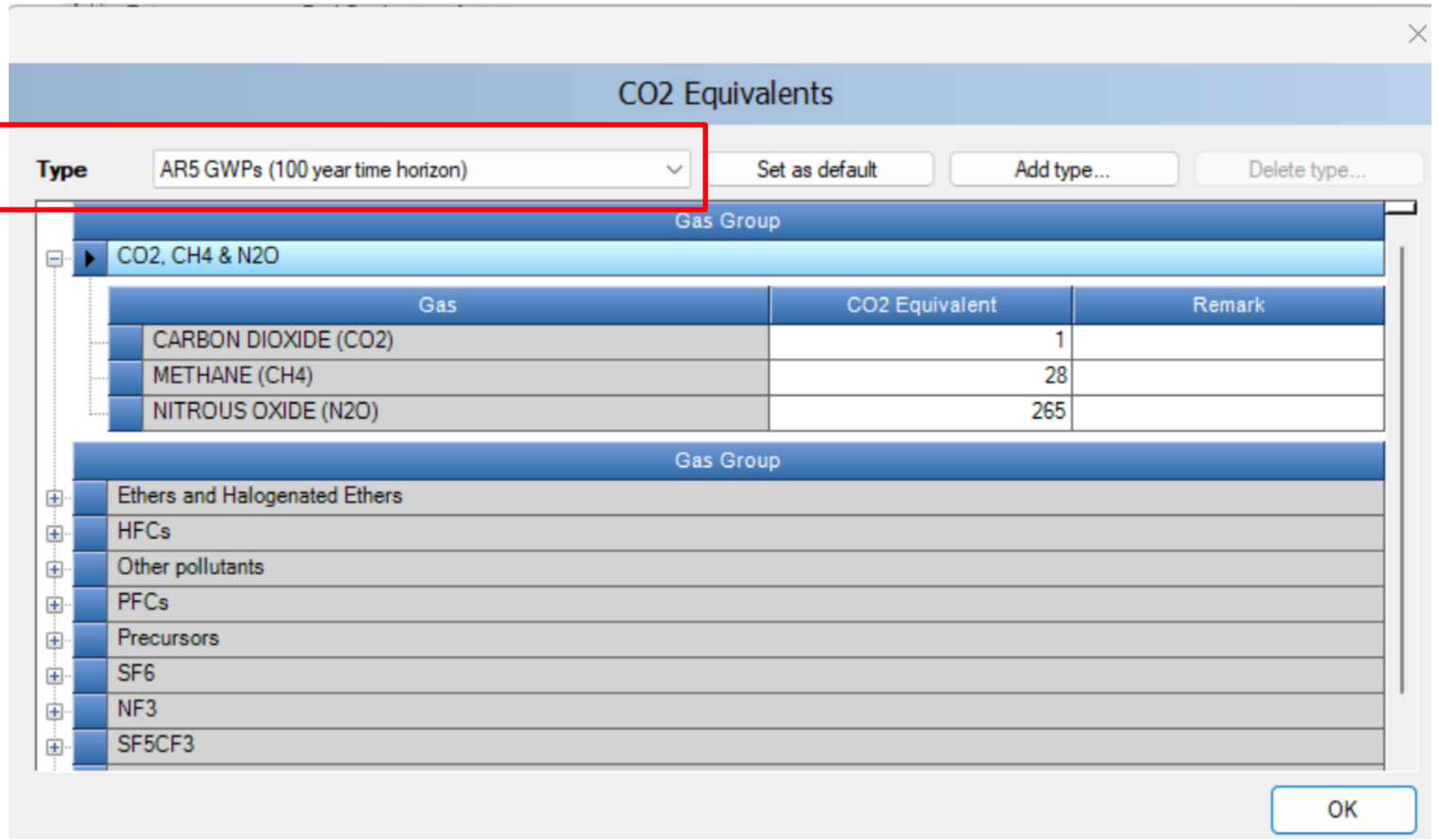


Check and set default CO_2 Equivalents

- 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.

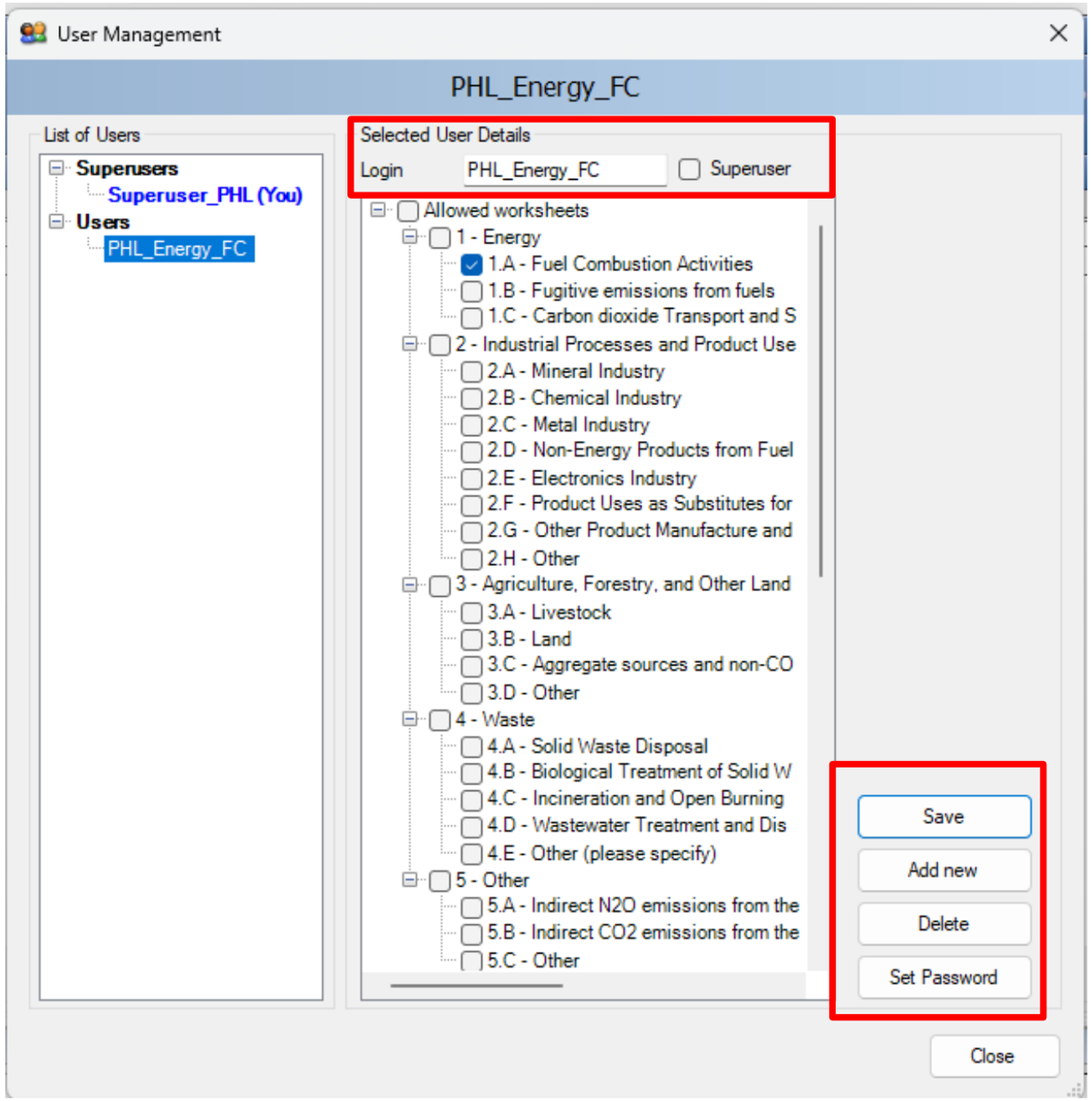
- The Type list contains 4 fixed types with fixed CO_2 Equivalent values, that cannot be changed or deleted:
  - SAR GWPs
  - TAR GWPs
  - AR4 GWPs
  - **AR5 GWPs –** these are set as default



Adding new user

- 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.

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



List of Users

Superusers

contains the list of all Superusers. The user marked blue represents the currently logged-in user.

The following restrictions apply to Superusers:

- Currently logged-in user is prohibited from removing themselves from the Superusers group for security reasons.
- Currently logged-in user is prohibited to delete itself
- All worksheets are allowed automatically without the possibility of changing the list of allowed worksheets

Users

contains the list of ordinary users.

The following restrictions apply:

- Access to the Administrate section of the software is prohibited
- Can see and edit only worksheets specified as Allowed Worksheets

Exercise 01

Please use the downloaded database and credentials for the respective sectors for data entering and compilation

Sector	Login Name	Password
Super User	BZE_Superuser	Superuser
Energy- 1.B-Fugitive Emissions	BZE_Energy	BZE_Energy
Waste- Solid waste disposal	BZE_SolidWaste	BZE_SolidWaste

Go to Dummy Data Databased (Default when downloading software)

ipcc2006_dummy_v291.accdb

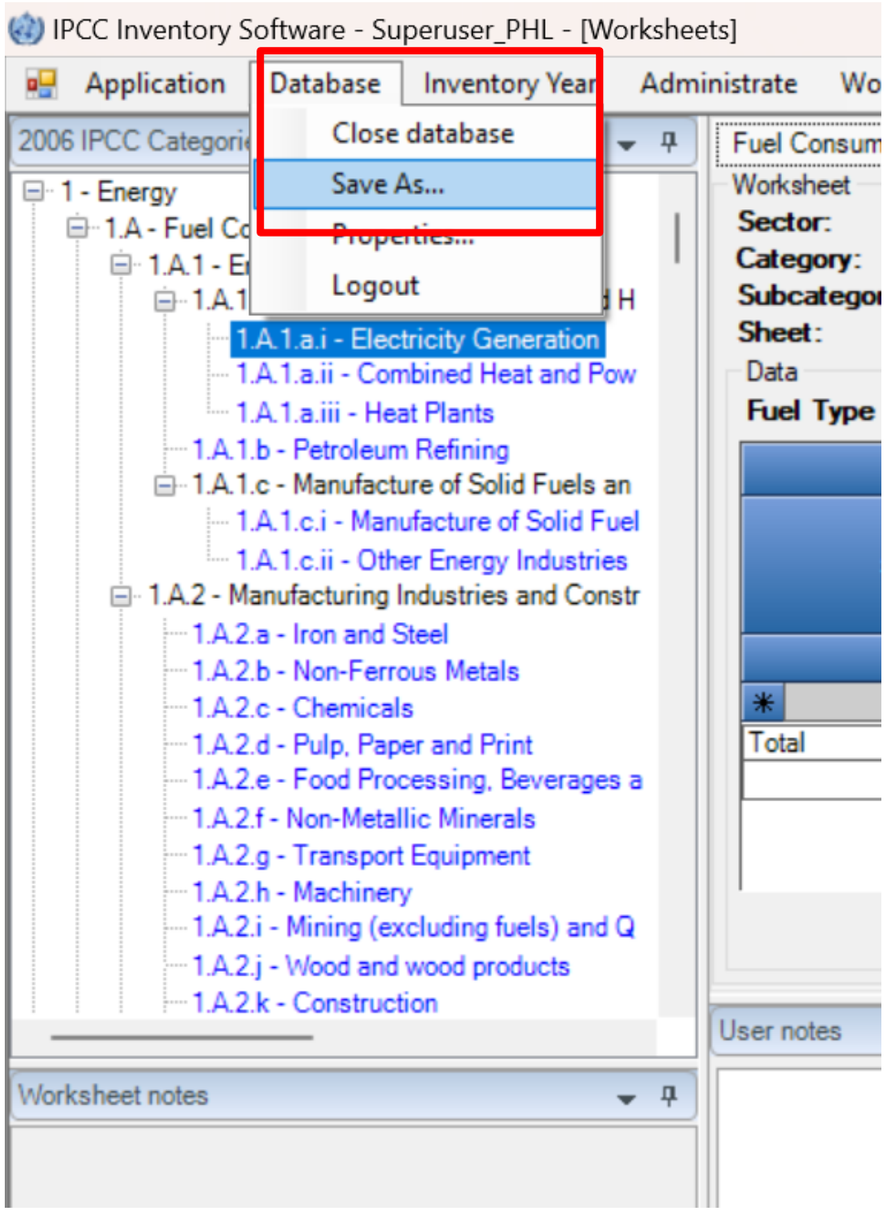
1. **Create Super User**
2. **Create Sector User for your sector**

Saving database

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

- ❑ Select destination folder and file
- ❑ Choose whether to remove password protection (see note below)
- ❑ 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)



Share one database vs. maintaining multiple databases

Share database file on a network drive

copy the created database file 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.

Share a copy of the database file via e-mail

Send a copy of the created database file 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.

Using the software in an inventory team

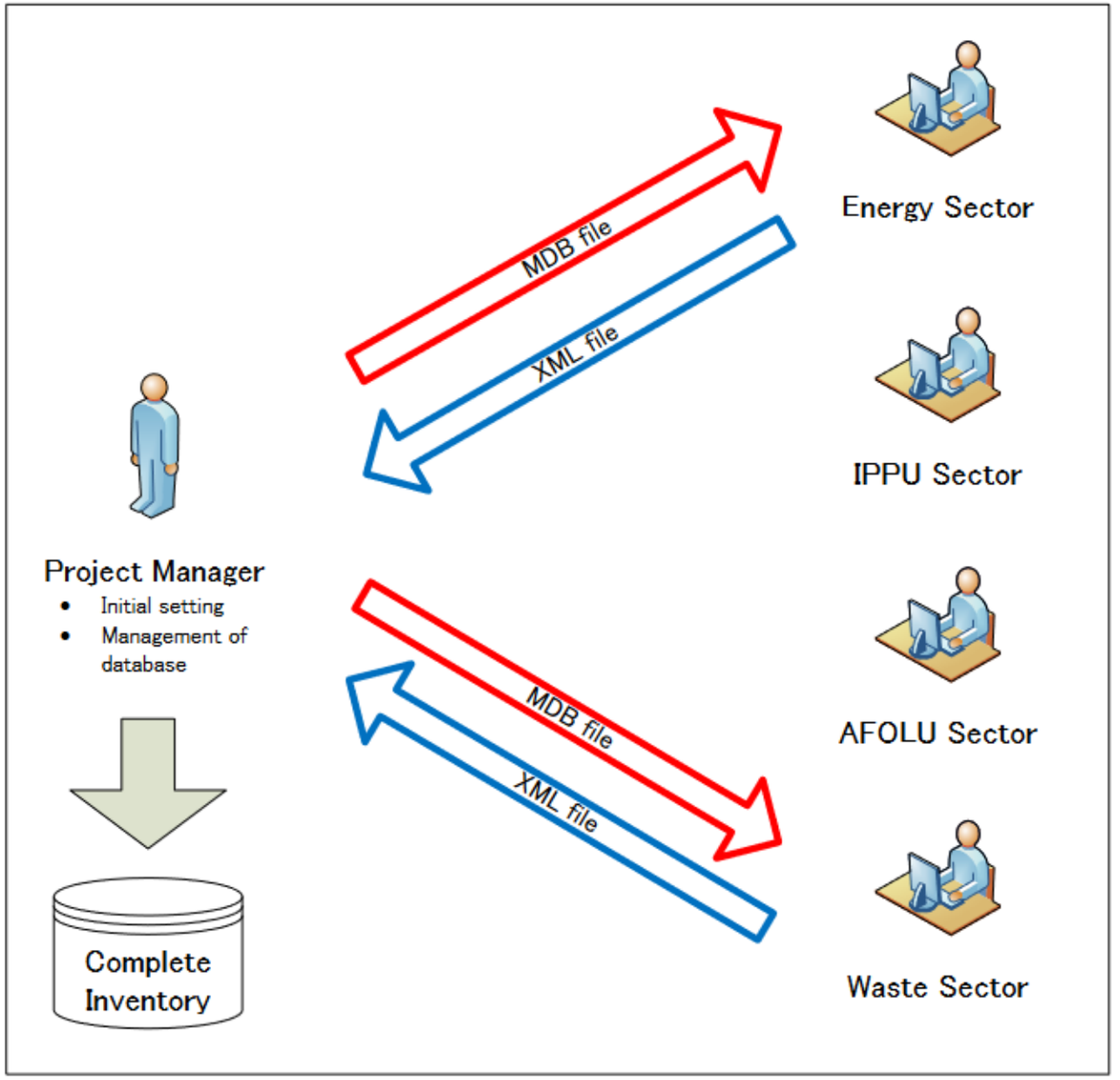
The safe and simple way to share the data between users is to share one database.

1) The project manager should initialize the database.

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.

4) The manager imports the XML file to update the database.

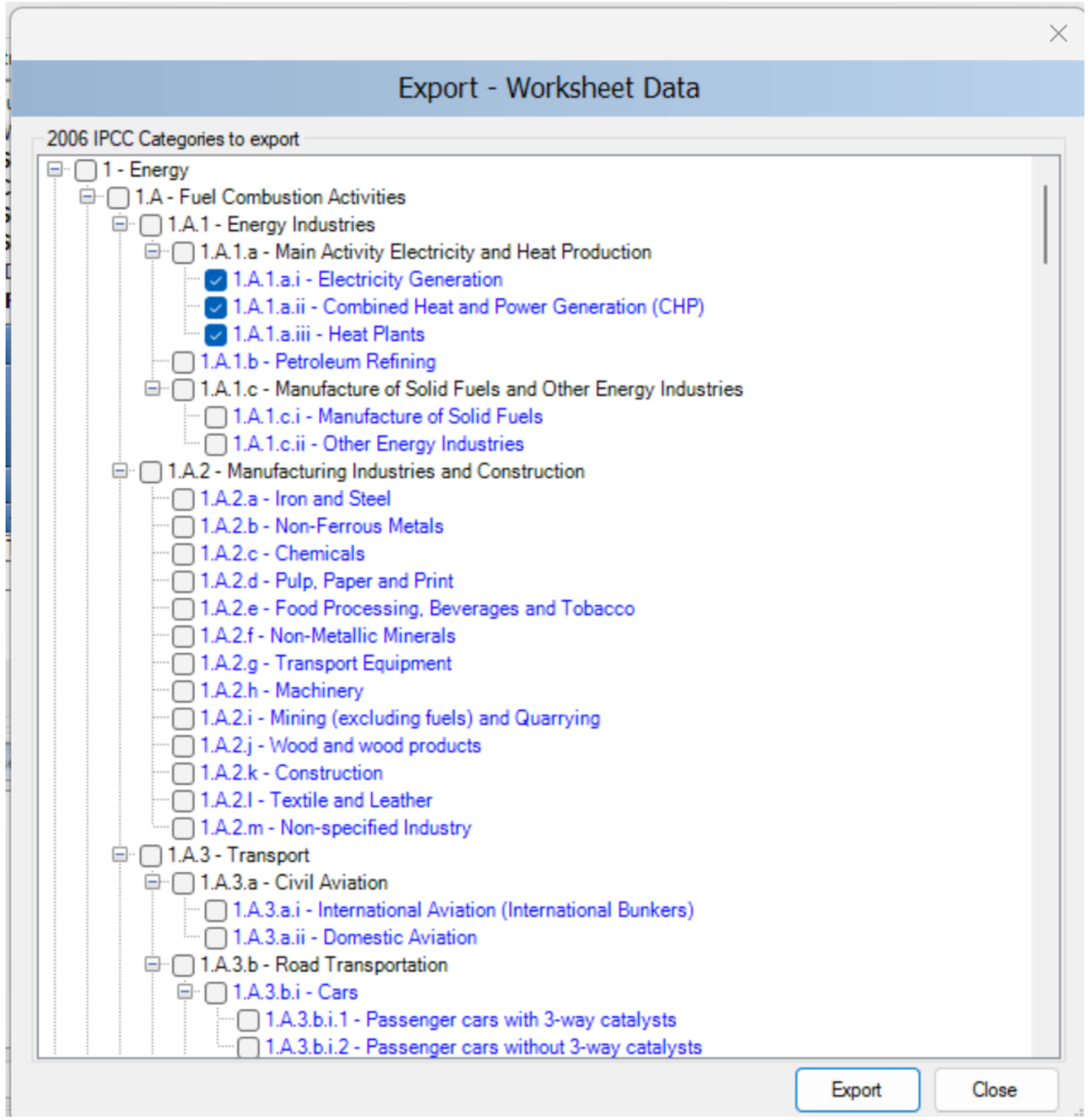


2. Export and Import Worksheets

Export Worksheet Data

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

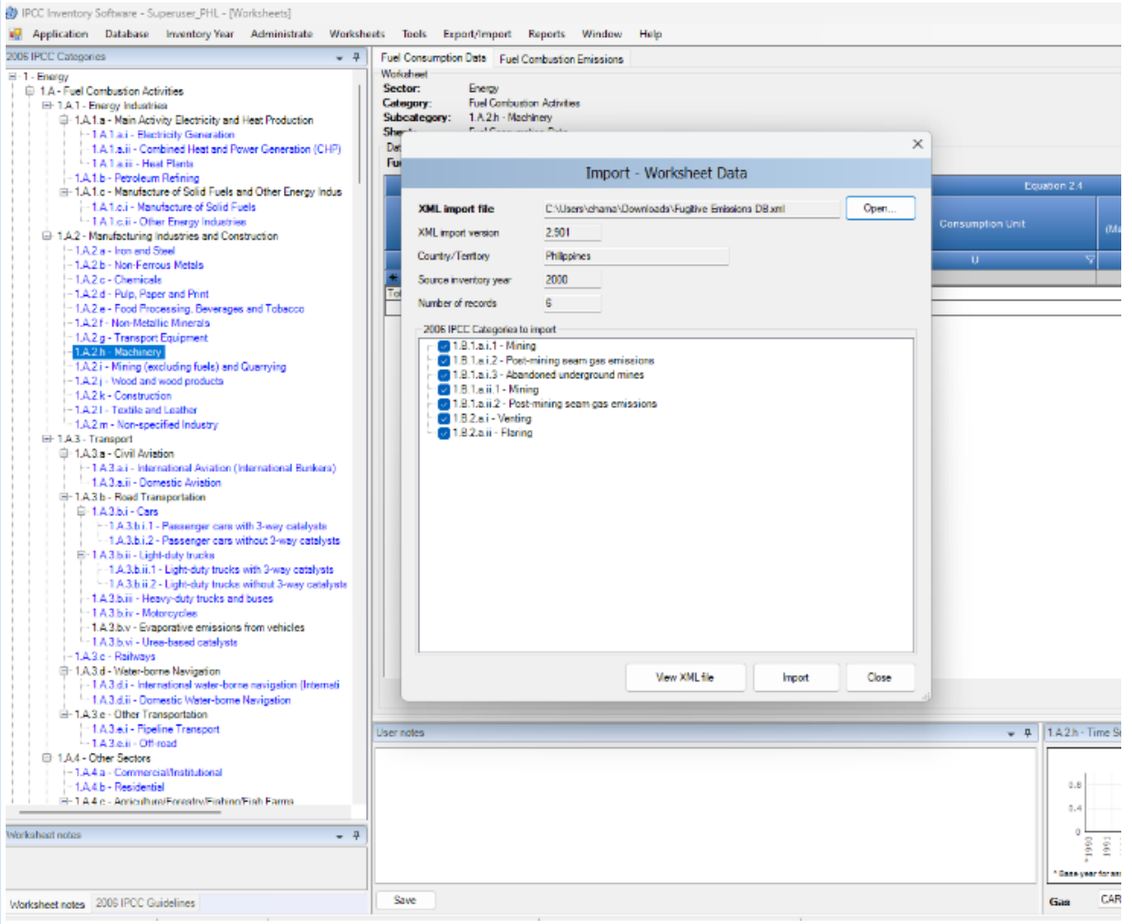
1) Select one or more categories of interest. Categories containing worksheets (data) are marked blue.
2) Click the Export button and supply the destination XML file when asked.



Import Worksheet Data

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

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



UNFCCC ETF Reporting Tool

16 – 19 April 2024
Belize

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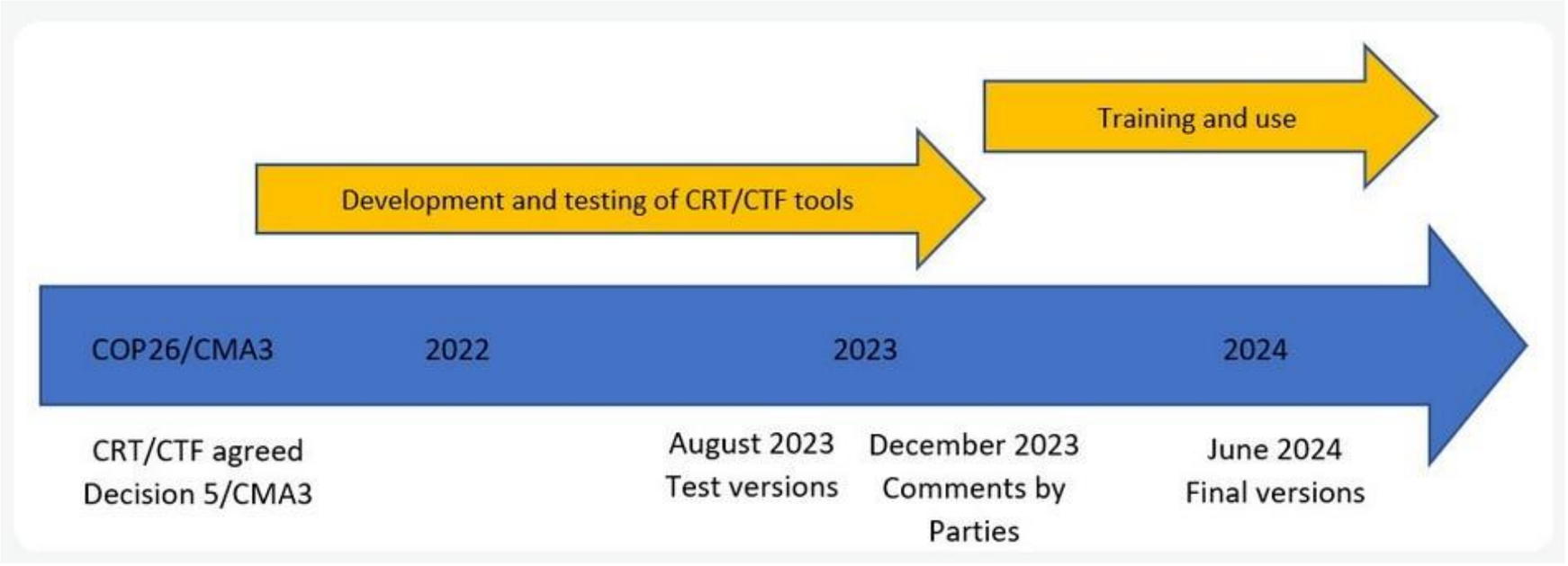
Contents

1. Introduction to the UNFCCC ETF Reporting Tool
2. Interoperability with IPCC Software
3. Request access to the ETF Reporting tools

Introduction

Following the mandate from decision 5/CMA.3, the secretariat is developing the ETF reporting tools for use by Parties for reporting the information as required by the modalities, procedures and guidelines for the enhanced transparency framework (decision 18/CMA.1)



Milestones in the process of development of the reporting tools

ETF Reporting Tools

GHG INVENTORY REPORTING TOOL

- Generates the common reporting tables (CRTs) for the electronic reporting of the information in the national inventory reports (NIRs) of anthropogenic emissions by sources and removals by sinks of GHG as contained in annex I to decision 5/CMA.3

PROGRESS REPORTING TOOL

- Generates the common tabular formats (CTFs) for the electronic reporting of the information necessary to track progress made in implementing and achieving nationally determined contributions (NDCs) under Article 4 of the Paris Agreement, as contained in Annex II to decision 5.CMA.3

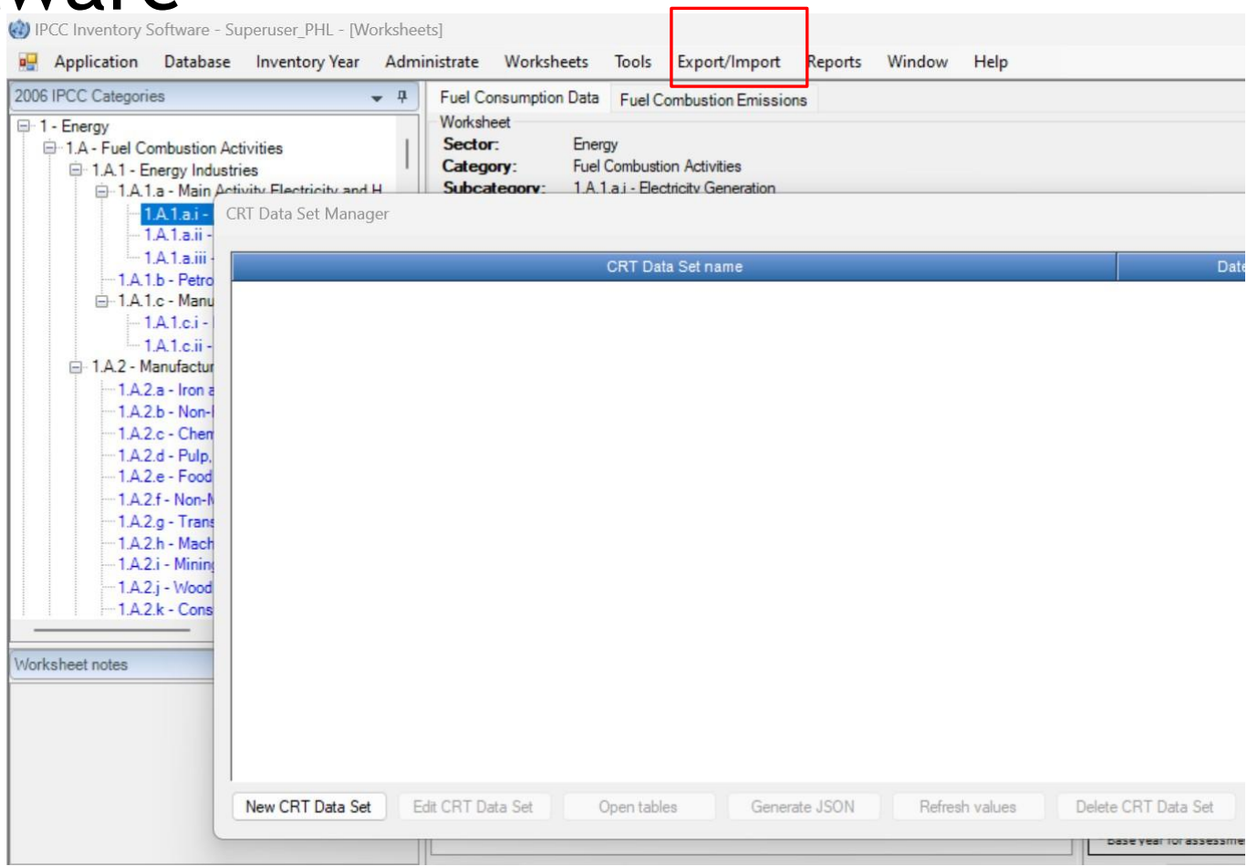
SUPPORT REPORTING TOOL

- Generates the common tabular formats (CTFs) for the electronic reporting of the information on financial, technology development and transfer and capacity-building (FTC) support provided and mobilized, as well as support needed and received, under Articles 9-11 of the Paris Agreement, as contained in annex III to the decision 5/CMA.3

Interoperability with IPCC Software

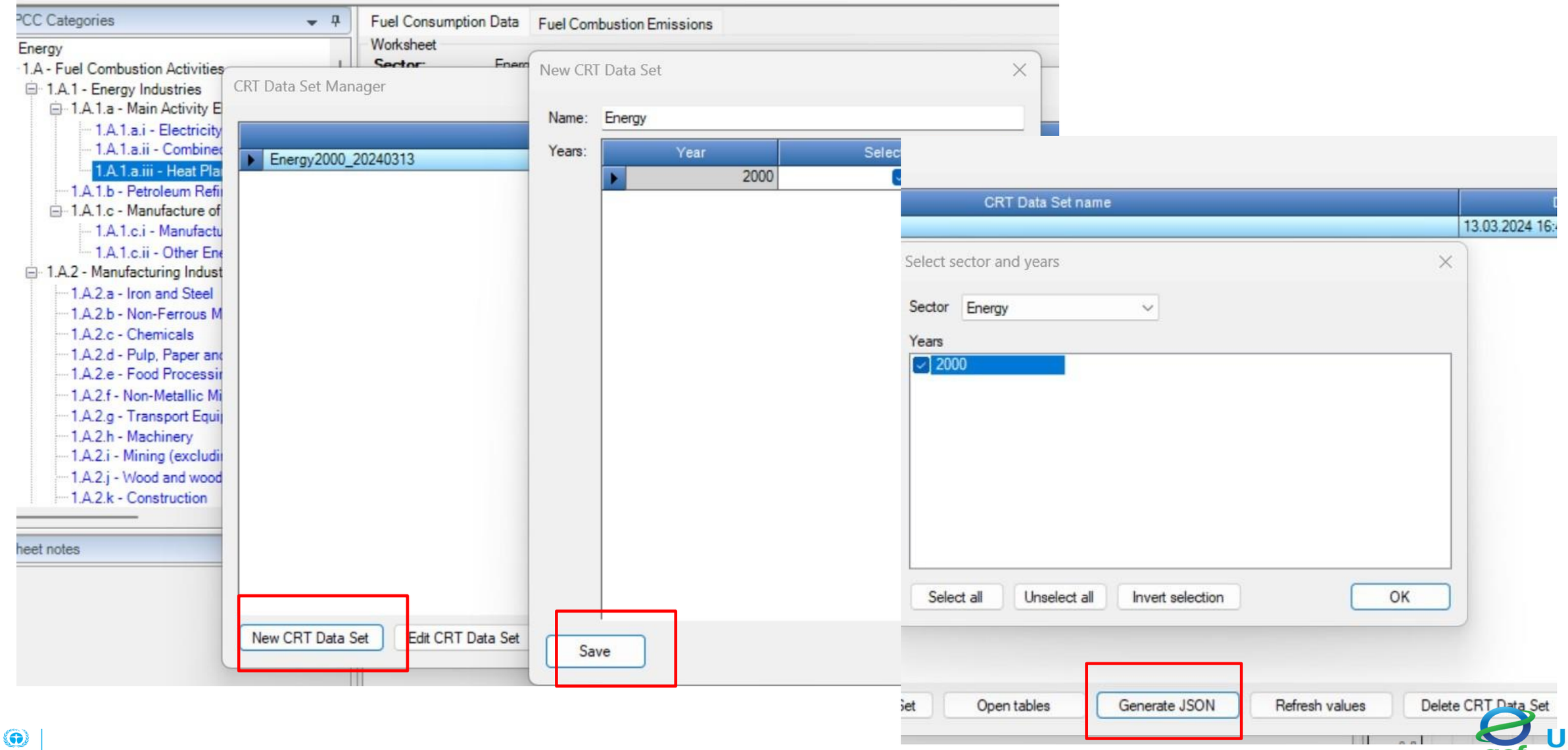
The interoperability with the IPCC Software allows the transfer of the data from the IPCC software to the GHG Inventory Reporting Tool. After estimating the national GHG inventory Parties can export the JSON data exchange file from IPCC software and import it to the GHG inventory reporting tool.

- Generation and Export of JSON files are available in the IPCC software version 2.871 or later.
- In the test version, JSON import can be done at the sector level only.
- In the test version, JSON file generation has been implemented for the Energy and Waste sector only. More sectors will follow in future releases.



In the IPCC Software
1. After compiling your GHG inventory, Click "Export/Import" > "Export" > "UNFCCC CRT"
2. Click "Generate JSON" and a JSON file is generated.
3. Save the JSON file to your computer and it can now be imported to the GHG Inventory reporting tool.

Interoperability with IPCC Software



Upload JSON files generated from IPCC Software to UNFCCC Reporting

In the GHG Inventory reporting tool

1. In the **"Inventories"** tab, click **"+ Create version"**
2. Click **"Select"** in the **"Upload a file"** tile
3. Click **"Select"** and select the JSON file exported from the IPCC software. You can also drag and drop the file in drag and drop area.
4. Specify **"Submission year"**, **"Default version"** and click **"Create inventory".** The inventory will be created.
5. Specify applicable version settings and click **"Go to data entry"** to start working on your inventory.
6. The data imported from the IPCC software will already be populated in the data entry grids.
7. You can modify the data, if needed.

Reference- https://unfccc.int/sites/default/files/resource/ETF_GHGI-RT_HandsOnTraining_LACCW_v1.pdf

How to request access to the ETF Reporting tools?

To request access for testing the ETF Reporting Tools

- Request your National Focal Point to nominate you for accessing ETF Reporting Tools
- UNFCCC Secretariat will provide access to the users
- Users can start testing the ETF Reporting Tools

Following the mandate from decision 5/CMA.3, the secretariat has released the test version of the tool at

https://apps.unfccc.int/home

Reference- https://unfccc.int/sites/default/files/resource/ETF_GHGI-RT_HandsOnTraining_LACCW_v1.pdf

Any Questions?

www.climate-transparency-platform.org

Thank you for your attention !

CBIT-GSP
CLIMATE TRANSPARENCY

Please reach out to us for any question, comments or suggestions!

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