Session 2: Overview of the IPCC Inventory Software for National Greenhouse Gas Inventories

SBSTA - 56

8 June, 2022

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IPCC TFI TSU

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Background

- ✓ **produced**, since 2012, **by** the **IPCC Task Force on National Greenhouse Gas Inventories** (**IPCC TFI**) **to assist** inventory compilers **in using the 2006 IPCC Guidelines**

- ✓ **based on MS-Access for WindowsOS**

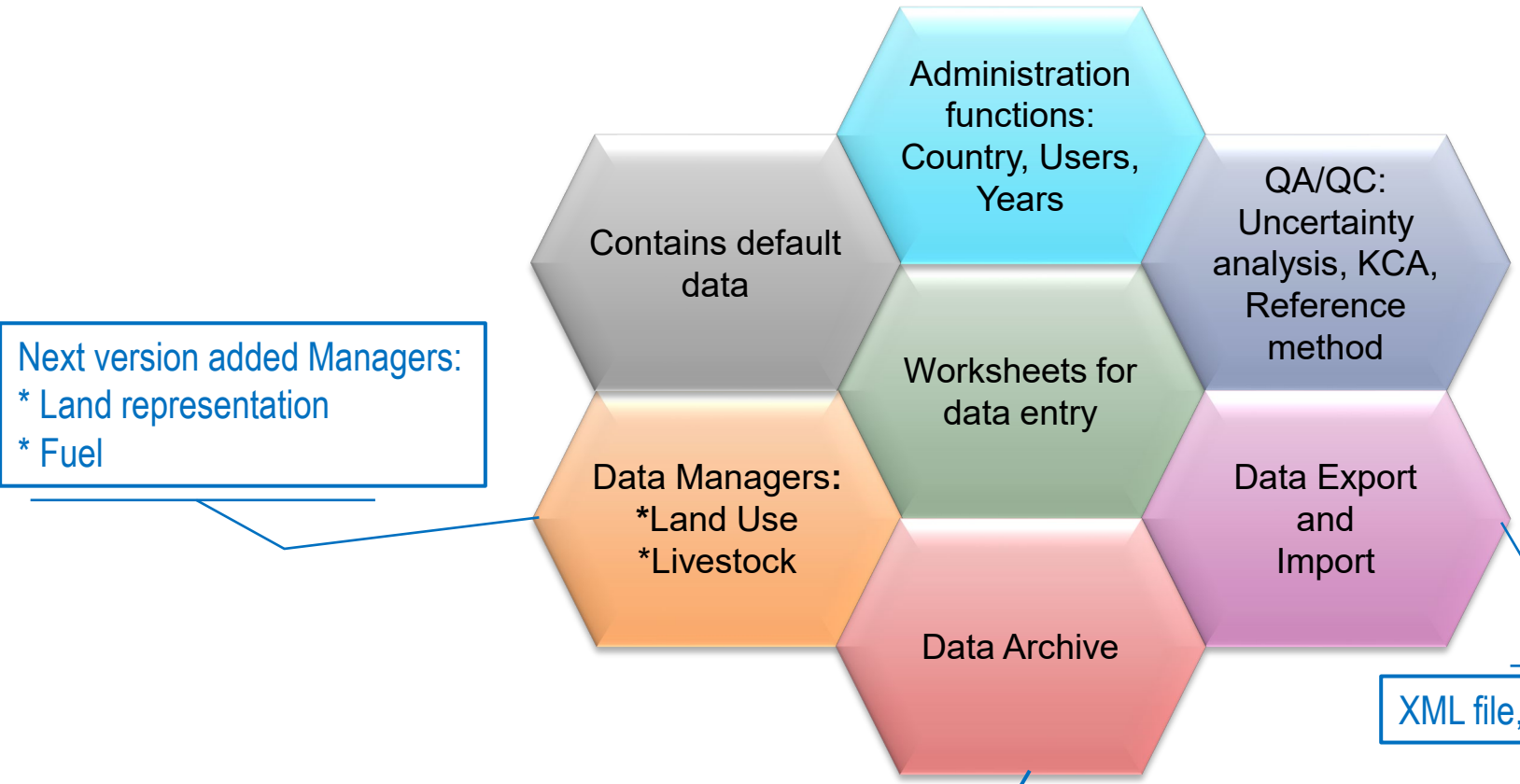
- ✓Free to use
  (download at https://www.ipcc-nggip.iges.or.jp/software/index.html)

- ✓ Support to users provided by IPCC TFI TSU

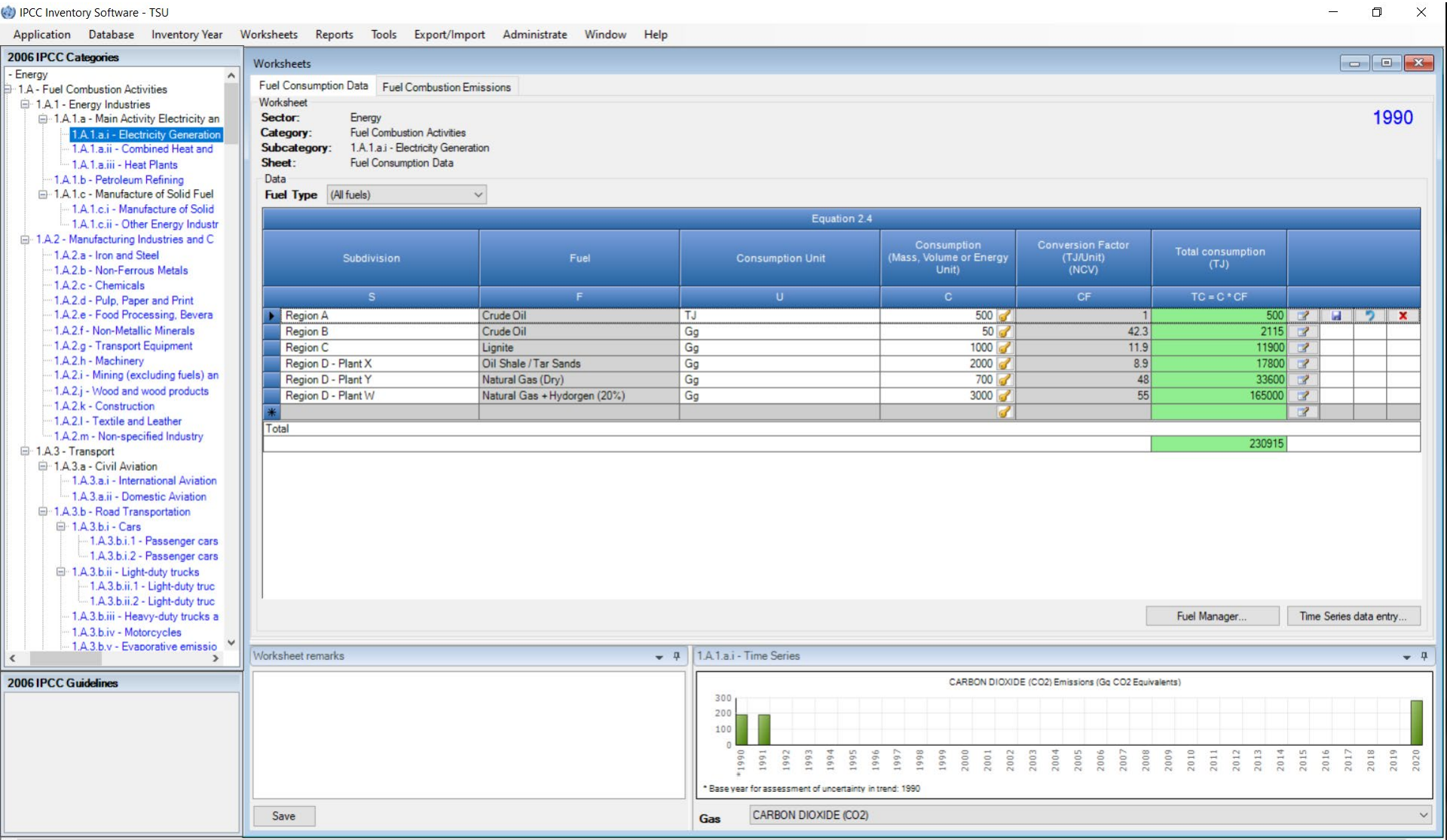
Background

- ✓ originally designed to implement Tier 1 Worksheets only **provides default data from the *2006 IPCC Guidelines***
- ✓ current **version 2.691 allows input** of **user-specific values** for **EFs** and **parameters** (**Tier 2**) for **Energy**, **IPPU**, **Agriculture**, **Waste** categories
- ✓ can be **used for** the **whole inventory or** just **individual categories**
- ✓ **allows different sectors to be developed simultaneously**
- ✓ **can report outputs in non-Annex I National Communications format** *(reporting tables, consistent with Tables 1 and 2 in Annex to Decision 17/CP.8)*
- ✓ **Support the implementation of IPCC methodological tiers and approaches** although **allow flexibility** to users **to match** their **national circumstances**

Software Functions



The Software



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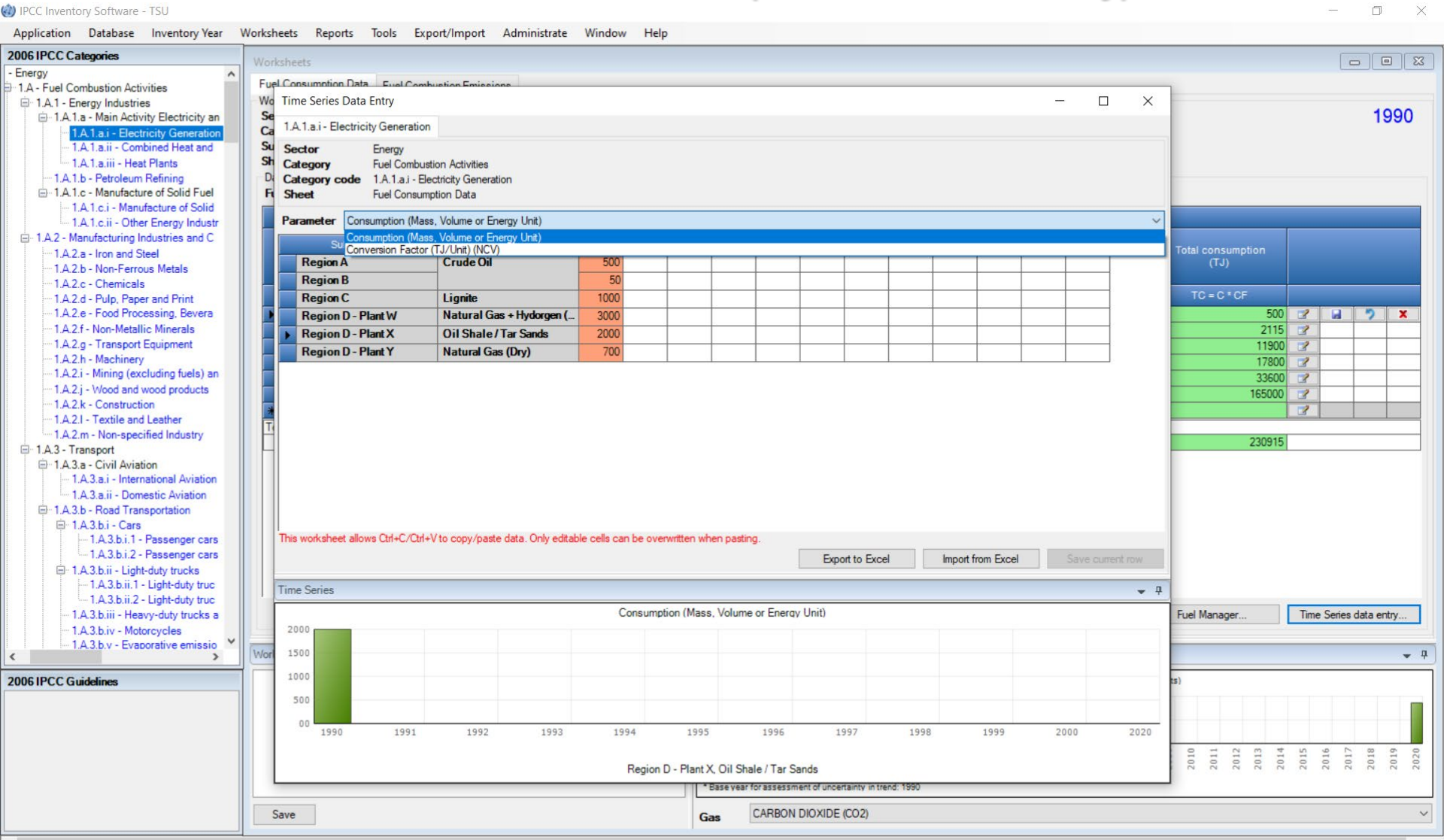
Worksheets (timeseries data entry)



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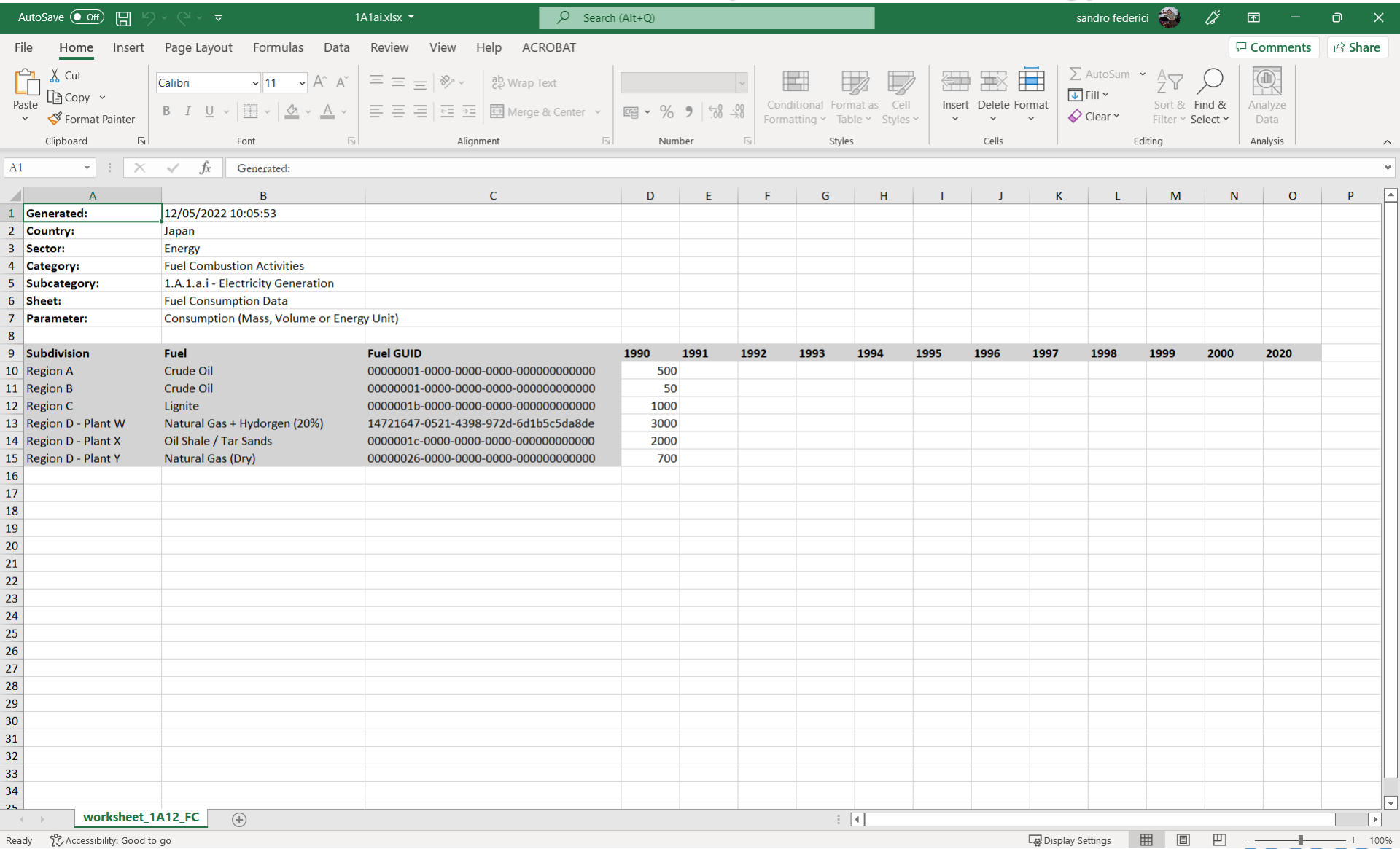
Worksheets (timeseries data entry)



	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	**Generated:**	12/05/2022 10:05:53														
2	**Country:**	Japan														
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**	**1990**	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2020**	
10	Region A	Crude Oil	00000001-0000-0000-0000-000000000000	500												
11	Region B	Crude Oil	00000001-0000-0000-0000-000000000000	50												
12	Region C	Lignite	0000001b-0000-0000-0000-000000000000	1000												
13	Region D - Plant W	Natural Gas + Hydorgen (20%)	14721647-0521-4398-972d-6d1b5c5da8de	3000												
14	Region D - Plant X	Oil Shale / Tar Sands	0000001c-0000-0000-0000-000000000000	2000												
15	Region D - Plant Y	Natural Gas (Dry)	00000026-0000-0000-0000-000000000000	700												

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Reporting

Main Menu

→ Report

IPCC Report	Level	Contents
Summary (IPCC)	1.A.1	Emissions/Removals
Short summary (IPCC)	1.A	Emissions/Removals
Sectoral (IPCC)	1.A.1.a.ii (most disaggregated level)	Emissions/Removals
Background (IPCC)	1.A.1.a.ii (most disaggregated level)	AD, Emissions/Removals

Main Menu

→ Export

UNFCCC Report	Level	Contents
NAI 1 & 2 (UNFCCC 17/CP.8)	1.A.1	Emissions/Removals

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

Version 2.80

Updated architecture:

- ✓ Microsoft .NET Framework 4.6.2
- ✓ Microsoft ACE OLEDB 12

Allow to use altogether **different Tier**-worksheets **within a category** *(instead of being a Tier alternative)*

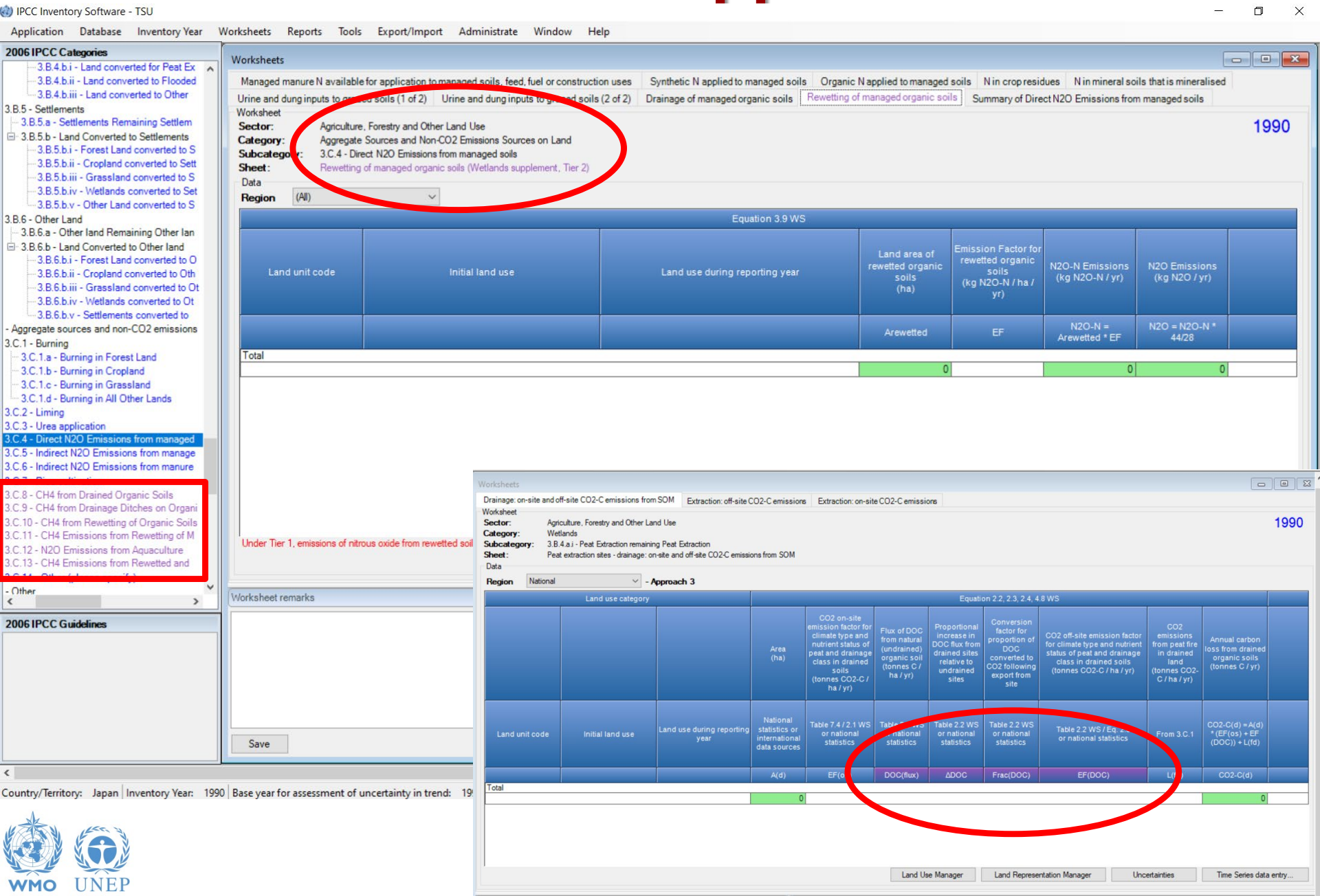
Allow input of user-defined emission factors and parameters in any worksheets

Version 2.80

Implementation of all **IPCC Tiers and Approaches** provided in the **2006 IPCC Guidelines** and its **Wetlands Supplement** in the

AFOLU & ENERGY sectors

Wetlands Supplement



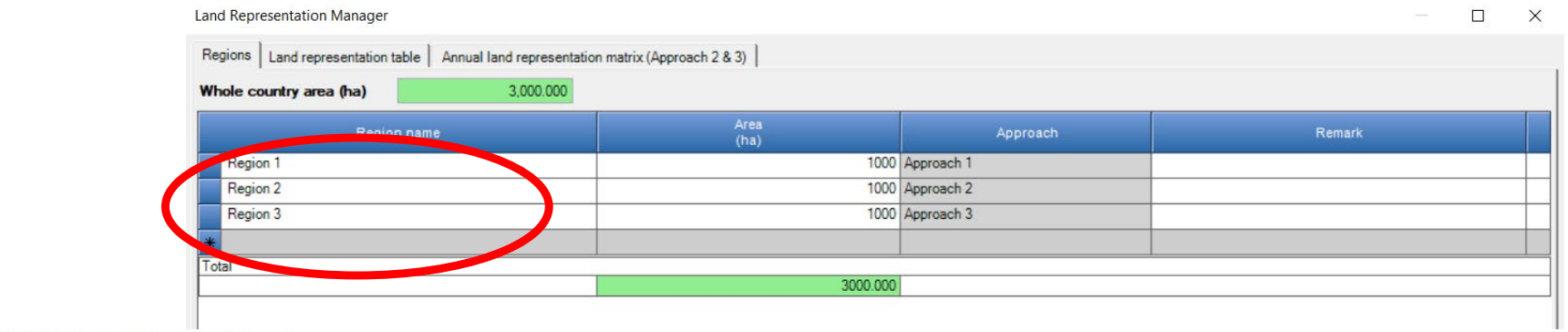
Subnational disaggregation

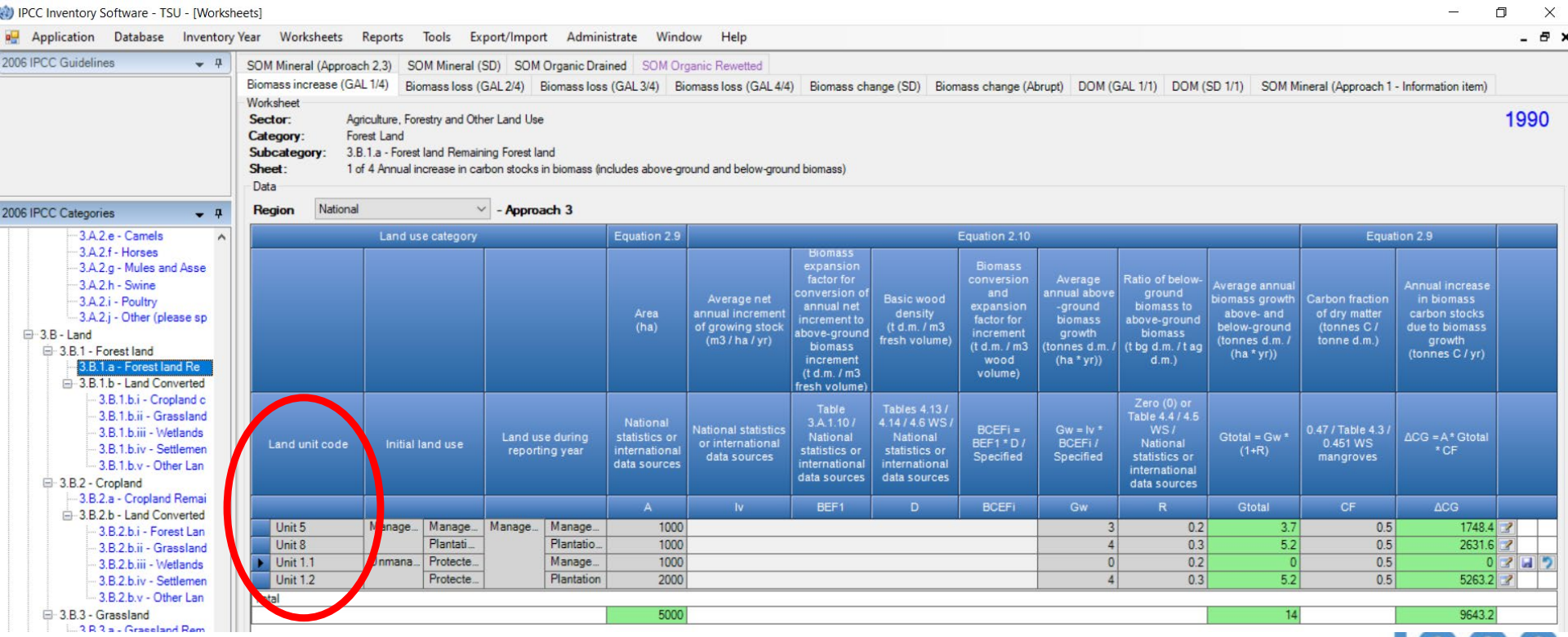
Subnational disaggregation of categories

(e.g. federal states inventories; tracking of specific sources subject to mitigation actions)

Although multi-users at category level not allowed yet

Subnational disaggregation (land)





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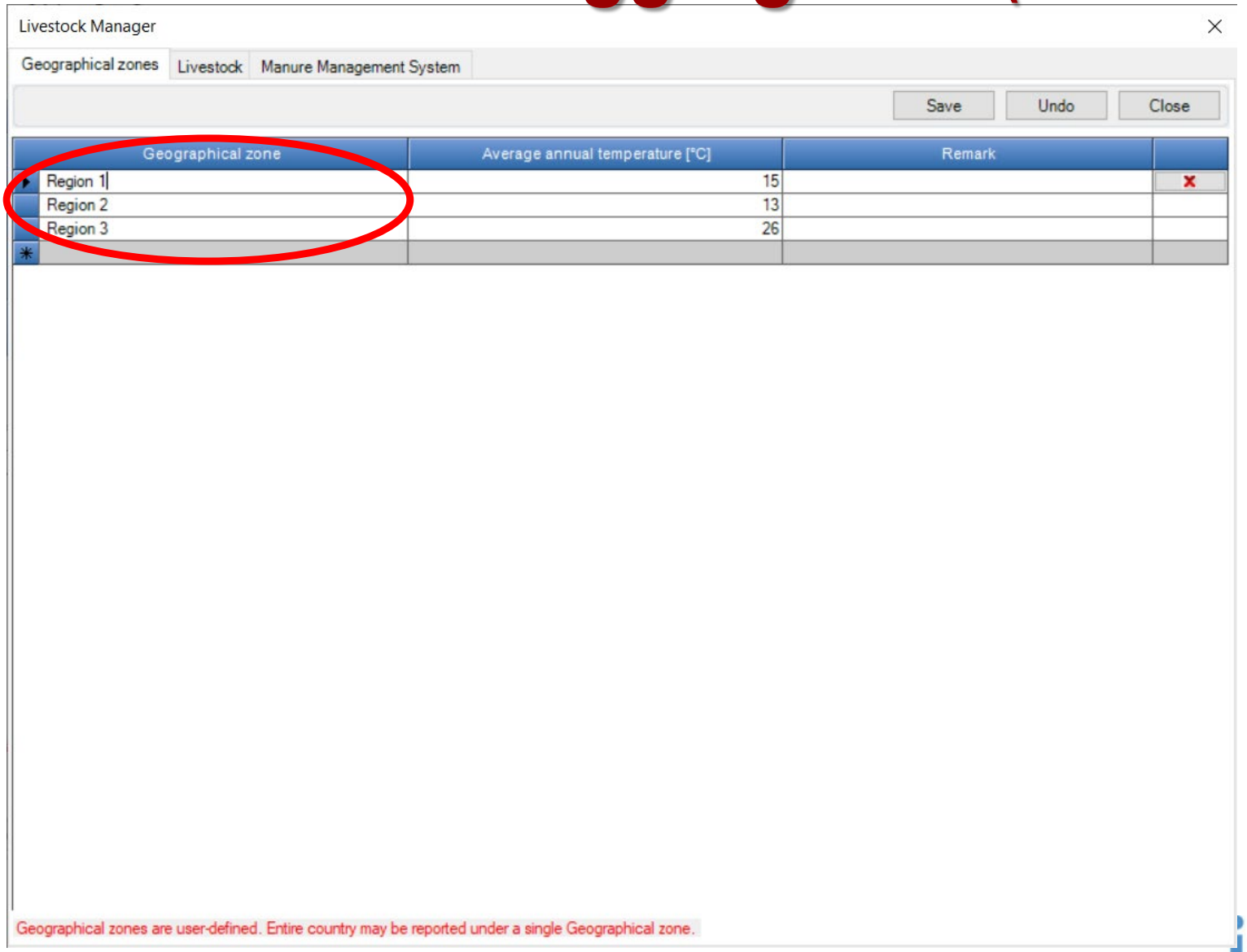
Subnational disaggregation (livestock)



Subnational disaggregation (others)

Fuel Consumption Data | Fuel Combustion Emissions

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
Region A	Crude Oil	TJ	500	1	500
Region B	Crude Oil	Gg	50	42.3	2115
Region C	Lignite	Gg	1000	11.9	11900
Region D - Plant X	Oil Shale / Tar Sands	Gg	2000	8.9	17800
Region D - Plant Y	Natural Gas (Dry)	Gg	700	48	33600
Region D - Plant W	Natural Gas + Hydorgen (20%)	Gg	3000	55	165000
Total					230915

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

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Upgrades - I

Implementation of all **IPCC Tiers and Approaches** provided in the **2006 IPCC Guidelines** and its **Wetlands Supplement** in the

IPPU & **WASTE** sectors

Upgrades - II

Paris agreement requirements:

- ✓ **AR5 GWP_{100}**
- ✓ **Indirect CO_2 emissions**
- ✓ (memo item) **Indirect N_2O emissions**
- ✓ **Interoperability** with **reporting tools** referred to in UNFCCC decision 5/CMA.3

Upgrades - III

- ✓ Time series export/import
- ✓ Uncertainty Analysis Approach 2
- ✓ Key Category Analysis Approach 2

Upgrades - IV

- ✓ **Multi-users** at **category level**
- ✓ **Connection to the IPCC Emission Factor DataBase**

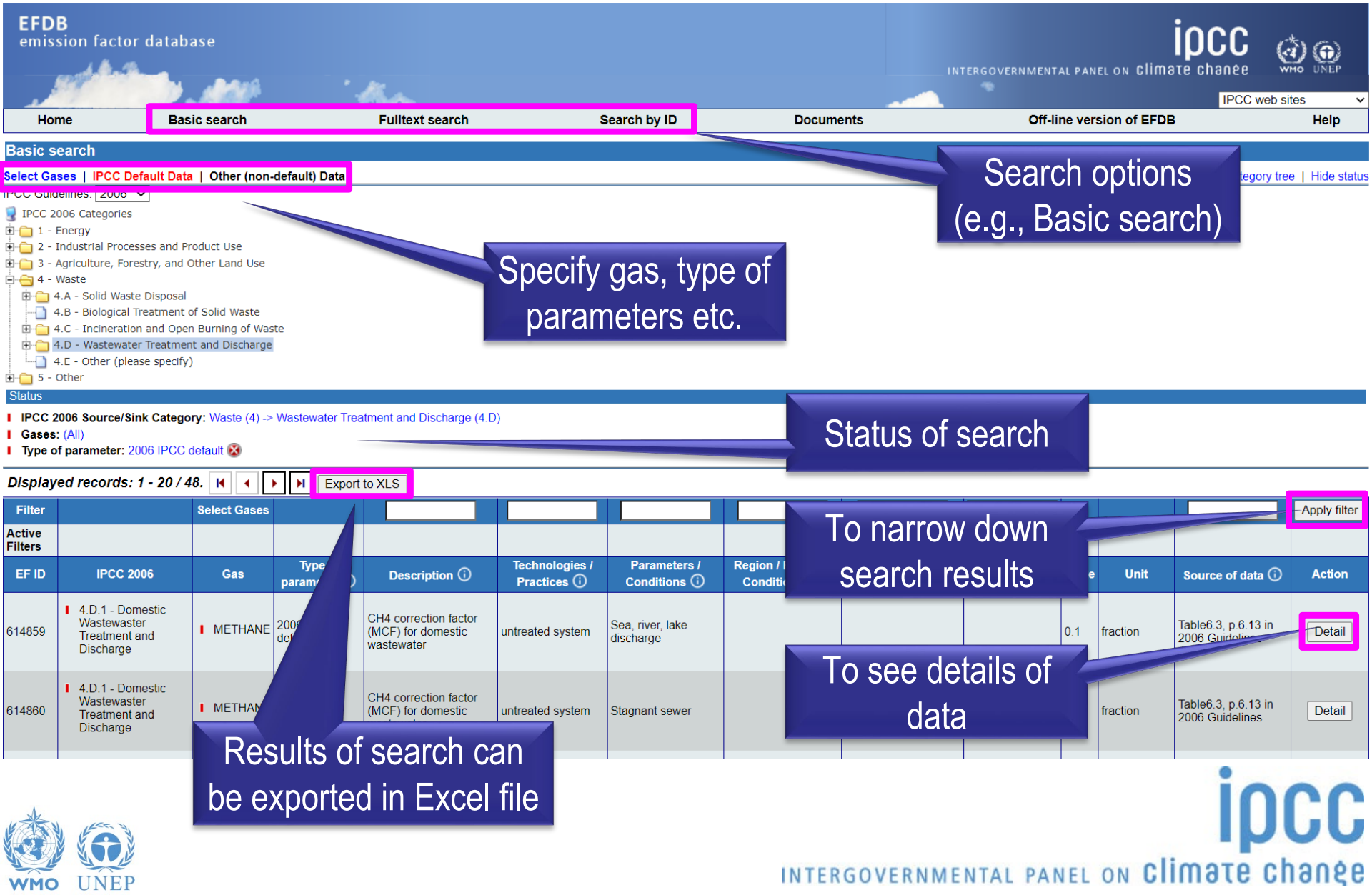
IPCC Emission Factor Database (EFDB)

- Launched in 2002
- Library of emission factors (EFs) and other parameters with background information https://www.ipcc-nggip.iges.or.jp/EFDB/main.php
  - ✓ Default data from IPCC Guidelines
  - ✓ Data from peer-reviewed scientific papers
  - ✓ Data from other publications (e.g., national reports)
- Communication platform to share data and information that can be used for estimation of national greenhouse gas (GHG) emissions/removals
- The EFDB has been referred to in a number of conclusions and recommendations from meetings under the UNFCCC
- Regularly updated with data (*e.g., more than 230 data were accepted by the Editorial Board in 2021 and added to the EFDB)*
- Continuously improved user-interface *(e.g., to allow planned addition of 2019 Refinement values)*

IPCC EFDB

- Freely accessible online *(offline application is also available for download)*
- Evolves dynamically through:
  - ✓ data proposals *(e.g., voluntary submissions from experts)*
  - ✓ data collection activities *(e.g., IPCC EFDB annual expert meetings on data, literature search)*
- Open to any data proposals (ipcc-efdb@iges.or.jp)
  - ✓ Data proposals are considered by the EFDB Editorial Board for inclusion into the EFDB
  - ✓ Criteria for inclusion of data: **robustness**, **applicability** and **documentation**

EFDB search


EFDB
emission factor database
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IPCC web sites
Home
Basic search
Fulltext search
Search by ID
Documents
Off-line version of EFDB
Help
Basic search
Select Gases | IPCC Default Data | Other (non-default) Data
Hide status
IPCC Guidelines: 2006
IPCC 2006 Categories
1 - Energy
2 - Industrial Processes and Product Use
3 - Agriculture, Forestry, and Other Land Use
4 - Waste
4.A - Solid Waste Disposal
4.B - Biological Treatment of Solid Waste
4.C - Incineration and Open Burning of Waste
4.D - Wastewater Treatment and Discharge
4.E - Other (please specify)
5 - Other
Status
IPCC 2006 Source/Sink Category: Waste (4) -> Wastewater Treatment and Discharge (4.D)
Gases: (All)
Type of parameter: 2006 IPCC default
Displayed records: 1 - 20 / 48.
Export to XLS
Filter
Select Gases
Apply filter
Active Filters
EF ID
IPCC 2006
Gas
Type
Description
Technologies / Practices
Parameters / Conditions
Region /
Unit
Source of data
Action
614859
4.D.1 - Domestic Wastewater Treatment and Discharge
METHANE
CH4 correction factor (MCF) for domestic wastewater
untreated system
Sea, river, lake discharge
0.1
fraction
Table6.3, p.6.13 in 2006 Guidelines
Detail
614860
4.D.1 - Domestic Wastewater Treatment and Discharge
CH4 correction factor
untreated system
Stagnant sewer
fraction
Table6.3, p.6.13 in 2006 Guidelines
Detail
Search options (e.g., Basic search)
Specify gas, type of parameters etc.
Status of search
To narrow down search results
To see details of data
Results of search can be exported in Excel file

EFDB outputs and details of data

A	B	C	D	E	F	G	H
EF ID	IPCC 1996 Source/Sink Category	IPCC 2006 Source/Sink Category	Gas	Type of parameter	Description	Technologies / Practices	Parameters / Conditions
614859	6B2 - Domestic and Commercial Wastewater	4.D.1 - Domestic Wastewaster Treatment and Discharge	METHANE	2006 IPCC default	CH4 correction factor (MCF) for domestic wastewater	untreated system	Sea, river, lake discharge
614860	6B2 - Domestic and Commercial Wastewater	4.D.1 - Domestic Wastewaster Treatment and Discharge	METHANE	2006 IPCC default	CH4 correction factor (MCF) for domestic wastewater	untreated system	Stagnant sewer
614861	6B2 - Domestic and Commercial Wastewater	4.D.1 - Domestic Wastewaster Treatment and Discharge	METHANE	2006 IPCC default	CH4 correction factor (MCF) for domestic wastewater	untreated system	Flowing sewer (open or closed)

EFDB
emission factor database

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IPCC web sites

Home | Basic search | Fulltext search | Search by ID | Documents | Off-line version of EFDB | Help

Emission Factor Data (ID: 614859)

Administrative information	
Data Provider:	IPCC
Data Provider Country:	(Not applicable)
Data Provider Contact:	ipcc-efdb@iges.or.jp
Date calculated:	
Date submitted to EFDB by Data Provider:	
Date posted to EFDB by IPCC:	

Technical information	
Gas:	METHANE
IPCC 1996 Source/Sink Category:	Waste (6) -> Wastewater Handling (6B) -> Domestic and Commercial Wastewater (6B2)
IPCC 2006 Source/Sink Category:	Waste (4) -> Wastewater Treatment and Discharge (4.D) -> Domestic Wastewaster Treatment and Discharge (4.D.1)
Properties	
Technologies/Practices:	untreated system
Parameters/Conditions:	Sea, river, lake discharge
Region/Regional Conditions:	
Abatement/Control Technologies:	
Others:	
Description:	CH4 correction factor (MCF) for domestic wastewater
Value:	0.1 fraction
Value in common units:	
Equation:	Equation 6.2 of Chapter 6, Volume 5 of 2006 IPCC Guidelines
IPCC Worksheet:	4D1
Source of data:	Table6.3, p.6.13 in 2006 Guidelines
Technical Reference:	Table6.3, p.6.13 in 2006 Guidelines
Reference language:	English
Abstract in English:	
Uncertainties expressed as 95% confidence limit:	Upper: .+50% Lower: -50%
Data quality:	
Distribution shape:	
Data quality reference:	expert judgement by lead authors of Chapter 6 Volume 5
Other info on data quality:	The MCF value can rang between 0 - 0.2. The MCF is technology dependent. Thus the uncertainty range is also technology dependent. The uncertainty range should be determined by expert judgement, bearing in mind that MCF is a fraction and must be between 0 and 1. Suggested ranges are provided below. Untreated systems and latrines, ± 50% Lagoons, poorly managed treatment plants± 30% Centralized well managed plant, digester, reactor, ± 10%

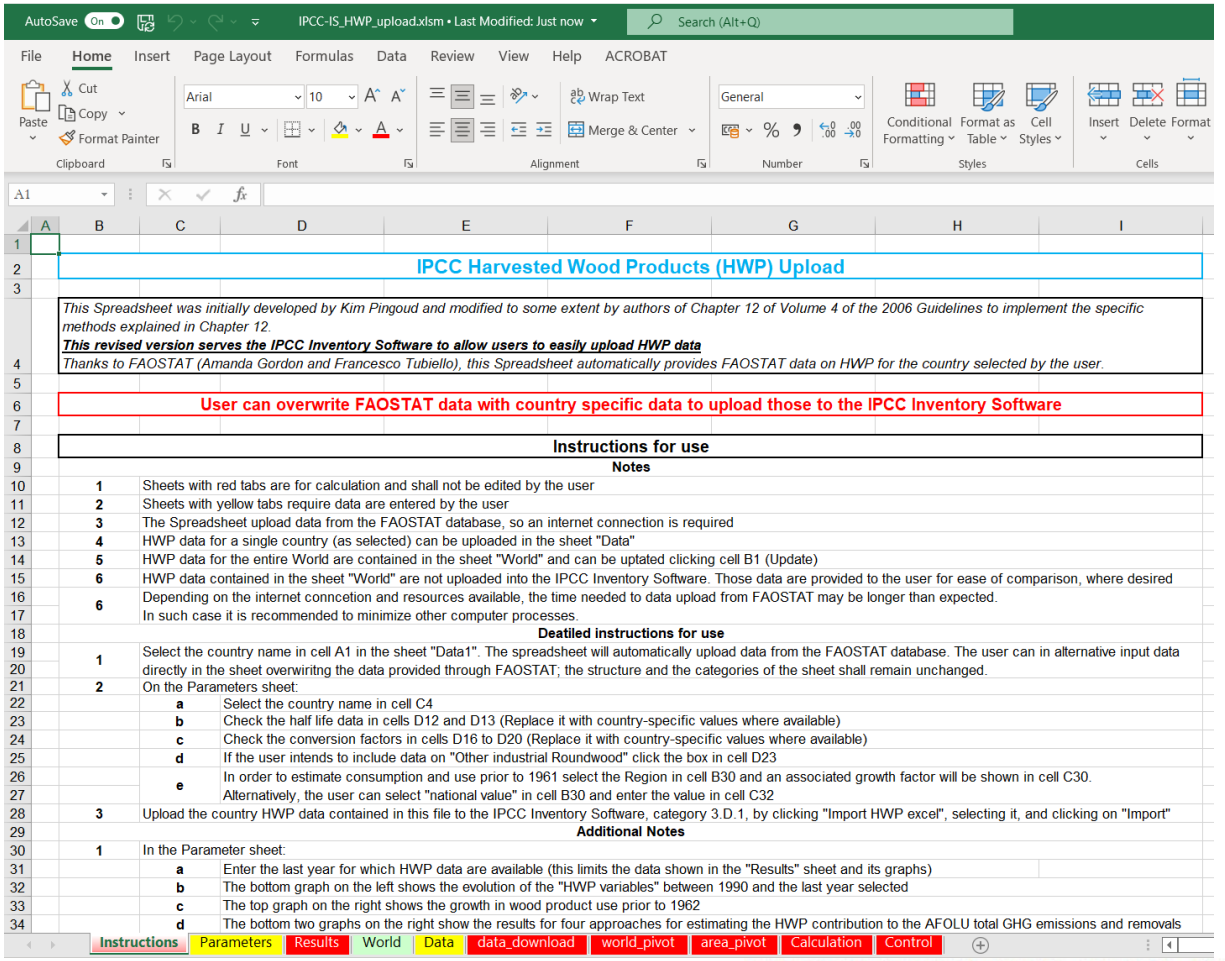
Usage/Review information	
Type of parameter:	2006 IPCC default
Comments from the data provider:	Rivers with high organic loadings can turn anaerobic
Comments from others:	
Link:	

Back to Search Results | Report to DOC | Report to XLS

Supporting Tools I

Excel-based tool:

- **HWP excel-based tool for data retrieval from FAOSTAT website and upload to the IPCC Inventory Software**



AutoSave On | IPCC-IS_HWP_upload.xlsm • Last Modified: Just now | Search (Alt+Q)

File Home Insert Page Layout Formulas Data Review View Help ACROBAT

Paste Cut Copy Format Painter | Arial 10 | Wrap Text | Merge & Center | General | Conditional Formatting | Format as Table | Cell Styles | Insert | Delete | Format

Clipboard | Font | Alignment | Number | Styles | Cells

A1

IPCC Harvested Wood Products (HWP) Upload

This Spreadsheet was initially developed by Kim Pingoud and modified to some extent by authors of Chapter 12 of Volume 4 of the 2006 Guidelines to implement the specific methods explained in Chapter 12.

This revised version serves the IPCC Inventory Software to allow users to easily upload HWP data

Thanks to FAOSTAT (Amanda Gordon and Francesco Tubiello), this Spreadsheet automatically provides FAOSTAT data on HWP for the country selected by the user.

User can overwrite FAOSTAT data with country specific data to upload those to the IPCC Inventory Software

Instructions for use

Notes

1	Sheets with red tabs are for calculation and shall not be edited by the user
2	Sheets with yellow tabs require data are entered by the user
3	The Spreadsheet upload data from the FAOSTAT database, so an internet connection is required
4	HWP data for a single country (as selected) can be uploaded in the sheet "Data"
5	HWP data for the entire World are contained in the sheet "World" and can be uptated clicking cell B1 (Update)
6	HWP data contained in the sheet "World" are not uploaded into the IPCC Inventory Software. Those data are provided to the user for ease of comparison, where desired
6	Depending on the internet conncetion and resources available, the time needed to data upload from FAOSTAT may be longer than expected. In such case it is recommended to minimize other computer processes.

Deatiled instructions for use

1		Select the country name in cell A1 in the sheet "Data1". The spreadsheet will automatically upload data from the FAOSTAT database. The user can in alternative input data directly in the sheet overwiritng the data provided through FAOSTAT; the structure and the categories of the sheet shall remain unchanged.
2		On the Parameters sheet:
	a	Select the country name in cell C4
	b	Check the half life data in cells D12 and D13 (Replace it with country-specific values where available)
	c	Check the conversion factors in cells D16 to D20 (Replace it with country-specific values where available)
	d	If the user intends to include data on "Other industrial Roundwood" click the box in cell D23
	e	In order to estimate consumption and use prior to 1961 select the Region in cell B30 and an associated growth factor will be shown in cell C30. Alternatively, the user can select "national value" in cell B30 and enter the value in cell C32
3		Upload the country HWP data contained in this file to the IPCC Inventory Software, category 3.D.1, by clicking "Import HWP excel", selecting it, and clicking on "Import"

Additional Notes

1		In the Parameter sheet:
	a	Enter the last year for which HWP data are available (this limits the data shown in the "Results" sheet and its graphs)
	b	The bottom graph on the left shows the evolution of the "HWP variables" between 1990 and the last year selected
	c	The top graph on the right shows the growth in wood product use prior to 1962
	d	The bottom two graphs on the right show the results for four approaches for estimating the HWP contribution to the AFOLU total GHG emissions and removals

Instructions | Parameters | Results | World | Data | data_download | world_pivot | area_pivot | Calculation | Control

Supporting Tools II

Excel-based tool:

- Data compilation of land representation and upload at once in the IPCC Inventory Software

Supporting Tools III

Guidebook for inventory compilers

- ✓ Sector by sector

- ✓ Simulating the use of the software for each inventory category, providing most relevant references to good practice from the 2006 IPCC Guidelines and its Wetlands Supplement

Supporting Tools IV

Add-ons for Land Representation:

- **based on wall-to-wall data collection and analysis (maps),**

  Under development by FAO SEPAL Team

  based on sampling data collection and analysis (inventories)

  Under development through FAO-COLLECT EARTH customization

Support

TSU is supporting the IPCC Inventory Software

- ✓ **User Manual**
- ✓ **Help Desk E-mail** ipcc-software@iges.or.jp
- ✓ **Pool of voluntary testers, to support software development and use**
- ✓ **Annual meeting on feedbacks** from software users, including **issues where support is needed or a software improvements is envisaged**

May be subject to change after the IPCC enters into its 7th assessment cycle in mid-2023, depending on consideration by the Task Force Bureau and TFI Technical Support Unit for the 7th assessment cycle

Thank you

https://www.ipcc-nggip.iges.or.jp/index.html

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