IPCC Inventory Software

The 6th Greenhouse Gas Inventory System Training Workshop

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Baasansuren Jamsranjav

IPCC TFI TSU

ipcc

INTERGOVERNMENTAL PANEL ON climate change

WMO UNEP

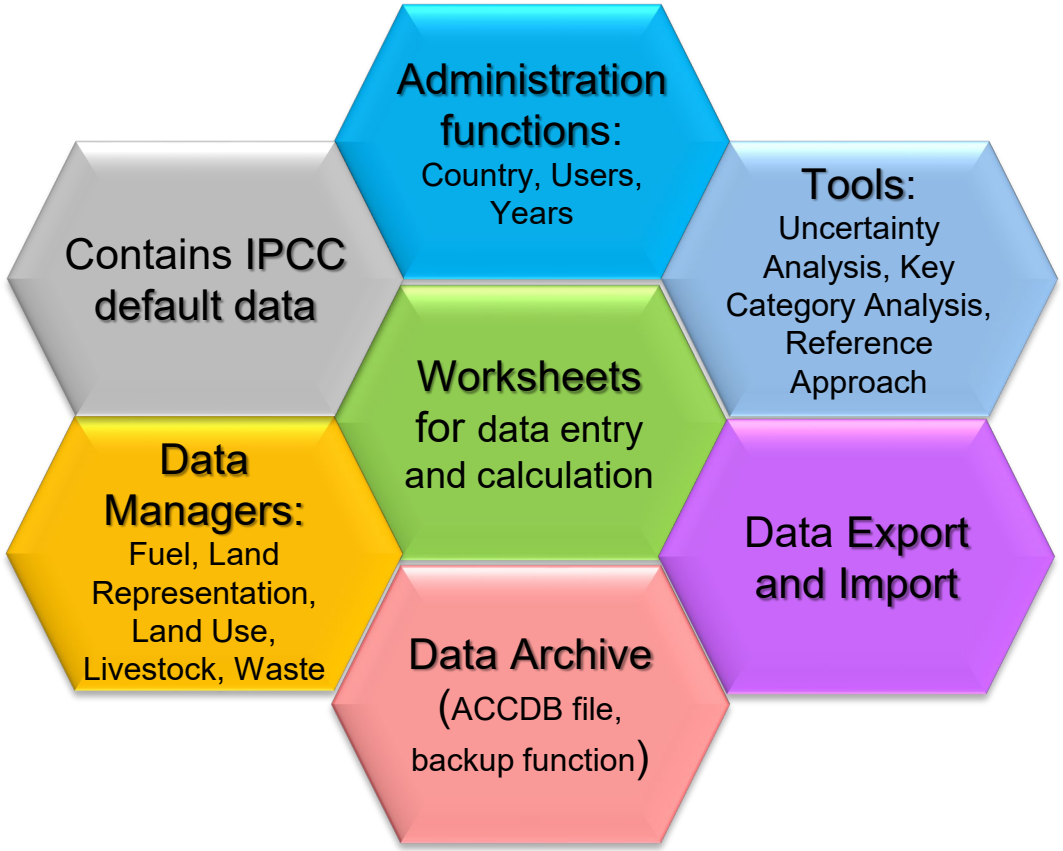
IPCC Inventory Software

- Launched in 2012
- Database based stand-alone software
- Implements all tiers and approaches of the *2006 IPCC Guidelines* and its *Wetlands Supplement**, and some elements of the *2019 Refinement*** to facilitate interoperability with the UNFCCC reporting tool for electronic reporting of common reporting tables (CRTs).
- Can be used for the whole inventory or individual categories
- Allows different parts of inventory to be developed simultaneously

The latest version 2.91 released on 5 April 2024 and available at IPCC TFI website https://www.ipcc-nggip.iges.or.jp/software/index.html

* Indicated with lilac color
** Indicated with magenta color

Software functions

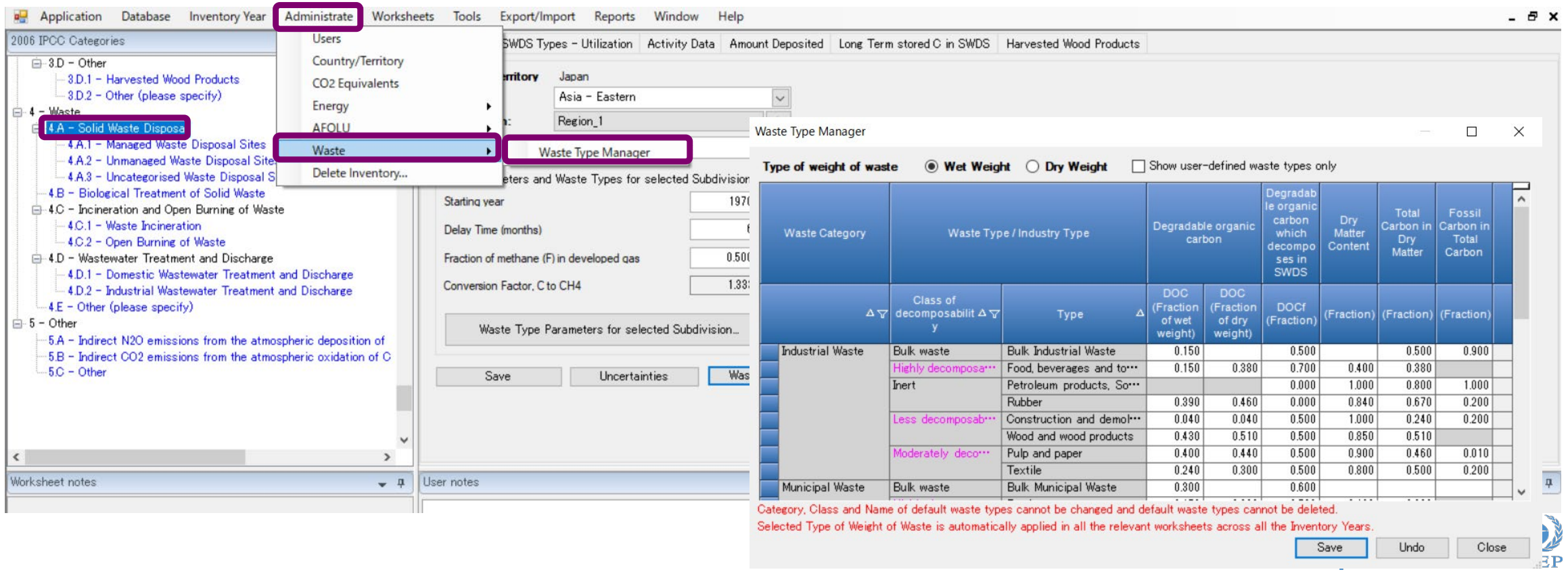


Key features

- Adaptable to national circumstances (e.g., subnational level of estimation of emissions /removals; use own country-specific values where available; use multiple tiers across inventory/category)
- A framework for data collection
- Automatically implements AR5 GWP100 values (also allows user-specific metric to be applied).
- Interoperability functionality with the UNFCCC reporting tool for CRT (Energy, IPPU non-F-gas, AFOLU, Waste)

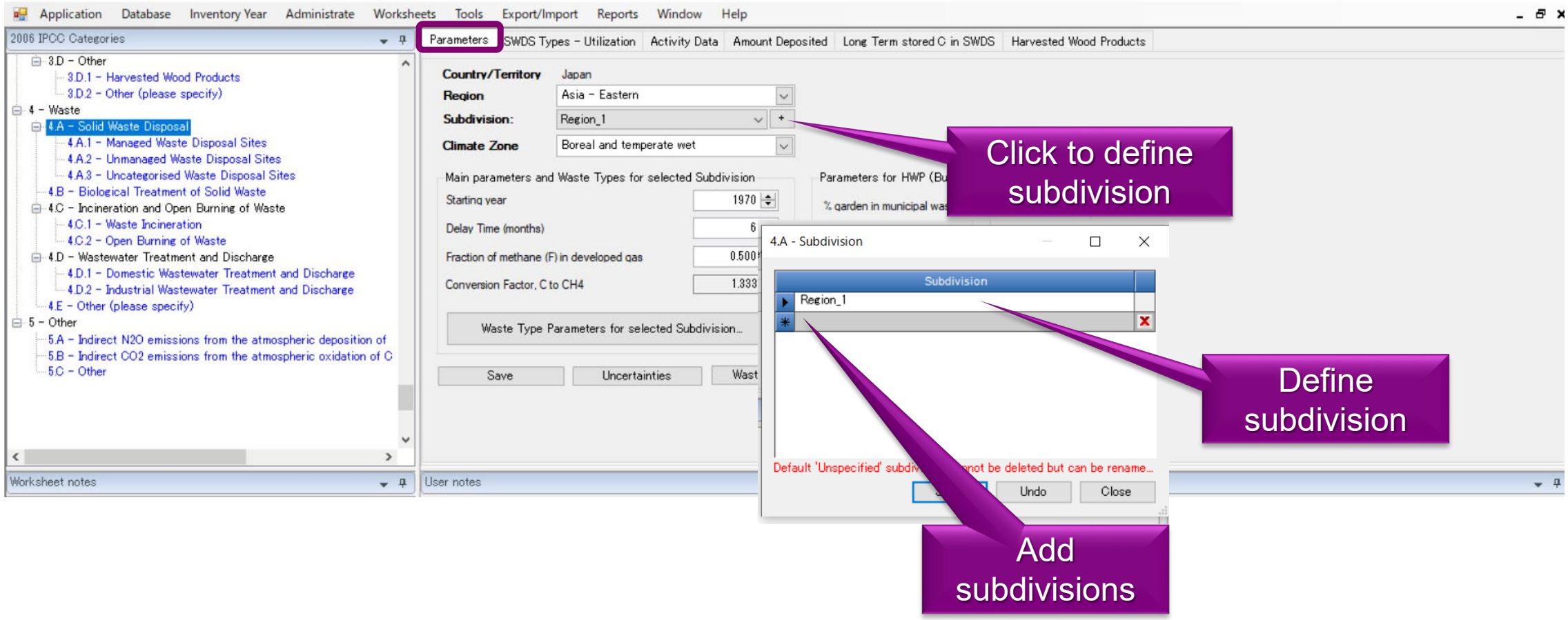
Data managers

- Organize and manage in one place relevant data used for multiple categories
  - Prepopulated with default data but also allows to enter user-specific data/information
  - Data transferred to relevant worksheets - facilitate data entry
- Help ensure consistency of data used in estimation of emissions/removals across all relevant categories

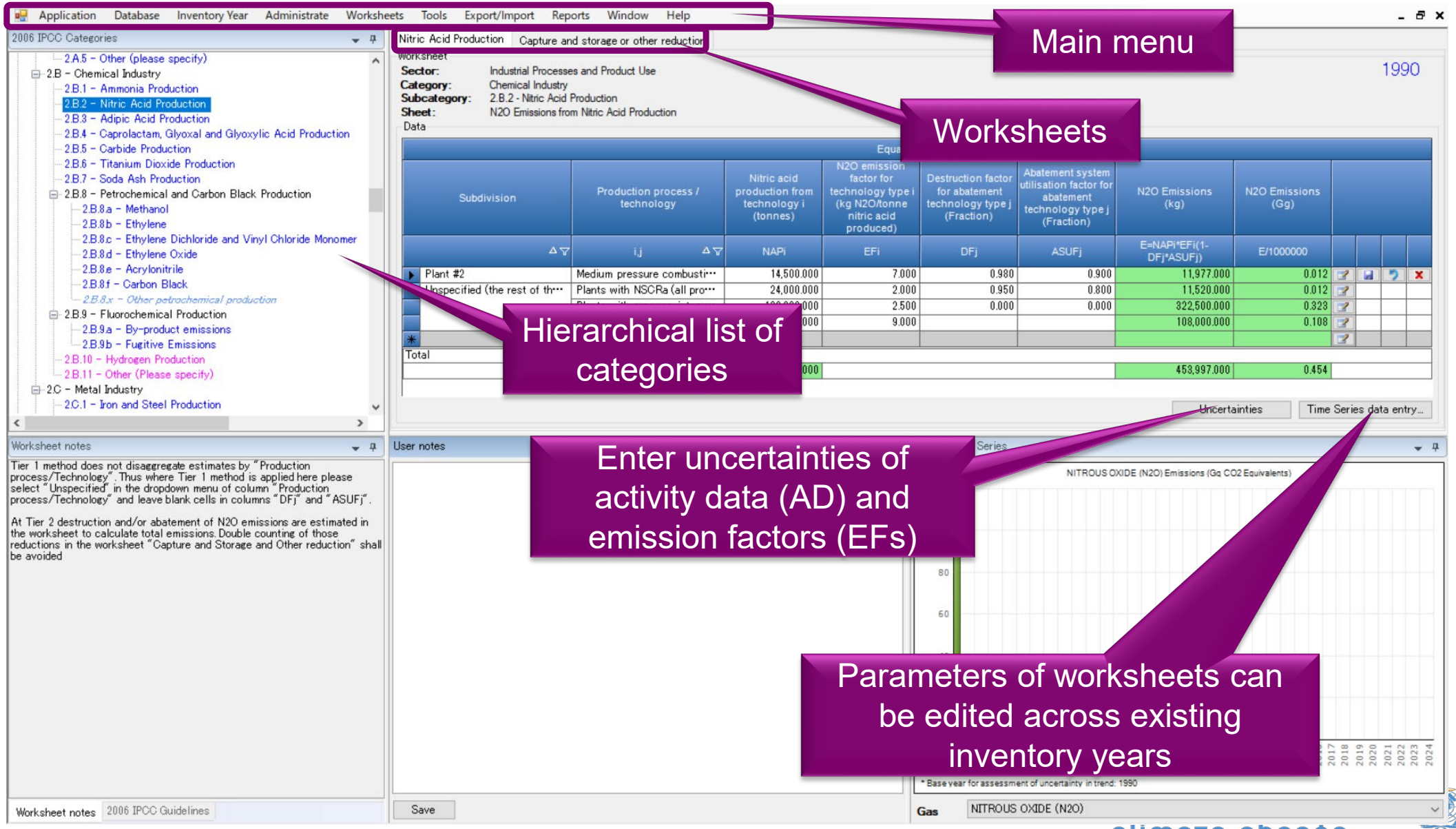


Subnational disaggregation

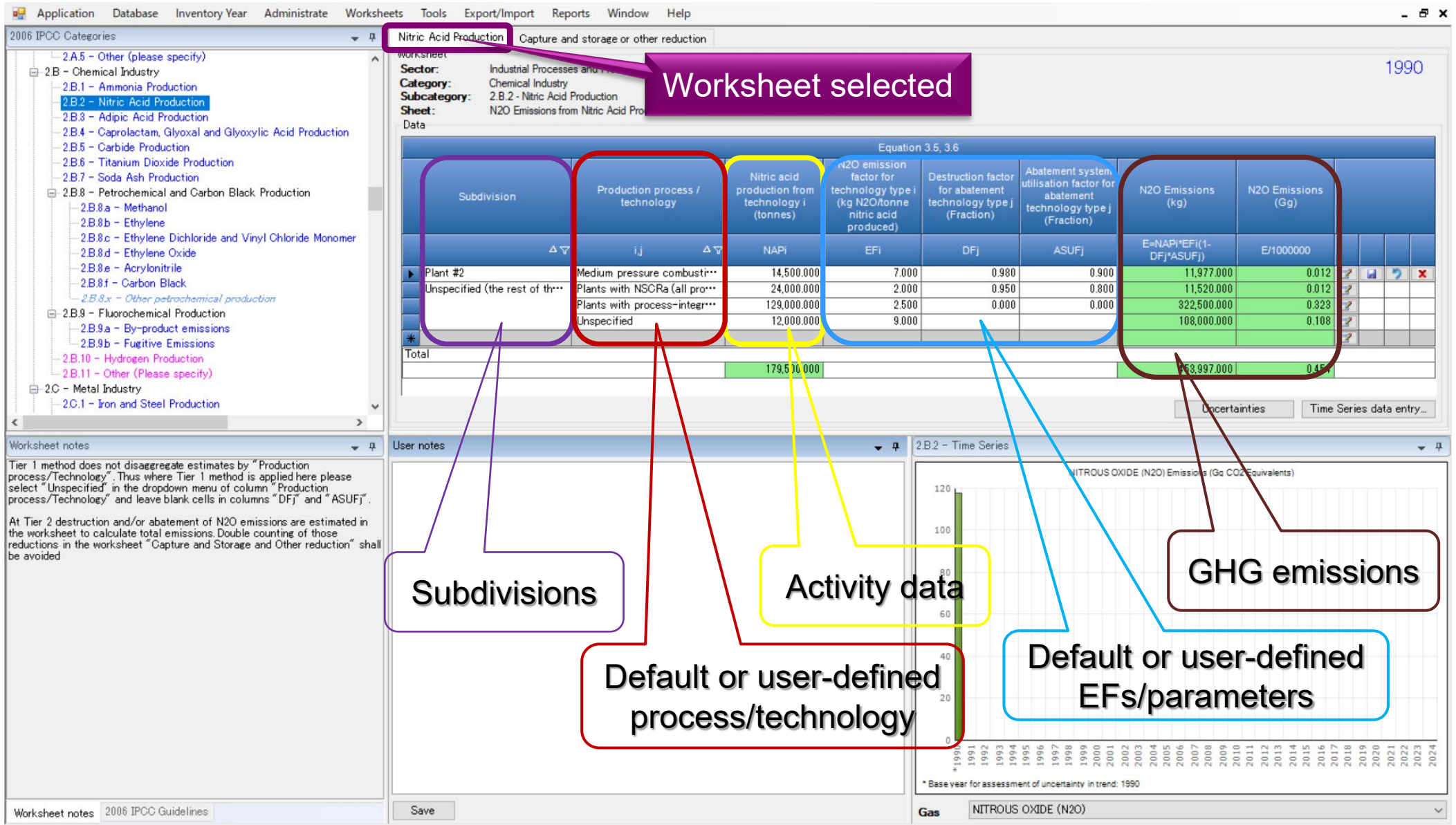
- Subdivision allows estimation of emissions/removals at subnational level (e.g., regions by climate zone)



Working area



Worksheets

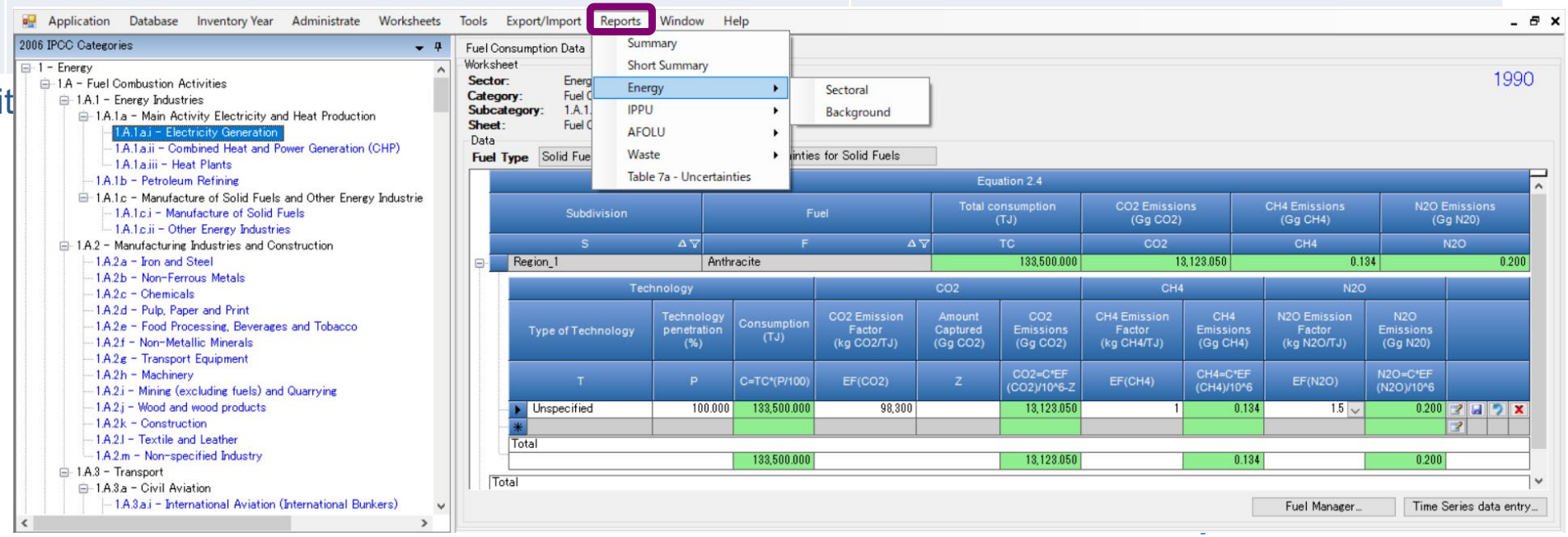

Application
Database
Inventory Year
Administrate
Worksheets
Tools
Export/Import
Reports
Window
Help
2006 IPCC Categories
2.A.5 - Other (please specify)
2.B - Chemical Industry
2.B.1 - Ammonia Production
2.B.2 - Nitric Acid Production
2.B.3 - Adipic Acid Production
2.B.4 - Caprolactam, Glyoxal and Glyoxylic Acid Production
2.B.5 - Carbide Production
2.B.6 - Titanium Dioxide Production
2.B.7 - Soda Ash Production
2.B.8 - Petrochemical and Carbon Black Production
2.B.8.a - Methanol
2.B.8.b - Ethylene
2.B.8.c - Ethylene Dichloride and Vinyl Chloride Monomer
2.B.8.d - Ethylene Oxide
2.B.8.e - Acrylonitrile
2.B.8.f - Carbon Black
2.B.8.x - Other petrochemical production
2.B.9 - Fluorochemical Production
2.B.9.a - By-product emissions
2.B.9.b - Fugitive Emissions
2.B.10 - Hydrogen Production
2.B.11 - Other (Please specify)
2.C - Metal Industry
2.C.1 - Iron and Steel Production
Nitric Acid Production
Capture and storage or other reduction
Worksheet selected
Sector: Industrial Processes and
Category: Chemical Industry
Subcategory: 2.B.2 - Nitric Acid Production
Sheet: N2O Emissions from Nitric Acid Pro
1990
Data
Equation 3.5, 3.6
Subdivision
Production process / technology
i,j
Nitric acid production from technology i (tonnes)
NAPi
N2O emission factor for technology type i (kg N2O/tonne nitric acid produced)
EFi
Destruction factor for abatement technology type j (Fraction)
DFj
Abatement system utilisation factor for abatement technology type j (Fraction)
ASUFj
N2O Emissions (kg)
E=NAPi*EFi(1-DFj*ASUFj)
N2O Emissions (Gg)
E/1000000
Plant #2
Medium pressure combusti…
14,500.000
7.000
0.980
0.900
11,977.000
0.012
Unspecified (the rest of th…
Plants with NSCRa (all pro…
24,000.000
2.000
0.950
0.800
11,520.000
0.012
Plants with process-integr…
129,000.000
2.500
0.000
0.000
322,500.000
0.323
Unspecified
12,000.000
9.000
108,000.000
0.108
Total
179,500.000
453,997.000
0.45
Uncertainties
Time Series data entry...
Worksheet notes
Tier 1 method does not disaggregate estimates by "Production process/Technology". Thus where Tier 1 method is applied here please select "Unspecified" in the dropdown menu of column "Production process/Technology" and leave blank cells in columns "DFj" and "ASUFj".
At Tier 2 destruction and/or abatement of N2O emissions are estimated in the worksheet to calculate total emissions. Double counting of those reductions in the worksheet "Capture and Storage and Other reduction" shall be avoided
Worksheet notes
2006 IPCC Guidelines
User notes
Save
2.B.2 - Time Series
NITROUS OXIDE (N2O) Emissions (Gg CO2 Equivalents)
120
100
80
60
40
20
0
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
* Base year for assessment of uncertainty in trend: 1990
Gas
NITROUS OXIDE (N2O)
Subdivisions
Activity data
Default or user-defined process/technology
Default or user-defined EFs/parameters
GHG emissions

Reports

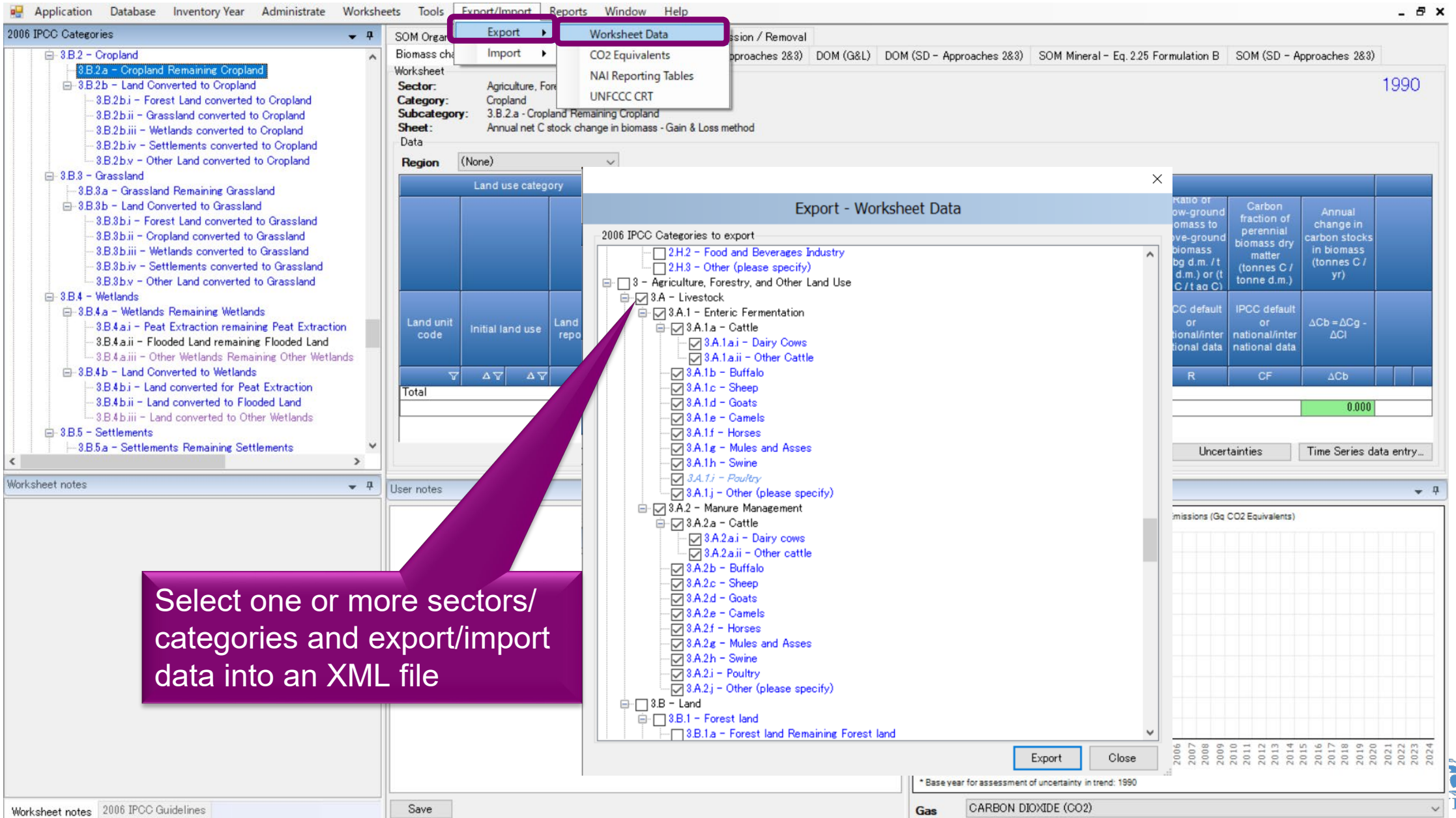
- Can produce reporting tables of the *2006 IPCC Guidelines* and export in Excel file.

Report	Level	Contents
Summary	Up to level 3 (e.g., 1.A.1)	Emissions/Removals
Short summary	Up to level 2 (e.g., 1.A)	Emissions/Removals
Sectoral	Most disaggregated level (e.g., 1.A.1.a.ii)	Emissions/Removals
Background		

*Sectoral tables contain addit



Data export and import

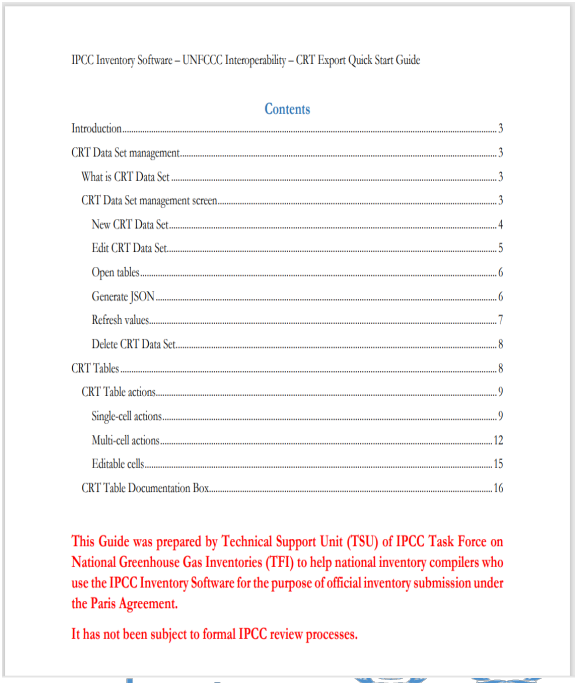


Interoperability with UNFCCC reporting tool for CRT

- Once data are entered and emissions/removals are calculated in the IPCC Inventory Software, users wishing to use these data to facilitate reporting to the UNFCCC can **generate a file** (in **JSON** format) in the IPCC Inventory Software
  - **Mapping*** between the IPCC Inventory Software and the CRT are visualized in the IPCC Inventory Software
  - JSON file can be imported into the UNFCCC electronic reporting tool for CRT

- IPCC Inventory Software: CRT Export Quick Start Guide
  - Describes functionalities in IPCC Inventory Software to prepare data for generation of JSON file for use by UNFCCC electronic reporting tool for CRT

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



IPCC Inventory Software – UNFCCC Interoperability – CRT Export Quick Start Guide

Contents

This Guide was prepared by Technical Support Unit (TSU) of IPCC Task Force on National Greenhouse Gas Inventories (TFI) to help national inventory compilers who use the IPCC Inventory Software for the purpose of official inventory submission under the Paris Agreement.

It has not been subject to formal IPCC review processes.

*See the Users' Guidebook https://www.ipcc-nggip.iges.or.jp/software/index.html

Interoperability with UNFCCC reporting tool for CRT

Step 1
- Calculate GHG emissions/removals in IPCC Inventory Software

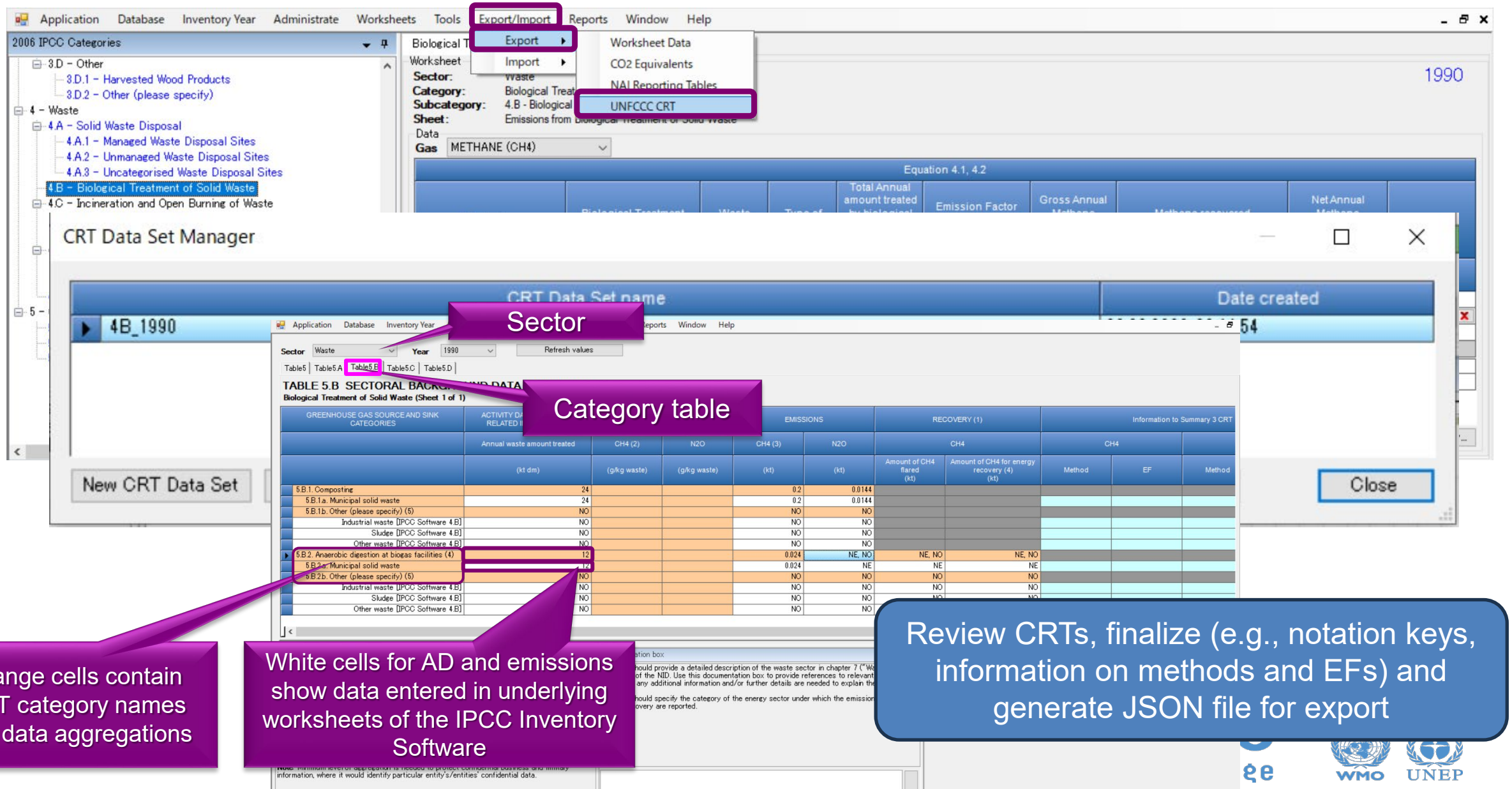
Step 2
- Access CRT interface in Export/Import menu of IPCC Inventory Software

Step 3
- Create data set for CRTs, review and finalize visualized CRTs

Step 4
- Generate JSON file for export of data from IPCC Inventory Software into UNFCCC reporting tool for CRT

Step 5
- Users conduct QC checks in UNFCCC reporting tool for CRT

Interoperability with UNFCCC reporting tool for CRT



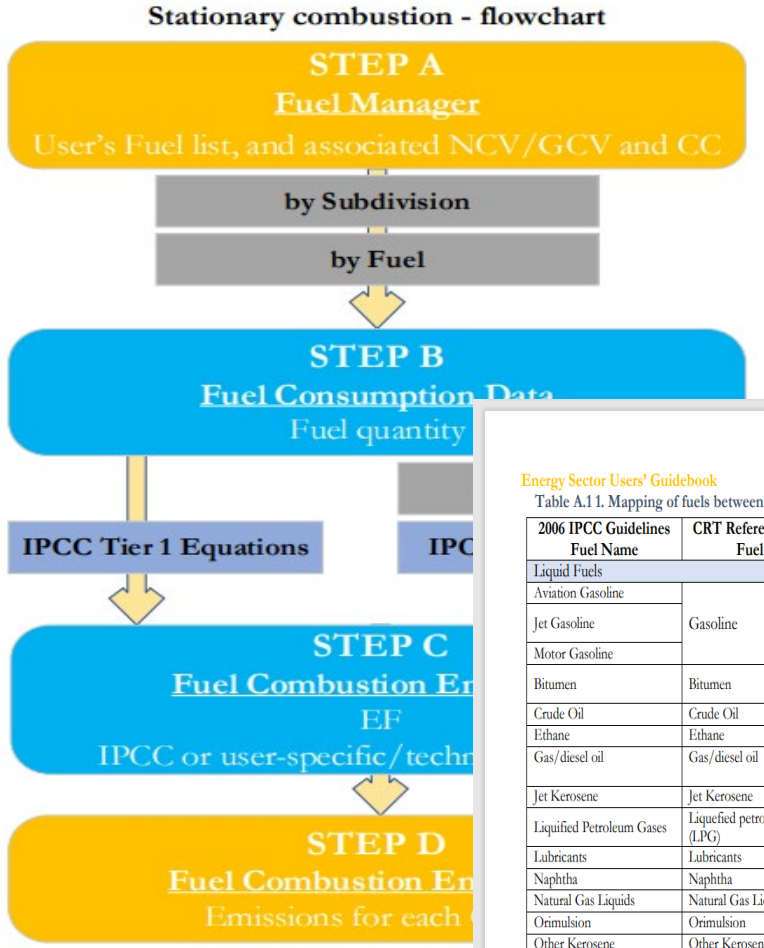
Support to users

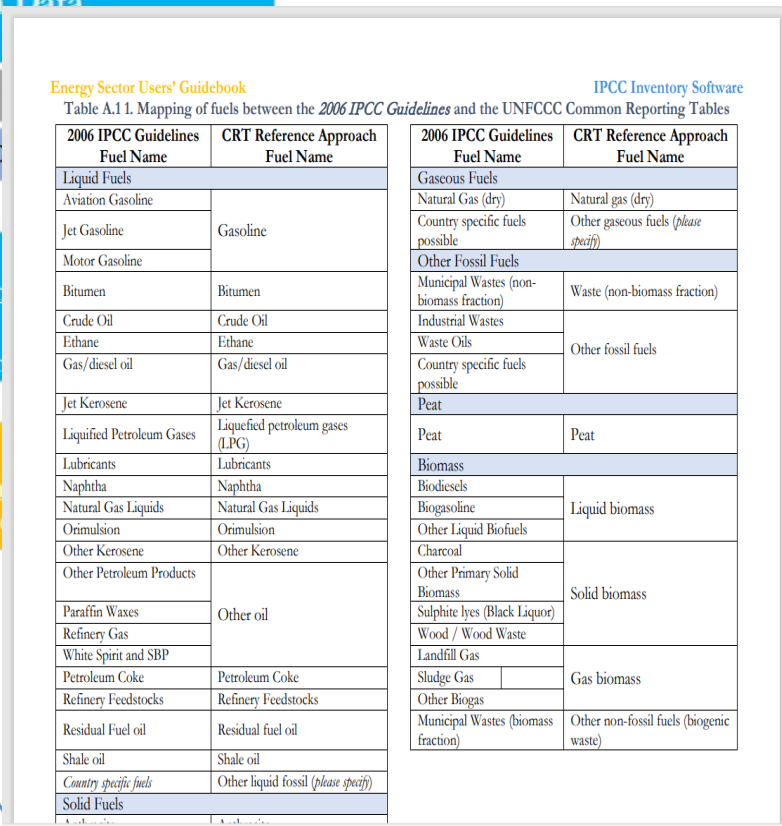
- Organizing expert meetings annually
  - IPCC Expert Meeting to collect Software and EFDB users' feedback, 1-3 May 2023, Bangkok, Thailand
- User Manual https://www.ipcc-nggip.iges.or.jp/software/index.html
- Guidebooks https://www.ipcc-nggip.iges.or.jp/software/index.html
  - Energy sector
  - Livestock categories (3.A)
  - Land representation
  - UNFCCC CRT Export Quick Start Guide
  - Other sectoral guidebooks are under development
- Help Desk ipcc-software@iges.or.jp

Users' Guidebook

- Step by step instructions on data entry and calculation of emissions/removals including explanations on equations, worksheets, and **flowchart** illustrating the workflow.
  - It does not replace guidance provided in the IPCC Methodology Reports.
- Contains Annex which illustrates the **mapping** of AD and GHG estimates for categories/gases from the IPCC Inventory Software to the corresponding UNFCCC CRT category/ies.

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





Energy Sector Users' Guidebook — IPCC Inventory Software

Table A.1 1. Mapping of fuels between the *2006 IPCC Guidelines* and the UNFCCC Common Reporting Tables

2006 IPCC Guidelines Fuel Name	CRT Reference Approach Fuel Name
Liquid Fuels	
Aviation Gasoline	Gasoline
Jet Gasoline	
Motor Gasoline	
Bitumen	Bitumen
Crude Oil	Crude Oil
Ethane	Ethane
Gas/diesel oil	Gas/diesel oil
Jet Kerosene	Jet Kerosene
Liquified Petroleum Gases	Liquefied petroleum gases (LPG)
Lubricants	Lubricants
Naphtha	Naphtha
Natural Gas Liquids	Natural Gas Liquids
Orimulsion	Orimulsion
Other Kerosene	Other Kerosene
Other Petroleum Products	Other oil
Paraffin Waxes	
Refinery Gas	
White Spirit and SBP	
Petroleum Coke	Petroleum Coke
Refinery Feedstocks	Refinery Feedstocks
Residual Fuel oil	Residual fuel oil
Shale oil	Shale oil
Country specific fuels	Other liquid fossil (*please specify*)
Solid Fuels	

2006 IPCC Guidelines Fuel Name	CRT Reference Approach Fuel Name
Gaseous Fuels	
Natural Gas (dry)	Natural gas (dry)
Country specific fuels possible	Other gaseous fuels (*please specify*)
Other Fossil Fuels	
Municipal Wastes (non-biomass fraction)	Waste (non-biomass fraction)
Industrial Wastes	Other fossil fuels
Waste Oils	
Country specific fuels possible	
Peat	
Peat	Peat
Biomass	
Biodiesels	Liquid biomass
Biogasoline	
Other Liquid Biofuels	
Charcoal	Solid biomass
Other Primary Solid Biomass	
Sulphite lyes (Black Liquor)	
Wood / Wood Waste	
Landfill Gas	Gas biomass
Sludge Gas	
Other Biogas	
Municipal Wastes (biomass fraction)	Other non-fossil fuels (biogenic waste)

Ongoing and planned work

- Interoperability with ETF reporting tool to be completed sequentially (after the completion of the ETF reporting tool)
- Extending capacity for Uncertainty Analysis and Key Category Analysis
- Facilitating export/import of time series data
- Completing publication of guidebooks
- Step-by-step instructions in ppt/video format to implement IPCC default methods
- Demonstration workshop, August 2024, Baku, Azerbaijan

Thank you

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