



IPCC Inventory Software

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IPCC Inventory Software

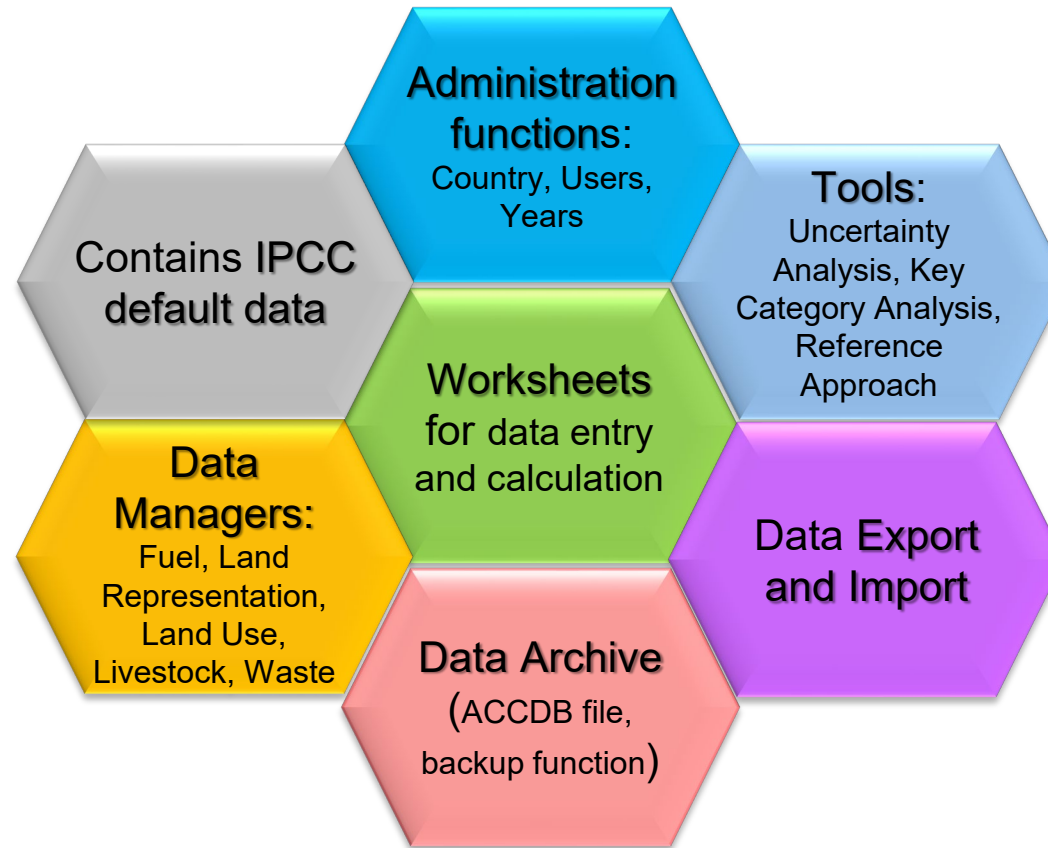
- Launched in 2012
- Database based stand-alone software
- Implements all tiers and approaches of the *2006 IPCC Guidelines* and its *Wetlands Supplement*^{*}, and some elements of the *2019 Refinement*^{**} to facilitate interoperability with the UNFCCC reporting tool for electronic reporting of common 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

The screenshot shows the 'Waste Type Manager' dialog box in a software application. The 'Administrative' menu is open, with 'Waste' and 'Waste Type Manager' highlighted. The 'Waste Type Manager' dialog has a 'Type of weight of waste' section with 'Wet Weight' selected. Below this is a table of waste types.

Waste Category	Waste Type / Industry Type		Degradable organic carbon	Degradable organic carbon which decomposes in SWDS	Dry Matter Content	Total Carbon in Dry Matter	Fossil Carbon in Total Carbon
	Class of decomposability	Type	DOC (Fraction of wet weight)	DOC (Fraction of dry weight)	DOCf (Fraction)	(Fraction)	(Fraction)
Industrial Waste	Bulk waste	Bulk Industrial Waste	0.150		0.500		0.500
	Highly decomposable	Food, beverages and tobacco	0.150	0.380	0.700	0.400	0.380
	Inert	Petroleum products, Solvents			0.000	1.000	0.800
		Rubber		0.390	0.460	0.000	0.840
	Less decomposable	Construction and demolition waste		0.040	0.040	0.500	1.000
	Moderately decomposable	Wood and wood products		0.430	0.510	0.500	0.850
Municipal Waste		Pulp and paper	0.400	0.440	0.500	0.900	0.460
		Textile	0.240	0.300	0.500	0.800	0.500
	Bulk waste	Bulk Municipal Waste	0.300		0.600		0.200

Category, Class and Name of default waste types cannot be changed and default waste types cannot be deleted.
Selected Type of Weight of Waste is automatically applied in all the relevant worksheets across all the Inventory Years.

Subnational disaggregation

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

The screenshot displays the IPCC software interface with the 'Parameters' tab selected. The left sidebar shows a tree view of IPCC categories, with '4 - Waste' expanded to '4.A - Solid Waste Disposal'. The main panel shows configuration options for 'Country/Territory' (Japan), 'Region' (Asia - Eastern), 'Subdivision' (Region_1), and 'Climate Zone' (Boreal and temperate wet). A purple callout box points to the '+' button next to the 'Subdivision' dropdown, labeled 'Click to define subdivision'. A secondary window titled '4.A - Subdivision' is open, showing a table with one row: 'Region_1'. A purple callout box points to the asterisk icon in the table, labeled 'Define subdivision'. Another purple callout box points to the bottom of the '4.A - Subdivision' window, labeled 'Add subdivisions'. The bottom of the main window shows a message: 'Default 'Unspecified' subdivision cannot be deleted but can be rename...'. Buttons for 'Save', 'Uncertainties', and 'Wast' are visible at the bottom of the main panel.

Working area

The screenshot displays the IPCC software interface with several key components highlighted by callouts:

- Main menu:** Located at the top of the window, containing options like Application, Database, Inventory Year, Administrate, Worksheets, Tools, Export/Import, Reports, Window, and Help.
- Worksheets:** A central panel showing a hierarchical tree on the left and a data table on the right. The table includes columns for Subdivision, Production process / technology, Nitric acid production, N2O emission factor, Destruction factor, Abatement system utilisation factor, and N2O Emissions (kg and Gg).
- Hierarchical list of categories:** A tree view on the left side of the interface, listing various IPCC categories such as 2.A.5 - Other (please specify), 2.B - Chemical Industry, and 2.C - Metal Industry.
- Enter uncertainties of activity data (AD) and emission factors (EFs):** A callout pointing to the 'Uncertainties' button at the bottom right of the worksheet area.
- Parameters of worksheets can be edited across existing inventory years:** A callout pointing to the 'Time Series data entry...' button at the bottom right of the worksheet area.

Subdivision	Production process / technology	Nitric acid production from technology i (tonnes)	N2O emission factor for technology type i (kg N2O/tonne nitric acid produced)	Destruction factor for abatement technology type j (Fraction)	Abatement system utilisation factor for abatement technology type j (Fraction)	N2O Emissions (kg)	N2O Emissions (Gg)
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
		100,000.000	2.500	0.000	0.000	322,500.000	0.323
		0.000	9.000			108,000.000	0.108
Total						453,997.000	0.454

Worksheets

Application Database Inventory Year Administrate Worksheets Tools Export/Import Reports Window Help

2006 IPCC Categories

Nitric Acid Production Capture and storage or other reduction

Worksheet selected

1990

Equation 3.5, 3.6

Subdivision	Production process / technology	Nitric acid production from technology i (tonnes)	n2O emission factor for technology type i (kg N2O/tonne nitric acid produced)	Destruction factor for abatement technology type j (Fraction)	Abatement system utilisation factor for abatement technology type j (Fraction)	N2O Emissions (kg)	N2O Emissions (Gg)
	ij	NAP _i	EF _i	DF _j	ASUF _j	$E = NAP_i * EF_i * (1 - DF_j * ASUF_j)$	$E / 1000000$
Plant #2	Medium pressure combust...	14,500.000	7.000	0.980	0.900	11,977.000	0.012
	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				458,997.000	0.459

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 "DF" and "ASUF".

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

User notes

2.B.2 - Time Series

NITROUS OXIDE (N2O) Emissions (Gg CO2 Equivalents)

Subdivisions

Activity data

Default or user-defined process/technology

Default or user-defined EFs/parameters

GHG emissions

Worksheet notes 2006 IPCC Guidelines Save Gas NITROUS OXIDE (N2O)

UNEP

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 additional data

The screenshot shows the Fuel Manager software interface. The 'Reports' menu is open, showing options for Summary, Short Summary, Energy, IPPU, AFOLU, Waste, and Table 7a - Uncertainties. The 'Energy' option is selected, and a sub-menu shows 'Sectoral' and 'Background' options. The main window displays a data table for Equation 2.4, showing emissions and consumption data for various subdivisions and fuels.

Subdivision	Fuel	Total consumption (TJ)	CO2 Emissions (Gg CO2)	CH4 Emissions (Gg CH4)	N2O Emissions (Gg N2O)				
S	F	TC	CO2	CH4	N2O				
Region_1	Anthracite	133,500.000	13,123.050	0.134	0.200				
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 N2O)
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	100.000	133,500.000	98,300		13,123.050	1	0.134	1.5	0.200
Total		133,500.000			13,123.050		0.134		0.200

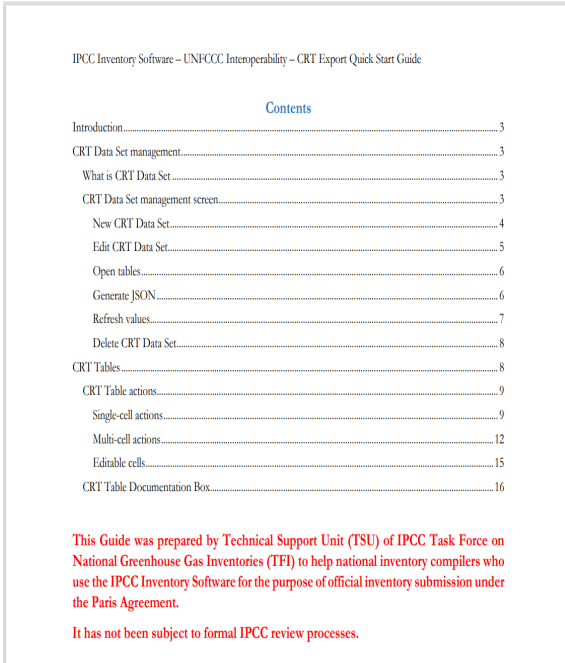
Interoperability with UNFCCC reporting tool for CRT

- 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

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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

The screenshot shows the UNFCCC reporting tool interface. The 'Export/Import' menu is open, with 'Export' selected, leading to a sub-menu where 'UNFCCC CRT' is highlighted. The 'CRT Data Set Manager' dialog is open, showing a table of CRT data sets with columns for 'CRT Data Set name' and 'Date created'. The 'Sector' dropdown is set to 'Waste' and the 'Year' is '1990'. The 'Category table' is displayed, showing a table with columns for 'Sector', 'Year', and various emission and recovery metrics. The table is titled 'TABLE 5.B. SECTORAL BACKLOG DATA' and 'Biological Treatment of Solid Waste (Sheet 1 of 1)'. The table has columns for 'GREENHOUSE GAS SOURCE AND SINK CATEGORIES', 'ACTIVITY DATA RELATED INFORMATION', 'EMISSIONS', 'RECOVERY (1)', and 'Information to Summary 3 CRT'. The table contains data for various waste treatment categories, including '5.B.1. Composting', '5.B.1.a. Municipal solid waste', '5.B.1.b. Other (please specify) (5)', '5.B.2. Anaerobic digestion at biogas facilities (4)', and '5.B.2.a. Municipal solid waste'. Orange cells indicate CRT category names and data aggregations, while white cells show data entered in underlying worksheets of the IPCC Inventory Software.

Export/Import menu options:

- Export
- Import
- Worksheet Data
- CO2 Equivalents
- NAI Reporting Tables
- UNFCCC CRT

CRT Data Set Manager dialog:

- CRT Data Set name: 4B_1990
- Date created: 54
- Sector: Waste
- Year: 1990

Category table (TABLE 5.B. SECTORAL BACKLOG DATA):

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	ACTIVITY DATA RELATED INFORMATION	EMISSIONS				RECOVERY (1)		Information to Summary 3 CRT	
		Annual waste amount treated (kt dm)	CH4 (2) (g/kg waste)	N2O (g/kg waste)	CH4 (3) (kt)	N2O (kt)	CH4	CH4	
5.B.1. Composting		24			0.2	0.0144			
5.B.1.a. Municipal solid waste		24			0.2	0.0144			
5.B.1.b. Other (please specify) (5)		NO			NO	NO			
Industrial waste [IPCC Software 4B]		NO			NO	NO			
Sludges [IPCC Software 4B]		NO			NO	NO			
Other waste [IPCC Software 4B]		NO			NO	NO			
5.B.2. Anaerobic digestion at biogas facilities (4)		12			0.024	NE, NO	NE, NO	NE, NO	
5.B.2.a. Municipal solid waste		12			0.024	NE	NE	NE	
5.B.2.b. Other (please specify) (5)		NO			NO	NO	NO	NO	
Industrial waste [IPCC Software 4B]		NO			NO	NO			
Sludges [IPCC Software 4B]		NO			NO	NO			
Other waste [IPCC Software 4B]		NO			NO	NO			

Callouts:

- Orange cells contain CRT category names and data aggregations
- White cells for AD and emissions show data entered in underlying worksheets of the IPCC Inventory Software
- Review CRTs, finalize (e.g., notation keys, information on methods and EFs) and generate JSON file for export

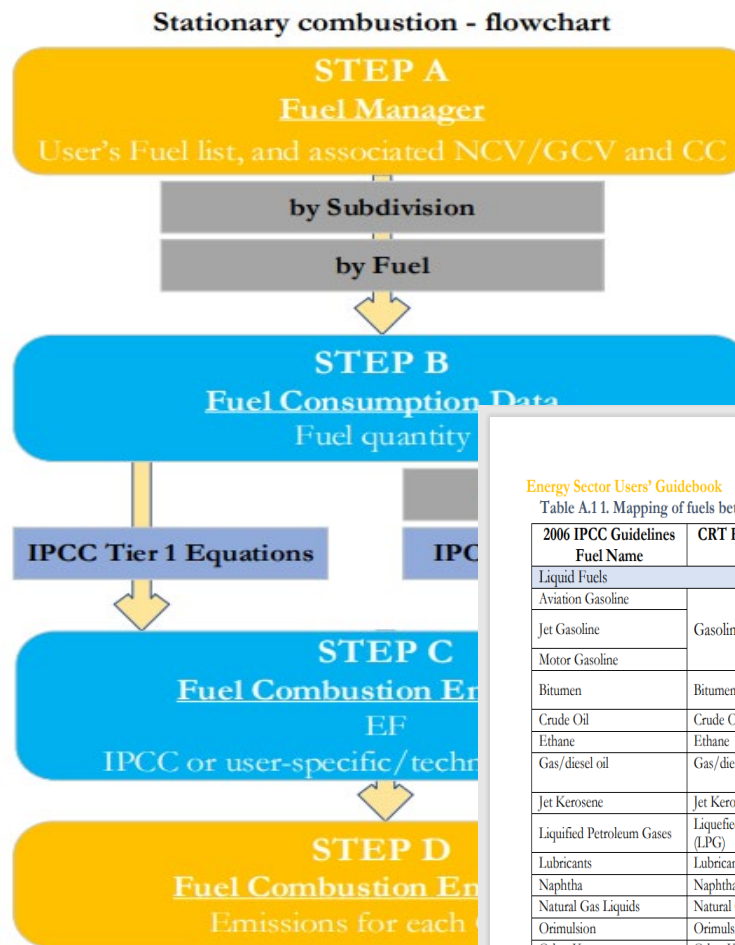
Support to users

- 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	2006 IPCC Guidelines Fuel Name	CRT Reference Approach Fuel Name
Liquid Fuels			
Aviation Gasoline	Gasoline	Natural Gas (dry)	Natural gas (dry)
Jet Gasoline		Country specific fuels possible	Other gaseous fuels (please specify)
Motor Gasoline		Other Fossil Fuels	
Bitumen	Bitumen	Municipal Wastes (non-biomass fraction)	Waste (non-biomass fraction)
Crude Oil	Crude Oil	Industrial Wastes	Other fossil fuels
Ethane	Ethane	Waste Oils	
Gas/diesel oil	Gas/diesel oil	Country specific fuels possible	
Jet Kerosene	Jet Kerosene	Peat	
Liquefied Petroleum Gases	Liquefied petroleum gases (LPG)	Peat	Peat
Lubricants	Lubricants	Biomass	
Naphtha	Naphtha	Biodiesels	Liquid biomass
Natural Gas Liquids	Natural Gas Liquids	Biogasoline	
Orimulsion	Orimulsion	Other Liquid Biofuels	Solid biomass
Other Kerosene	Other Kerosene	Charcoal	
Other Petroleum Products	Other oil	Other Primary Solid Biomass	
Paraffin Waxes		Sulphite lyes (Black Liquor)	
Refinery Gas		Wood / Wood Waste	
White Spirit and SBP		Landfill Gas	
Petroleum Coke		Sludge Gas	Gas biomass
Refinery Feedstocks	Refinery Feedstocks	Other Biogas	Other non-fossil fuels (biogenic waste)
Residual Fuel oil	Residual fuel oil	Municipal Wastes (biomass fraction)	
Shale oil	Shale oil		
Country specific fuels	Other liquid fossil (please specify)		
Solid Fuels			

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>