



IPCC Inventory Software: Waste Sector

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IPCC TFI TSU

Key functionalities

- Subnational disaggregation
- Implements all methods in Volume 5 of the *2006 IPCC Guidelines* and Chapter 6 of the *Wetlands Supplement*
- Data Manager: Waste Type Manager (new functionality)
 - Waste Type Parameters (Solid Waste Disposal category)
- Interoperability functionality with UNFCCC reporting tool for CRT (new functionality)

Waste Type Manager

- Contains main data/information needed for estimation of greenhouse gas (GHG) emissions from solid waste disposal and treatment.
 - All waste categories, types and associated parameters (e.g., DOC, DOCf, dm, TC, FC)
 - Populated with IPCC defaults but allows to enter user-specific data/information. Needs to be populated before starting the estimation of emissions.
- Data/information entered are transferred to relevant worksheets

The screenshot displays the 'Waste Type Manager' application. The main window has a menu bar with 'Application', 'Database', 'Inventory Year', 'Worksheets', 'Reports', 'Tools', 'Export/Import', 'Administrate', 'Window', and 'Help'. The 'Administrate' menu is open, showing options like 'Users', 'Country/Territory', 'CO2 Equivalents', 'Delete Inventory...', 'Energy', 'AFOLU', 'Waste', and 'Guidelines Information Texts'. The 'Waste' option is selected, and a sub-menu is visible with 'Waste Type Manager' highlighted.

The 'Waste Type Manager' window is open, showing a table of waste types and their associated carbon parameters. The table has columns for 'Waste Category', 'Waste Type / Industry Type', 'Degradable organic carbon', 'Dry Matter Content', 'Total Carbon in Dry Matter', and 'Fossil Carbon in Total Carbon'. The table is organized by waste category (Industrial Waste, Municipal Waste, Other waste, Sludge) and waste type (Bulk waste, Inert, Rapidly degrading waste, Slowly degrading waste, Moderately degrading waste, Food waste, Paper and cardboard, Textile, Wood, Clinical waste, Hazardous waste, Industrial sewage sludge, Municipal sewage sludge).

Waste Category	Waste Type / Industry Type	Degradable organic carbon	Dry Matter Content	Total Carbon in Dry Matter	Fossil Carbon in Total Carbon
		DOC (Fraction of wet weight)	DOCf (Fraction of dry weight)	DM (Fraction)	TC (Fraction)
Industrial Waste	Bulk waste	0.15	0.5	0.5	0.9
	Inert			1	1
	Petroleum products, Solvents, Plastics	0.39	0.46	0.84	0.87
	Rubber	0.16	0.36	0.4	0.39
	Rapidly degrading waste	0.94	0.94	1	0.24
	Slowly degrading waste	0.4	0.44	0.5	0.46
	Pulp and paper	0.24	0.3	0.5	0.5
	Textile	0.43	0.51	0.5	0.51
	Wood and wood products	0.19	0.5	0.5	0.5
	Bulk Municipal Waste				
Municipal Waste	Inert			1	1
	Glass			0.5	1
	Metal			0.5	1
	Plastic			0.5	1
	Rubber and leather	0.39	0.46	0.84	0.87
	Moderately degrading waste	0.24	0.3	0.5	0.4
	Disposible nappies	0.2	0.49	0.5	0.49
	Garden and park	0.16	0.36	0.4	0.39
	Rapidly degrading waste	0.4	0.44	0.5	0.46
	Slowly degrading waste	0.24	0.3	0.5	0.5
Other waste	Bulk waste	0.43	0.51	0.5	0.51
	Wood	0.15	0.28	0.5	0.5
	Clinical waste			0.5	0.5
	Hazardous waste			0.5	0.5
Sludge	Industrial sewage sludge	0.09	0.35	0.5	
	Municipal sewage sludge	0.05	0.5	0.5	

Solid Waste Disposal

- Waste Type Parameters

- Waste categories, types and relevant parameters (e.g., DOC, DOC_f) are transferred from *Waste Type Manager* and transferred to calculation worksheets
- Users can select/indicate the waste categories and types to be used for estimation of CH_4 emissions from solid waste disposal sites (SWDS)

The screenshot displays the 'Waste Type Manager' software interface. On the left, a tree view shows the '2006 IPCC Categories' hierarchy, with '4.A - Solid Waste Disposal' selected. The main window shows the 'Parameters' tab for 'SWDS Types - Utilization', with fields for 'Country/Territory' (Japan), 'Region' (Asia - Eastern), 'Subdivision' (Region_1), and 'Climate Zone' (Boreal and temperate wet). Below these are checkboxes for 'Main parameters and Waste Types for selected Subdivision' and 'Parameters for HWP (Bulk MSW)', along with a 'Starting year' (1970) and a '% garden in municipal waste' (0.00 %).

A 'Waste Type Parameters' dialog box is open, displaying a table with the following data:

Waste Category	Class of decomposability	Waste Type / Industry Type	Use in calculations	Degradable organic carbon (DOC) (Fraction of wet weight)	Degradable organic carbon which decomposes in SWDS (DOC_f) (Fraction)	Methane generation rate constant (k)
Industrial Waste	Bulk waste	Bulk Industrial Waste	☒	0.15	0.15	0.09
	Rapidly degrading waste	Food, beverages and tobacco	☒	0.15	0.15	
	Slowly degrading waste	Construction and demolition	☒	0.04	0.5	
		Pulp and paper	☒	0.4	0.4	
		Textile	☒	0.24	0.24	
		Wood and wood products	☒	0.43	0.43	
Municipal Waste	Bulk waste	Bulk Municipal Waste	☒	0.18	0.18	0.09

The dialog box includes 'Cancel' and 'OK' buttons at the bottom.

- Estimation of CH₄ emissions by type of SWDS

Select type

Wastewater Treatment and Discharge

- Implements the method for estimation of N₂O emissions from industrial wastewater treatment (2019 Refinement)
 - No method in the 2006 IPCC Guidelines

The screenshot displays the IPCC Emissions Estimation Software (EES) interface. The left pane shows the 2006 IPCC Categories tree, with '4.D.2 - Industrial Wastewater Treatment and Discharge' highlighted. The main pane shows the 'N2O Emissions from Effluent wastewater' worksheet for the year 1990. The worksheet is divided into two sections: 'Equation 6.11 (NEW), 6.13 (NEW)' and 'Equation 6.12(NEW), 6.13 (NEW), 6.14 (NEW)'. The top section is a summary table, and the bottom section is a detailed data table.

Subdivision	Industry sector	Total N in wastewater from industry (kg N/yr)	N2O Emissions (kg N2O)	N2O Emissions (Gg N2O)
Region_1	Meat & Poultry	2470000	11644.28571	0.01164

Type of treatment and discharge pathway or system	Degree of utilization (Fraction)	Fraction of total wastewater N removed during wastewater treatment (Fraction)	Total annual amount of N in the industrial wastewater effluent (kg N/yr)	Emission Factor (kg N2O-N/kg N)	N2O Emissions (kg N2O)	N2O Emissions (Gg N2O)
j	Tij	Nrem(j)	Neff(j) = TNind(j) * Tij * (1-Nrem(j))	EFj	Eij = Neff(j) * EFj * 44/28	Eij / 10 ⁶
Anaerobic lagoons	1	0.4	1482000	0.005	11644.28571	0.01164
Total					11644.28571	0.01164

Interoperability with UNFCCC reporting tool for CRT

The screenshot illustrates the interoperability between the UNFCCC reporting tool and the CRT (Common Reporting Tool) for Carbon Reporting Tables (CRT).

Export/Import Menu: The 'Export/Import' menu is open, showing options for 'Export' and 'Import'. The 'Export' option is selected, and the 'UNFCCC CRT' option is highlighted under the 'Export' submenu.

CRT Data Set Manager: This window displays a list of CRT Data Sets. The table shows the following data:

CRT Data Set name	Date created
1990-1991	07.06.2023 17:43:28
4B_1990	28.08.2023 09:41:54

New CRT Data Set: This window shows the 'Sector' dropdown set to 'Waste' and the 'Year' dropdown set to '1990'. The 'Refresh values' button is visible.

TABLE 5.B. SECTORAL BACKGROUND DATA FOR WASTE: This table provides detailed data for the waste sector. The table is titled 'Biological Treatment of Solid Waste (Sheet 1 of 1)'. The table structure is as follows:

Greenhouse gas source and sink categories	ACTIVITY DATA AND OTHER RELATED INFORMATION Annual waste amount treated (kt dm)	IMPLIED EMISSION FACTOR		EMISSIONS		RECOVERY (1)		Information to Summary 3 CRT			
		CH ₄ (2) (g/kg waste)	N ₂ O (g/kg waste)	CH ₄ (3) (kt)	N ₂ O (kt)	CH ₄		CH ₄		N ₂ O	
						Amount of CH ₄ flared (kt)	Amount of CH ₄ for energy recovery (4) (kt)	Method	EF	Method	EF
5.B.1. Composting	24			0.2	0.0144						
5.B.1a. Municipal solid waste	24			0.2	0.0144						
5.B.1b. Other (please specify) (5)	NO			NO	NO						
Industrial waste [IPCC Software 4.B]	NO			NO	NO						
Sludge [IPCC Software 4.B]	NO			NO	NO						
Other waste [IPCC Software 4.B]	NO			NO	NO						
5.B.2. Anaerobic digestion at biogas faci...	12			0.024	NE, NO	NE, NO	NE, NO				
5.B.2a. Municipal solid waste	12			0.024	NE	NE	NE				
5.B.2b. Other (please specify) (5)	NO			NO	NO	NO	NO				
Industrial waste [IPCC Software 4.B]	NO			NO	NO	NO	NO				
Sludge [IPCC Software 4.B]	NO			NO	NO	NO	NO				
Other waste [IPCC Software 4.B]	NO			NO	NO	NO	NO				

Annotations: Two purple callouts are present. One points to the 'Sector' dropdown with the text 'Select sector'. The other points to the 'Table5.B' tab with the text 'Select category/table'.

Summary

- Waste Type Manager helps ensure consistency of data and information used in estimation of GHG emissions from solid waste disposal and treatment categories
- Allows estimation of CH₄ emissions by type of SWDSs
- Provides interoperability with UNFCCC reporting tool for CRT
- Guidebook for Waste sector is under development

Thank you

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

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