



IPCC Inventory Software

IPCC Side-event- IPCC-TFI tools for National GHGs Inventories
UN Climate Change Conference

Katowice, Poland

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ipcc

INTERGOVERNMENTAL PANEL ON climate change



IPCC Inventory Software- Presentation Outline

➤ Part 1:-

- ✓ Overview/Introduction
- ✓ Structure of Software
- ✓ Key functions/features software

➤ Part 2:-

- ✓ How to get started when using IPCC Inventory Software



Part 1: IPCC Inventory Software – Key Functions/Features

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INTERGOVERNMENTAL PANEL ON climate change



Introduction

- IPCC launched the Inventory Software in 2012
- The software implements the 2006 IPCC Guidelines for National Greenhouse Gas Inventories
 - can assist countries in using the IPCC Guidelines
 - presentations explaining the *2006 IPCC Guidelines* and other supporting materials are available at IPCC TFI website

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

- The latest version of the software (version 2.54) implements Tier 2 methods in the *2006 IPCC Guidelines* for Energy, Industrial Processes & Product Use and Waste sectors. Available at <http://www.ipcc-nggip.iges.or.jp/software/index.html>

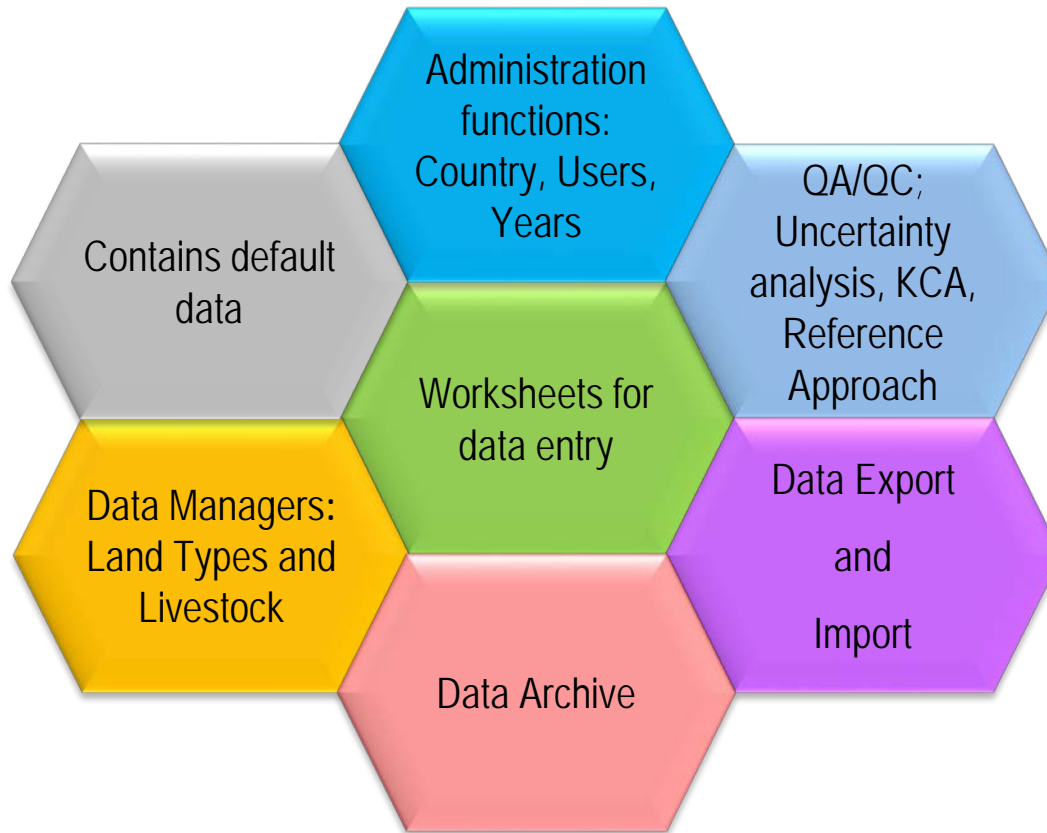
Introduction

- Development to implement Tier 2 methods for the AFOLU sector is underway and includes Wetland Supplement (at Tier 1)
- Agriculture sector - Tier 2 implementation for livestock categories was completed in 2018, new version of software with Tier 2 for livestock categories is expected first quarter of 2019.
- Work on implementation of Tier 2 for LULUCF categories is due to start (December –January)
- Implementation of Wetlands Supplement, is an extension to 2006 IPCC Guidelines dealing with new methodologies for calculating and reporting emissions for inland/coastal, drained/rewetted lands under Land Use sector (at Tier 1)

IPCC Inventory Software

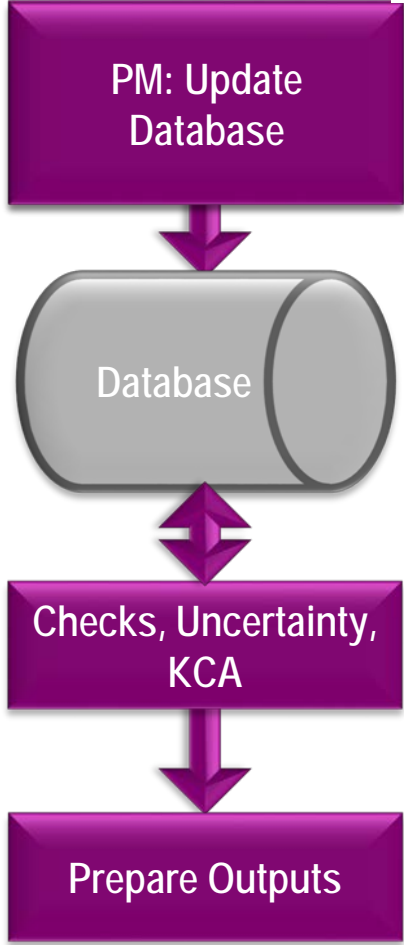
- Database based and stand alone software
- Does not require internet access or expensive hardware
- Can be used for the whole inventory or just individual categories
- Allows different parts of inventory to be developed simultaneously
- Can be used for reporting under the *Revised 1996 Guidelines* or *2006 IPCC Guidelines*
- Aids QA/QC
- FREE

Software Functions



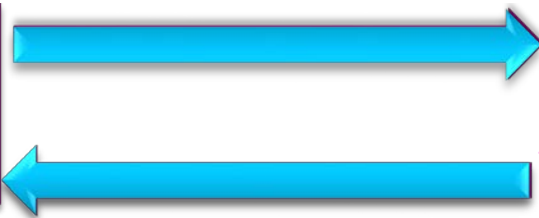
Multiple Users

Project manager

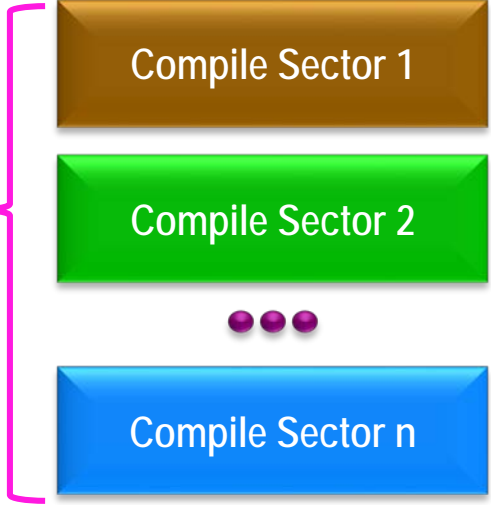


Sectoral Experts

Distribute updated DB (MDB file)



Combine Databases (XML File)



Using XML file will reduce the chances of losing or overwriting the database unintentionally

- 2006 IPCC Categories
- 3.B5 - Settlements
 - 3.B5.a - Settlements Remaining Settlements
 - 3.B5.b - Land Converted to Settlements
 - 3.B5.bi - Forest Land converted to Settlements
 - 3.B5.bii - Cropland converted to Settlements
 - 3.B5.biii - Grassland converted to Settlements
 - 3.B5.biv - Wetlands converted to Settlements
 - 3.B5.bv - Other Land converted to Settlements
 - 3.B6 - Other Land
 - 3.B6.a - Other land Remaining Other land
 - 3.B6.b - Land Converted to Other land
 - 3.B6.bi - Forest Land converted to Other Land
 - 3.B6.bii - Cropland converted to Other Land
 - 3.B6.biii - Grassland converted to Other Land
 - 3.B6.biv - Wetlands converted to Other Land
 - 3.B6.bv - Settlements converted to Other Land
 - 3.C - Aggregate sources and non-CO2 emissions source
 - 3.C.1 - Emissions from biomass burning
 - 3.C.1.a - Biomass burning in forest lands
 - 3.C.1.b - Biomass burning in croplands
 - 3.C.1.c - Biomass burning in grasslands
 - 3.C.1.d - Biomass burning in all other land
 - 3.C.2 - Liming
 - 3.C.3 - Urea application
 - 3.C.4 - Direct N2O Emissions from managed soils
 - 3.C.5 - Indirect N2O Emissions from managed soils
 - 3.C.6 - Indirect N2O Emissions from manure management
 - 3.C.7 - Rice cultivations
 - 3.C.8 - Other (please specify)
 - 3.D - Other
 - 3.D.1 - Harvested Wood Products
 - 3.D.2 - Other (please specify)

Annual CH4 emission from rice

Worksheet

Sector: Agriculture, Forestry and Other Land Use

Category: Rice Cultivations

Subcategory: 3.C.7 - Rice cultivations

Sheet: 1 of 1 Annual CH4 emission from rice

Data

Gas: METHANE (CH4)

Main menu

Category: AFOLU

1990

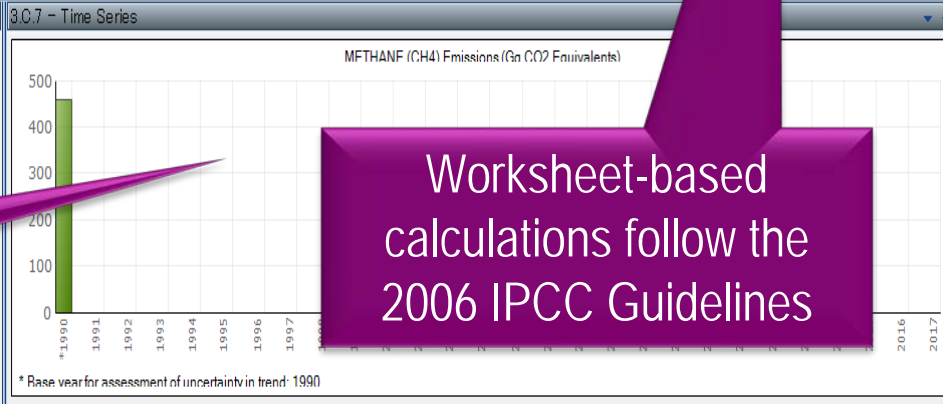
	Equation 2.2	Equation 5.1		Equation 5.2			Equation 5.3			Equation 5.2	Equation 5.1		
		Available area (ha)	Annual harvested area (ha/yr)	Cultivation period (Day)	Baseline emission factor for continuously flooded fields without organic amen	Scaling factor to account for the differences in water regime during the cultivation period	Scaling factor to account for the differences in water regime in the pre-season before the cultivation	Application rate of organic amendment in fresh weight (tonnes / ha)	Conversion factor for organic amendment	Scaling factor for both types and amount of organic amendment applied	Scaling factor for soil type, rice cultivar, etc., if available	Adjusted daily emission factor for a particular harvested area (kg CH4 / (ha Day))	Annual CH4 emission from Rice Cultivation (Gg CH4/yr)
	Rice ecosystem	Subcategories for reporting year			Table 5.11	Table 5.12	Table 5.13		Table 5.14	SF _o = (1 + ROAI * CFOAI) ^{0.59}	SF _{s,r}	EF _i = EFC * SF _w * SF _p * SF _o * SF _{s,r}	CH ₄ = A * t * EF _i * 10 ⁻⁶
		A	t	EFC	SF _w	SF _p	ROAI	CFOAI	SF _o	SF _{s,r}	EF _i	CH ₄	
Irrigated	Rice Cultivation	100000	100000	120	1.3	0.6	1	2	1	1.91206	1	1.49141	17.89688
		100000											7.89688

Data entry

Hierarchical list of categories

Worksheet-based calculations follow the 2006 IPCC Guidelines

Time series display



- 2006 IPCC Categories
 - 3.B5 - Settlements
 - 3.B5.a - Settlements Remaining Settlements
 - 3.B5.b - Land Converted to Settlements
 - 3.B5.bi - Forest Land converted to Settlements
 - 3.B5.bii - Cropland converted to Settlements
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 - 3.B6.a - Other land Remaining Other land
 - 3.B6.b - Land Converted to Other land
 - 3.B6.bi - Forest Land converted to Other Land
 - 3.B6.bii - Cropland converted to Other Land
 - 3.B6.biii - Grassland converted to Other Land
 - 3.B6.biv - Wetlands converted to Other Land
 - 3.B6.bv - Settlements converted to Other Land
 - 3.C - Aggregate sources and non-CO2 emissions source
 - 3.C.1 - Emissions from biomass burning
 - 3.C.1.a - Biomass burning in forest lands
 - 3.C.1.b - Biomass burning in croplands
 - 3.C.1.c - Biomass burning in grasslands
 - 3.C.1.d - Biomass burning in all other land
 - 3.C.2 - Liming
 - 3.C.3 - Urea application
 - 3.D - Other
 - 3.D.1 - Harvested Wood Products
 - 3.D.2 - Other (please specify)

Annual CH4 emission from rice
Worksheet
Sector: Agriculture, Forestry and Other Land Use
Category: Rice Cultivations
Subcategory: 3.C.7 - Rice cultivations
Sheet: 1 of 1 Annual CH4 emission from rice
Data
Gas: METHANE (CH4)

1990

	Equation 2.2	Equation 5.1			Equation 5.2			Equation 5.3		Equation 5.2		Equation 5.1	
		Available area (ha)	Annual harvested area (ha/yr)	Cultivation period (Day)	Baseline emission factor for continuously flooded fields without organic amen	Scaling factor to account for the differences in water regime during the cultivation period	Scaling factor to account for the differences in water regime in the pre-season before the cultivation	Application rate of organic amendment in fresh weight (tonnes / ha)	Conversion factor for organic amendment	Scaling factor for both types and amount of organic amendment applied	Scaling factor for soil type, rice cultivar, etc., if available	Adjusted daily emission factor for a particular harvested area (kg CH4 /(ha Day))	Annual CH4 emission from Rice Cultivation (Gg CH4/yr)
	Rice ecosystem	Subcategories for reporting year			Table 5.11	Table 5.12	Table 5.13		Table 5.14	SF _o = (1+ROAI*CFOAi) ^{0.59}		EF _i = EF _c * SF _w * SF _p * SF _o * SF _{s,r}	CH ₄ = A * t * EF _i * 10 ⁻⁶
			A	t	EF _c	SF _w	SF _p	ROAI	CFOAI	SF _o	SF _{s,r}	EF _i	CH ₄
✓	Irrigated	Rice Cultivation	100000	100000	1.3	0.6	1	2	1	1.91206	1	1.49141	17.89688
Total			100000										17.89688

Notation keys available

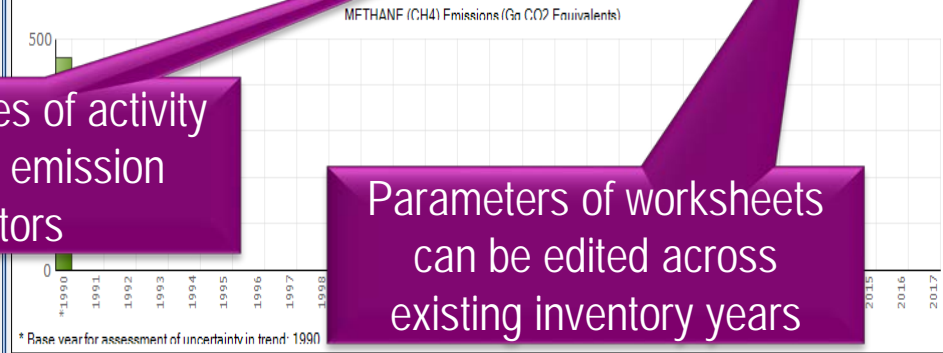
Defaults available: can be overwritten with country specific data

Uncertainties of activity data and emission factors

Parameters of worksheets can be edited across existing inventory years

2006 IPCC Guidelines

Worksheet remarks



Save

Gas METHANE (CH4)

AFOLU Data Managers: Land Type and Livestock

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

2006 IPCC Categories

- 3.B5 - Settlements
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- 3.D - Other
 - 3.D.1 - Harvested Wood Products
 - 3.D.2 - Other (please specify)

Annual CH4 emission from rice

Worksheet

Sector: Agriculture, Forestry and Other Land Use
 Category: Rice Cultivations
 Subcategory: 3.C.7 - Rice cultivations
 Sheet: 1 of 1 Annual CH4 emission from rice
 Data: METHANE (CH4)

Administrate

- Users
- Country/Territory
- CO2 Equivalents
- Delete Inventory...
- AFOLU
 - Land Type Manager
 - Livestock Manager
- Guidelines Information Texts

Equation 2.2	Equation 4.1	Equation 4.2	Equation 5.3	Equation 5.2	Equation 5.1						
Available area (ha)	Annual harvested area (ha/yr)	Cultivation period (Day)	Baseline emission factor for continuous flooded rice cultivation	Scaling factor to account for the differences in water regime during the cultivation period	Scaling factor to account for the differences in water regime in the pre-season before the cultivation	Application rate of organic amendment in fresh weight (tonnes / ha)	Conversion factor for organic amendment	Scaling factor for both types and amount of organic amendment applied	Scaling factor for soil type, rice cultivar, etc., if available	Adjusted daily emission factor for a particular harvested area (kg CH4 / (ha Day))	Annual CH4 emission from Rice Cultivation (Gg CH4/yr)
Rice ecosystem	Subcategories for reporting year	A	Table 5.12	Table 5.13	Table 5.14	SF _o = (1+ROA*CFO/A) ^{0.59}	SF _o	SF _{s,r}	EF _i = EFC * SF _w * SF _p * SF _o * SF _{s,r}	CH ₄ = A * EF _i * 10 ⁻⁶	
Irrigated	Rice Cultivation	100000	100000	1.3	0.6	1	2	1	1.91206	1.49141	17.89688
Total			100000								17.89688

Uncertainties Time Series data entry...

Time Series

METHANE (CH4) Emissions (Gg CO2 Equivalents)

* Base year for assessment of uncertainty in trend: 1990

Save

Gas METHANE (CH4)

Parameters defined here are used in relevant worksheets of AFOLU sector

1990

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

2006 IPCC Categories

- 2.H - Other
 - 2.H1 - Pulp and Paper Industry
 - 2.H2 - Food and Beverages Industry
 - 2.H3 - Other (please specify)
- Agriculture, Forestry, and Other Land Use
- 3.A - Livestock
 - 3.A1 - Enteric Fermentation
 - 3.A1.a - Cattle
 - 3.A1.a.i - Dairy Cows
 - 3.A1.a.ii - Other Cattle
 - 3.A1.b - Buffalo
 - 3.A1.c - Sheep
 - 3.A1.d - Goats
 - 3.A1.e - Camels
 - 3.A1.f - Horses
 - 3.A1.g - Mules and Asses
 - 3.A1.h - Swine
 - 3.A1.j - Other (please specify)
 - 3.A2 - Manure Management
 - 3.A2.a - Cattle
 - 3.A2.a.i - Dairy cows
 - 3.A2.a.ii - Other cattle
 - 3.A2.b - Buffalo
 - 3.A2.c - Sheep
 - 3.A2.d - Goats
 - 3.A2.e - Camels
 - 3.A2.f - Horses
 - 3.A2.g - Mules and Asses
 - 3.A2.h - Swine
 - 3.A2.i - Poultry
 - 3.A2.j - Other (please specify)

Region, Livestock, MMS Associations CH4 Emissions from Manure Management Direct N2O Emissions from Manure Management Systems

Worksheet

Sector: Agriculture, Forestry and Other Land Use

Category: Livestock

Subcategory: 3.A.2.a.i - Dairy cows

Sheet: 1 of 1

Data

A		B			
Region		Average Temperature			
Asia		15			
C	D	E	F	G	
Animal T	Number of Animals N(T) [head]	Typical Animal Mass TAM(T) [kg]	Excretion Rate per mass per day [kg N * (1000kg animal mass) ⁻¹ * day ⁻¹]	Excretion Rate per animal per year Nex(T) [kg N * animal ⁻¹ * yr ⁻¹]	
G = E / 1000 * F * 365					
Dairy cow_A	350000	350	0.47	600425	
H	I	J	K	L	
Manure Management System S	Fraction of manure in system MS(T,S)	Fraction of N Loss FraLossMS [%]	N in organic Bedding (solid storage and deep bedding MMS - otherwise zero) NBeddingMS	Managed Manure N available NMMSAbv [kg N * yr ⁻¹]	
L = (D * G * I) * (1 - J / 100) + (D * I * K)					
Pasture/Range/Paddock	0.2		0	4202975	
Liquid/Slurry	0.3	40	0	3782677.5	
Anaerobic digester	0.3		0	6304462.5	
Solid storage	0.2	40	0	2521785	
*					

Livestock

1990

2006 IPCC Guidelines

Worksheet remarks

3.A.2.a.i - Time Series

NITROUS OXIDE (N2O) Emissions (Gn CO2 Equivalents)

BASE YEAR for assessment of uncertainty in trend: 1990

Gas: NITROUS OXIDE (N2O)

Save

This worksheet is used to define the associations between regions, livestock and manure management systems defined in Livestock Manager

Tools

The screenshot displays the IPCC software interface. The 'Tools' menu is open, showing options: Reference Approach, Uncertainty Analysis, and Key Category Analysis. A purple callout box points to 'Uncertainty Analysis' with the text: "Click 'Uncertainty Analysis'".

The main data table shows CH4 emissions for various livestock categories. A purple callout box points to the 'Uncertainties' button at the bottom right with the text: "Click to enter AD and EF uncertainties".

The 'Uncertainties' dialog box is open, showing settings for Category (3.A1.a.i - Dairy Cows), Activity Data Uncertainties (Lower: -15.00%, Upper: +15.00%), and Emission Factors Uncertainties (Lower: -50.00%, Upper: +50.00%).

The 'Time Series' window shows a bar chart of METHANE (CH4) Emissions (in CO2 Equivalents) from 1990 to 2017. The y-axis ranges from 0 to 700. There are two bars: one at 1990 (approx. 500) and one at 2010 (approx. 650).

Species/Livestock Category	Number (head)	CH4 Emissions (Gg CH4/yr)
Dairy cow_A	350000	23.8
Total		23.8

Category	Activity Data Uncertainties	Emission Factors Uncertainties
3.A1.a.i - Dairy Cows	Lower: -15.00%, Upper: +15.00%	Lower: -50.00%, Upper: +50.00%

Year	METHANE (CH4) Emissions (in CO2 Equivalents)
1990	500
2010	650

Data Export and Import

The screenshot displays a software application window with a menu bar including 'Application', 'Database', 'Inventory Year', 'Worksheets', 'Reports', 'Tools', 'Export/Import', 'Administrative', 'Window', and 'Help'. The 'Export/Import' menu is highlighted. A callout box points to this menu item.

The main application window shows a tree view of '2006 IPCC Categories' on the left, with '3.A - Livestock' selected. The 'Worksheet' pane shows 'Sector: Agriculture, Forestry, and Other Land Use', 'Category: Livestock', 'Subcategory: 3.A.2. Dairy cows', and 'Sheet: 1 of 1'. The 'Data' pane shows a grid with values like 60.0425, 4202975, 3782677.5, 6304462.5, and 2521785. The 'Export - Worksheet Data' dialog box is open, showing a tree view of categories to export, including 3.A.1 - Enteric Fermentation and 3.A.2 - Manure Management. The dialog has 'Export' and 'Close' buttons.

1990

Export - Worksheet Data

2006 IPCC Categories to export

- 3 - Agriculture, Forestry, and Other Land Use
 - 3.A - Livestock
 - 3.A.1 - Enteric Fermentation
 - 3.A.1.a - Cattle
 - 3.A.1.a.i - Dairy Cows
 - 3.A.1.a.ii - Other Cattle
 - 3.A.1.b - Buffalo
 - 3.A.1.c - Sheep
 - 3.A.1.d - Goats
 - 3.A.1.e - Camels
 - 3.A.1.f - Horses
 - 3.A.1.g - Mules and Asses
 - 3.A.1.h - Swine
 - 3.A.1.j - Other (please specify)
 - 3.A.2 - Manure Management
 - 3.A.2.a - Cattle
 - 3.A.2.a.i - Dairy cows
 - 3.A.2.a.ii - Other cattle
 - 3.A.2.b - Buffalo
 - 3.A.2.c - Sheep
 - 3.A.2.d - Goats
 - 3.A.2.e - Camels
 - 3.A.2.f - Horses
 - 3.A.2.g - Mules and Asses
 - 3.A.2.h - Swine
 - 3.A.2.i - Poultry
 - 3.A.2.j - Other (please specify)
 - 3.B - Land
 - 3.B.1 - Forest land
 - 3.B.1.a - Forest land Remaining Forest land
 - 3.B.1.b - Land Converted to Forest land
 - 3.B.1.bi - Cropland converted to Forest Land
 - 3.B.1.bii - Grassland converted to Forest Land
 - 3.B.1.biii - Wetlands converted to Forest Land
 - 3.B.1.biv - Settlements converted to Forest Land

Export/Import worksheet data as XML file.

In this example, worksheet data for category 3A for year 1990 will be exported.

Inventory Years

The screenshot displays the IPCC Inventory Software interface. The main window shows a worksheet for 'CH4 Emissions from Enteric fermentation' for the year 2010. The 'Sector' is 'Agriculture, Forestry and Other Land Use', 'Category' is 'Livestock/Enteric Fermentation', and 'Subcategory' is '3.A.1.a.i - Dairy Cows'. The 'Gas' is 'METHANE (CH4)'. A 'New inventory' dialog box is open, allowing the user to create a new inventory year (2011) or copy data from an existing year (2010). A 'Worksheet remarks' dialog box is also open, providing instructions on how to use the inventory year selection.

Inventory Year

- Create new year
- Select year

CH4 Emissions from Enteric fermentation

Worksheet: 2010

Sector: Agriculture, Forestry and Other Land Use
Category: Livestock/Enteric Fermentation
Subcategory: 3.A.1.a.i - Dairy Cows
Sheet: 1 of 1

Data
Gas: METHANE (CH4)

New inventory

Create new Inventory Year

New Inventory Year: 2011

Create empty inventory year
 Copy data from inventory year: 2010

Create Cancel

CH4	
CH4 Emissions (Gg CH4/yr)	
CH4 = N(T) * EF(T) * 10 ⁻⁶	
68	3094
	3094

IPCC Inventory Software

Inventory Year

Choose the inventory year from the drop-down box below and press OK or press "Create new" to create new Inventory year.

1990

OK Create new...

2014 2015 2016 2017

Save

Gas: METHANE (CH4)

Reports

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

2006 IPCC Categories

- 3.A.1.a.i - Dairy Cows
- 3.A.1.a.ii - Other Cattle
- 3.A.1.b - Buffalo
- 3.A.1.c - Sheep
- 3.A.1.d - Goats
- 3.A.1.e - Camels
- 3.A.1.f - Horses
- 3.A.1.g - Mules and Asses
- 3.A.1.h - Swine
- 3.A.1.j - Other (please specify)
- 3.A.2 - Manure Management
 - 3.A.2.a - Cattle
 - 3.A.2.a.i - Dairy cows
 - 3.A.2.a.ii - Other cattle
 - 3.A.2.b - Buffalo
 - 3.A.2.c - Sheep
 - 3.A.2.d - Goats
 - 3.A.2.e - Camels
 - 3.A.2.f - Horses
 - 3.A.2.g - Mules and Asses
 - 3.A.2.h - Swine
 - 3.A.2.i - Poultry
 - 3.A.2.j - Other (please specify)
- 3.B - Land
 - 3.B.1 - Forest land
 - 3.B.1.a - Forest land Rem...
 - 3.B.1.b - Land Converted to Agriculture
 - 3.B.1.bi - Cropland converted to agriculture
 - 3.B.1.bii - Grassland converted to agriculture
 - 3.B.1.biii - Wetlands converted to agriculture
 - 3.B.1.biv - Settlements

CH4 Emissions from

Worksheet: CH4 Emissions from

Sector: Livestock/Enteric Fermentation

Category: Livestock/Enteric F...

Subcategory: 3.A.1.a.i - Dairy Co...

Sheet: 1 of 1

Data

Gas: METHANE (CH4)

Export/Import

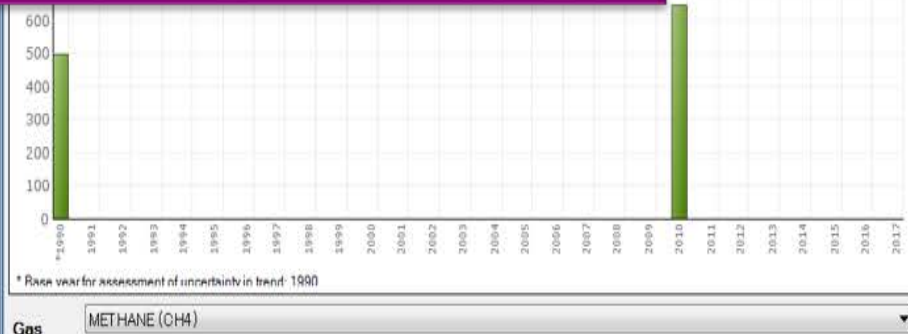
- Export
 - Worksheet Data
 - CO2 Equivalents
 - F-Gases Data
 - NAI Reporting Tables
- Import

T	N(T)	EF(T)	CH4
Species/Livestock C...	Number of Animals (head)	Emission Factor (kg CH4/(head yr))	CH4 Emissions (Gg CH4/yr)
			$CH_4 = N(T) * EF(T) * 10^{-6}$
Dairy cow_A	455000	68	3094
Total			3094

Time Series data entry...

2006 IPCC Guidelines

Can export to non-Annex I (NAI) reporting tables. The format of the NAI reporting tables follows the Tables 1 and 2 in Annex to Decision 17/CP.8 of the UNFCCC (Guidelines for the preparation of National Communications from Parties not included in Annex I to the Convention)



Ongoing Activities

- Organizing expert meetings annually
- Continuing support to users
 - Help Desk:
ipcc-software@iges.or.jp
 - Web Forum:
<https://discussions.zoho.com/ipccinventorysoftware/>
- Work to incorporate Tier 2 methods for AFOLU sector is underway

Part 2: IPCC Inventory Software - Getting Started

Let's get started. – Define ID&PW



You will find this icon on the desktop screen.
Click on it, then you will be requested to define super-user.

IPCC 2006

Welcome to 2006 IPCC Software for National Greenhouse Gas Inventories

The application is being run for the first time.

It is necessary to define superuser. Superuser has full control over database and application and is responsible for defining and managing additional users working with this instance of application.

Please, supply superuser login name and password in the textboxes

Login

Password

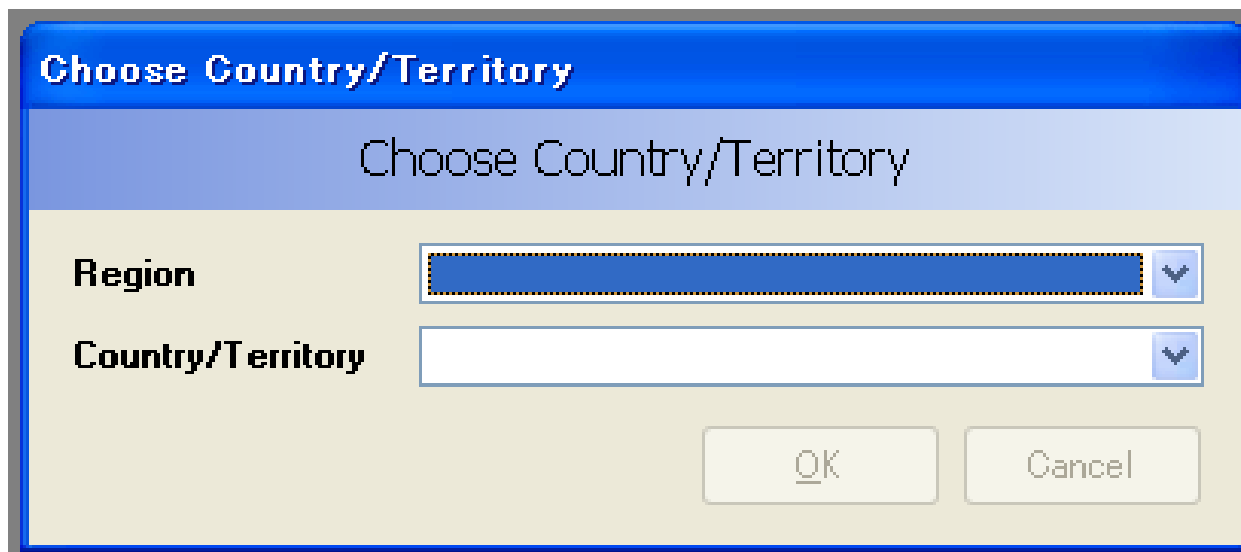
Confirm Password

Password hint

OK Cancel

➤ Do not forget your login name & password!!!

Select Region & Country



Choose Country/Territory

Choose Country/Territory

Region

Country/Territory

- Select your region & country from the dropdown list.

Determine Initial Inventory Year

New inventory

Create new Inventory Year

New Inventory Year 1990

Create empty inventory

Copy data from inventory

1990

1991

1992

1993

1994

1995

1996

1997

Create

Cancel

- Determine the year for which you are going to produce your national GHG inventory.
 - ✓ Determine the initial inventory year first.
 - ✓ The other years can be created later.

- IPCC 2006 Categories
 - 2.F.1.a - Refrigeration and Stations
 - 2.F.1.b - Mobile Air Conditioning
 - 2.F.2 - Foam Blowing Agents
 - 2.F.3 - Fire Protection
 - 2.F.4 - Aerosols
 - 2.F.5 - Solvents
 - 2.F.6 - Other Applications (please specify)
 - Other Product Manufacture and Use
 - 2.G.1 - Electrical Equipment
 - 2.G.1.a - Manufacture of Electrical
 - 2.G.1.b - Use of Electrical Equipme
 - 2.G.1.c - Disposal of Electrical Equi
 - 2.G.2 - SF6 and PFCs from Other Prod
 - 2.G.2.a - Military Applications
 - 2.G.2.b - Accelerators
 - 2.G.2.c - Other (please specify)
 - 2.G.3 - N2O from Product Uses
 - 2.G.3.a - Medical Applications
 - 2.G.3.b - Propellant for pressure an
 - 2.G.3.c - Other (Please specify)
 - 2.G.4 - Other (Please specify)
 - Other
 - 2.H.1 - Pulp and Paper Industry
 - 2.H.2 - Food and Beverages Industry

Emissions from Refrigeration and Air Conditioning

Worksheet

Sector: Industrial Processes and Production

Category: Refrigeration and Air Conditioning

Subcategory: 2.F.1.a - Refrigeration and Stations

Sheet: CHF3 Emissions

Data

Gas: HFC-23 (CHF3) Intro Year: NA EF (%): NA Destroyed (%): NA

A	B	C	D	E	F	G	I
Production (tonnes)	Exports (tonnes)	Imports (tonnes)	Total new agent to domestic market (tonnes)	Agent in retired equipment (tonnes)	Destruction of agent in retired equipment (tonnes)	Release agent in retired equipment (tonnes)	Emissions (tonnes)
			$D = A - B + C$			$G = E - F$	$I = H * EF + G$

F-Gases Data... Series data entry... Uncertainties Import from Excel

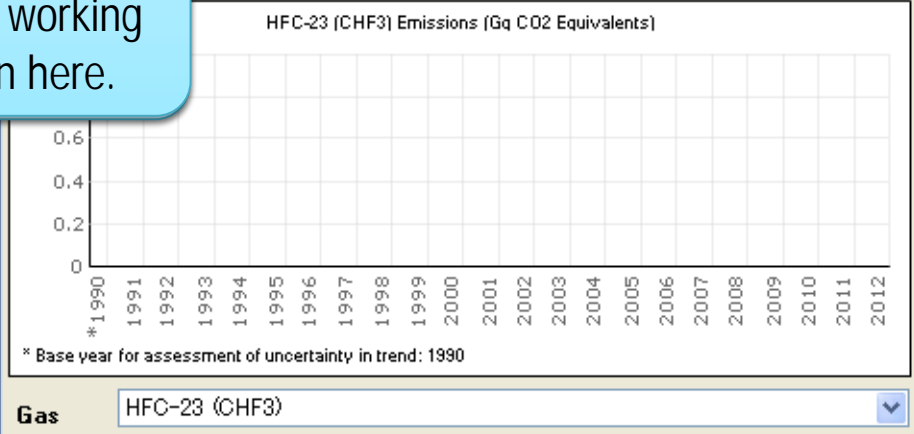
Your login name is shown here.

1995

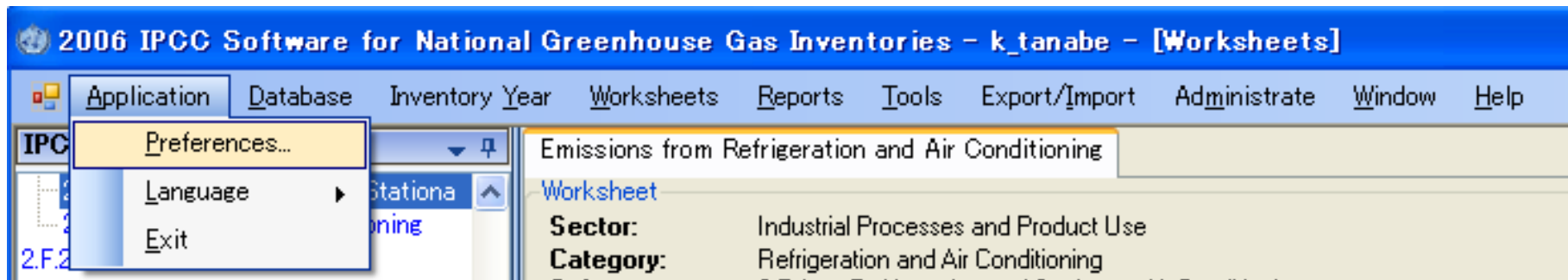
The inventory year you are now working on is shown here.

Your country is shown here.

Worksheet remarks

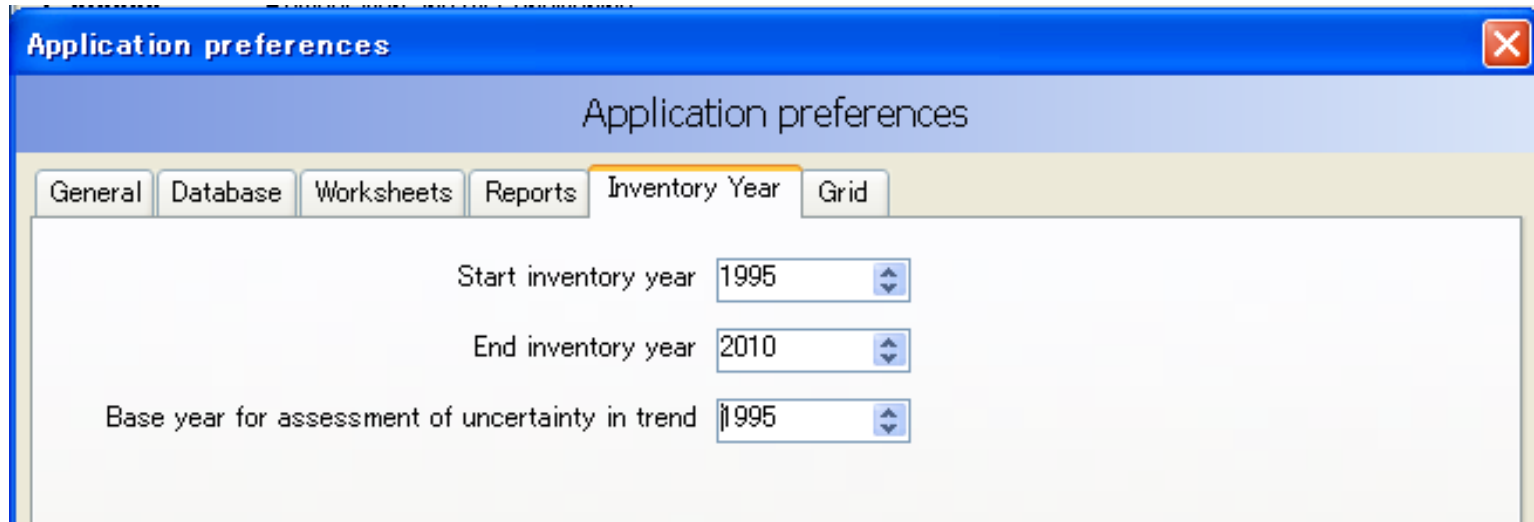


Adjust Configuration As You Like



- You can adjust configuration as you like using the menu "Application" – "Preferences", e.g.:
 - ✓ Appearance of windows
 - ✓ Database management
 - ✓ Default number of decimal places in worksheets and reporting tables
 - ✓ Inventory years (from what year to what year)

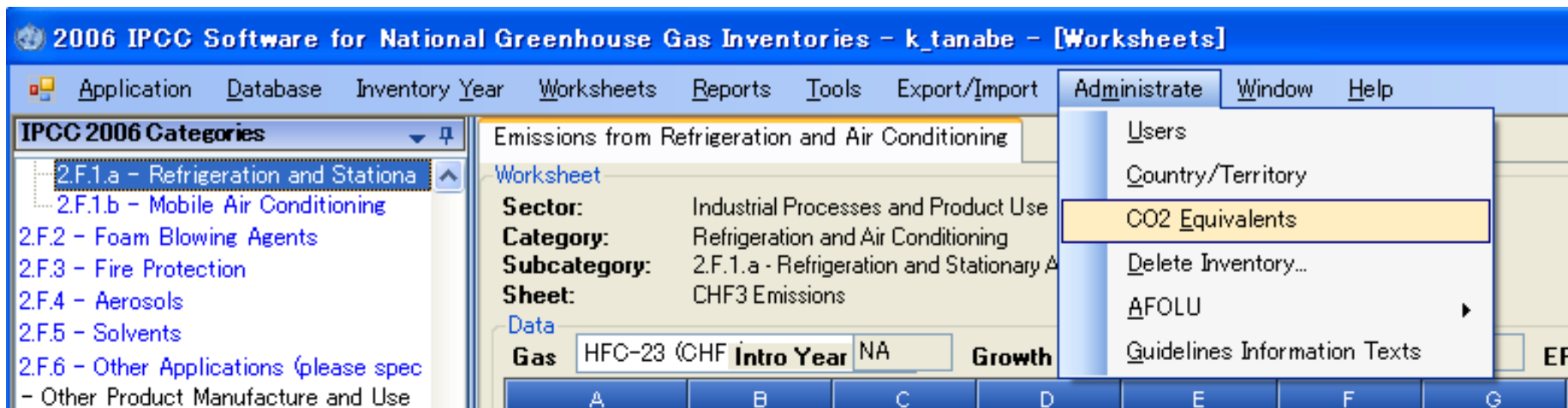
Determine Inventory Years



The screenshot shows a dialog box titled 'Application preferences' with a close button in the top right corner. The dialog has several tabs: 'General', 'Database', 'Worksheets', 'Reports', 'Inventory Year', and 'Grid'. The 'Inventory Year' tab is selected and highlighted with an orange border. Inside this tab, there are three dropdown menus: 'Start inventory year' set to 1995, 'End inventory year' set to 2010, and 'Base year for assessment of uncertainty in trend' set to 1995. At the bottom of the dialog, there are three buttons: 'OK', 'Cancel', and 'Apply'.

- ✓ Base year for assessment of uncertainty trend
 - This is used for uncertainty analysis and key category analysis.
 - This information is not used for this training, but let's set it to be 1995.

Determine CO₂-eq conversion factors



➤ You can select, or even newly define, the CO₂ equivalent conversion factors using “Administrate” – “CO2 Equivalents” menu.

- ✓ According to the current NAI-NC Guidelines (Dec17/CP.8), “20. Non-Annex I Parties wishing to report on aggregated GHG emissions and removals expressed in CO2 equivalents should use the **global warming potentials (GWP)** provided by the IPCC in its **Second Assessment Report** (“1995 IPCC GWP Values”) based on the effects of GHGs over a **100-year time horizon**.”

Determine CO₂-eq conversion factors

CO2 Equivalents

Type: SAR GWPs (100 year time horizon) [Set as default] [Add type...] [Delete type...]

Gas Group: CO2, CH4, N2O

Gas	CO2 Equivalent
CARBON DIOXIDE (CO2)	1
METHANE (CH4)	21
NITROUS OXIDE (N2O)	310

Gas Group: HFCs

Gas	CO2 Equivalent
HFC-23 (CHF3)	11700
HFC-32 (CH2F2)	650
HFC-41 (CH3F)	150
HFC-43-10mee (CF3CHFCHF2CF3)	1300
HFC-125 (CHF2CF3)	2800
HFC-134 (CHF2CHF2)	1000

OK

➤ Let's select "SAR GWPs (100 year time horizon)" as an example.

- IPCC 2006 Categories**
- 2.F.1.a - Refrigeration and Stationary Air Conditioning
 - 2.F.1.b - Mobile Air Conditioning
 - 2.F.2 - Foam Blowing Agents
 - 2.F.3 - Fire Protection
 - 2.F.4 - Aerosols
 - 2.F.5 - Solvents
 - 2.F.6 - Other Applications (please specify)
 - Other Product Manufacture and Use
 - 2.G.1 - Electrical Equipment
 - 2.G.1.a - Manufacture of Electrical Equipment
 - 2.G.1.b - Use of Electrical Equipment
 - 2.G.1.c - Disposal of Electrical Equipment
 - 2.G.2 - SF6 and PFCs from Other Product Manufacture and Use
 - 2.G.2.a - Military Applications
 - 2.G.2.b - Accelerators
 - 2.G.2.c - Other (please specify)
 - 2.G.3 - N2O from Product Manufacture and Use
 - 2.G.3.a - Medical Applications
 - 2.G.3.b - Propellant for pressure equipment
 - 2.G.3.c - Other (Please specify)
 - 2.G.4 - Other (Please specify)
 - Other
 - 2.H.1 - Pulp and Paper Industry
 - 2.H.2 - Food and Beverages Industry
- IPCC 2006 Guidelines

Emissions from Refrigeration and Air Conditioning

Worksheet: 1995

Sector: Industrial Processes and Product Use
Category: Refrigeration and Air Conditioning
Subcategory: 2.F.1.a - Refrigeration and Stationary Air Conditioning
Sheet: CHF3 Emissions

Gas	HFC-23 (CHF3)	Intro Year	NA	Growth Rate (%)	NA	Lifetime (years)	NA	EF (%)	NA	Destroyed (%)	NA
	A	B	C	D	E	F	G	H	I	J	K
	Production (tonnes)	Exports (tonnes)	Imports (tonnes)	Total new agent to domestic market (tonnes)	Agent in retired equipment (tonnes)	Destruction of agent in retired equipment (tonnes)	Release of agent from retired equipment (tonnes)	Bank (tonnes)	Emissions (tonnes)		
				$D = A - B + C$		$F = E * \text{Recovery}$	$G = E - F$		$I = H * EF + G$		

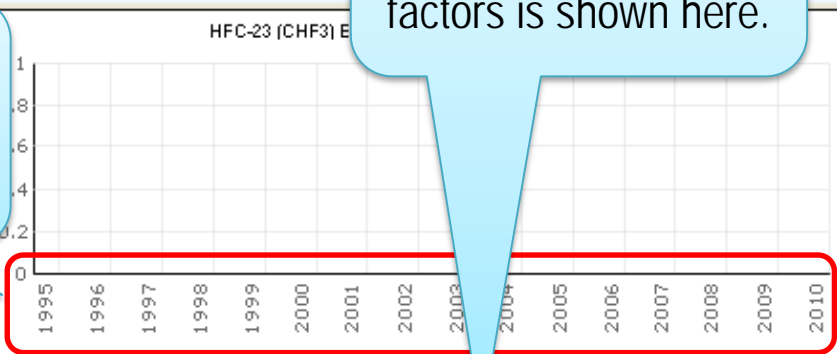
F-Gases Data Time Series data entry...

Worksheet remarks 2.F.1.a - Time Series

Your selection of CO₂ equivalent conversion factors is shown here.

The period from "start inventory year" to "end inventory year" will be in this window.

Base year for uncertainty assessment is shown here.



Gas HFC-23 (CHF3)

Thank you

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