



Partnership on Transparency  
in the Paris Agreement



Ministry of Environment  
Greenhouse Gas Inventory  
and Research Center

# IPCC Inventory Software

Sabino Del Vento – Ricardo

*22/09/2024*

Supported by:



Federal Ministry  
for Economic Affairs  
and Climate Action

Federal Foreign Office

on the basis of a decision  
by the German Bundestag



INTERNATIONAL  
CLIMATE  
INITIATIVE



**United Nations**  
Framework Convention on  
Climate Change



AUSTRALIA



## What is the IPCC Inventory Software?


- Preparation of national GHG Inventories according to 2006 IPCC Guidelines either for complete inventories or for separate categories or groups of categories
- Implementation of Tier1, Tier2 and Tier 3 methodologies in the 2006 IPCC Guidelines and the 2019 Refinement
- The primary target groups of users are inventory compilers who wish to apply default 2006 IPCC Guidelines methods



# Resources and support

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

The screenshot shows the IPCC website's 'Inventory Software' page. The header includes the IPCC logo and the text 'Task Force on National Greenhouse Gas Inventories'. A navigation menu on the left lists various sections, with 'Inventory Software' highlighted. The main content area features a green banner for 'New Version 2.93 – IPCC Inventory Software', followed by a paragraph announcing the release on August 14, 2024. Two download links are provided: 'Ver. 2.93 IPCC Inventory Software - 64bit' and 'Ver. 2.93 IPCC Inventory Software - 32bit'. A red 'Note' section explains that version 2.93 comes in two files and provides a link to a decision tree. Below this, a 'Changes of v2.93' section lists updates such as 'Civil Aviation Tier 2 (Cruise Emissions)', 'Methanol production Tier 3b', and 'Fixes in CRTs and Interoperability functionality'. The page concludes with contact information for reporting issues and a thank-you message.

Home IPCC	<h2>Inventory Software</h2> <h3>New Version 2.93 – IPCC Inventory Software</h3> <p>This is the new version 2.93 of the IPCC Inventory Software released on 14 August, 2024.</p> <ul style="list-style-type: none"><li>Ver. 2.93 IPCC Inventory Software - 64bit</li><li>Ver. 2.93 IPCC Inventory Software - 32bit</li></ul> <p><b>Note</b> Please note that version 2.93 comes in 2 different files for installation. Thus, before downloading the file you shall check which one you actually need by using <a href="#">this decision tree</a>.</p> <p><b>Changes of v2.93</b> The main changes of this version are as follows. For the details, please see the <a href="#">Changelog</a></p> <ul style="list-style-type: none"><li>- Civil Aviation Tier 2 (Cruise Emissions), added disaggregation by aircraft type</li><li>- Methanol production Tier 3b, corrected calculation of weighted average EF</li><li>- Incineration and open burning of waste, revised treatment of bulk waste</li><li>- Fixes in CRTs and Interoperability functionality</li><li>- Removed export of NAI tables</li></ul> <p>If you find any issues in the use of the IPCC Inventory Software, come back to us at <a href="mailto:ipcc-software@iges.or.jp">ipcc-software@iges.or.jp</a> .</p> <p>Thank you very much for your support.</p>
IPCC-TFI Home	
Organization	
Publications	
Emission Factor Database (EFDB)	
Inventory Software	
Meetings	
FAQs	
Links	
Electronic Discussion Group (EDG)	
	



## Manual for inventory compilers (PPT file)



[https://www.ipcc-nggip.iges.or.jp/software/files/IPCC\\_InventorySoftwareUserManual\\_ver1.pptx](https://www.ipcc-nggip.iges.or.jp/software/files/IPCC_InventorySoftwareUserManual_ver1.pptx)



# The IPCC Inventory Software

## Complete



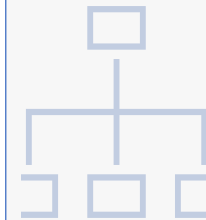
**All IPCC methods** (*all Tiers*)  
and all IPCC approaches



**All sectors and categories of the  
National GHG Inventory**



**Automatically implements  
AR5 GWP100 values**  
(*and allows any other user-specific metric  
to be applied*)




**Cross-cutting elements**  
(*Uncertainty Analysis  
Key Category Analysis*)

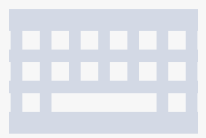


# The IPCC Inventory Software

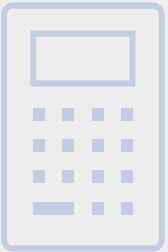
## Easy to Use



**Prepare an inventory using IPCC default methods with minimal efforts**



**All IPCC defaults at your fingertips**



**Avoids methodological and calculation errors**



**Data Managers facilitate data entry**  
*(Fuels, Solid Waste, F-gases, Livestock, Land Representation, Land Use)*



**Have NGHGI estimates ready for Paris Agreement reporting**



# The IPCC Inventory Software Pivotal for National GHG Inventory (NGHGI) Preparation



## Adaptable to national circumstances

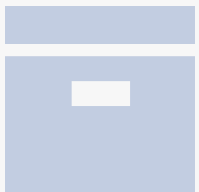
- Allows subnational level of reporting
- Use multiple tiers across inventory, even within a category
- Apply your own country-specific values wherever available



**Organizing framework for data collection among national entities**



**Multiple experts in your country can work on different categories/sectors simultaneously**



**Establishes a single archive, in-country, to help you build for the future**



**Confidence that your inventory is consistent with the 2006 IPCC Guidelines & UNFCCC requirements**



# Calculation Worksheet – Example

IPCC Inventory Software - pavel - [Worksheets]

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

2006 IPCC Categories

- 2.A.3 - Glass Production
- 2.A.4 - Other Process Uses of Carbonates
  - 2.A.4.a - Ceramics
  - 2.A.4.b - Other Uses of Soda Ash
  - 2.A.4.c - Non Metallurgical Magnesia Pro
  - 2.A.4.d - Other (please specify)
- 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 A
  - 2.B.5 - Carbide Production
  - 2.B.6 - Titanium Dioxide Production
  - 2.B.7 - Soda Ash Production
  - 2.B.8 - Petrochemical and Carbon Black Pro
    - 2.B.8.a - Methanol
    - 2.B.8.b - Ethylene
    - 2.B.8.c - Ethylene Dichloride and Vinyl C
    - 2.B.8.d - Ethylene Oxide
    - 2.B.8.e - Acrylonitrile
    - 2.B.8.f - Carbon Black
  - 2.B.9 - Fluorochemical Production
    - 2.B.9.a - By-product emissions
    - 2.B.9.b - Fugitive Emissions
  - 2.B.10 - Other (Please specify)
- 2.C - Metal Industry
  - 2.C.1 - Iron and Steel Production
  - 2.C.2 - Ferroalloys Production
  - 2.C.3 - Aluminium production
  - 2.C.4 - Magnesium production
  - 2.C.5 - Lead Production
  - 2.C.6 - Zinc Production
  - 2.C.7 - Other (please specify)
- 2.D - Non-Energy Products from Fuels and Solv
  - 2.D.1 - Lubricant Use
  - 2.D.2 - Paraffin Wax Use
  - 2.D.3 - Solvent Use

Nitric Acid Production - Tier 1 Nitric Acid Production - Tier 2 Capture and storage or other reduction

Worksheet

Sector: Industrial Processes and Product Use  
 Category: Chemical Industry  
 Subcategory: 2.B.2 - Nitric Acid Production  
 Sheet: N2O Emissions from Nitric Acid Production - Tier 2

1990

Equation 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)
	i, j	NAPi	EFi	DFj	ASUFj	E=NAPi*EFi*(1-DFj)*ASUFj	E/1000000
Facility #2	Medium pressure combustion plants	1,250	7	0.99	0.9	953.75	0.00095
Kanagawa	High pressure plants	10,000	9	0.5	1	45,000	0.045
	Plants with NSCRa (all processes)	1,000	2	0.5	1	1,000	0.001
Tokyo	Combined technology	5,000	2	0.5	1	5,000	0.005
	Plants with NSCRa (all processes)	1,000	2	0.6	1	800	0.0008
Total		18,250				52,753.75	0.05275

Uncertainties Time Series data entry...

Worksheet notes

User notes

2.B.2 - Time Series

NITROUS OXIDE (N2O) Emissions (Gg CO2 Equivalents)

\* Base year for assessment of uncertainty in trend: 1990

Save

Country/Territory: Country X | Inventory Year: 1990 | Base year for assessment of uncertainty in trend: 1990 | CO2 Equivalents: AR4 GWPs (100 year time horizon) | Database file: (C:\Users\shermanau\Desktop\pavel\SOFT\IPPU SPEC\7 TESTING 282\Database\_backup\_282\_IPPU\_September.acbdb)





Categories

Worksheets

Sub-divisions

Default or User-defined  
process/technology

Default or User-defined  
EF & parameters

The screenshot shows the IPCC Inventory Software interface. On the left is a tree view of categories, with '2.B.2 - Nitric Acid Production' selected. The main area displays a data table for 'Nitric Acid Production - Tier 2' for the year 1990. The table includes columns for Subdivision, Production process / technology, NAP (tonnes), and various emission factors and parameters. A yellow box highlights the 'Activity Data' (NAP) column, and a brown box highlights the 'GHG emissions' (N2O Emissions) columns. A time series graph at the bottom right shows 'NITROUS OXIDE (N2O) Emissions (Gg CO2 Equivalents)' for the year 1990.

Subdivision	Production process / technology	NAP (tonnes)	EFi (kg N2O/tonne nitric acid produced)	DFj (Fraction)	ASUFj (Fraction)	N2O Emissions (kg) E=NAP*EFi*(1-DFj)*ASUFj	N2O Emissions (Gg) E/1000000
Facility #2	Medium pressure combustion plants	1,250	7	0.99	0.9	953.75	0.00095
Kanagawa	High pressure plants	10,000	9	0.5	1	45,000	0.045
	Plants with NSCRa (all processes)	1,000	2	0.5	1	1,000	0.001
	Combined technology	5,000	2	0.5	1	5,000	0.005
Tokyo	Plants with NSCRa (all processes)	1,000	2	0.6	1	800	0.0008
<b>Total</b>		<b>18,250</b>				<b>52,753.75</b>	<b>0.05275</b>

Activity Data

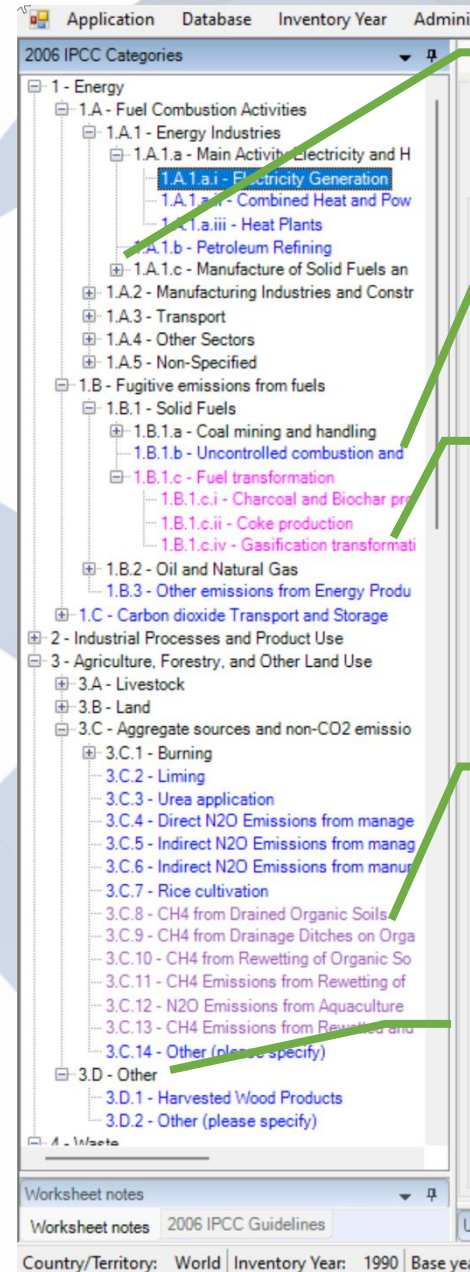
GHG emissions



# 2006 IPCC Categories Navigation Window (tree)

This window contains the full 2006 IPCC Guidelines Category tree structure. The navigation tree is useful to select the category to work with, by clicking on it. The worksheets relevant to the selected IPCC Category will be displayed in the main working area on the right.

Worksheets are available for all IPCC categories that are highlighted in blue, magenta and lilac.



Press **+** to open a subcategory

Blue highlighted categories are from the 2006 IPCC Guidelines

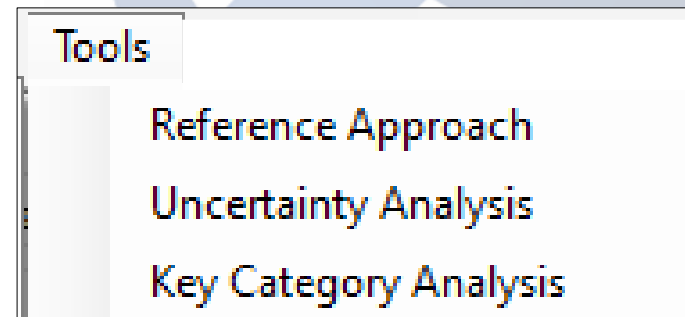
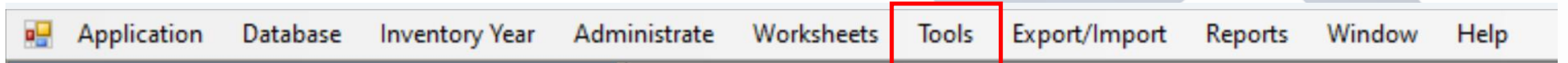
Magenta highlighted categories are from the 2019 Refinement

Lilac highlighted categories are from the Wetlands Supplement

Clicking on the Black "Sector/ Sub-sector" level shows the CO2e time series graph of the "Sector/ Sub-sector".



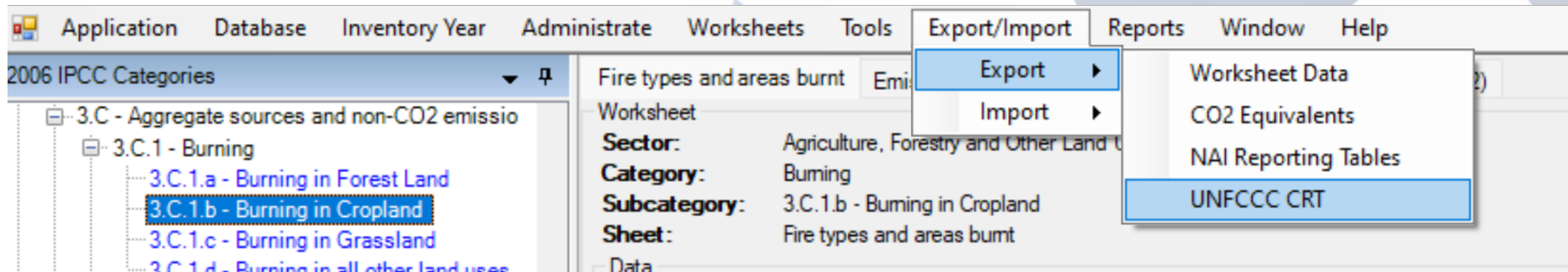
## Tools Menu



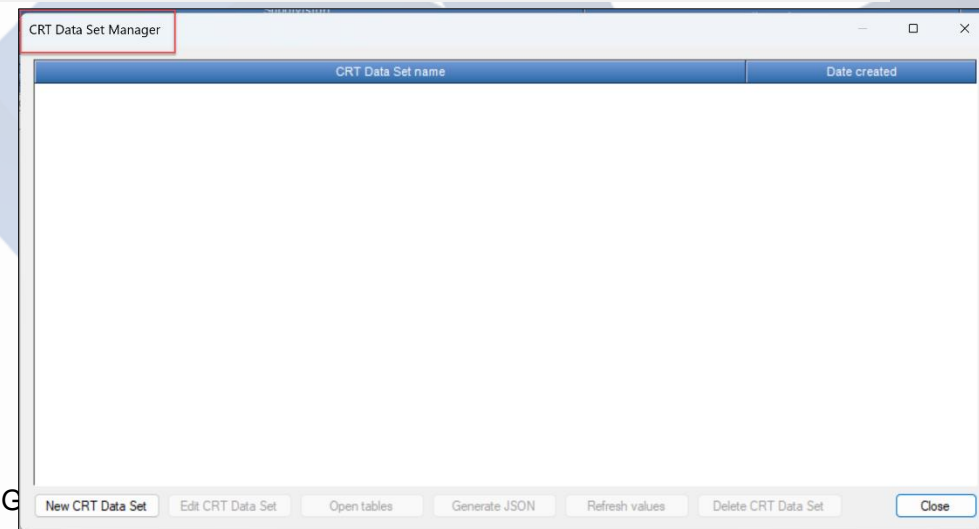


## Access CRT Interface in Software

1. **Navigate** to Main Menu and select “**Export/Import**”
2. **Select** “Export” and “UNFCCC CRT”



This opens the **CRT Data Set Manager** interface





# Additional resources and support

## Support

- | [User Manual \(Ver 2.93\)](#)
- | [Manual for inventory compilers \(PPT file\)](#)
- | Guidebooks
  - | [Energy Guidebook v1.1draft of 2024/04/05](#)
  - | [IPPU Guidebook v1.0 draft of August 2024](#)
  - | [Land Representation Guide v1.2 draft of 2024/04/06](#)
  - | [Livestock Categories 3.A Users' Guidebook v1.0 draf of February 2024](#)
  - | [Waste Guidebook v1.0 draft of 2024/07/06](#)
  - | [UNFCCC CRT Export Guide draft of August 2024](#)

These Guidebooks are still drafts for further improvement. They have been compiled by IPCC TFI TSU, and have not been subject to formal IPCC review processes. Feedback from users on areas of improvements and/or errors identified are most welcome and are to be sent to [ipcc-software@iges.or.jp](mailto:ipcc-software@iges.or.jp)

- | Tools
  - | [IPCC Harvested Wood Products \(HWP\) Upload \(MS-Excel File\)](#)
- | [Unofficial translations in ARABIC and in FRENCH](#) kindly provided by Prof. Sidaty Ould Dah
- | Help Desk: email [ipcc-software@iges.or.jp](mailto:ipcc-software@iges.or.jp)

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



# Additional resources and support

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

**Task Force on National Greenhouse Gas Inventories**

ipcc  
INTERGOVERNMENTAL PANEL ON climate change

WMO UNEP

IPCC web sites

- Home IPCC
- IPCC-TFI Home
- Organization
- Publications
  - 2019 Refinement
  - Wetlands Supplement
  - KP Supplement
  - 2006 IPCC Guidelines
  - GPG-LULUCF
  - Degradation of Forest
  - GPG2000
  - Revised 1996 IPCC Guidelines
  - Technical Bulletins
- Presentations**
- Support to Inventory Compilers
- Emission Factor Database (EFDB)
- Inventory Software
- Meetings
- FAQs
- Links
- Electronic Discussion Group (EDG)

**Publications**

**TFI Presentation**

IPCC TFI at COP28 - December 2023 - Dubai, UAE

UNFCCC side event (4 December) and IPCC TFI events at the IPCC Pavilion (6 and 9 December)

- Software Overview PDF
- Software Interoperability PDF
- Software Waste PDF
- Software Guidebooks PDF
- Work on SLCFs PDF
- EFDB PDF

IPCC TFI Side Event at UNFCCC SB58 jointly organised by the UNFCCC secretariat - 6th June 2023

The Latest Developments of the IPCC Inventory Software for National Greenhouse Gas Inventories

- Overview of the IPCC Inventory Software for National Greenhouse Gas (GHG) Inventories PDF
- IPCC Inventory Software for National GHG inventories – The Land Representation in the (AFOLU) sector PDF
- Interoperability between the UNFCCC Reporting Tools and the IPCC Inventory Software PDF
- IPCC Emission Factor Database PDF
- Agenda PDF

TFI at COP27 - November 2022 Sharm El Sheikh, Egypt

IPCC TFI Side Event jointly organised by the UNFCCC secretariat - 9th November 2022

Launch of the New Generation of the IPCC Inventory Software

- Overview of the IPCC Inventory Software for National Greenhouse Gas Inventories PDF
- IPCC Inventory Software for National GHG inventories – Overview of the Energy Sector PDF
- IPCC Inventory Software for National GHG inventories – Overview of the IPPU Sector PDF
- IPCC Inventory Software for National GHG inventories – Overview of the AFOLU Sector PDF
- IPCC Inventory Software for National GHG inventories – Overview of the Waste sector PDF
- Work on interoperability with the UNFCCC Reporting Tool for CRT PDF
- FAO work on add-ons to the IPCC Inventory Software for the Land Representation PDF

Presentation



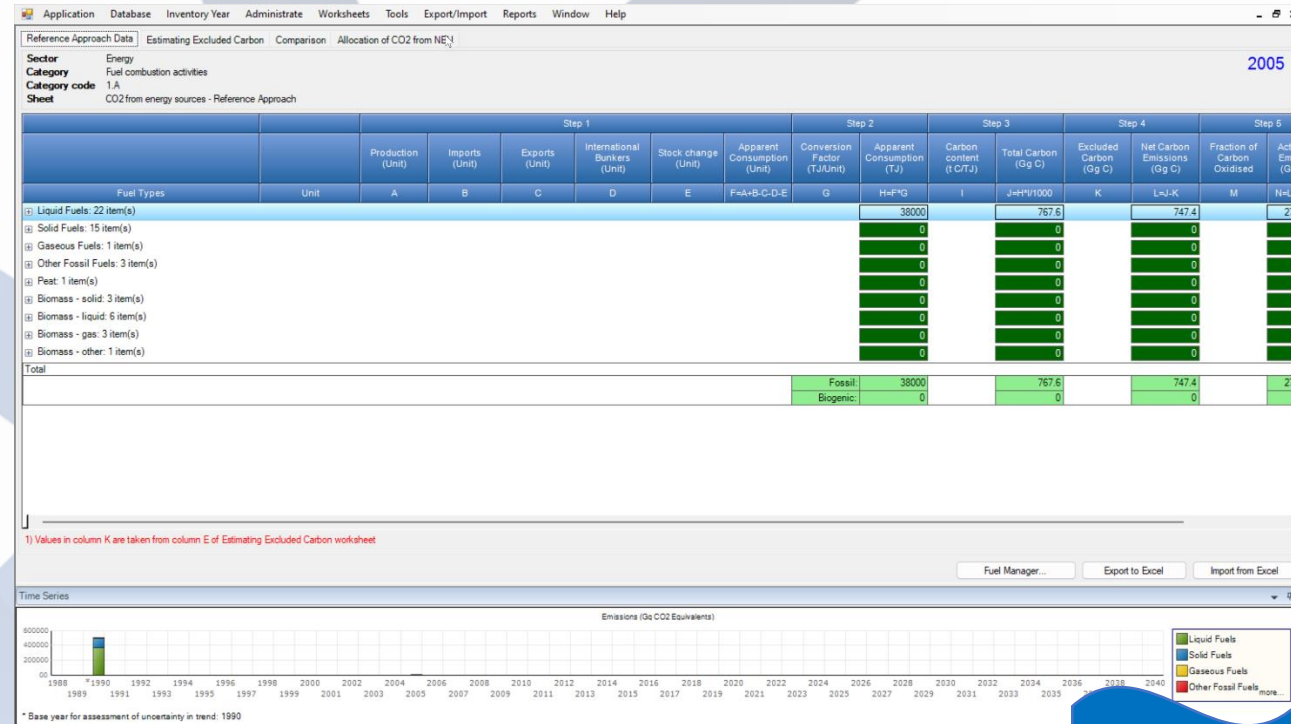


# Thank you



## Tools Menu – Reference approach

- The Reference Approach is a top-down approach, using a country’s energy supply data to calculate emissions of CO2 from combustion of fossil fuels.
- The Reference Approach can be applied using relatively easily available energy supply statistics.
- The Software has 4 TABs to enter data (3 TABS) and calculate results (1 TAB) for the Reference approach, see the Energy Sector Users’ Guidebook.



### For users preparing a GHG inventory for upload to the UNFCCC ETF Reporting Tool:

According to para. 36 of the MPGs, “Each Party should compare the national estimates of CO<sub>2</sub> emissions from fuel combustion with those obtained using the reference approach, as contained in the IPCC Guidelines... ..and report the results of this comparison in its national inventory report.” Thus, information added in the Reference approach tabs is included in the JSON file for upload to the UNFCCC ETF Reporting





## Tools Menu – Uncertainty Analysis

This menu item creates Reporting Table 3.2 as defined in the 2006 IPCC Guidelines. The procedures for the calculations in this table are explained in Volume 1, chapter 3 of the 2006 IPCC Guidelines.

Uncertainty values are not entered here, but in each Worksheet. A user should enter uncertainty values for all activity and emission factors. Default uncertainty values are applied, where available, when the user does not enter any uncertainty values.

There is no limit and no check for uncertainty ranges, i.e. it is the responsibility of the user to define the appropriate values. Default uncertainty values presented in the 2006 IPCC Guidelines are pre-loaded as default upper and lower limits for most categories.

**To perform Uncertainty Analysis,  
click the Refresh Data button**

Uncertainty Analysis - Approach 1 (Table 3.2)								
Base year for assessment of uncertainty in trend		1990	Year T	2005	Refresh Data			
A	B	C	D	E	F	G	H	I
2006 IPCC Categories	Gas	Base Year emissions or removals (Gg CO2 equivalent)	Year T emissions or removals (Gg CO2 equivalent)	Activity Data Uncertainty (%)	Emission Factor Uncertainty (%)	Combined Uncertainty (%)	Contribution to Variance by Category in Year T	Type A Se (%)
<b>1.A - Fuel Combustion Activities</b>								
1.A.1.a.1 - Electricity Generation - Liquid Fuels								
	CO2	252,990	252,990	5,000	6,136	7,915		0,000
	CH4	0,006	0,006	5,000	228,788	228,843		0,000
	N2O	0,001	0,001	5,000	228,788	228,843		0,000

**For users preparing a GHG inventory for upload to the UNFCCC ETF Reporting Tool:**

Decision 5/CMA.3 does not contain a common reporting table for the reporting of uncertainty, therefore data entered in these worksheets are **not** included in the JSON file for upload to the UNFCCC ETF Reporting Tool. Information on the uncertainty analysis is to be included in the NID, consistent with the requirements in paragraphs 29 and 44 of decision 18/CMA.1





# Tools Menu – Key Category Analysis

It is good practice for each country to identify its national key categories in a systematic and objective manner, by performing a quantitative analysis of the relationships between the level and the trend of each category's emissions and removals and total national emissions and removals. Two Approaches for performing the key category analysis have been developed. Both Approaches identify key categories in terms of their contribution to the absolute level of national emissions and removals and to the trend of emissions and removals. **The Software automatically calculates the key category analysis using Approach 1.** The methods are described in Chapter 4.3, Volume 1 of 2006 IPCC Guidelines.

Approach 1: Level Assessment		Approach 1: Trend Assessment					
A	B	C	D	E	F	G	H
IPCC Category code	IPCC Category	Chemical gas	1990-2010 (kg CO <sub>2</sub> e)	1990-2010 (kg CO <sub>2</sub> e)	1990-2010 (kg CO <sub>2</sub> e)	1990-2010 (kg CO <sub>2</sub> e)	Calculated as Total of Column F
2.H	Other	Nitrogen Trifluoride (NF <sub>3</sub> )	193,183,900	193,216,100	0.0904462	0.0904462	0.0904462
		Sulphur Hexafluoride (SF <sub>6</sub> )	140,812,000	141,180,000	0.0660876	0.0660876	0.1565338
		PFC-41 (HFC-138e)	140,713,000	140,806,500	0.0661938	0.0661938	0.2224444
		Nitrogen Trifluoride (NF <sub>3</sub> )	128,050,100	128,544,500	0.0602618	0.0602618	0.2827798
		PFC-23 (HFC-113)	128,763,300	128,836,200	0.0603078	0.0603078	0.3411088
		HFC-125 (HFC-22)	124,000,000	124,000,000	0.0580452	0.0580452	0.4011196
		PFC-6-1H (HFC-23)	94,896,270	94,943,730	0.0444420	0.0444420	0.44880
2.E	Electronic Industry	SF <sub>6</sub> PFCs (HFCs and other HFCs)	88,485,487,594487	88,487,560,70000	0.04140207	0.04140207	0.4870104
2.H	Other	PFC-4-1-10 (HFC-12)	85,482,900	85,517,100	0.04002914	0.04002914	0.521042
		PFC-318 (HFC-227)	76,306,300	76,338,000	0.0367336	0.0367336	0.562776
		HFC-134 (HFC-134a)	66,720,000	66,720,000	0.0312311	0.0312311	0.594000
		Perfluorocyclohexane (C <sub>6</sub> H <sub>11</sub> F <sub>12</sub> )	62,887,400	62,912,500	0.0294468	0.0294468	0.62344
		Perfluorobutane (C <sub>4</sub> H <sub>10</sub> F <sub>8</sub> )	67,912,200	67,927,200	0.0271819	0.0271819	0.65007
		PFC-31 (HFC-18)	59,117,000	59,262,800	0.02581759	0.02581759	0.661446
		HFC-236a (HFC-236a)	48,335,000	48,334,100	0.02364817	0.02364817	0.69006
		H-Codeless (HFC-236a)	46,120,000	46,120,000	0.02112004	0.02112004	0.72012004
1.A.3.a	Other Transported - Gaseous Fuels	NITROUS OXIDE (N <sub>2</sub> O)	42,739,764,768	42,739,764,768	0.0200008	0.0200008	0.740222
2.H	Other	PFC-718 (HFC-227)	36,578,000	36,671,300	0.01644976	0.01644976	0.796836
		HFC-229a (HFC-229a)	33,978,700	33,980,200	0.01547500	0.01547500	0.772295
		HFC-125 (HFC-22)	31,680,300	31,719,000	0.01484757	0.01484757	0.787143
		PFC-81 (HFC-18)	28,702,400	28,817,500	0.01348821	0.01348821	0.800732
		HFC-14 (HFC-14)	26,480,000	26,480,000	0.01182328	0.01182328	0.813116
		HFC-23 (HFC-23)	24,762,000	24,837,300	0.01162606	0.01162606	0.824798
		PFC-116 (HFC-116)	22,122,000	22,217,700	0.01042788	0.01042788	0.836210
1.B.2.a	Oil	NITROUS OXIDE (N <sub>2</sub> O)	21,833,974,310,760	21,833,974,310,760	0.00829008	0.00829008	0.846436
2.H	Other	HFC-236a (HFC-236a)	21,249,300	21,290,600	0.00990095	0.00990095	0.855449
		HFC-245a (HFC-245a)	18,470,700	18,489,200	0.00800664	0.00800664	0.864000
		HFC-134a (HFC-134a)	18,190,900	18,209,100	0.00803511	0.00803511	0.872500
		HFC-226a (HFC-226a)	16,931,500	16,946,470	0.00793362	0.00793362	0.880100
		HFC-245a (HFC-245a)	16,436,700	16,451,700	0.00774238	0.00774238	0.887143
		PFC-71-18 (HFC-18)	15,186,660	15,293,300	0.00715867	0.00715867	0.894000
1.B.1.a	Coal mining and handling	METHANE (CH <sub>4</sub> )	14,627,204,860,021	14,627,204,860,021	0.00689360	0.00689360	0.901700
1.B.1	Other emissions from Energy Production	NITROUS OXIDE (N <sub>2</sub> O)	14,045,000	14,045,000	0.00647433	0.00647433	0.908333
2.H	Other	HFC-134 (HFC-134a)	13,437,760	13,442,300	0.00629218	0.00629218	0.914628
		HFC-227a (HFC-227a)	13,381,300	13,406,300	0.00627960	0.00627960	0.920000
		HFC-43-100a (HFC-43-100a)	13,191,700	13,209,200	0.00618004	0.00618004	0.927000
2.G	Other Product Manufacture and Use	SF <sub>6</sub> PFCs	12,450,218,27,875	12,466,439,27,875	0.0060304	0.0060304	0.932295

**To perform Uncertainty Analysis, click the Refresh Data button**

For users preparing a GHG inventory for upload to the UNFCCC ETF Reporting Tool:

Decision 5/CMA.3 does not contain a common reporting table for the reporting of uncertainty, therefore data entered in these worksheets are **not** included in the JSON file for upload to the UNFCCC ETF Reporting Tool. Information on the uncertainty analysis is to be included in the NID, consistent with the requirements in paragraphs 29 and 44 of decision 18/CMA.1

