



# Overview of the IPCC Inventory Software for National Greenhouse Gas Inventories and its interoperability with UNFCCC CRT

UNFCCC Side Event, UNFCCC COP28

IPCC TFI TSU

# IPCC Inventory Software

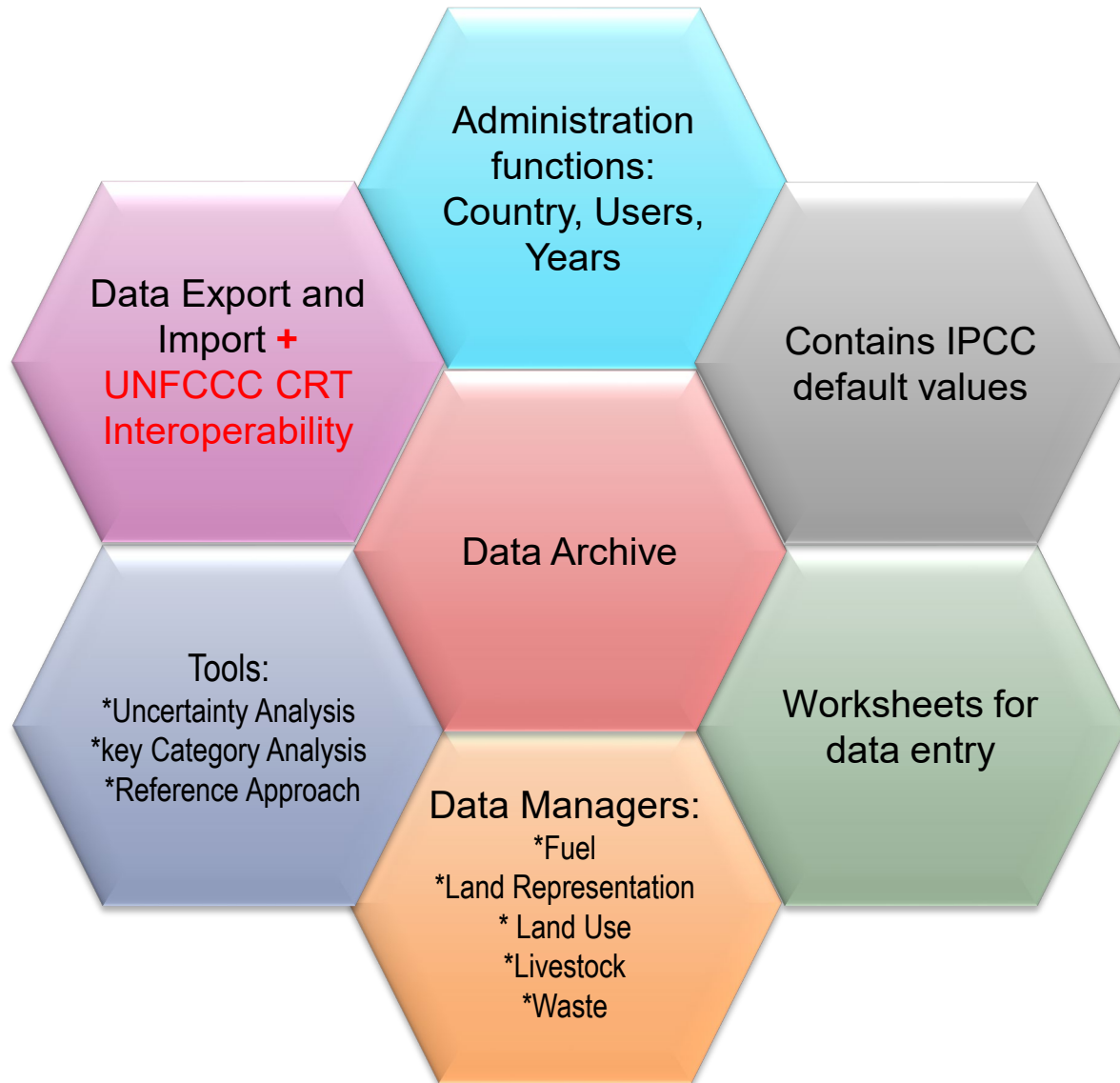
- IPCC Inventory Software was first released in 2012. Initially, it was designed to be a simple tool implementing only Tier 1 methods according to the *2006 IPCC Guidelines*
- Latest version, 2.89, has been released on November 28, 2023, for UNFCCC COP28
- Version 2.89 implements the following:
  - all Methodological Tiers & Approaches according to the *2006 IPCC Guidelines*, and its
    - ✓ *Wetlands Supplement* (in lilac colour)
    - ✓ in addition, some elements of the *2019 Refinement* (in magenta colour) to facilitate Interoperability with the UNFCCC CRT Reporting tool
  - Calculation of Indirect CO<sub>2</sub> and N<sub>2</sub>O emissions according to the *2006 IPCC Guidelines and its 2019 Refinement*
  - Interoperability functionality with the UNFCCC CRT Reporting tool (Energy Sector, Waste sector, Agriculture categories)

# Version 2.89

## ○ More features

- allows **subnational level of reporting** (*e.g., tracking specific activities or regions*)
- allows for each source/sink to use either a **single methodological Tier or a mix of Tiers**
- allows, in each equation, to **input user-specific values for EFs and parameters**
- allows different categories/sectors to be developed simultaneously
- implements **AR5 GWP<sub>100</sub>** values (*and allows any other user-specific metric to be applied*)
- stores the entire set of information of NGHGI within a single database

# Architecture



- MSAccess (ACE OLEDB 12) for WindowsOS
- ACCDB file, *backup function*
- Microsoft .NET Framework 4.6.2
- Password protected  
**NEVER FORGET PASSWORD!**

Categories

Worksheets

Sub-divisions

Default or User-defined  
process/technology

Default or User-defined  
EF & parameters

IPCC Inventory Software - Pavel - [Worksheets]

Application Database Inventory Year Worksheets Reports Tools Export/Import Administrative 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 Production
  - 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 Acid
  - 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
    - 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 Solvents
  - 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

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

Subdivision	Production process / technology	Nitric acid production from technology i (tonnes)	N2O emission factor for technology type i (g 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)
		NAP <sub>i</sub>	EF <sub>i</sub>	DF <sub>j</sub>	ASUF <sub>j</sub>	E=NAP <sub>i</sub> *EF <sub>i</sub> *(1-DF <sub>j</sub> )*ASUF <sub>j</sub>	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

Equation 3.6

Activity Data

Uncertainties Time Series data entry...

2006 IPCC Guidelines

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

Gas NITROUS OXIDE (N2O)

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.accd)

*Example of a worksheet*

# Reporting

[Main Menu](#)

→ **Report**

IPCC Report	Level	Contents
Short summary (IPCC)	1.A	Emissions/Removals
Summary (IPCC)	1.A.1	Emissions/Removals
Sectoral (IPCC)	1.A.1.a.ii (most disaggregated level)	Emissions/Removals
Background (IPCC)	1.A.1.a.ii (most disaggregated level)	AD, Emissions/Removals

[Main Menu](#)

→ **Export**

UNFCCC Report	Level	Contents
NAI 1 & 2 (UNFCCC 17/CP.8)	1.A.1	Emissions/Removals

**Note: All reports can be exported as MS Excel file**

# Ongoing work

- **Paris Agreement requirements**
  - Interoperability with UNFCCC reporting tool for Common Reporting Tables (*Decision 5/CMA.3*), land categories and IPPU sector
- **Other**
  - Notation Keys
  - Time series export/import
  - Uncertainty Analysis
  - Guidebooks

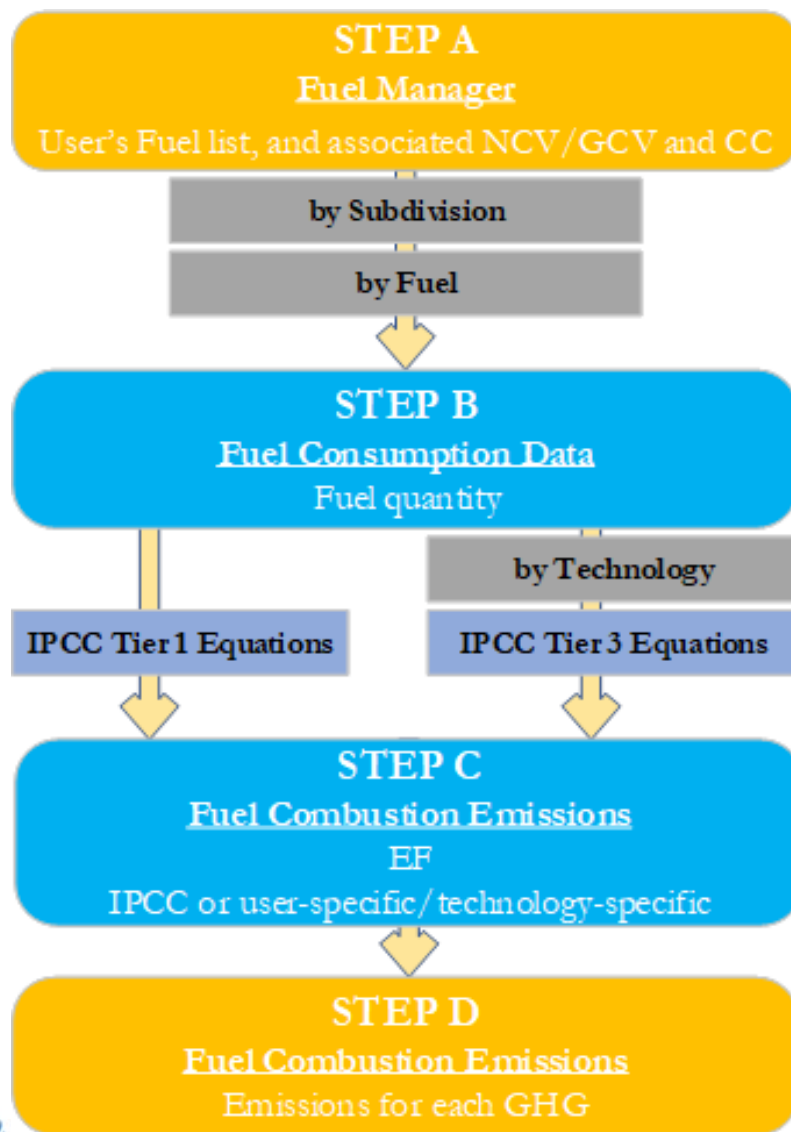


# Guidebook - Scope

- Guide to estimate anthropogenic GHG emissions and removals from each inventory category by implementing all methodological Tiers & Approaches according to the 2006 IPCC Guidelines and its *Wetlands Supplement* with elements of the *2019 Refinement*.
- Software users SHALL be familiar with the IPCC methodologies and read the *Software Manual* (downloadable from the “Help” menu) before going through the Guidebook.
- ✓ *The Guidebook does not replace guidance provided in the IPCC Methodology Reports*



# Guidebook - Structure



- Category by category, the Guidebook shows the workflow of data input and calculation in each worksheet when implementing any of the available IPCC methodological Tiers and Approaches to estimate anthropogenic GHG emissions/removals
- Guidebook Appendices describe the use of multi-category components (e.g., Fuel manager)

# Land Representation

- Land Representation deals with:

- I. Classification of land according to bio-physical -*climate, soil, vegetation*- and socio-economic -*use, management (e.g. age-class)*- **variables** aimed at identifying units of land homogenous for C stocks levels and dynamics [Land use categories/subcategories/subdivisions]

- II. Identification and tracking across the inventory time series of units of land –i.e. *land area homogeneous for variables of interest, including current and historical classification*– [Area data to estimate C stock changes and other GHG emissions]

- It is the most data intensive and thus labour requiring dataset in an NGHGI

# Land Representation Tool

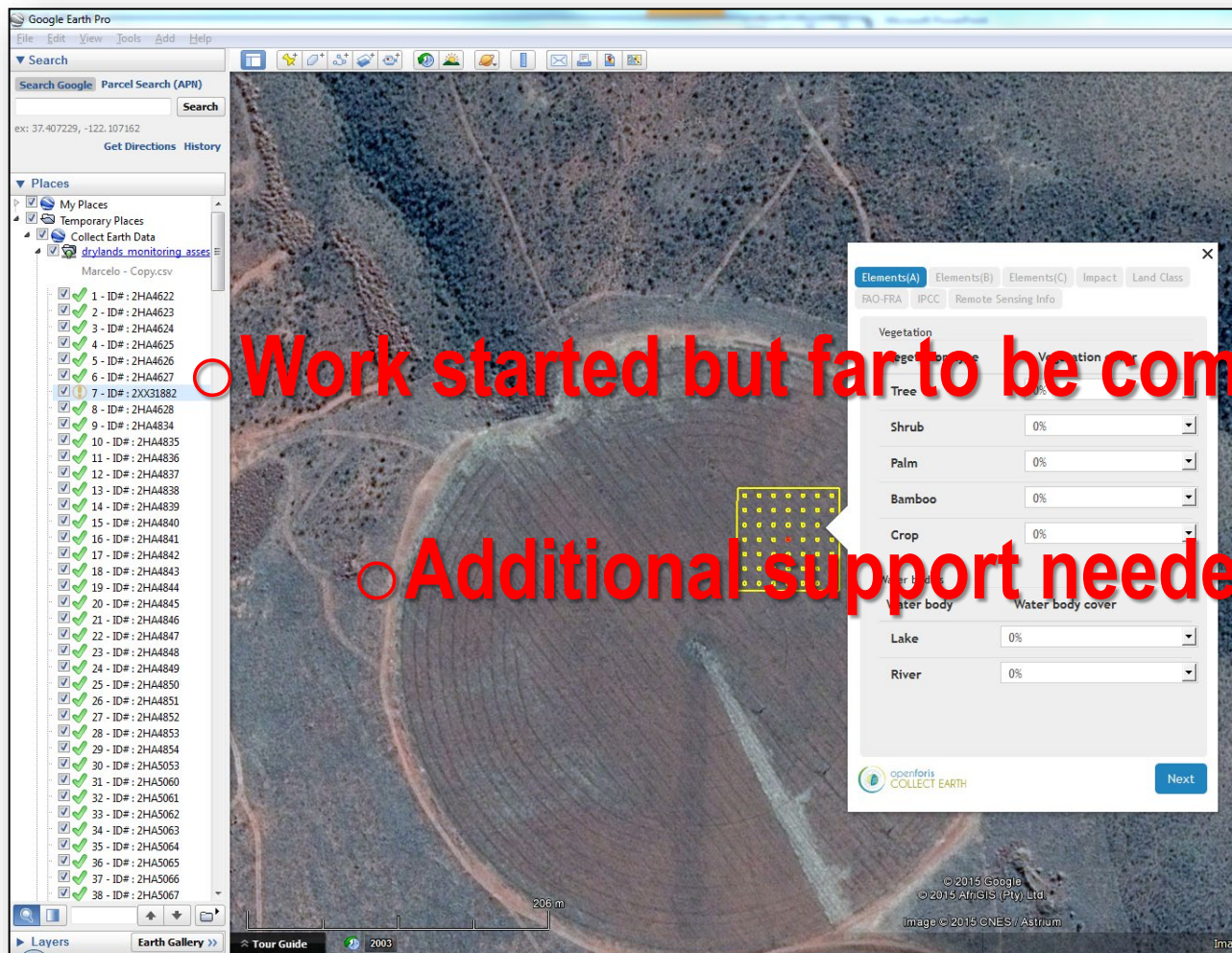
Thus, working on an add-on will provide the following functions:

- I. Customization of mask for data collection;
- II. Collection of sampling data on land cover/use through multi-spectral and multi-temporal analysis of remotely sensed images;
- III. Analysing data collected by producing annual matrices of land use and land-use change (Approach 2) or a dataset of units of land (Approach 3);
- IV. Assessing bias and correcting for it, then calculating standard error of adjusted area data;
- V. Gap-filling the time series of adjusted annual matrices to ensure a complete land representation;
- VI. For each year of the time series, producing the land representation, as activity data for each and every land category, with associated uncertainties;
- VII. Exporting the land representation in a file readily uploadable in the IPCC Inventory software.



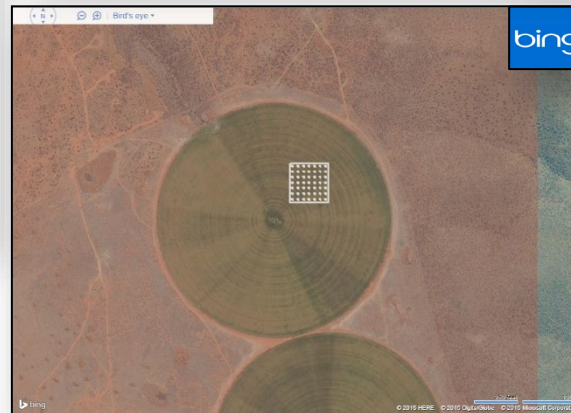
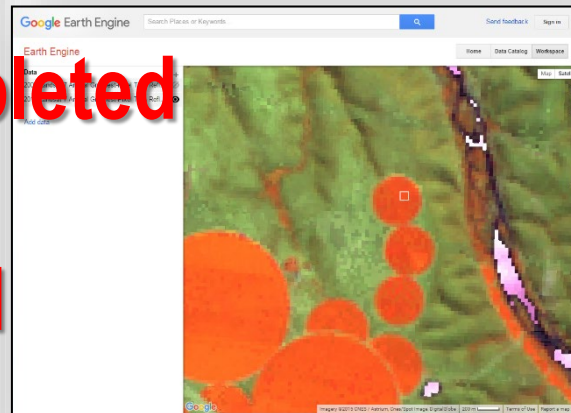


## Land Representation Tool



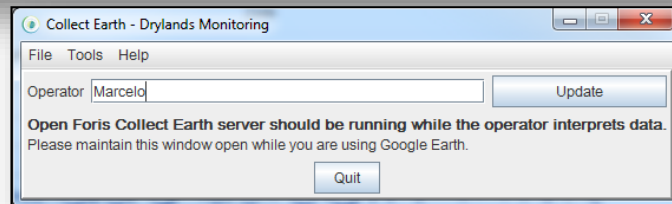
○ Work started but far to be completed

○ Additional support needed



<https://openforis.org/tools/collect-earth/>

<http://www.mdpi.com/2072-4292/8/10/807>



# Download

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

**Task Force on  
National Greenhouse Gas Inventories**

**ipcc**  
INTERGOVERNMENTAL PANEL ON climate change

WMO UNEP

IPCC web sites ▼

**Inventory Software**

**New Version 2.890 – IPCC Inventory Software**

This is the new version 2.890 of the IPCC Inventory Software released on November 27, 2023.

Please note that version 2.890 comes in 2 different files for installation. Thus, before downloading the file you shall check which one you actually need by using [this decision tree](#).

- Ver. 2.890 IPCC Inventory Software - 64bit
- Ver. 2.890 IPCC Inventory Software - 32bit


If you find any issues in the use of the IPCC Inventory Software, come back to us at [ipcc-software@iges.or.jp](mailto:ipcc-software@iges.or.jp).

Thank you very much for your support.

**Important!**

When setting YOUR Password always set YOUR Password Hint too.  
It is highly recommended that you take note of your password and store it in a safe place. In case you lose or forget your password, the IPCC Inventory Software does not have a mechanism to restore your password, this means that you can no longer access your database.

Please note that the IPCC Inventory Software cannot be used with iOS (Apple Computers).



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IPCC honoured with the  
2007 Nobel Peace Prize

- Version 2.89 of the IPCC Inventory Software comes with two alternative installation packages: 32 bit vs. 64bit.
- Please support by using it and reporting any findings to: [ipcc-software@iges.or.jp](mailto:ipcc-software@iges.or.jp)

# Support

- IPCC TFI TSU is supporting the IPCC Inventory Software:
  - User Manual
  - Help Desk: [ipcc-software@iges.or.jp](mailto:ipcc-software@iges.or.jp)
  - Pool of voluntary testers, *to support software development and use*
  - Cooperation with the UNFCCC at training workshops on the use of the IPCC Inventory Software
  - Annual IPCC meetings on feedback from software users, *including issues where support is needed, or software improvements are envisaged*





# Thank you

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

[ipcc-software@iges.or.jp](mailto:ipcc-software@iges.or.jp)

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INTERGOVERNMENTAL PANEL ON climate change

