



Task Force on National Greenhouse Gas Inventories

Software for Inventory Preparation

Regional African Workshops on REDD+ National Forest Monitoring Systems
and Greenhouse Gas National Inventory Systems

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Software for Inventory Preparation

- An electronic tool to help users (inventory compilers) prepare national GHG inventories.

- History

1996: Revised 1996 IPCC Guidelines were published.

1997: IPCC Software for the Workbook (version 1.1) was released.

2000: IPCC Good Practice Guidance 2000 was published.

2002: UNFCCC Guidelines for the preparation of national communications from non-Annex I Parties were adopted at COP8.

2003: IPCC Good Practice Guidance 2003 (LULUCF) was published.

2005: UNFCCC non-Annex I GHG Inventory Software was released.

2006: 2006 IPCC Guidelines were published.

2012: IPCC Inventory Software was published.

Formerly, widely used by Non-Annex I countries

Currently, widely used by Non-Annex I countries

Expected to be used widely

IPCC Software (version 1.1)

- Based on the Revised 1996 IPCC Guidelines
- It contains:
 - **Worksheets** from the *Workbook* (Vol.2)
 - Formulas are built in. (Tier 1/Default)
 - ⇒ Facilitate calculation of GHG emissions/removals
 - **Reporting tables** from the *Reporting Instructions* (Vol.1)
 - Linkages between relevant cells are built in.
 - ⇒ Facilitate reporting in accordance with the Guidelines.

UNFCCC NAI GHG Inventory Software

- Based on the IPCC Software
(= Based on the Revised 1996 IPCC Guidelines)
 - All the spreadsheets in the IPCC Software have been inherited.
 - The same format is used.
 - Errors detected in the IPCC Software have been corrected.
 - ⇒ Those who have been using the IPCC Software can easily familiarize themselves with the UNFCCC Software.

- Equipped with additional features not present in the IPCC Software
 - A new tool for key category analysis based on the IPCC GPGs
 - A new module on LULUCF based on the IPCC GPG-LULUCF
 - Reporting tables contained in the UNFCCC Guidelines for the preparation of national communications from non-Annex I Parties
 - ⇒ Non-Annex I Parties can better meet the reporting requirements under the UNFCCC.

Benefits

- Guides the users calculate emissions/removals in accordance with the Revised 1996 IPCC Guidelines and GPGs
- Helps to avoid potential mistakes/inconsistencies
- Enhance transparency
- Helps to save resources (in particular time)
- Facilitates the reporting to the UNFCCC and the management of data
- Offers a uniform data management system which will be useful in trend analysis

Attention

- When running the UNFCCC Software, the users should read:
 - **Software Manual**
 - **Revised 1996 IPCC Guidelines**
 - GPG2000 [where appropriate]
 - GPG-LULUCF (GPG2003) [where appropriate]

- The UNFCCC Software should be used with the commercial spreadsheet application **Excel 2000 or a later version.**

IPCC Inventory Software

- The IPCC Software implements the 2006 IPCC Guidelines for National Greenhouse Gas Inventories
- However it can also be used for reporting under the 1996 Guidelines
 - This allows countries to utilise the improvements in the methodologies and default values since 1996
- It improves on earlier software
 - It is database based
 - It is stand-alone – does not depend on specific versions of MS Windows or MS Office.
 - Does not require internet access or expensive hardware

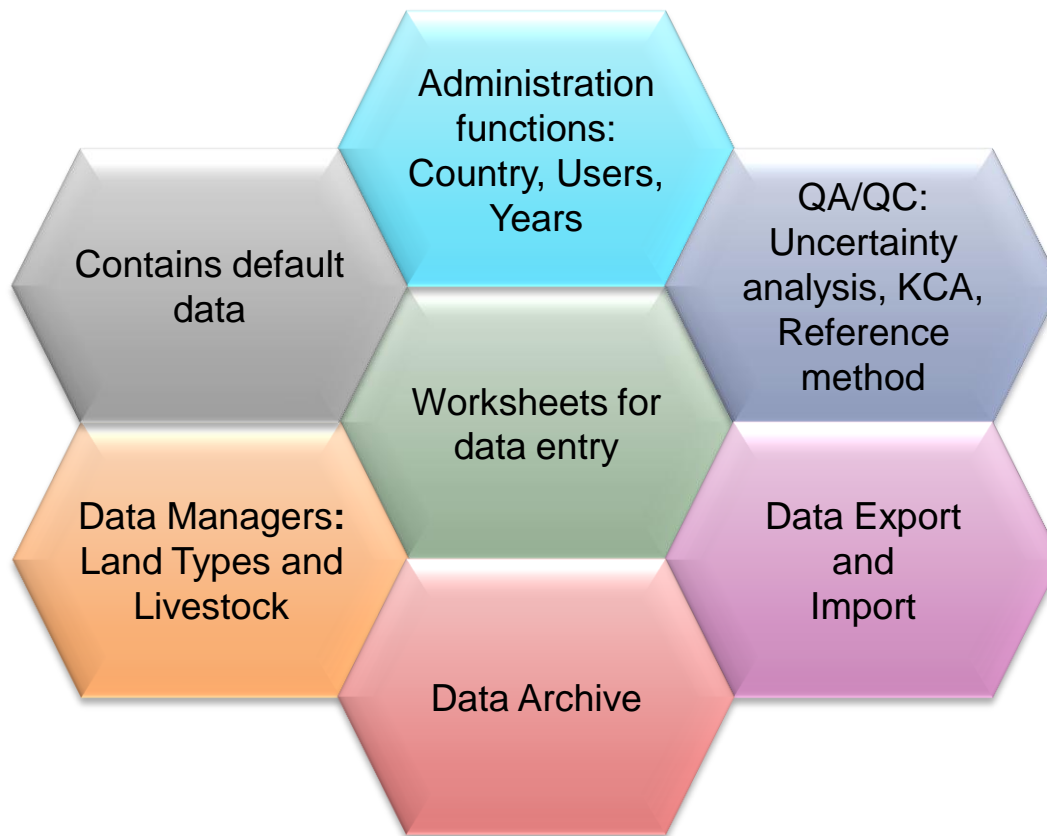
IPCC Guidelines

- IPCC Guidelines consist of:
 1. Methods
 2. Default data
 3. Good Practice Guidance
 4. Reporting Instructions
- 1,2 & 3 can be used whatever reporting is agreed on
 - IPCC or otherwise
- Thus the methods and data in the 2006 Guidelines can be used however emissions and removals are reported
 - 1996 Guidelines, GPG or 2006 Guidelines

IPCC Inventory Software

- Inventory Software that can assist in using the IPCC Guidelines
 - ❖ It can be used for the whole inventory or just individual categories
 - ❖ Can be used when reporting 1996 or 2006 Guidelines
 - ❖ Stand alone software with modest hardware requirements
 - ❖ Includes Uncertainty and Key Category Analysis
 - ❖ Aids QA/QC
 - ❖ Will output in non-Annex 1 National Communications format
 - ❖ Will be developed to include more input/output and reporting options and complete Tier 2 coverage
 - ❖ FREE!

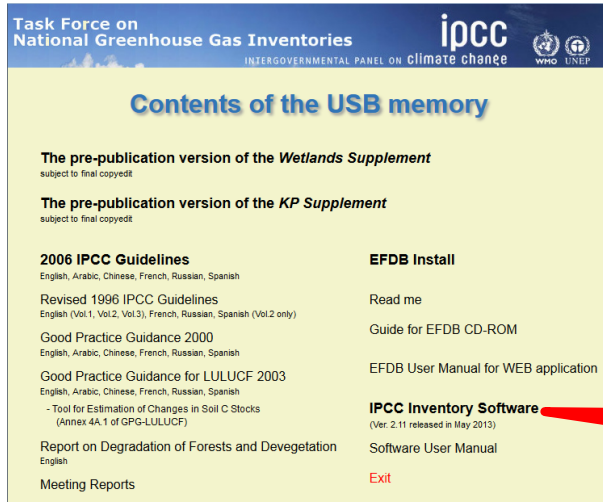
Software Functions



Let's install the latest version

1. Installation file is stored in TFI USB memory

✓ Click “menu.html”



Click “IPCC Inventory Software”

2. Launch the software

✓ Click the icon



Let's install the latest version (2)

3. Initial setting at the first run

- ✓ Superuser (Login name and Password)

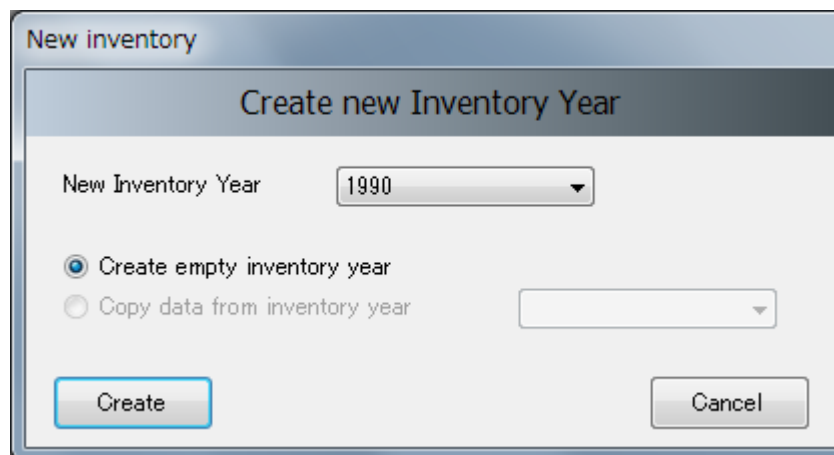


The screenshot shows a dialog box titled "IPCC Inventory Software". The main heading is "Welcome to IPCC Inventory Software". Below this, it states: "The application is being run for the first time. It is necessary to define superuser. Superuser has full control over database and application and is responsible for defining and managing additional users working with this instance of application." The dialog prompts the user to "Please, supply superuser login name and password in the textboxes". There are four input fields: "Login", "Password", "Confirm Password", and "Password hint". At the bottom, there are "OK" and "Cancel" buttons.

Let's install the latest version (3)

3. Initial setting at the first run - continued

- ✓ Country
- ✓ Inventory year



New inventory

Create new Inventory Year

New Inventory Year: 1990

Create empty inventory year

Copy data from inventory year

Create Cancel

- IPCC 2006 Categories
- 1.A.4b - Residential
 - 1.A.4c - Agriculture/Forestry/Fishing/Fish F
 - 1.A.4.c.i - Stationary
 - 1.A.4.c.ii - Off-road Vehicles and Other
 - 1.A.4.c.iii - Fishing (mobile combustion)
 - 1.A.5 - Non-Specified
 - 1.A.5a - Stationary
 - 1.A.5b - Mobile
 - 1.A.5.b.i - Mobile (aviation component)
 - 1.A.5.b.ii - Mobile (water-borne component)
 - 1.A.5.b.iii - Mobile (Other)
 - 1.A.5c - Multilateral Operations
 - 1.B - Fugitive emissions from fuels
 - 1.B.1 - Solid Fuels
 - 1.B.1.a - Coal mine and handling
 - 1.B.1.a.i - Underground mines
 - 1.B.1.a.i.1 - Mining
 - 1.B.1.a.i.2 - Post-mining seam gas emi
 - 1.B.1.a.i.3 - Abandoned underground
 - 1.B.1.a.i.4 - Flaring of drained methan
 - 1.B.1.a.ii - Surface mines
 - 1.B.1.a.ii.1 - Mining
 - 1.B.1.a.ii.2 - Post-mining seam gas em
 - 1.B.1.b - Uncontrolled combustion and burn in
 - 1.B.1.c - Solid fuel transformation
 - 1.B.2 - Oil and Natural Gas
 - 1.B.2.a - Oil
 - 1.B.2.a.i - Venting
 - 1.B.2.a.ii - Flaring
 - 1.B.2.a.iii - All Other
 - 1.B.2.a.iii.1 - Exploration
 - 1.B.2.a.iii.2 - Production and Upgradin
 - 1.B.2.a.iii.3 - Transport
 - 1.B.2.a.iii.4 - Refining
 - 1.B.2.a.iii.5 - Distribution of oil produc
 - 1.B.2.a.iii.6 - Other
 - 1.B.2.b - Natural Gas
 - 1.B.2.b.i - Venting
 - 1.B.2.b.ii - Flaring
 - 1.B.2.b.iii - All Other
 - 1.B.2.b.iii.1 - Exploration
 - 1.B.2.b.iii.2 - Production
 - 1.B.2.b.iii.3 - Processing

Oil and Natural Gas

Worksheet

Sector: Energy
 Category: Fugitive Emissions from Fuels - Oil and Gas Operations
 Subcategory: 1.B.2.a.i - Venting
 Sheet: CO2, CH4 and N2O from fugitive emissions

1994

Industry Segment	Subcategory	Activity	AD	Emission Factor (Gg CO2/Unit for AD)	CO2 Emissions (Gg CO2)	CH4		N2O	
						Emission Factor (Gg CH4/Unit for AD)	CH4 Emissions (Gg CH4)	Emission Factor (Gg N2O/Unit for AD)	N2O Emissions (Gg N2O)
						C=A*B	E=A*D	O=A*F	
Oil Production	Conventional Oil	1000	10 ⁶ Sm ³	95E-05	0.095	0.00072	0.72	0.05	50
	Default Weighted Total	500	10 ⁶ Sm ³	0.0018	0.9	0.00087	4.35	0.05	25
	Heavy Oil / Cold Bitumen	600	10 ⁶ Sm ³	0.0053	3.18	0	0	0	0
	Thermal Oil Production	400	10 ⁶ Sm ³	0.0022	0.88	0.0035	1.4	0.03	12
	Oil Transport	Loading of Off-shore Production on Tanker Ships	300	10 ⁶ Sm ³	0.005	1.5	0.0003	0.09	0.0002
Total					5.763				

Notation Keys Available

Defaults Available: can be over-written with country specific data

Uncertainties

Time Series Data Entry

IPCC 2006 Guidelines

See Table 4.27 'Guidance on obtaining the activity data values required for use in Tier 1 approach to estimate fugitive emissions from oil and gas operations' in Chapter 4, Volume 2 of the 2006 IPCC Guidelines

Worksheet remarks

1.B.2.a.i - Time Series

Year	Emissions (CO2 Equivalents)
1997	
1998	
1999	
2000	
2001	
2002	
2003	
2004	
2005	
2006	
2007	
2008	
2009	
2010	
2011	
2012	

Save

Gas CARBON DIOXIDE (CO2)

Reports

Report	Level	Contents	Export as Excel file
Summary	1.A.1	Emissions	OK
Short summary	1.A	Emissions	OK
Sectoral	1.A.1.a.ii (Most disaggregated level)	Emissions	OK
Background	1.A.1.a.ii (Most disaggregated level)	Activity data Emissions	OK

Tools

- Uncertainty analysis
- Key category analysis

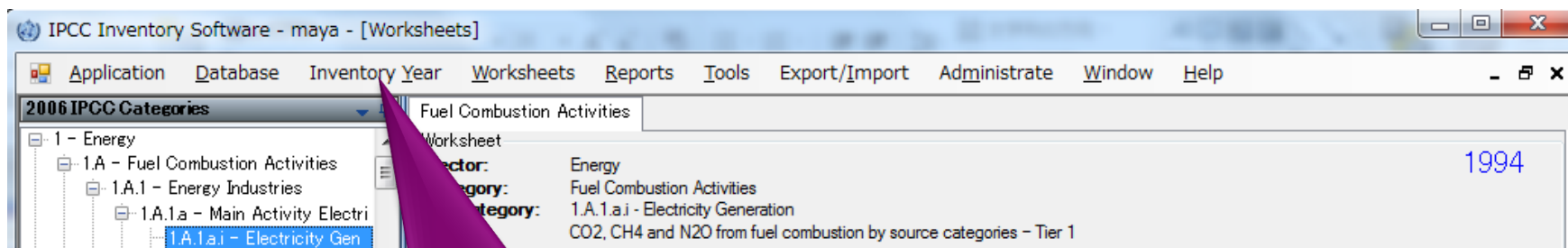
Click Tools –
Uncertainty Analysis

The screenshot shows the 'IPCC Inventory Software - maya - [Uncertainty Analysis]' window. The menu bar includes 'Application', 'Database', 'Inventory Year', 'Worksheets', 'Reports', 'Tools', 'Export/Import', 'Administrate', 'Window', and 'Help'. The main area displays 'Uncertainty Analysis - Approach 1 (Table 3.2)'. Below this, there are dropdown menus for 'Base year for assessment of uncertainty in trend' (set to 1990) and 'Year T' (set to 1994). A table with columns A through F is shown, with headers: '2006 IPCC Categories', 'Gas', 'Base Year emissions or removals (Gg CO2 equivalent)', 'Year T emissions or removals (Gg CO2 equivalent)', 'Activity Data Uncertainty (%)', and 'Emission Factor Uncertainty (%)'. The table contains data for '1.A - Fuel Combustion Activities' and its sub-categories. At the bottom, there are controls for 'Number of decimal places' (set to 3) and a checked 'Zero padding' option. Two buttons are visible: 'Refresh Data' and 'Export to Excel'. A purple callout box points to the 'Tools' menu, and another purple callout box points to the 'Refresh Data' button.

A	B	C	D	E	F
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 (%)
1.A - Fuel Combustion Activities					
1.A.1.a.i - Electricity Generation - Liquid Fuels	CO2	1193.979	635.250	5.000	6.136
	CH4	1.461			28.788
	N2O	4.314			28.788
1.A.1.a.i - Electricity Generation - Solid Fuels	CO2	18345.840			12.412
	CH4	3.891			00.000
	N2O	88.937			22.222
1.A.1.a.iii - Heat Plants - Liquid Fuels	CO2	31.006		5.000	5.000
	CH4	0.027		5.000	5.000
	N2O	0.000	0.000	5.000	5.000

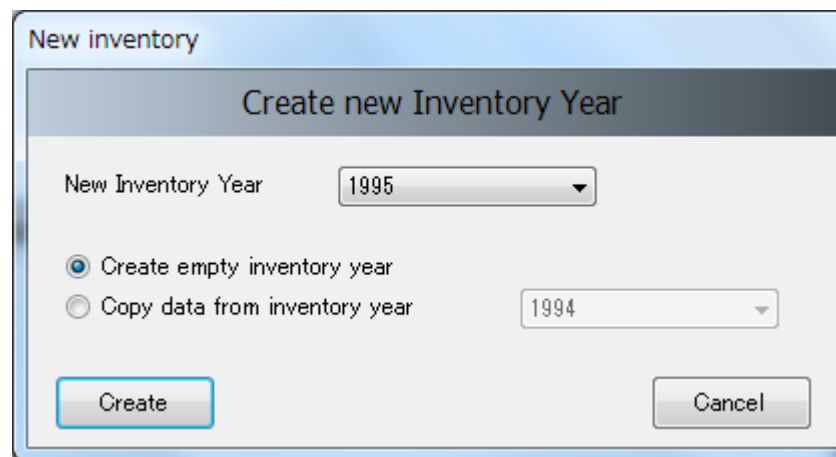
Click "Refresh Data"
to perform analysis

Other basic operations

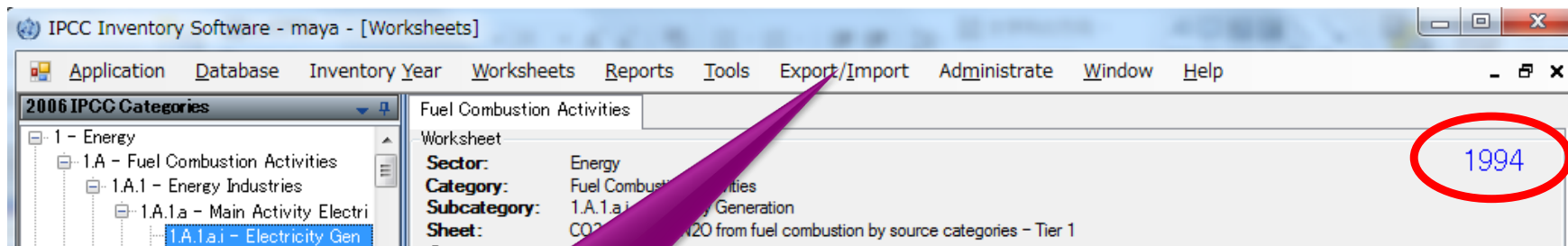


Inventory Year

- Create New year
- Select year

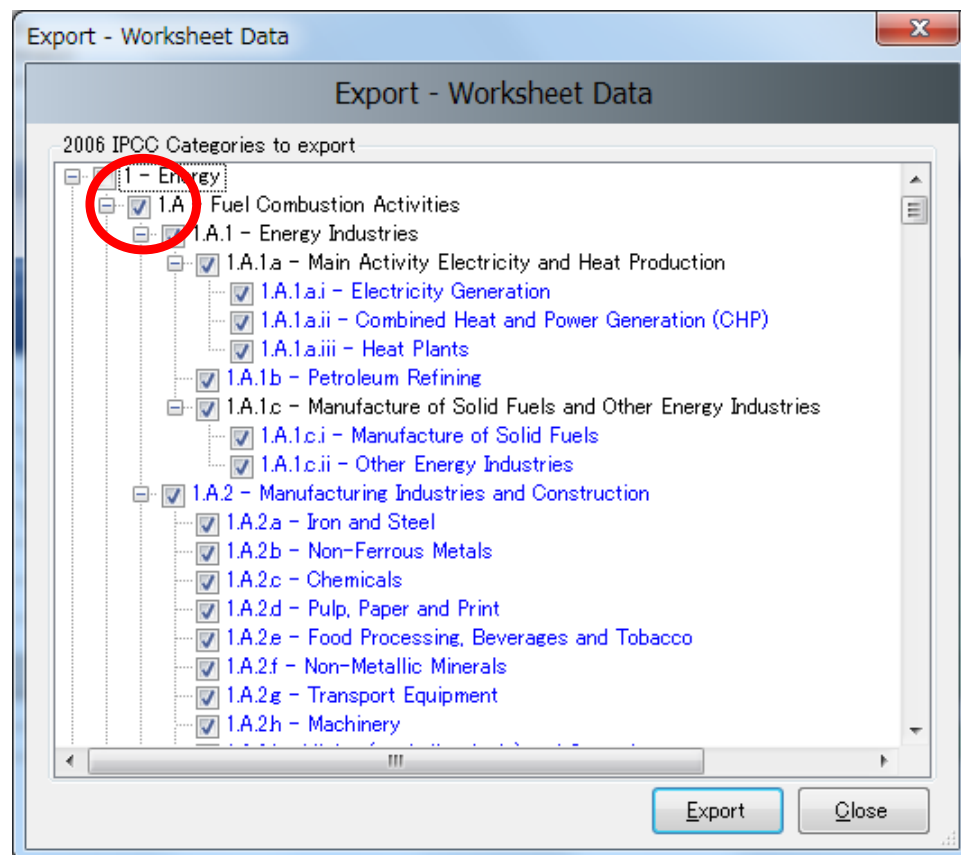


Other basic operations (2)



Export/Import worksheet data as XML file format.

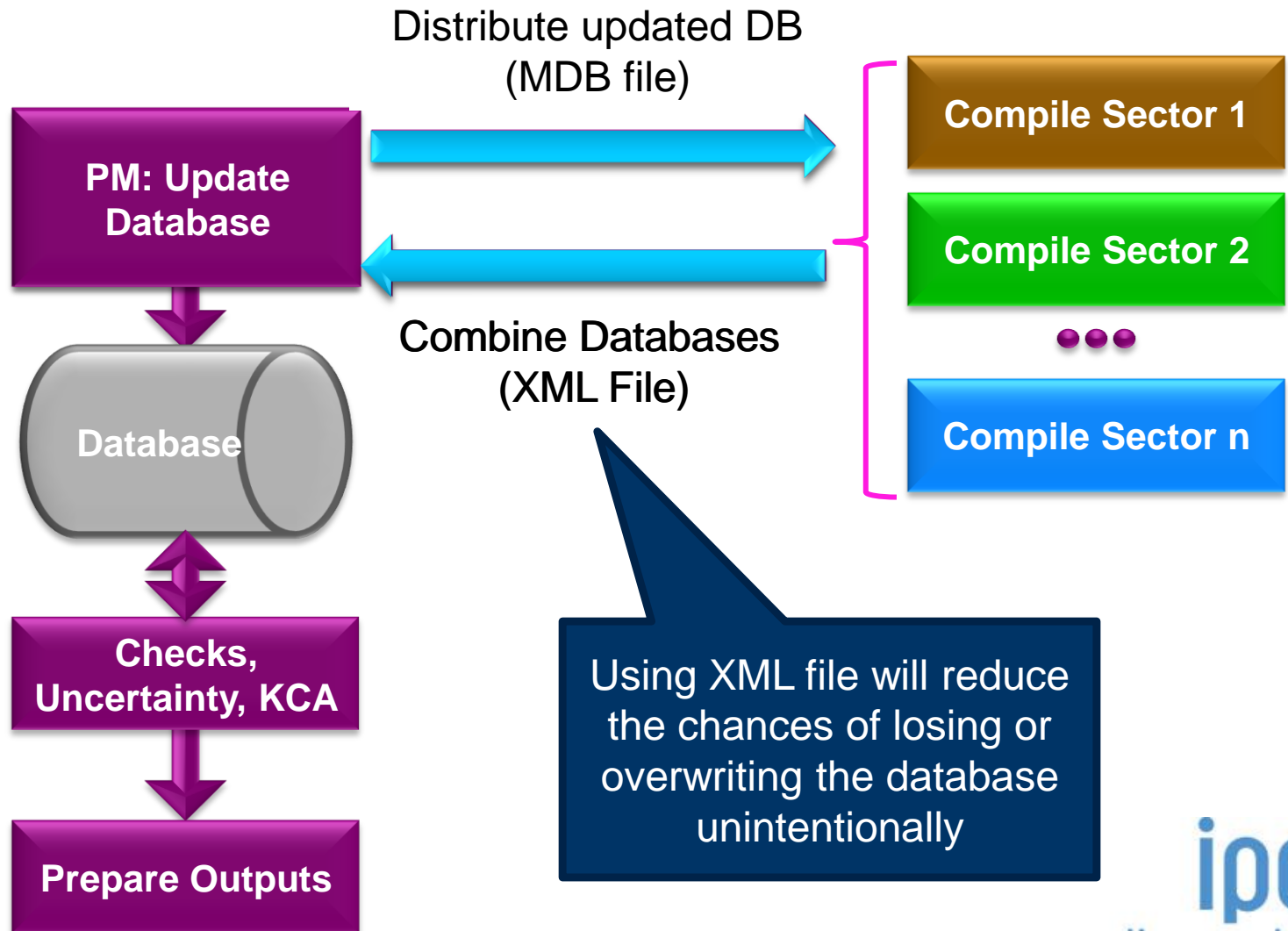
In this example, Worksheet data for category 1A for year 1994 will be exported.



Multiple Users

Project manager

Sectoral Experts(s)



Support

- The TSU is supporting the software:
 - ❖ Help Desk: email ipcc-software@iges.or.jp
 - ❖ Web Forum: <https://discussions.zoho.com/ipccinventorysoftware/>
- TSU will maintain software and is planning to add functions to the software:
 - ❖ Complete Tier 2 coverage
 - ❖ Implement Wetlands Supplement
 - ❖ More output formats



Task Force on National Greenhouse Gas Inventories

Thank you