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## **Introduction of the IPCC tools**

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# Outline

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- IPCC Inventory software
- IPCC EFDB
- Preparation of IPCC Inventory software

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# IPCC software

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# Introduction of the IPCC Inventory Software

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- The IPCC Inventory Software has been developed by the IPCC TSU. The latest version is 2.17 (1<sup>st</sup> March, 2016).
- The IPCC Inventory Software implements the 2006 IPCC Guidelines for National Greenhouse Gas Inventories.
- The software covers Tier.1 methods. Tier.2 methods and Wetlands Supplement are planned but not implemented at this moment.
- Inventory Software can assist inventory compilers in using the IPCC Guidelines
  - It can be used for the whole inventory or just individual categories
  - Stand alone software with modest hardware requirements
  - Includes Uncertainty and Key Category Analysis
  - Aids QA/QC
  - FREE

# Data Entry Sheet

**Main menu**

**Category selected: Energy**

**Data Entry**

**Hierarchical list of categories**

**Worksheet-based calculations follow 2006 Guidelines**

**Time Series Display**

**Status bar contains useful information e.g. country, inventory year**

Fuel	A Consumption (Mass, Volume or Energy Unit)	B Conversion Factor (TJ/Unit) (NVC)	C Combustion Factor (TJ) (CAFE)	D CO2 Emission Factor (kg CO2/TJ)	E Amount Captured (Gg CO2)	F CO2 Emission Factor (Gg CO2) (NVC-2)	G CH4 Emission Factor (kg CH4/TJ) (G-CF-A0)	H N2O Emission Factor (kg N2O/TJ) (G-CF-A0)	I CO2 Equivalent (Gg CO2e) (G-CF-A0)
Anthracite	1000	Ge	20.7	20100	96300	20	0.0	15	0.04
Sub-bituminous	4000	Ge	25.8	77400	94600	75	0.0	2	0.1548
Lignite	5000	Ge		101000	500	35	0.0	15	0.08
Oil shale	500	Ge		101000	47	0	0.0	15	0.00
Gas	600	Ge		99500	12	0.0	0.0	15	0.00
Coal	300	Ge		73000	49	0.0	0.0	06	0.00
				100000	000791	0.00277	0.00000	0.00000	0.00000

Country/Territory: Slovakia Inventory Year: 1994 Base year for assessment of uncertainty in trend: 1990 CO2 Equivalent: SAR GMPs (100 year time horizon) Database file

Source

IPCC-TSU side event, 12.2015

# Data Entry Sheet

**2006 IPCC Software for National Greenhouse Gas Inventories - mayo - (Worksheets)**

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

**IPCC 2006 Categories**

- 1.A.5 - Non-Specified
  - 1.A.5.a - Stationary
  - 1.A.5.b - Mobile
    - 1.A.5.b.i - Mobile (w/air component)
    - 1.A.5.b.ii - Mobile (water-borne compone)
    - 1.A.5.b.iii - Mobile (Other)
  - 1.A.5.c - Multilateral Operations
- 1.B - Fugitive emissions from fuels
  - 1.B.1 - Solid Fuels
    - 1.B.1.a - Coal mining 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 on
    - 1.B.1.b - Uncontrolled combustion and burnin
    - 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.ii - All Other
          - 1.B.2.a.ii.1 - Exploration
          - 1.B.2.a.ii.2 - Production and Upgradin
          - 1.B.2.a.ii.3 - Transport
          - 1.B.2.a.ii.4 - Refining
          - 1.B.2.a.ii.5 - Distribution of oil produc
          - 1.B.2.a.ii.6 - Other
      - 1.B.2.a.iii - Natural Gas
        - 1.B.2.a.iii - Venting
        - 1.B.2.a.iii - Flaring
        - 1.B.2.a.iii - All Other
          - 1.B.2.a.iii.1 - Exploration
          - 1.B.2.a.iii.2 - Production
          - 1.B.2.a.iii.3 - Processing

**Oil and Natural Gas**

Worksheet: 1994

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

**Notation Keys Available**

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)
Oil Production	Conventional Oil	1000	10 <sup>6</sup> Std	95E-05	0.086	0.00072	0.72	0.05	50
		500	10 <sup>6</sup> Std	0.0070	0.0	0.0087	4.8	0.05	25
		600	10 <sup>6</sup> Std	0.0055	3.18	0	0	0	0
		400	10 <sup>6</sup> Std	0.00122	0	0.0035	1.4	0.03	12
		Oil Transport	Loading of Off-shore Production on Tanker Ships	300	10 <sup>6</sup> Std	0.005	1.5	0.0002	0.09
<b>Total</b>					<b>0.763</b>				

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

**Uncertainties**

**Time Series Data Entry**

Worksheet remarks: 1.B.2.a.i - Time Series

Gas: CARBON DIOXIDE CO2

Country/Territory: Slovakia Inventory Year: 1994 Base year for assessment of uncertainty in trend: 1990 CO2 Equivalents: SAR GWPs (100 year time horizon) Database file

Source

IPCC-TSU side event, 12.2015

# NAI Reporting Table

IPCC Inventory Software - maya - [NAI Reporting Tables]

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

NAI Reporting Table 1

Greenhouse gas source and sink categories	Net CO2 (Gg)	CH4 (Gg)	N2O (Gg)	CO (Gg)	NOx (Gg)	NMVOCs (Gg)	SOx (Gg)
<b>Total National Emissions and Removals</b>	55610.091	4600.209	15.494	1.249	0.000	0.000	0.000
<b>1 - Energy</b>	50586.186	505.375	2.268	0.000	0.000	0.000	0.000
<b>1A - Fuel Combustion Activities</b>	44029.577	12.634	2.268	0.000	0.000	0.000	0.000
1A1 - Energy Industries	22398.655	0.379	0.326	0.000	0.000	0.000	0.000
1A2 - Manufacturing Industries and Construction (ISIC)	3837.813	1.246	0.166	0.000	0.000	0.000	0.000
1A3 - Transport	17993.109	11.010	1.777	0.000	0.000	0.000	0.000
1A4 - Other Sectors	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1A5 - Other	0.000	0.000	0.000	0.000	0.000	0.000	0.000
<b>1B - Fugitive Emissions from Fuels</b>	6556.559	492.740	0.000	0.000	0.000	0.000	0.000
1B1 - Solid Fuels	6500.004	480.009	0.000	0.000	0.000	0.000	0.000
1B2 - Oil and Natural Gas	56.555	12.731	0.000	0.000	0.000	0.000	0.000
<b>2 - Industrial Processes</b>	1298.264	0.522	14.16	0.000	0.000	0.000	0.000
2A - Mineral Products	8.935	0.000	0.000	0.000	0.000	0.000	0.000
2B - Chemical Industry	78.678	0.508	14.16	0.000	0.000	0.000	0.000
2C - Metal Production	241.461	0.014	0.000	0.000	0.000	0.000	0.000
2D - Other Production	0.000	0.000		0.000	0.000	0.000	0.000
2E - Production of Halocarbons and Sulphur Hexafluoride				0.000	0.000	0.000	0.000
2F - Consumption of Halocarbons and Sulphur Hexafluoride	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2G - Other (please specify)	969.191	0.000	0.000	0.000	0.000	0.000	0.000
<b>3 - Solvent and Other Product Use</b>	0.000	0.000	9.201	0.000	0.000	0.000	0.000
<b>4 - Agriculture</b>		0.216	0.000	1.249	0.000	0.000	0.000
4A - Enteric Fermentation		0.134		0.000	0.000	0.000	0.000
4B - Manure Management		0.037	0.000	0.000	0.000	0.000	0.000
4C - Rice Cultivation		0.000		0.000	0.000	0.000	0.000
4D - Agricultural Soils			0.000	0.000	0.000	0.000	0.000
4E - Prescribed Burning of Savanna		0.000	0.000	0.000	0.000	0.000	0.000

Number of decimal places: 3  Zero padding

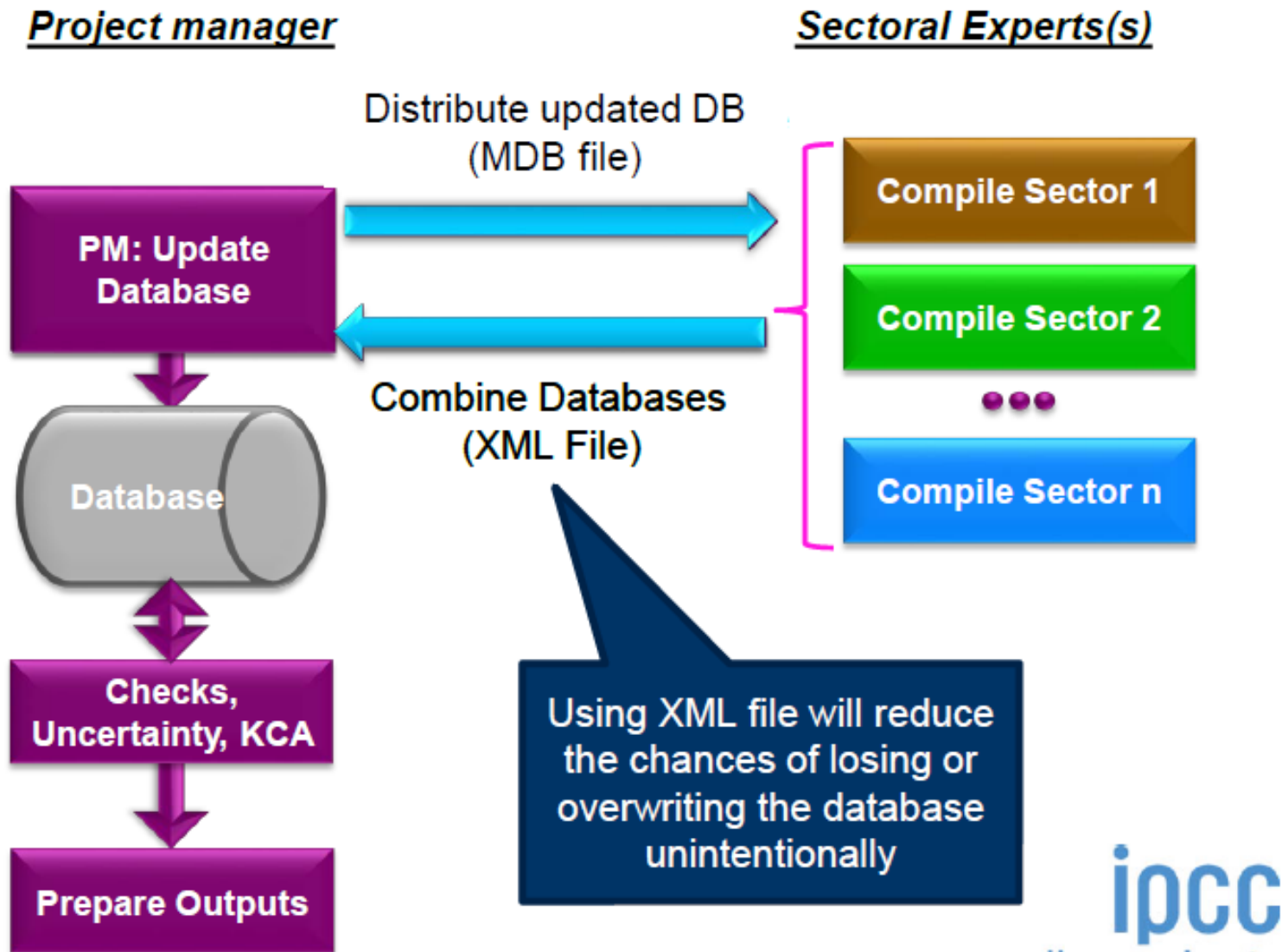
Documentation box

Country/Territory: Slovakia | Inventory Year: 1991 | Base year for assessment of uncertainty in trend: 1990 | CO2 Equivalents: SAR GWPs (100 year time horizon)

Source

IPCC-TSU side event, 12.2015

# Multiple Users



Source

IPCC-TSU side event, 12.2015



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# IPCC EFDB

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# Introduction of the IPCC Emission Factor Data Base

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## Background

- IPCC Guidelines contain global or regional default values (mostly for Tier 1) based on the best science when guidelines were compiled.
- Higher tier estimates need country-specific factors based on:
  - Situation in country, methods, management etc
  - Latest science and best practice elsewhere
  - Latest mitigation being applied
- However
  - it is expensive to measure all these. It would be more efficient to use appropriate literature or experience in similar situations.
  - Emission factors and other parameters may not be easily accessible..

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# Introduction of the IPCC Emission Factor Data Base

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- EFDB is a library
  - Documented Emission Factors (interpreted broadly – all parameters)
    - ◆ Peer reviewed
    - ◆ Non-peer reviewed (government reports, industry studies etc.)
    - ◆ In any language (need English abstract)
  - Available through internet as well as in the form of CDROM
    - ◆ <http://www.ipcc-nggip.iges.or.jp/EFDB/>
  - Data evaluated by Editorial Board
  
- Emission Factors in EFDB are not equal to the default factor. The user must decide if data is suitable in their specific situation

# EFDB snapshot

IPCC NGGIP

Home Find EF Documents Downloads Help

IPCC web sites

Main Page Language: English OK

**Welcome to EFDB!**

- ▶ **Nature of EFDB:** EFDB is meant to be a recognised library, where users can find emission factors and other parameters with background documentation or technical references that can be used for estimating greenhouse gas emissions and removals. **The responsibility of using this information appropriately will always remain with the users themselves.**
- ▶ **Request for data input:** Users are encouraged to provide the EFDB with any relevant proposals on emission factors or other related parameters. If you wish to submit your data for the first time, please contact the [Technical Support Unit](#). Acceptance of such proposals will be subject to evaluation by the EFDB Editorial Board using well-defined criteria.
- ▶ **Terminology:** EFDB is a database on various parameters to be used in calculation of anthropogenic emissions by sources and removals by sinks of greenhouse gases. It covers not only the so-called "emission factors" but also the other relevant parameters. For convenience sake, however, the term "Emission Factor" or its abbreviation "EF" is sometimes used to represent parameters in this database generally.
- ▶ **Software requirements:** It is highly recommended to use Microsoft Internet Explorer version 5.0 or higher for best performance. Alternatively Netscape Navigator version 6.0 or higher can be used. It is also recommended to have Microsoft Office 97 or higher for generating Word and Excel outputs.
- ▶ EFDB at present contains the IPCC default data (IPCC Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories, IPCC Good Practice Guidance for Land Use, Land-Use Change and Forestry, and 2006 IPCC Guidelines for National Greenhouse Gas Inventories), and data from peer-reviewed journals and other publications including National Inventory Reports (NIRs). The old [CORINAIR](#) data have been removed as it is outdated. Information on emissions from local and regional air pollutants can be found from a number of sources including the [Air Pollutant Emission Factor Library](#) and [EMEP/EEA air pollutant emission inventory guidebook](#).

**What's new**

13 May 2016 - Updated offline application of the EFDB (version 2.5) is available [here](#).

# EFDB snapshot

IPCC NGGIP

IPCC web sites

Home

Find EF

Documents

Downloads

Help

## Find EF - Start Page

This is the start page of searching the EFDB for emission factors. You have several options to choose from. The first option is to search EFDB by specifying the criteria such as the IPCC Source/Sink Category, Fuel (if applicable), Gas(es) and fulltext filters. The second one is to search EFDB using FULLTEXT search by specifying the keywords. The last option allows to search for one particular EF by specifying its unique ID.

### **Choose your option:**

- Search by specifying the criteria such as the IPCC Source/Sink Category, Gas and fulltext filters
- Fulltext search using keywords
- Find Emission Factor or other parameter using its unique ID

OK

## Find EF - Search criteria

Click [here](#) for online help.

IPCC Guidelines version:

### IPCC Source/Sink Category

- ▶ 1: Energy
- ▶ 2: Industrial Processes and Product Use
- ▶ 3: Agriculture, Forestry, and Other Land Use
- ▶ 4: Waste
- ▶ 5: Other

### Gases

<input type="text" value="CO2, CH4 &amp; N2O"/> <input type="button" value="OK"/>		
Gas name	Formula	Select gas <input type="checkbox"/>
CARBON DIOXIDE	CO2	<input type="checkbox"/>
METHANE	CH4	<input type="checkbox"/>
NITROUS OXIDE	N2O	<input type="checkbox"/>
		<input type="button" value="Apply"/>

## Find EF - Search criteria

Click [here](#) for online help.

PCC Guidelines version: 2006

### IPCC Source/Sink Category

Root -> Agriculture, Forestry, and Other Land Use (3) -> Aggregate sources and non-CO2 emissions sources on land (3.C)

- 3.C.1: Emissions from biomass burning
- 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)

### Gases

CO <sub>2</sub> , CH <sub>4</sub> & N <sub>2</sub> O <input type="button" value="OK"/>		
Gas name	Formula	Select gas <input type="checkbox"/>
CARBON DIOXIDE	CO <sub>2</sub>	<input type="checkbox"/>
METHANE	CH <sub>4</sub>	<input type="checkbox"/>
NITROUS OXIDE	N <sub>2</sub> O	<input type="checkbox"/>
		<input type="button" value="Apply"/>

# EFDB snapshot

IPCC NGGIP

IPCC web sites

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## Find EF - Results

Click [here](#) for online help.

[Status](#)

- ▶ IPCC 2006 Source/Sink Category: Agriculture, Forestry, and Other Land Use (3) -> Aggregate sources and non-CO2 emissions sources on land (3.C) -> Direct N2O Emissions from managed soils (3.C.4)
- ▶ Gases: N2O

Displayed records: 1 - 10 / 14.



<< B:

Filter													
Active Filters							Europe [x]						
EF ID	IPCC 1996	IPCC 2006	Gas	Description	Technologies / Practices	Parameters / Conditions	Region / Regional Conditions	Abatement / Control Technologies	Other properties	Value	Unit	Data provider	Source of data
43890	4D - Agricultural Soils	3.C.4 - Direct N2O Emissions from managed soils	NITROUS OXIDE	Tentative Default Values for Nitrogen Excretion per Head of Animal per Region	Animal Production	Type of Animal: Non-dairy cattle	Region: Western Europe			70	kg/animal/yr	IPCC	Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories (Table 4-20 on Page 4.99 of the Reference Manual)
						The experimental field with a total area of 4.1 ha was divided into 10 experimental plots of							



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# **Preparation of the IPCC Inventory software**

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# Preparation of the IPCC Inventory software

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- Please refer “IPCC Inventory Software User Manual Version 2.17”
- Could you set the following information.
  - Country: Moldova
  - Inventory year: 2013
  - Start Inventory year: 1990
  - Common Metrics: AR4
  - Users: Superusers at this moment