Supporting GHG inventories and other activities

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Supporting GHG Inventories and Other IPCC Activities

Agenda

Part 1	**Task Force on National Greenhouse Gas Inventories**	
	Introduction	Taka Hiraishi
	Use of FAO Data	Simon Eggleston
	Managed Land	
	Forest Inventories	Nalin Srivastava
	Uncertainty & Verification	Jamsranjav Baasansuren
	EFDB	Kiyoto Tanabe
	Software	Simon Eggleston
	Future Tasks	
	Discussion	Taka Hiraishi & Thelma Krug
Part 2	**AR5 and other ongoing IPCC activities - Renate Christ**	

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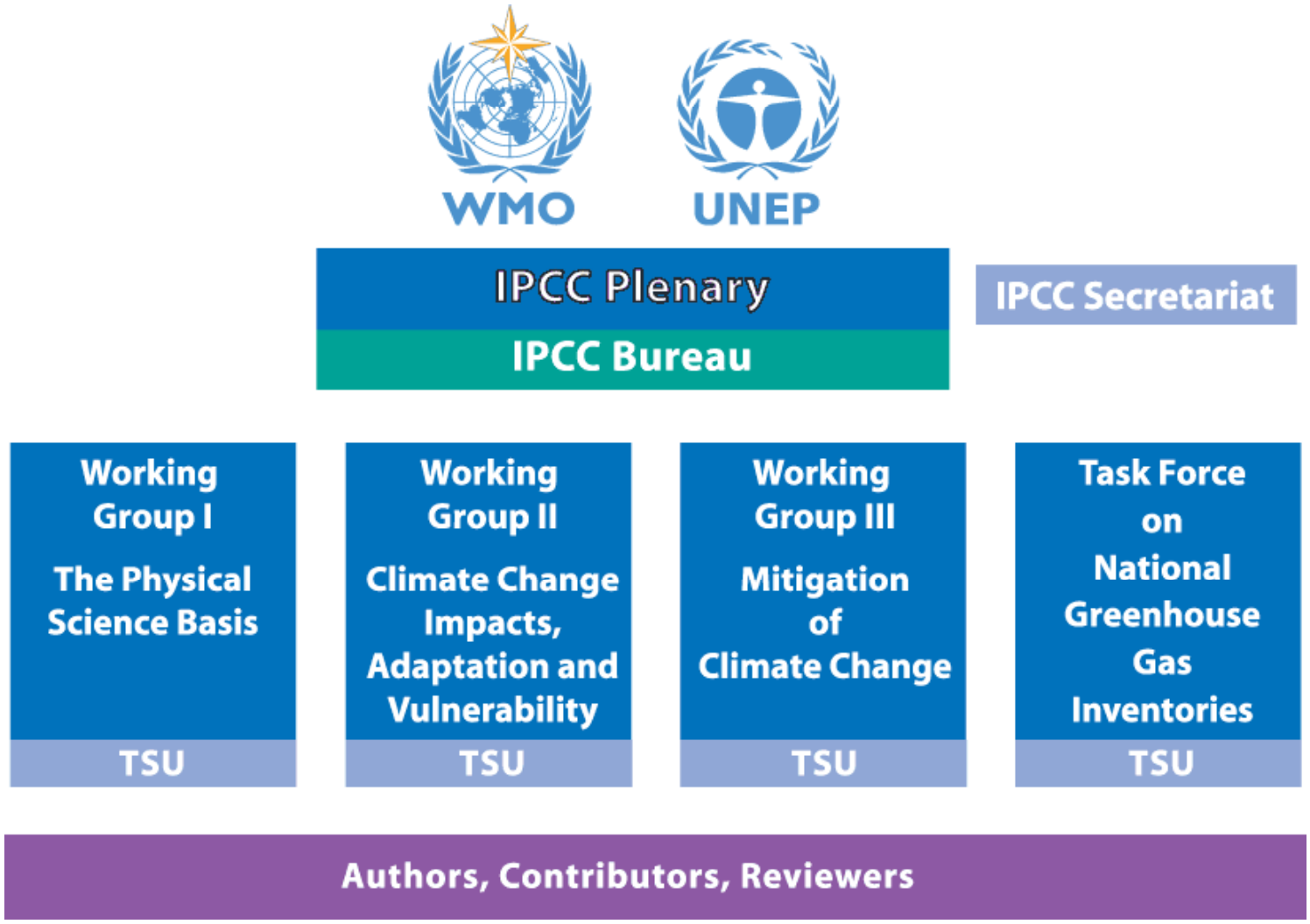

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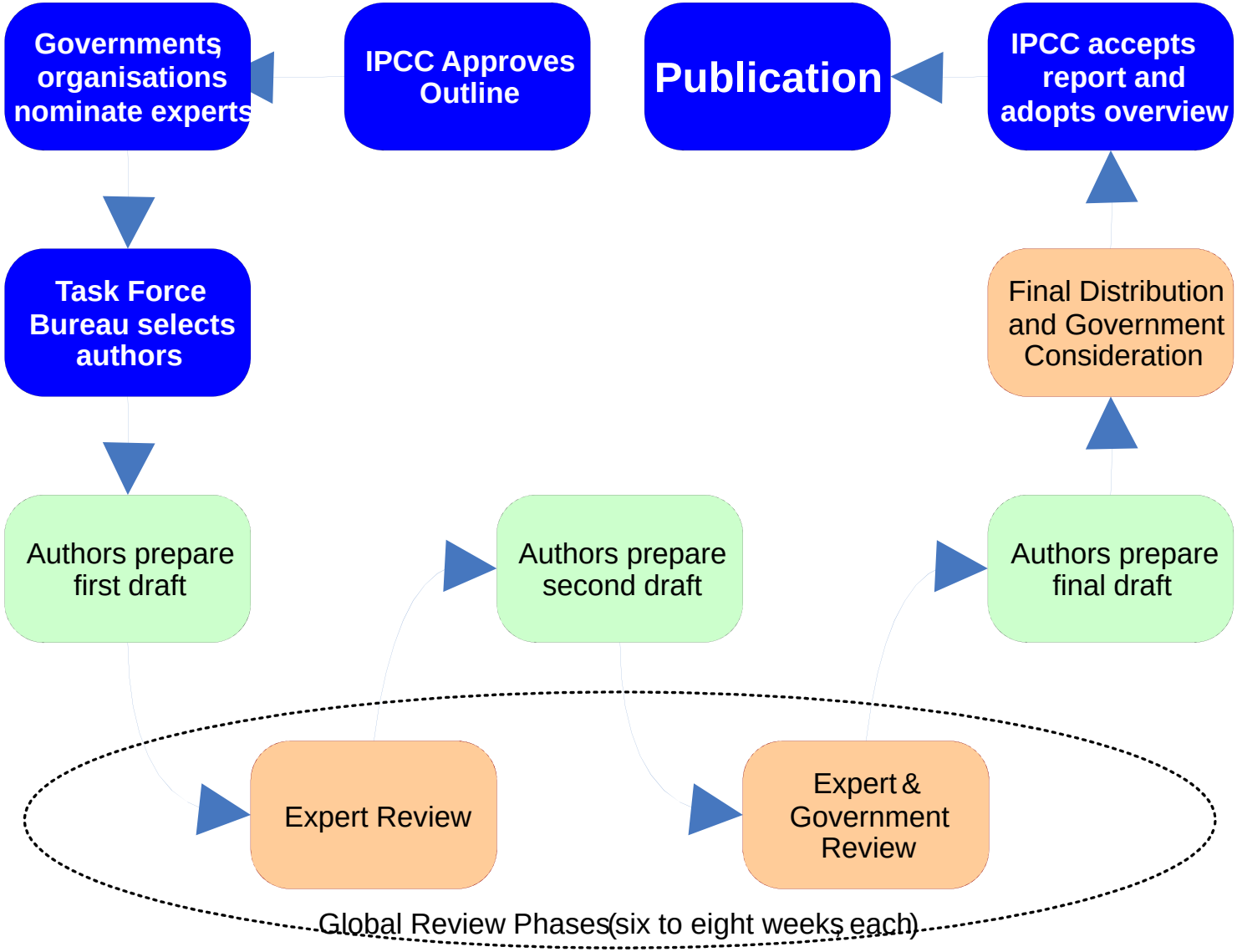
Task Force on National Greenhouse Gas Inventories

- The IPCC Task Force on National Greenhouse Gas Inventories (TFI)
  - Produces, refines and improves the IPCC Guidelines for National Greenhouse Gas Inventories
  - Encourages and aids their use
- Latest Guidelines are the 2006 IPCC Guidelines
  - These updated and included new science and technical data
  - Combined methodological guidance and good practice guidance into a single set of guidance

IPCC Methodology Reports



Following the 2006 Guidelines

- The TFI has focused on providing assistance to users of all the IPCC Guidelines. This includes:
  - Holding expert meetings to explore problems and solutions
  - Developing the Emission Factor Database (EFDB) to maintain a library of up-to-date information for inventory compilers
  - Developing Software
  - Developing information on our web site
    - FAQ
    - Presentations

This Side Event:

- Will briefly present important outputs from the meetings
- Present the EFDB and Software
- Discuss other information available
- Look forward
- Opportunity to ask questions

Datasets for use in the IPCC Guidelines:
FAO data and how it can be used in the IPCC Agriculture and Land Use Guidelines

IPCC Expert Meeting,
20-22 October, 2009,
IFAD, Rome, ITALY

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Background

- Many inventory compilers have noted the difficulty in obtaining suitable data for LULUCF and/or AFOLU
- Much of the data is available from the FAO but it is not clear to inventory compilers where this is held or how to use it
- While national data is preferable the FAO data provides a useful set of data especially for smaller categories

Expert Meeting

- The IPCC TFI held a meeting jointly with the FAO and IFAD to explore these issues
- The outcome was a report that lists the data items (largely activity data) needed to compile an inventory and where to find it on the FAO web site, or FAO contacts.

Information

- Description of the information needed
- Description of where the data is used in both the 2006 and 1996 Guidelines
- Description of the dataset including units and other conversions
- Comments describing the dataset and any limitations

Description	Information on area of annual and perennial crops remaining as cropland and conversion to cropland from other land uses disaggregated as feasible according to different climate zones, ecological zones, soil types, crop-types, management systems, and regions of a country or other nationally relevant stratification systems
Definition(s) in the IPCC Guidelines	See the "Description" above
Units in the IPCC Guidelines	Hectare
2006 IPCC Guidelines	See guidance in Chapter 5, Volume 4(1) and Equations 2.6, 2.9, 2.18, 2.19, 2.21, 2.23 and 2.25
GPG/GPG-LULUCF	GPG-LULUCF: Chapter 3
1996 IPCC Guidelines	Chapter 5, Reference Manual
FAO Dataset(s)	• FAOSTAT • FRA
URL(s)	*http://faostat.fao.org/* *http://www.fao.org/forestry/fra*
Features of the dataset including definitions	• FAOSTAT: o Annual crops are those that are planted and harvested during the same production season. o Perennial crops are plants that live for more than two years. • FRA 2010 will include information on the area of rubber plantations to ensure that these areas are not double-counted.
Units in the dataset	1000 hectares
Availability (Years/country/region)	• FAOSTAT: o Data availability: Available for all countries o Reporting years: Annual data from 1961 onwards • FRA 2010: o Data availability: It will cover 233 countries and territories and data will be available in 2010. o Reporting years: 1990, 2000, 2005 and 2010.
Conversion if any required	Area should be multiplied by 1000.
Remarks	• FAOSTAT uses "area harvested" for production purposes. • Although FRA includes "Other land with tree cover", it may not be equivalent to perennial cropland. • Other relevant datasets are: o Country reports to FRA o Agro-maps o LADA(one-time assessment of land use systems)

Report

- Limited number of printed copies are available today
- Report is also downloadable from our website
- If this is found useful we will consider updating it and extending it to other datasets

Revisiting the Use of Managed Land as a Proxy for Estimating National Anthropogenic Emissions and Removals

IPCC Expert Meeting,
5 -7 May, 2009, INPE, São José dos Campos, BRAZIL

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Conclusions – Co-Chairs Summary

- Anthropogenic emissions and removals affect the level of greenhouse gases in the atmosphere.
- IPCC inventory methods for forestry and land use estimate greenhouse gas fluxes between land and the atmosphere.
- IPCC's advice in the 2006 Guidelines is that the anthropogenic component of emissions and removals from forestry and land use is the component which occurs on managed land. This is the managed land proxy (MLP).

Conclusions (2)

- The MLP is a first approach for distinguishing between anthropogenic and non-anthropogenic emissions and removals, and is the current approach in the 2003 Good Practice Guidance for Land Use, Land-use Change and Forestry and the 2006 Guidelines for National Greenhouse Gas Inventories.

Conclusions (3)

- The experts noted progress with the development of methods for separating anthropogenic from non-anthropogenic emissions and removals, and the possibility for comparison between these methods.
- The experts considered a range of techniques, some of these methods could be the basis for Tier 1 approaches.

Conclusions (4)

- The experts noted that where these methods are used to help estimate anthropogenic emissions and removals, it is important that the methods and estimates are fully described and transparently documented; are applied in accordance with time series consistency; and follow good practice.
- The experts noted that the outcome of the meeting will be summarised in a report to the IPCC Plenary.

National Forest GHG Inventories – A Stock Taking

IPCC Expert Meeting
23-25 February, 2010, Yokohama, Japan

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Background

- Forest GHG inventories are one of the more difficult areas in GHG inventory compilation, in particular for developing countries that face difficulties with data collection, both current and time series, and with appropriate parameters for use in GHG estimation.
- More reliable GHG inventories for forests will be increasingly required if UNFCCC deliberations, and agreements, advance on both REDD+ and NAMAs.
- There may be expectations for the IPCC to do further methodological work in this area.

Meeting Identified Area for Additional Guidance

- Design of forest monitoring systems
  - inventory design, stratification (particularly in dynamic landscapes) , sampling, pools and accuracy/uncertainty assessment;
- Combination of ground based inventories with remote sensing and modeling approaches;
- Use of remote sensing data in forest GHG inventories
  - stratification, change assessment and use of remote sensing methods for biomass estimation;
- Guidance on selectively logged forests.
- Data on emission factors and parameters have improved since the 2006 Guidelines were finalised (EFDB)
  - e.g. Biomass (Conversion and) Expansion Factors (BEF/BCEF), and emission factors for peat lands.

Areas were more assistance is needed

- A simple introductory guide to estimation of emission and removals in forests
- Use of GPG – additional decision trees and flow charts
- More advice on the implementation of Uncertainty Estimation Methods in AFOLU
- Use of “Tier 3” models
  - Expert meeting later this year

Ways to ensure latest information is available

- "Technical Bulletins" or Meeting Reports
  - Updates on latest science since guidelines were completed
- EFDB
  - Repository of latest emission factors and other parameters
- Discussion Forum
  - Exchange of ideas by practitioners via web
- FAQ
- Peatlands / Wetlands
  - Existing guidance incomplete

Uncertainty and Validation of Emission Inventories

IPCC Expert Meeting, 23-25 March 2010,
Utrecht, the Netherlands

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Background

- Uncertainty is an area where inventory compilers were having difficulties in following the IPCC Guidelines and GPG
- Since the 2006 IPCC Guidelines was produced the science of remote sensing and ambient measurements has developed
  - increasing potential applicability of these techniques to inventory validation/verification
- TFI decided to convene an expert meeting on uncertainty and validation/verification of emission inventories

Objective

- To consider
  - Need of any additional advice on assessment of uncertainties in emission inventories
  - Use of ambient measurements (satellite, aircraft, flux towers, ground based measurements etc.) and inverse modelling for the validation/verification of emission inventories
- To provide some additional material to assist inventory compilers

Discussion topics

- Uncertainty assessments of emission inventories
- Treatment of uncertainties associated with remote sensing
- Use of ambient measurements and inverse modelling
- Current capabilities of ambient measurement systems - e.g. satellite, aircraft, flux towers, ground based measurements etc.
- Anticipated improvements of these systems over time in respect of their capabilities to validate emission inventories
- In the context of specific IPCC categories how can these systems be used to validate emission estimates

Conclusions

- Current guidelines still reflect the state of the art but need to be supplemented by easy-to-use advice on how to approach uncertainties, and this can be written as Q&A
  - *A first set of Q&A was developed*

- Remote sensing, ambient measurement and inverse modelling techniques are currently not sufficiently developed to provide comprehensive verification at the required accuracy
  - *Identified a number of areas for possible prioritisaton*

Conclusions

- The meeting highlighted the increasing emphasis and attention on uncertainty analysis as monitoring and verification are getting more important

- The participants looked forward to further collaboration and hoped that the group would meet again to review the progress

Emission Factor Database (EFDB) and Data Meetings

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Emission Factor Database (EFDB)

- Library of well documented emission factors and other parameters which
  - Evolves dynamically through contributions of new data from researchers, scientists, industry...
  - Provides a wide variety of emission factors and other parameters with background documentation or technical references so that users can select and use appropriate data on their own responsibility.
- Communication platform for distribution and commenting on new research and measurement data

Emission Factor Detail (ID: 43143)

Administrative information

Data Provider:	IPCC
Data Provider Country:	(Not applicable)
Data Provider Contact:	ipcc-efdb@iges.or.jp
Date calculated:	Unknown
Date submitted to EFDB by Data Provider:	(Not applicable)
Date posted to EFDB by IPCC:	2002-09-27

View history

Technical information

Gas:	METHANE
IPCC 1996 Source/Sink Category:	Agriculture (4) -> Manure Management (4B) -> Horses (4B6)
IPCC 2006 Source/Sink Category:	Agriculture, Forestry, and Other Land Use (3) -> Livestock (3.A) -> Manure Management (3.A.2) -> Horses (3.A.2.f)
Properties	
Technologies/Practices:	All manure is assumed to be managed in dry manure management systems, including pastures and ranges, drylots, and daily spreading on fields.
Parameters/Conditions:	Annual Average temperature is greater than 25 C; MCF value used in the estimation is 2%
Region/Regional Conditions:	Climate: Warm; Country: Developing Countries
Abatement/Control Technologies:	
Others:	
Description:	Manure Management Emission Factor
Value:	2.2 kg/head/yr
Value in common units:	
Equation:	Equation 4.15 on Page 4.30 of the IPCC Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories
IPCC Worksheet:	Worksheet 4-1, Sheet 1 of 2
Source of data:	Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories (Table 4-5 on Page 4.12 of the Reference Manual)
Technical Reference:	Woodbury, J.W. and A. Hashimoto (1993), "Methane Emissions from Livestock Manure." In International Methane Emissions, US Environmental Protection Agency, Climate Change Division, Washington, D.C., U.S.A.
Reference language:	English
Abstract in English:	
Uncertainties expressed as 95% confidence limit:	**Upper:** 20% **Lower:** -20%
Data quality:	IPCC default
Distribution shape:	
Data quality reference:	
Other info on data quality:	

Usage/Review information

Type of parameter:	1996 IPCC default
Comments from the data provider:	
Comments from others:	
Link:	

Back to Find EF by ID page | Report to DOC | Report to XLS

Data Collection

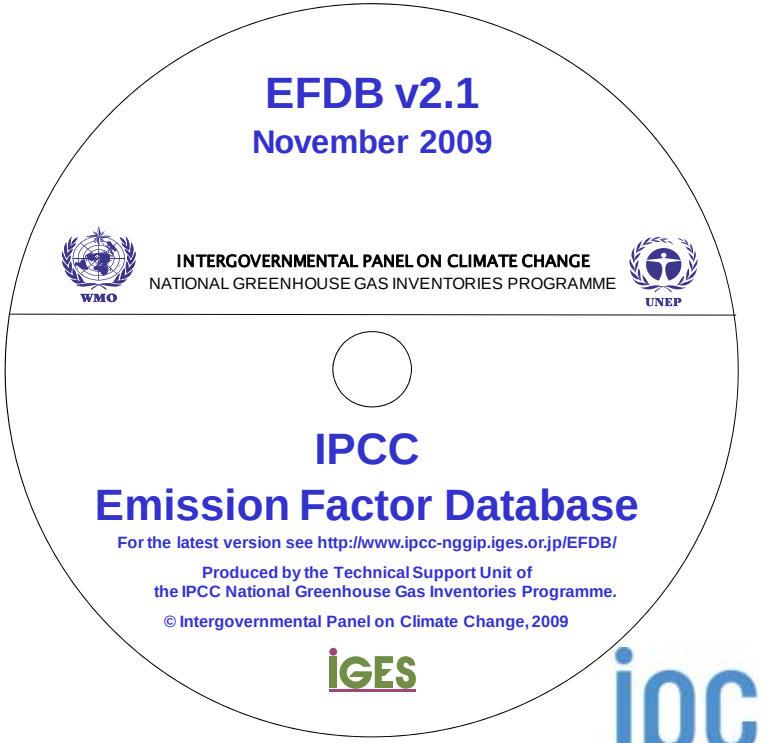
- Criteria for inclusion of new data
  - Robustness, Applicability, Documentation
  - Editorial Board (EB) judges whether to accept or not
- Approaches to collecting new data
  - Submission of data proposals by inventory experts, etc
    - Anyone can submit his/her data – always welcome!!
    - Contact by e-mail: ipcc-efdb@iges.or.jp
  - Data collection from actual national inventory submissions to the UNFCCC
  - Literature search by TSU
  - Data meetings

Data Meetings

- Data holders and EB members work together
  - to help populate the EFDB by identifying, selecting and approving data on specific themes/categories;
  - to identify ways to populate the EFDB and to foster greater co- operation between the research community and the IPCC TFI in helping populate the EFDB.
- Three meetings have been successfully held:
  - 1st meeting on forestry, especially on biomass expansion factors (*Buenos Aires, November 2008*)
  - 2nd meeting on livestock emissions (Santiago, *June 2009*)
  - 3rd meeting on soil C in croplands and grasslands (Santiago, *June 2009*)

Access to EFDB

- Web site (http://www.ipcc-nggip.iges.or.jp/EFDB/)
  - For all users to carry out on-line search
  - For data providers to submit new emission factors or other parameters
- CDROM
  - For all users, in particular for those who have difficulty with Internet connection, to carry out off-line search



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Other Activities

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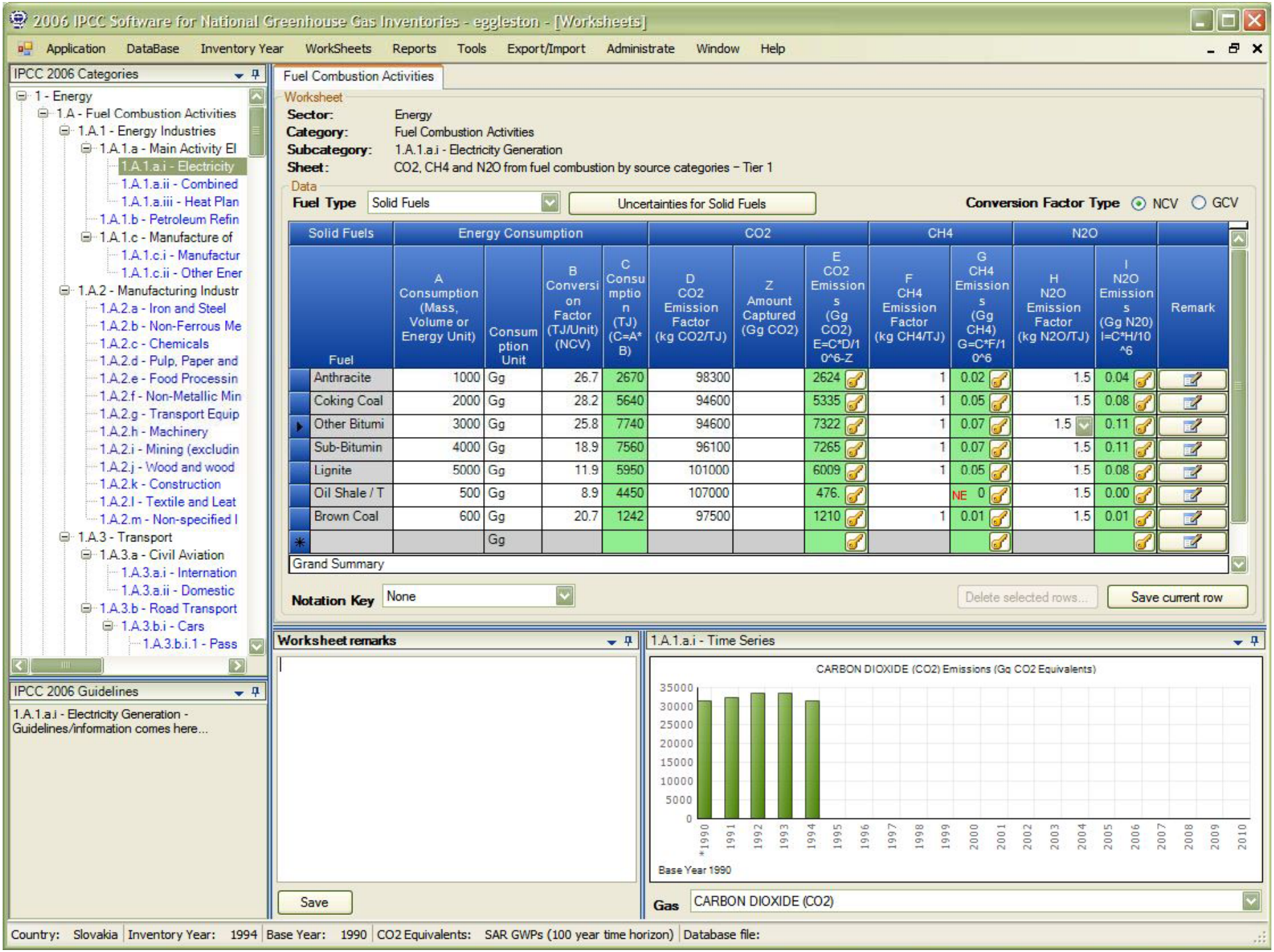
Software

- Software for the 1996 Guidelines and GPG LULUCF now maintained by UNFCCC
- We are developing software for the 2006 Guidelines
  - An incomplete demonstration version is available on our web site
  - We hope to shortly have a review version for the AFOLU sector available from our web site
  - We aim to have a complete version available by the end of 2010 with an expert meeting to consider the complete software in December 2010


2006 IPCC Software for National Greenhouse Gas Inventories - eggleston - [Worksheets]
Application DataBase Inventory Year WorkSheets Reports Tools Export/Import Administrate Window Help
IPCC 2006 Categories
1 - Energy
1.A - Fuel Combustion Activities
1.A.1 - Energy Industries
1.A.1.a - Main Activity El
1.A.1.a.i - Electricity
1.A.1.a.ii - Combined
1.A.1.a.iii - Heat Plan
1.A.1.b - Petroleum Refin
1.A.1.c - Manufacture of
1.A.1.c.i - Manufactur
1.A.1.c.ii - Other Ener
1.A.2 - Manufacturing Industr
1.A.2.a - Iron and Steel
1.A.2.b - Non-Ferrous Me
1.A.2.c - Chemicals
1.A.2.d - Pulp, Paper and
1.A.2.e - Food Processin
1.A.2.f - Non-Metallic Min
1.A.2.g - Transport Equip
1.A.2.h - Machinery
1.A.2.i - Mining (excludin
1.A.2.j - Wood and wood
1.A.2.k - Construction
1.A.2.l - Textile and Leat
1.A.2.m - Non-specified I
1.A.3 - Transport
1.A.3.a - Civil Aviation
1.A.3.a.i - Internation
1.A.3.a.ii - Domestic
1.A.3.b - Road Transport
1.A.3.b.i - Cars
1.A.3.b.i.1 - Pass
IPCC 2006 Guidelines
1.A.1.a.i - Electricity Generation - Guidelines/information comes here...
Fuel Combustion Activities
Worksheet
Sector: Energy
Category: Fuel Combustion Activities
Subcategory: 1.A.1.a.i - Electricity Generation
Sheet: CO2, CH4 and N2O from fuel combustion by source categories – Tier 1
Data
Fuel Type Solid Fuels
Uncertainties for Solid Fuels
Conversion Factor Type NCV GCV
Solid Fuels
Energy Consumption
CO2
CH4
N2O
Fuel
A Consumption (Mass, Volume or Energy Unit)
Consumption Unit
B Conversion Factor (TJ/Unit) (NCV)
C Consumption (TJ) (C=A*B)
D CO2 Emission Factor (kg CO2/TJ)
Z Amount Captured (Gg CO2)
E CO2 Emissions (Gg CO2) E=C*D/10^6-Z
F CH4 Emission Factor (kg CH4/TJ)
G CH4 Emissions (Gg CH4) G=C*F/10^6
H N2O Emission Factor (kg N2O/TJ)
I N2O Emissions (Gg N20) I=C*H/10^6
Remark
Anthracite 1000 Gg 26.7 2670 98300 2624 1 0.02 1.5 0.04
Coking Coal 2000 Gg 28.2 5640 94600 5335 1 0.05 1.5 0.08
Other Bitumi 3000 Gg 25.8 7740 94600 7322 1 0.07 1.5 0.11
Sub-Bitumin 4000 Gg 18.9 7560 96100 7265 1 0.07 1.5 0.11
Lignite 5000 Gg 11.9 5950 101000 6009 1 0.05 1.5 0.08
Oil Shale / T 500 Gg 8.9 4450 107000 476. NE 0 1.5 0.00
Brown Coal 600 Gg 20.7 1242 97500 1210 1 0.01 1.5 0.01
Gg
Grand Summary
Notation Key None
Delete selected rows...
Save current row
Worksheet remarks
Save
1.A.1.a.i - Time Series
CARBON DIOXIDE (CO2) Emissions (Gg CO2 Equivalents)
35000
30000
25000
20000
15000
10000
5000
0
*1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010
Base Year 1990
Gas CARBON DIOXIDE (CO2)
Country: Slovakia Inventory Year: 1994 Base Year: 1990 CO2 Equivalents: SAR GWPs (100 year time horizon) Database file:

Web site

- IPCC Guidelines in all Languages
- FAQ
- Presentations
- Primer & Brochures

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Future Developments.

- More Expert Meetings on important topics
  - Aug 2010, Use of Models and Measurements in GHG Inventories. The use of Tier 3 approaches brings issues of validation, reports, documentation
  - TFB to decide on topics for next year
    - Depends on needs of UNFCCC (if any)
    - We welcome inputs for users on issues we can address
  - Efforts to promote exchange of ideas and practices
- EFDB, more effort to collect data, consideration of interface needs to be easier for land use categories
- Software, finalisation and distribution, training material etc.

Thank you

Any Questions

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IPCC AR5
and other ongoing activities

Bonn, 31 May 2010

Dr. Renate Christ, Secretary of the IPCC

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Some highlights – WG I

- Observation, incl. paleoclimatic archives
- Carbon and other biochemical cycles
- Clouds and aerosols
- Detection and attribution – also regional
- Near term projection and predicitability
- Sea level change
- Climate phenomena – monsoon, El Nino

Some highlights – WG II

- Natural and managed resources
  - Freshwater, terrestrial systems, coasts, oceans, food production
- Human settlements, industry, infrastructure
- Human Health, well being and security
- Adaptation – options, costs, constraints
- Multi sector impacts, risks, climate resilient pathways
- Part B – Regional aspects

Some highlights – WG III

- Integrated risk and uncertainty assessment, social, economic and ethical concepts, SD, equity
- Pathways for mitigation
  - Assessing pathways, sectoral analysis
  - Human settlements, infrastructure, planning
- Policies, institutions, investment and finance

Cross cutting themes

- Uncertainties and risks
- Costing and economic analysis
- Regional aspects
- Scenarios and their use in the AR5
- Carbon cycle including ocean acidifaction
- Ice sheets and sea level rise
- Mitigation, adaptation and SD
- Issues related to Art. 2

AR5 Synthesis Report

- **Broad draft outline**:
- Observed changes and their causes
- Future changes (short and long term)
- Response
  - Reduction of vulnerabilities, risk management and framing of responses, effect of policies, co-benefits and externalities
- Transitions and transformation
  - Equity dimensions, development pathways, behavioural and societal changes

- **Scoping meeting August 2010 Liege, Belgium**

AR5 timetable

- WG I – September 2013
- WG II – March 2014
- WG III – April 2014
- Synthesis Report – September 2014

Special Report on Renewable Energy Sources and Climate Change Mitigation

- Review by governments and experts from 18 June to 16 August
- Due to be finalized in February 2011.

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Special Report on Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation

- Expert Review from 26 July to 20 September 2010
- Scheduled to be completed in November 2011

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