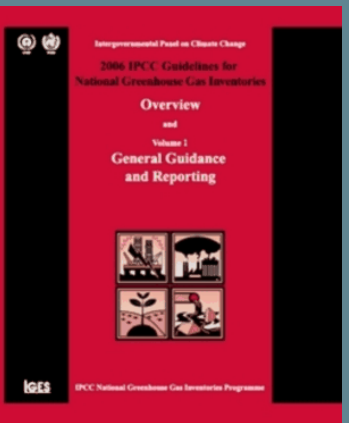
2006 IPCC Guidelines for National Greenhouse Gas Inventories

Kiyoto Tanabe
Technical Support Unit,
IPCC NGGIP

The 4th Workshop on GHG Inventories in Asia (WGIA)
14-15 February 2007, Jakarta, Indonesia

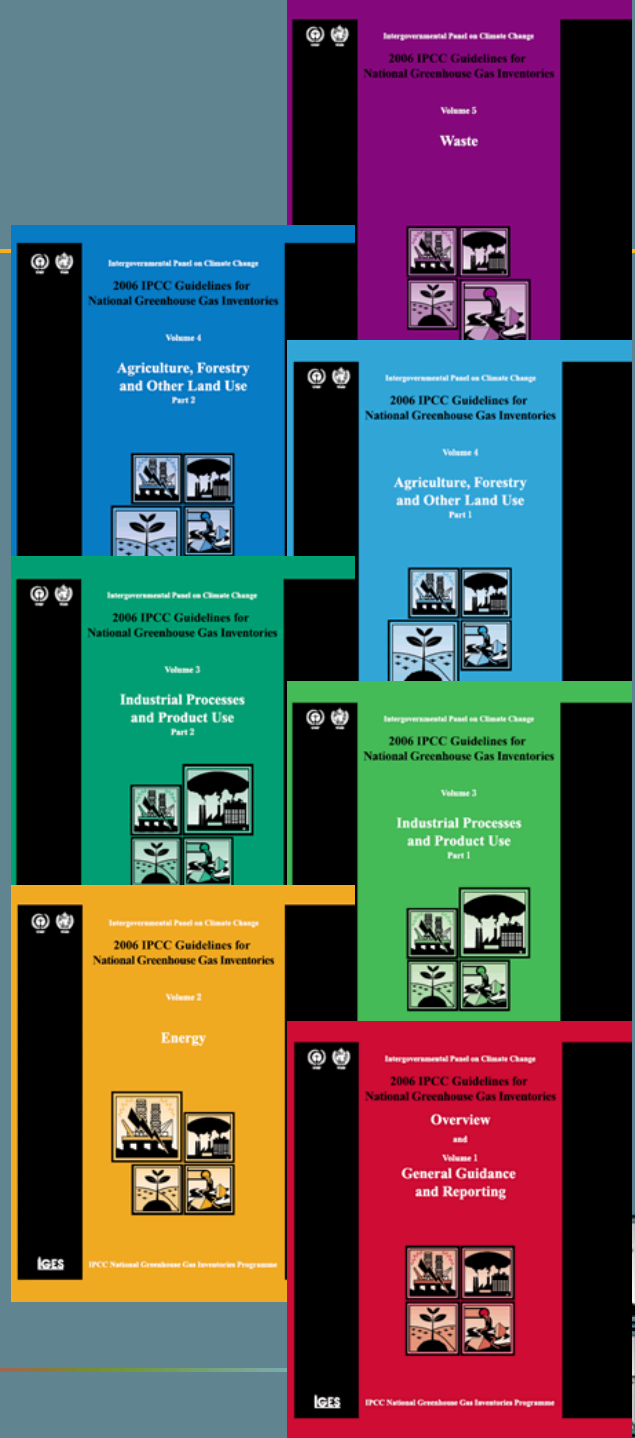


Outline

- Features of 2006 IPCC Guidelines
  - ✓ History
  - ✓ Approach to developing 2006GLs
  - ✓ Coverage
  - ✓ Specific developments
- 2006 IPCC Guidelines and UNFCCC
  - ✓ Requirements under UNFCCC
  - ✓ Relevance of 2006GLs
- Further developments in prospect

History

- 1995 Guidelines
- 1996 Revised IPCC Guidelines
- 2000 Good Practice Guidance and Uncertainty Management
- 2003 Good Practice Guidance for Land Use, Land-Use Change and Forestry
- 2006 IPCC Guidelines



Approach to developing 2006GLs

- An evolutionary development starting from 1996GLs and two GPGs
- Retain the definition of "*good practice*"
  - ✓ neither over- nor under-estimates so far as can be judged
  - ✓ uncertainties are reduced as far as practicable.
- Generally provide advice on estimation methods at three levels of detail
  - ✓ from Tier 1 (the default method) to Tier 3 (the most detailed method)

Coverage

Revised 1996 Guidelines

Vol.1 Reporting Instructions

Vol.2 Workbook

Vol.3 Reference Manual

GPG2000

GPG-LULUCF

Sectoral Guidance Methodological Issues

2006 Guidelines

Vol.1 General Guidance and Reporting

Vol.2 Energy

Vol.3 Industrial Processes and Product Use

Vol.4 Agriculture, Forestry and Other Land Use

Vol.5 Waste

UNEP

INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE

NATIONAL GREENHOUSE GAS INVENTORIES PROGRAMME

Coverage

Revised 1996 Guidelines

Vol.1
Reporting
Instructions

Vol.2
Workbook

Vol.3
Reference
Manual

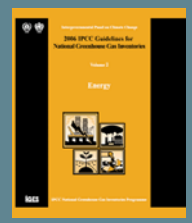
GPG2000

GPG-LULUCF

Cross-cutting Issues
Key Category Analysis
QA/QC, etc.

2006 Guidelines

Vol.1
General Guidance
and Reporting



Vol.2
Energy

Vol.3
Industrial Processes
and Product Use

Vol.4
Agriculture, Forestry
and Other Land Use

Vol.5
Waste

WMO

UNEP

INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE

NATIONAL GREENHOUSE GAS INVENTORIES PROGRAMME

WMO

Coverage

Revised 1996 Guidelines

Vol.1
Reporting
Instructions

Vol.2
Workbook

Vol.3
Reference
Manual

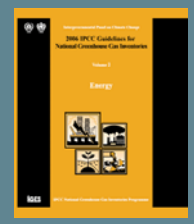
GPG2000

GPG-LULUCF

Worksheets

2006 Guidelines

Vol.1
General Guidance
and Reporting



Vol.2
Energy

Vol.3
Industrial Processes
and Product Use

Vol.4
Agriculture, Forestry
and Other Land Use

Vol.5
Waste

Coverage

Revised 1996 Guidelines

Vol.1 Reporting Instructions

Vol.2 Workbook

Vol.3 Reference Manual

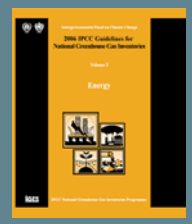
GPG2000

GPG-LULUCF

Reporting Guidance & Reporting Tables

2006 Guidelines

Vol.1 General Guidance and Reporting



Vol.2 Energy

Vol.3 Industrial Processes and Product Use

Vol.4 Agriculture, Forestry and Other Land Use

Vol.5 Waste

Coverage

2006 Guidelines

TABLE 1
CONTENTS OF 2006 GUIDELINES

Volumes	Chapters
1 - General Guidance and Reporting	1. Introduction to the 2006 Guidelines 2. Approaches to Data Collection 3. Uncertainties 4. Methodological Choice and Identification of Key Categories 5. Time Series Consistency 6. Quality Assurance/Quality Control and Verification 7. Precursors and Indirect Emissions 8. Reporting Guidance and Tables
2 - Energy	1. Introduction 2. Stationary Combustion 3. Mobile Combustion 4. Fugitive Emissions 5. CO_2 Transport, Injection and Geological Storage 6. Reference Approach
3 - Industrial Processes and Product Use	1. Introduction 2. Mineral Industry Emissi 3. Chemical Indu 4. Met …for Ozone Depleting Substances …e and Use
4 - A O	…eneric Methodologies Applicable to Multiple Land-use Categories 3. Consistent Representation of Lands 4. Forest Land 5. Cropland 6. Grassland 7. Wetlands 8. Settlements 9. Other Land 10. Emissions from Livestock and Manure Management 11. N_2O Emissions from Managed Soils, and CO_2 Emissions from Lime and Urea Application 12. Harvested Wood Products
5 - Waste	1. Introduction 2. Waste Generation, Composition and Management Data 3. Solid Waste Disposal 4. Biological Treatment of Solid Waste 5. Incineration and Open Burning of Waste 6. Wastewater Treatment and Discharge

See Table 1 in "Overview"

Vol.1
General Guidance and Reporting

Vol.2
Energy

Vol.3
Industrial Processes and Product Use

Vol.4
Agriculture, Forestry and Other Land Use

Vol.5
Waste

Coverage - Gases

- Gases for which GWP values are available in the IPCC-TAR
  - ✓ CO_2, CH_4, N_2O, HFCs, PFCs, SF_6
  - ✓ NF_3, SF_5CF_3, Halogenated Ethers, etc.
- Gases for which GWP values are not available in the IPCC-TAR
  - ✓ C_7F_{16}, C_4F_6, c-C_4F_8O, etc.
- Other gases (Precursors)
  - ✓ 2006GLs contain links to information on methods used under other agreements and conventions

Specific Developments
Vol 1: General Guidance and Reporting

- New chapter on introductory advice
  - ✓ Overview of greenhouse gas inventories
  - ✓ Steps needed to prepare an inventory for the first time
- Extended advice on data collection
  - ✓ Systematic cross-cutting advice on data collection from existing sources and by new activities
- Key category analysis
  - ✓ Better integrated across emission and removal categories

Specific Developments Vol 2: Energy

- Treatment of CO_2 capture and storage (CCS)
  - ✓ Emissions from geological CO_2 capture, transport and storage are covered comprehensively
    - Fugitive losses from CO_2 capture and transport stages
    - Any losses from CO_2 stored underground
  - ✓ Consistent with IPCC Special Report on Carbon Dioxide Capture and Storage (2005)
- Methane from abandoned coal mines
  - ✓ A methodology for estimating these emissions is included for the first time.

Specific Developments Vol 3: IPPU

- New categories and new gases
  - ✓ Expanded to include more manufacturing sectors and product uses (e.g., Production of TiO_2, petrochemicals, LCD)
  - ✓ Additional GHGs identified in the IPCC TAR (e.g., NF_3, SF_5CF_3)
- Non-Energy Uses of Fossil Fuels
  - ✓ Improved guidance on demarcation with the Energy Sector
- Actual emissions of F-gases as Tier 1
  - ✓ Potential emissions - no longer considered appropriate
  - ✓ New Tier 1 - Actual emission estimation based on default activity data where better data are not available.

Specific Developments Vol 4: AFOLU

- Integration between Agriculture and LULUCF
- Managed land as a proxy for identifying anthropogenic emissions and removals
- Consolidation of previously optional categories
  - ✓ Emissions and removals from all fires on managed land
  - ✓ CO_2 emissions and removals associated with terrestrial carbon stocks in settlements and managed wetlands
- Approach-neutral methods to include HWP
- "Appendix" - Basis for future methodological development
  - ✓ e.g., CH_4 emissions from managed flooded lands

Specific Developments Vol 5: Waste

- Revised methodology for CH_4 from landfills
  - ✓ New Tier 1 method - a simple first order decay model
  - ✓ Option to use data available from the UN and other sources
  - ✓ Regional and country-specific defaults on waste generation, composition and management
- Carbon accumulation in landfills
  - ✓ Relevant for the estimation of HWP in AFOLU
- Biological treatment and open burning of waste
  - ✓ To ensure a more complete coverage of sources

Specific Developments Relevant to all volumes

- CO_2 resulting from emissions of other gases
  - ✓ 2006GLs estimate carbon emissions in terms of the species which are emitted
  - ✓ CO_2 from atmospheric oxidation of non-CO_2 species can be estimated additionally, if necessary
- Treatment of nitrogen (N) deposition
  - ✓ Formerly only agricultural sources were covered
  - ✓ 2006GLs cover all significant sources of N deposition, including agriculture, industrial and combustion sources
- Relationship to entity- or project level estimates
  - ✓ Methods for national inventories can also be relevant for estimating actual emissions or removals at the entity or project level.

Requirements under UNFCCC

- 1996 Guidelines (+GPGs)
  - ✓ Annex I Parties "shall" use 1996GLs and GPGs
  - ✓ Non-Annex I Parties:
    - "should" use 1996GLs [Dec 17/CP.8]
    - "are encouraged to" use GPGs [Dec 13/CP.9]
- 2006 Guidelines
  - ✓ Not yet approved by UNFCCC for use as a whole
  - ✓ Nevertheless, 2006GLs may assist Parties in fulfilling their inventory reporting requirements under the UNFCCC

Relevance of 2006 IPCC Guidelines

- Individual methods in 2006GLs can be used within the 1996/UNFCCC reporting guidelines
  - ✓ "… Users are encouraged to go beyond these minimum default methods where possible, …" (1996GLs Vol.1 Overview)
  - ✓ Remember!! The 2006GLs are:
    - An **evolutionary** development
    - Authors' best methodologies available (accepted by IPCC)
    - For the use of all countries
- For example…
  - ✓ New or revised default EF data for Fuel Combustion
  - ✓ Tier 1 methods to calculate actual emissions of F-gases
  - ✓ Tier 1 FOD method to estimate CH_4 from SWDSs

Further developments in prospect

- Non-English 2006 IPCC Guidelines
  - ✓ Translation into 5 UN languages under way
- Software for 2006 IPCC Guidelines
  - ✓ Development under way
- Emission Factor Database (EFDB)
  - ✓ Will be upgraded in accordance with 2006GLs
- Others (e.g., FAQs on website)