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The project for the publication *Background Papers – IPCC Expert Meetings on Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories* was initiated after the publication of Good Practice Report in late 2000 by the NGGIP TSU. The basic editing was done by Leandro Buendia (Programme Officer), Robert Hoppaus (Programme Officer), Jeroen Meijer (Programme Officer), Kyoko Miwa (Administrative Officer) and Kiyoto Tanabe (Programme Officer) under the guidance of the TSU Head of that time, Sal Emmanuel. The final editing of the papers has been done by Todd Ngara (Programme Officer), Kyoko Miwa (Administrative Officer), Leandro Buendia (Programme Officer), Kiyoto Tanabe (Programme Officer) and Riitta Pipatti (Head), the present staff of the TSU. Chiharu Harashima provided valuable help in harmonising the format of the papers for publication.

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The most significant contribution to the background papers comes from the authors, and also from the reviewers of the papers as well as the experts who provided input for the contents of the papers during the meetings.

## **PREFACE**

The report on Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories (Good Practice Report) was published in the year 2000. The report was prepared in response to the invitation by the United Nations Framework Convention on Climate Change (UNFCCC) to the Intergovernmental Panel on Climate Change (IPCC) to give priority to completing its work on uncertainty as well as to prepare a report on good practice in inventory management.

The Good Practice Report provides good practice guidance to assist countries in producing inventories that are neither over nor underestimates so far as can be judged, and in which uncertainties are reduced as far as practicable. The report has been subsequently endorsed by the Conference of the Parties to the UNFCCC, and it has been extensively referred to in the Marrakesh Accords as well as in the decisions and conclusions of the Subsidiary Bodies of the UNFCCC.

During the preparation of the Good Practice Report, many scientific and/or technical papers were produced as background material for the issues to be included in the report. These papers served as the basis for the discussions at the expert meetings and in preparing the final texts of the Good Practice Report.

The publication of this background material as IPCC Supporting Material was decided during the preparation of the Good Practice Report. The papers were seen to contain much valuable scientific and technical material that would enhance the understanding of the compilation of national greenhouse gas inventories.

This publication, “Background Papers – IPCC Expert Meetings on Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories” has the same basic structure as the Good Practice Report. The background for the project on the preparation of the Good Practice Report is addressed in the first paper, options and background for good practice guidance for the main IPCC Sectors (Energy, Industrial Processes, Agriculture, and Waste) are given in the following 27 papers. Cross-cutting issues like quantification of uncertainties, methodological choice including key source identification and verification are discussed in the last three papers.

This publication has not been subject to formal IPCC review processes and should therefore be considered only as material supporting the deeper understanding of estimation and reporting of greenhouse gas emissions and removals as well as providing additional references to related scientific and technical work.

## BASIC INFORMATION

### Prefixes and multiplication factors

Multiplication Factor	Abbreviation	Prefix	Symbol
1 000 000 000 000 000	10 <sup>15</sup>	peta	P
1 000 000 000 000	10 <sup>12</sup>	tera	T
1 000 000 000	10 <sup>9</sup>	giga	G
1 000 000	10 <sup>6</sup>	mega	M
1 000	10 <sup>3</sup>	kilo	k
100	10 <sup>2</sup>	hecto	h
10	10 <sup>1</sup>	deca	da
0.1	10 <sup>-1</sup>	deci	d
0.01	10 <sup>-2</sup>	centi	c
0.001	10 <sup>-3</sup>	milli	m
0.000 001	10 <sup>-6</sup>	micro	μ

### Abbreviations for chemical compounds

CH <sub>4</sub>	Methane
N <sub>2</sub> O	Nitrous oxide
CO <sub>2</sub>	Carbon dioxide
CO	Carbon monoxide
NO <sub>x</sub>	Nitrogen oxides
NMVOG	Non-methane volatile organic compound
NH <sub>3</sub>	Ammonia
CFCs	Chlorofluorocarbons
HFCs	Hydrofluorocarbons
PFCs	Perfluorocarbons
SF <sub>6</sub>	Sulphur hexafluoride
CCl <sub>4</sub>	Carbon tetrachloride
C <sub>2</sub> F <sub>6</sub>	Hexafluoroethane
CF <sub>4</sub>	Tetrafluoromethane

## Standard equivalents

1 tonne of oil equivalent (toe)	1 x 10 <sup>10</sup> calories
10 <sup>3</sup> toe	41.868 TJ
1 short ton	0.9072 tonne
1 tonne	1.1023 short tons
1 tonne	1 megagram
1 kilotonne	1 gigagram
1 megatonne	1 teragram
1 gigatonne	1 petagram
1 kilogram	2.2046 lbs
1 hectare	10 <sup>4</sup> m <sup>2</sup>
1 calorie <sub>IT</sub>	4.1868 Joules
1 atmosphere	101.325 kPa

## Units<sup>1</sup> and abbreviations

cubic metre	m <sup>3</sup>
hectare	ha
gram	g
tonne	t
joule	J
degree Celsius	° C
calorie	cal
year	yr
capita	cap
gallon	gal
dry matter	dm

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<sup>1</sup> For decimal prefixes see previous page.