



Intergovernmental Panel on Climate Change



2006 IPCC Guidelines for National Greenhouse Gas Inventories

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IPCC National Greenhouse Gas Inventories Programme

IGES

A report prepared by the Task Force on National Greenhouse Gas Inventories (TFI) of the IPCC and accepted by the Panel but not approved in detail

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Foreword

Recognizing the problem of potential global climate change, the World Meteorological Organization (WMO) and the United Nations Environment Programme (UNEP) co-established in 1988 the Intergovernmental Panel on Climate Change (IPCC). One of the IPCC's activities is to support the UN Framework Convention on Climate Change (UNFCCC) through its work on methodologies for National Greenhouse Gas Inventories.

This report is the culmination of three years of work by the IPCC National Greenhouse Gas Inventories Programme, to update its own previous guidance on National Greenhouse Gas Emission Inventories. The task was started in response to an invitation made at the seventeenth session of the Subsidiary Body for Scientific and Technological Advice (SBSTA) of the UNFCCC, held in New Delhi in 2002. At the time, the IPCC was invited to revise the *1996 IPCC Guidelines*, taking into consideration the relevant work made under the Convention and the Kyoto Protocol¹, with the aim to complete this task by early 2006.

In response to this invitation by the UNFCCC, the IPCC initiated a process at its 20th session (Paris, February 2003) that led to an agreement at its 21st session (Vienna, November 2003) on the Terms of Reference, Table of Contents and a Workplan² for the *2006 IPCC Guidelines*. The Workplan aimed to complete the task in time for its acceptance and adoption at the 25th session of the IPCC, to be held in April 2006.

The 1996 guidelines comprised the *Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories*³, together with the *Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories*⁴ and the *Good Practice Guidance for Land Use, Land-Use Change and Forestry*⁵. The *2006 Guidelines* have built upon this body of work in an evolutionary manner to ensure that the transition from the previous guidelines to these new ones will be as straightforward as possible. These new guidelines include new sources and gases as well as updates to the previously published methods whenever scientific and technical knowledge have improved since the previous guidelines were issued.

The development of these guidelines has depended on the expertise, knowledge and co-operation of the Coordinating Lead Authors, Lead Authors and Contributing Authors – the contribution over 250 experts worldwide. We wish to thank these authors for their commitment, time and efforts in preparing this report throughout all the drafting and reviewing stages of the IPCC process. As indicated, this report has built upon the work of the previous IPCC inventory reports as well as on reports of the inventory experts' experiences in using the IPCC inventory guidelines without which the task would have been much more demanding and we are pleased to acknowledge our debt with all those who contributed to these reports.

The steering group, consisting of IPCC TFI Co-Chairs Taka Hiraishi (Japan) and Thelma Krug (Brazil) together with Michael Gytarsky (Russian Federation), William Irving (USA) and Jim Penman (UK) has guided the development of these guidelines, ensuring consistency across all the volumes and continuity with the earlier IPCC inventory reports. We would therefore wish to thank them for their considerable efforts in leading and guiding the report preparation.

Authors and experts meetings were held in Oslo (Norway); Le Morne (Mauritius); Washington (USA); Arusha (Tanzania); Ottawa (Canada); Manila (The Philippines); Moscow (Russian Federation); and Sydney (Australia). We would therefore like to thank the host countries and agencies for organizing these meetings. We would also

¹ Including, inter alia, work by the Subsidiary Body for Scientific and Technological Advice and the Subsidiary Body for Implementation, and by the Consultative Group of Experts on National Communications from Parties not included in Annex I to the Convention, and the technical review of greenhouse gas inventories of Annex I Parties.

² The Terms of Reference, Table of Contents and Work plan can be found at <http://www.ipcc-nggip.iges.or.jp/>.

³ Intergovernmental Panel on Climate Change (IPCC) (1997). Houghton J.T., Meira Filho L.G., Lim B., Tréanton K., Mamaty I., Bonduki Y., Griggs D.J. and Callander B.A. (Eds). *Revised 1996 IPCC Guidelines for National Greenhouse Inventories*. IPCC/OECD/IEA, Paris, France.

⁴ Intergovernmental Panel on Climate Change (IPCC) (2000). Penman J., Kruger D., Galbally I., Hiraishi T., Nyenzi B., Emmanuel S., Buendia L., Hoppaus R., Martinsen T., Meijer J., Miwa K., and Tanabe K. (Eds). *Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories*. IPCC/OECD/IEA/IGES, Hayama, Japan.

⁵ Intergovernmental Panel on Climate Change (IPCC) (2003), Penman J., Gytarsky M., Hiraishi T., Krug, T., Kruger D., Pipatti R., Buendia L., Miwa K., Ngara T., Tanabe K., Wagner F., *Good Practice Guidance for Land Use, land-Use Change and Forestry* IPCC/IGES, Hayama, Japan

like to thank all governments that supported authors and reviewers, for without their contributions, the production of this report might not have been possible.

Two reviews of these guidelines were made in 2005. The first, an expert review, produced over 6000 comments, while the second, a combined governmental and expert review, resulted in an additional 8600 comments. The efforts of the reviewers and their comments have contributed greatly to the quality of the final report and we wish to thank them accordingly. Furthermore, the review editors have ensured the appropriate consideration of all the comments received, so we would also like to thank them for their work.

In addition, the NGGIP Technical Support Unit (TSU Head: Simon Eggleston; Programme officers: Leandro Buendia, Kyoko Miwa, Todd Ngara and Kiyoto Tanabe; Administrative Assistant: Ayako Hongo; Project Secretary: Masako Abe; and IT Officer: Toru Matsumoto) has provided guidance and assistance as well as technical and organisational support for the project. They worked extensively with the authors especially in the editing of the various drafts and preparation of the final version, and we wish to congratulate them for their exemplary work. We would also like to express our gratitude to the Government of Japan, for its generous support for the TSU, without which this report might not have been completed.

We would also like to thank the IPCC Secretariat (Jian Liu, Rudie Bourgeois, Annie Courtin, and Joelle Fernandez) for their assistance and support in enabling this project to meet its tight deadlines.

Finally we would like to thank IPCC Chair Rajendra Pachauri, IPCC Secretary Renate Christ and the Task Force Bureau: the TFI Co-Chairs and Soobaraj Nayroo Sok Appadu (Mauritius), Dari N. Al-Ajmi (Kuwait), Ian Carruthers (Australia), Sergio Gonzalez-Martineaux (Chile), Art Jaques (Canada), Jamidu H.Y. Katima (Tanzania), Sadeddin Kherfan (Syria), Dina Kruger (USA), Kirit Parikh (India), Jim Penman (UK, since 2006), Helen Plume (New Zealand), Audun Rosland (Norway until 2005) and Freddy Tejada (Bolivia) for their support.

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Preface

These *2006 IPCC Guidelines for National Greenhouse Gas Inventories* build on the previous Revised 1996 IPCC Guidelines and the subsequent Good Practice reports in an evolutionary manner to ensure that moving from the previous guidelines to these new guidelines is as straightforward as possible. These new guidelines cover new sources and gases as well as updates to previously published methods where technical and scientific knowledge have improved.

This guidance assists countries in compiling complete, national inventories of greenhouse gases. The guidance has been structured so that any country, regardless of experience or resources, should be able to produce reliable estimates of their emissions and removals of these gases. In particular, default values of the various parameters and emission factors required are supplied for all sectors, so that, at its simplest, a country needs only supply national activity data. The approach also allows countries with more information and resources to use more detailed country-specific methodologies while retaining compatibility, comparability and consistency between countries. The guidance also integrates and improves earlier guidance on good practice in inventory compilation so that the final estimates are neither over- nor under-estimates as far as can be judged and uncertainties are reduced as far as possible.

Guidance is also provided to identify areas of the inventory whose improvement would most benefit the inventory overall. Hence limited resources can be focused on those areas most in need of improvement to produce the best practical inventory.

The IPCC also manages the *IPCC Emission Factor Database* (EFDB). The EFDB was launched in 2002, and is regularly updated as a resource for inventory compilers to use to assist them by providing a repository of emission factors and other relevant parameters that may be suitable for use in more country-specific methodologies.

The 2006 Guidelines are the latest step in the IPCC development of inventory guidelines for national estimates of greenhouse gases. In the opinion of the authors, they provide the best, widely applicable default methodologies and, as such, are suitable for global use in compiling national greenhouse gas inventories. They may also be of use in more narrowly-defined project based estimates, although here they should be used with caution to ensure they correctly include just the emissions and removals from within the system boundaries.

We would also like to thank all the authors (over 250) as well as reviewers, review editors, the steering group and the TFB for their contributions and experience. We would also like to thank all the governments who contributed by hosting meetings (Oslo, Norway; Le Morne, Mauritius; Washington, USA; Arusha, Tanzania; Ottawa, Canada; Manila, The Philippines; Moscow, Russian Federation; and Sydney, Australia) as well as those who supported authors and other contributors. Finally we would like to express our gratitude to the NGGIP TSU and the IPCC Secretariat for their invaluable support throughout the entire process of drafting and producing these guidelines.

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