

Accounting for Climate Change Uncertainty in Greenhouse Gas Inventories—Verification, Compliance, and Trading

Edited by Daniel Lieberman, Matthias Jonas, Zbigniew Nahorski, and Sten Nilsson

Reprinted from WATER, AIR, & SOIL POLLUTION: FOCUS, 7:4–5, 2007

The assessment of greenhouse gases (GHGs) emitted to and removed from the atmosphere is high on both political and scientific agendas internationally. As increasing international concern and cooperation aim at policy-oriented solutions to the climate change problem, several issues have begun to arise regarding verification and compliance under both proposed and legislated schemes meant to reduce the human-induced global climate impact. The approaches to addressing uncertainty discussed in this volume attempt to improve national inventories or to provide a basis for the standardization of inventory estimates to enable comparison of emissions and emission changes across countries. Several authors use detailed uncertainty analyses to enforce the current structure of the emissions trading system while others attempt to internalize high levels of uncertainty by tailoring the emissions trading market rules. In all approaches, uncertainty analysis is regarded as a key component of national GHG inventory analyses.

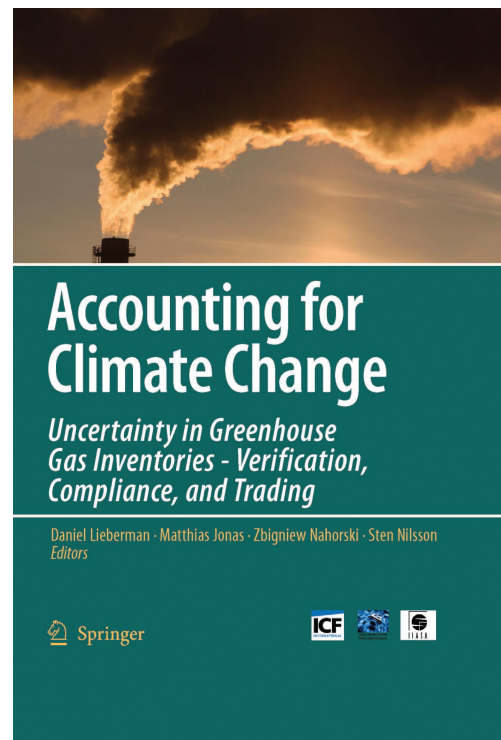
Topics of interest include:

- national greenhouse gas emission inventories
- bottom-up versus top-down emission analyses
- signal detection and analysis techniques
- verification and compliance issues
- role of uncertainty in emissions trading schemes
- compliance and emissions trading under the Kyoto Protocol

Assessment of uncertainty can help improve inventories and manage risk. Through recognizing the importance of identifying and quantifying uncertainties, great strides can be made in the process of Accounting for Climate Change.

Contributing Authors

P. Bartoszczuk, A. Bun, R. Bun, J. Cohen, M. Gillenwater, M. Gusti, J. Horabik, D. Lieberman, W. Jeda, M. Jonas, L. Kujii, S. Monni, I. McCallum, Z. Nahorski, S. Nilsson, R. Pipatti, O. Rouse, I. Savolainen, B. Sévi, A. Shvidenko, F. Sussman, S. Syri, O. Tokar, Y. Tsybrivskyy, W. Winiwarter



The editors

Daniel Lieberman, Associate, ICF International.

Dr. Matthias Jonas, Research Scholar, IIASA's Forestry Program.

Professor Zbigniew Nahorski, Systems Research Institute, Polish Academy of Sciences

Professor Sten Nilsson, Deputy Director, IIASA and Leader, IIASA's Forestry Program.

Ordering information:

Accounting for Climate Change is published by Springer in association with ICF International, Systems Research Institute at the Polish Academy of Sciences, and IIASA. For ordering information, please visit www.springer.com

ISBN: 978-1-4020-5929-2 hardback \$129.00

Accounting for Climate Change Uncertainty in Greenhouse Gas Inventories— Verification, Compliance, and Trading

Edited by

**Daniel Lieberman, Matthias Jonas,
Zbigniew Nahorski, and Sten Nilsson**

Contents

Accounting for Climate Change: Introduction

D. Lieberman, M. Jonas, Z. Nahorski, W. Winiwarter, S. Nilsson

1. Uncertainties of a Regional Terrestrial Biota Full Carbon Account: A Systems Analysis
S. Nilsson, A. Shvidenko, M. Jonas, and I. McCallum
2. National Greenhouse Gas Inventories: Understanding Uncertainties versus Potential for Improving Reliability
W. Winiwarter
3. Practical Policy Applications of Uncertainty Analysis for National Greenhouse Gas Inventories
M. Gillenwater, F. Sussman, and J. Cohen
4. Modeling Afforestation and the Underlying Uncertainties
M. Gusti
5. Spatial GHG Inventory: Analysis of Uncertainty Sources. A Case Study for Ukraine
R. Bun, M. Gusti, L. Kujii, O. Tokar, Y. Tsybrivskyy, and A. Bun
6. Prior to Economic Treatment of Emissions and Their Uncertainties under the Kyoto Protocol: Scientific Uncertainties that Must Be Kept in Mind
M. Jonas and S. Nilsson
7. Processing National CO₂ Inventory Emissions Data and Their Total Uncertainty Estimates
Z. Nahorski and W. Jeda
8. Extension of EU Emissions Trading Scheme to Other Sectors and Gases: Consequences for Uncertainty of Total Tradable Amount
S. Monni, S. Syri, R. Pipatti, and I. Savolainen
9. Compliance and Emissions Trading under the Kyoto Protocol: Rules for Uncertain Inventories
Z. Nahorski, J. Horabik, and M. Jonas
10. The Impact of Uncertainty on Banking Behavior: Evidence from the US Sulfur Dioxide Emissions Allowance Trading program
O. Rousse and B. Sévi
11. Tradable Permit Systems: Considering Uncertainty in Emission Estimates
P. Bartoszczuk and J. Horabik