Workshop on the Incorporation of Land Use and Greenhouse Gas Emissions into the Global Trade Analysis Project (GTAP) Data Base

September 5 and 6, 2002
Hosted by the
MIT Joint Program on the Science and Policy of Global Change
Cambridge, Massachusetts

Organized by the Center for Global Trade Analysis, Purdue University

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Purpose and Scope of the Workshop

Policies to mitigate climate changes have been widely assessed by using economic models and, in particular, Computable General Equilibrium (CGE) models. However, as the scope of these policies has been extended to cover all Greenhouse Gases (GHGs) emission sources and sinks, there is an increasing demand for incorporating complex biological, physical and technological information about terrestrial ecosystems into CGE models, or to link CGE models with models of terrestrial ecosystems. This requires further innovations in terms of modeling approaches, as well as adaptation of existing information to calibrate these new CGE models.

In this context, the US Environmental Protection Agency (EPA) has funded a three-year project at the Center for Global Trade Analysis, Purdue University, to establish an integrated database for assessing the overall potential of GHGs mitigation in CGE models. This database will cover all major GHGs (including carbon dioxide, methane and nitrous oxide) and all economic activities that emit or sequester these gases. In particular, it will focus on the net emissions that are associated with different types of land uses and with land-use changes. The format of this database will be compatible with the global economic data base provided by the Global Trade Analysis Project (GTAP). The GTAP data base currently supports the majority of global economic analyses of trade policy, and, since the introduction of energy volumes and CO₂ emissions into GTAP, it is being widely used to address the trade dimensions of efforts to mitigate CO₂ emissions. This new project aims to extend GTAP to make it relevant for analysis of carbon sequestration as well as the emissions of other GHGs.

The EPA-Purdue project involves close collaboration with several other institutions. The MIT Joint Program on the Science and Policy of Global Change will be involved in incorporating EPA and other inventory data on the non-CO₂ gases, and the Economic Research Service (ERS) of the US Department of Agriculture (USDA) will provide a core set of data on land uses. In order to ensure that this project is of use to the broader Integrated Assessment community, and in order to facilitate input from the community of economic modelers and researchers working with bio-physical models, two workshops are planned.

The first of these workshops will be held at MIT on September 5-6, 2002. This will be a focused working meeting that brings together those with a keen interest in developing CGE models that integrate all GHG emission sources as well as individuals who are familiar with data and bio-physical models dealing with the land use dimension of the carbon cycle and other GHG emissions. The purpose will be evaluate and refine the specific approach for this project and to identify potential sources of data beyond or in addition to those already identified. Sessions will provide ample time for presentation and discussion of the details, methods, requirements, limitations and applicability of the data and methods to the analyses that will be conducted with this expanded data and modeling capability.

A concrete set of examples for incorporating carbon sequestration, land use, and GHGs into a CGE modeling framework will set the stage for the workshop discussion. Practical suggestions for improving this framework, developing alternative methodological approaches, how this modeling approach can best fit into Integrated Assessment modeling, or how we can best incorporate the existing data are welcomed. The guidance, ideas, suggestions, and comments of all participants are eagerly sought. We intend to keep the meeting to no more than 25 so that the discussion can be fruitful and focused.
Proposed Agenda

Thursday, September 5

9:30 – 10:00am Overview of the Project and Introductions:
Francisco de la Chesnaye, US Environmental Protection Agency
Thomas Hertel, Purdue University
John Reilly, MIT

10:00am – 12 noon Economic Modeling of Emissions Mitigation Policy
Thomas Hertel, Chair

Recent Developments in Integrated Assessment models: A review of the MIT experience:
John Reilly, MIT.

A Prototype, Global General Equilibrium Modeling Framework for Assessing the
Sequestration Potential from Land Use Changes: Information Requirements, Potential
Data Sources and Feasibility. Jean-Marc Burniaux, Purdue University and OECD.

Discussant: Ton Manders, The Netherlands Bureau of Economic Policy Analysis

To be followed by discussion from the floor

12 – 1pm: Lunch

1 – 3pm: Land Use Data Bases
John Reilly, Chair

University of Wisconsin data base on land use:
Navin Ramankutty, University of Wisconsin

The FAO/IIASA database on global land use by agro-ecological zone:
Guenther Fischer, IIASA Food and Agriculture Program

The new FARM database on global land use:
Roy Darwin, ERS/USDA

To be followed by discussion from the floor

3 – 3:30pm: Coffee

3:30 – 5:30pm: GHG emissions from land use changes
Jean-Marc Burniaux, OECD and Purdue, Chair

The MBL approach to estimating GHG emissions:
Dave Kicklighter: MBL

RIVM-IMAGE estimates of GHG emissions associated with land use
Bas Eickhout, RIVM

Discussant: Bruce McCarl, Texas A&M

To be followed by discussion from the floor
Friday, September 6

8:30 – 10:15

GHG Inventories and detail required for consistency with production sectors in a global CGE model
Francisco de la Chesnaye, US EPA, Chair

The EPA Inventory of Non-CO₂ Greenhouse Gas Emissions:
Elizabeth Scheele, US EPA

ABARE data base on Non-CO₂ GHGs:
Helal Ahammad, ABARE

The PNNL approach
Ron Sands, Batelle - PNNL

To be followed by discussion from the floor

10:15 - 10:45am Coffee

10:45 – 12:30pm

Estimating and modeling marginal abatement costs

John Reilly, MIT, Chair

GHG abatement and US agriculture: A summary function approach
Bruce McCarl, Texas A&M

Experience in estimating abatement costs in forestry
Darius Adams, Oregon State University

Discussant: Jean-Marc Burniaux, OECD and Purdue University

12:30 – 1:30pm: Lunch

1:30 – 3pm:
Roundtable discussion: Outstanding issues and research agenda
Panelists to be determined

3 – 3:30pm:
Wrap-up and next steps with the project:
Thomas Hertel, Purdue University