

Joint Program on the Science and Policy of Global Change,
Massachusetts Institute of Technology
Report on Activities using GTAP Data

A significant effort was the completion of a report documenting the most recent version of the Emissions Prediction and Policy Analysis (EPPA) model that is based on the GTAP 4-E data set (Babiker, M., J. Reilly, M. Mayer, R. Eckaus, I. Sue Wing, and R. Hyman, 2001). We also conducted a number of policy studies using this version of the model and other versions. Among the more significant efforts was the breakout of a commercial and personal transportation sector for the US, EU countries and Japan (Babiker, M., Bautista, M.E., Jacoby, H.D., Reilly, J.M., 2000; Viguier, L.L., M.H. Babiker, and J.M. Reilly, 2001). In this research we also made use of version 5 pre-release data that disaggregated the EU into member countries. The 1997 data in GTAP 5 was used to reconstruct the individual EU country SAMs for 1995, consistent with the base year for the rest of the EPPA model based on GTAP 4E. EC, BEA, and Japanese supplementary income and product account data were used to disaggregate transportation. This allowed us to study intra-European climate policy and sectorally oriented policies. A related effort, taking advantage of the disaggregated EU region was the incorporation of distortionary capital and labor taxes and study of the issue of carbon revenue recycling (Babiker, Mustafa, Gilbert E. Metcalf, John Reilly, 2001). Another significant effort has been the investigation of uncertainty in emissions of greenhouse gases and in earth systems (Webster, M.D., C.E. Forest, J.M. Reilly, A.P. Sokolov, P.H. Stone, H.D. Jacoby, and R. G. Prinn, 2001; Reilly, J. M., Mayer, M., Webster, M. D., Wang, C., Babiker, M. and Hyman, R. 2000). We also developed a data set on a several other greenhouse gases and other air pollutants emitted from energy, waste, agriculture, and other industrial processes and studied the economics of controlling these emissions (Babiker, M., J. Reilly, M. Mayer, R. Eckaus, I. Sue Wing, and R. Hyman, 2001; Hyman, Robert C., 2001; Reilly, J., M. Mayer, and J. Harnisch, submitted; Reilly, John, Mustafa Babiker, and Monika Mayer, submitted). Another area of research considered technical change and specification of alternative energy and CO₂ sequestration technologies (Babiker, M, J. Reilly, A.D. Ellerman, 2000; Biggs, S., 2000; Sue Wing, Ian, 2001). A final set of studies investigated strategic policy issues (Babiker, M. 2001a; Babiker, M., 2001b; Ellerman, A.D. and I. Sue Wing, 2000). Reports published as part of our Joint Program series can be downloaded directly from our WEB site (<http://web.mit.edu/globalchange/www>). Abstracts of journal articles are also available via our WEB site along with information on requesting reprints of publications included in our reprint series.

Publications by MIT Joint Program Staff that have been submitted or have appeared in the past year using GTAP data and EPPA model results.

Babiker, M. 2001a. The CO₂ abatement game: Costs, incentives, and enforceability of a sub-global coalition, *Journal of Economic Dynamics and Control*, 25, 1-34.

Babiker, M., 2001b. Subglobal climate-change actions and carbon leakage: the implication of international capital flows, *Energy Economics*, 23, 121-139.

Babiker, M., Bautista, M.E., Jacoby, H.D., Reilly, J.M., 2000. Effects of Differentiating Climate Policy by Sector: A U.S. Example. MIT Joint Program on the Science and Policy of Global Change, Report No. 73, May 2000, 15 pp.

Babiker, Mustafa, Gilbert E. Metcalf, John Reilly, 2001. Distortionary Taxation in General Equilibrium Climate Modeling, Paper prepared for the Fourth Annual Conference on Global Economic Analysis, Purdue University W. Lafayette, IN, June 27-29, 2001

Babiker, M. J. Reilly, H. Jacoby, 2000, The Kyoto Protocol and developing countries, *Energy Policy*, 28: 525-536.

Babiker, M, J. Reilly, A.D. Ellerman, 2000. Japanese Nuclear Power and the Kyoto Agreement, *Journal of Japanese and International Economies* 14: 169-188.

Babiker, M., J. Reilly, M. Mayer, R. Eckaus, I. Sue Wing, and R. Hyman, 2001. The MIT Emissions Prediction and Policy Analysis (EPPA) Model: Revisions, Sensitivities, and Comparison of Results, MIT Joint Program on the Science and Policy of Global Change, Report No. 71 (Feb.) 90 pp.

Biggs, S., 2000. Sequestering carbon from power plants: The jury is still out, M.S. Thesis, Technology Policy Program, Massachusetts Institute of Technology, May.

Ellerman, A.D. and I. Sue Wing, 2000. Supplimentary: an invitation to monopsony?, *Energy Journal*, 21(4): 29-59.

Hyman, Robert C., 2001. A More Cost-Effective Strategy for Reducing Greenhouse Gas Emissions: Modeling the Impact of Methane Abatement Opportunities, M.S. Thesis, Technology and Policy Program and Department of Civil and Environmental Engineering, Massachusetts Institute of Technology, May.

Reilly, J., M. Mayer, and J. Harnisch, submitted. Multiple gas control under the kyoto agreement, joint program on the science and policy of global change, *Environmental Modeling and Assessment*.

Reilly, John, Mustafa Babiker, and Monika Mayer, submitted. Comparing Greenhouse Gases, *Resource and Energy Economics*.

Reilly, J. M., Mayer, M., Webster, M. D., Wang, C., Babiker, M. and Hyman, R. 2000. Uncertainty in emissions for climate models. *EOS Transactions*, American Geophysical Union, 81 (48): F22.

Sue Wing, Ian, 2001. Induced Technical Change in Computable General Equilibrium Models for Climate-Change Policy Analysis, Ph.D. Thesis, Technology, Management and Policy Program, Massachusetts Institute of Technology, May

Viguier, L.L., M.H. Babiker, and J.M. Reilly, 2001. Carbon Emissions and the Kyoto Commitment in the European Union, MIT Joint Program on the Science and Policy of Global Change, Report No. 70, (Feb.) 32 pp.

Viguier, L.L., M.H. Babiker, and J.M. Reilly, submitted. Carbon emissions and the Kyoto commitment in the European Union, *Energy Policy*.

Webster, M.D., C.E. Forest, J.M. Reilly, A.P. Sokolov, P.H. Stone, H.D. Jacoby, and R. G. Prinn, 2001. Uncertainty Analysis of Global Climate Projections, MIT Joint Program on the Science and Policy of Global Change, Report No. 73, (March), 3 pp.