

U.S. Environmental Protection Agency
2019 GTAP Advisory Board Report

GTAP Model and Data Base Usage

The U.S. Environmental Protection Agency (EPA) uses models based on the GTAP data base for analyses of congressional legislation, economic and environmental projections, and other research. EPA offices that are currently using or have used GTAP-based models include the Office of Atmospheric Programs (OAP), the Office of Transportation and Air Quality (OTAQ), and the Office of Policy (OP).

Publications/Papers

1. Marten, A. 2019. "The Importance of Source-Side Effects for the Incidence of Single Sector Technology Mandates and Vintage Differentiated Regulation." NCEE Working Paper 2019-03. Available at: <https://www.epa.gov/sites/production/files/2019-04/documents/2019-03.pdf>.
2. Cole, J., Li, J., Waldhoff, S., Edmonds, J., Cai, Y., Beach, R., Daenzer, K., Sue Wing, I., Rodriguez, A. M. L., Cui, Y., Kyle, P., Link, R., Wise, M., Fawcett, A. 2019. "Effects of Climate Change in Achieving Mitigation Policy: A Look at the Global Agriculture Sector." Working paper. (to be submitted later this year)
3. Waldoff, S. T., Sue Wing, I., Beach, R., Cai, Y., Daenzer, K., Ren, X., Cole, J., Cui, Y., Edmonds, J., Horing, J., Kyle, P., Link, R., Shouse, K., and Wise, M. 2019. "Macroeconomic Consequences of Climate Change Impacts on Agriculture: The Latin America Modeling Project." Working paper. (submitted to *Climate Change Economics*)
4. Lucena, A.F.P, Hejazi, M., Vasquez-Arroyoa, E., Turner, S., Koberle A.C, A.C., Daenzer, K., Rochedo P.R.R., Kober, T., Cai, Y., Beach, R.H., Gernaat, D., van Vuuren, D.P., van der Zwaan, B. 2018. "Interactions between climate change mitigation and adaptation: The case of hydropower in Brazil." *Energy*. 164:1161-1177.
5. Marten, A., Garbaccio, R., and Wolverton, A. 2018. "Exploring the General Equilibrium Costs of Sector-Specific Environmental Regulations." NCEE Working Paper 2018-06. (accepted at *Journal of the Association of Environmental and Resource Economists*) Available at: <https://www.epa.gov/sites/production/files/2018-10/documents/2018-06.pdf>.
6. Marten, A., and Garbaccio, R. 2018. "The SAGE Applied General Equilibrium Model v1.0: Technical Documentation." NCEE Working Paper 2018-05. Available at: <https://www.epa.gov/sites/production/files/2018-10/documents/2018-05.pdf>.

Presentations

1. Alex Marten, Andrew Schreiber and Ann Wolverton (presenter). "Occupational Affiliation and the Incidence of Environmental Regulation", 2019 AERE Meetings in Lake Tahoe, NV.

Special Reports

1. Update of non-CO2 greenhouse gas assessments

The US EPA (OAP) is preparing the latest installment of EPA non-CO2 greenhouse gas assessments, combining two long-running EPA report series, Non-CO2 Greenhouse Gases: International Emissions and Projections [USEPA, 2006, 2012] and Global Mitigation of Non-CO2 Greenhouse Gases [USEPA, 2005, 2013]. The new report, titled "Global Non-CO2 Greenhouse Gas Emissions Projections & Mitigation: 2015-2050" is anticipated to be released Summer 2019.

This report provides a consistent and comprehensive set of historical and projected estimates of emissions, as well as technical and economic mitigation estimates of non-carbon dioxide (non-CO2) greenhouse gases (GHGs) from anthropogenic sources for 195 individual countries. The analysis provides information that can be used to understand national contributions of GHG emissions, historical progress on reductions, and mitigation opportunities. The projections are generated using a combination of country-reported inventory data supplemented with USEPA-estimated calculations consistent with IPCC inventory guidelines. The mitigation estimates are generated using a bottom-up, engineering cost approach, which analyzes the costs of a wide range of mitigation technologies and incorporates them into marginal abatement cost curves.

Projects

1. Development of ADAGE

OTAQ funds and works with RTI on the development of the ADAGE model. ADAGE is built on the GTAP data base and includes other countries/regions in addition to the U.S. Development this year has included updates and enhancements to the transportation and energy sectors of the model, such as updating costs of different vehicle technology types and assumptions about energy generation.

2. Development of SAGE (SAGE is an Applied General Equilibrium model)

The National Center for Environmental Economics (OP) was tasked by the Science Advisory Board with building the capacity for computable general equilibrium modeling at EPA. SAGE is a multi-regional dynamic CGE model of the US economy that relies on GTAP (v7) Armington elasticities for intra- and international trade (aggregated using information from GTAP v9). The model is currently configured to quantify the impacts of environmental regulation in the form of command and control style technology mandates.

3. The Latin American Modeling Project (LAMP)

The GTAP database underlies Phoenix, a multi-regional global CGE model, whose results are featured in model inter-comparisons and publications from the Latin American Modeling Project (LAMP). Phoenix is a 24 region 26 sector global dynamic CGE model using GTAP 7 data. LAMP examines the implications of climate change and emissions mitigation in Latin America (see the May 2016 Special Issue of Energy Economics for mitigation results). Several models, including Phoenix, provide global results. LAMP was funded by USAID and US EPA. US EPA also funded the development of the Phoenix model.