## Construction of EMPAX-CGE Data Files

The dynamic version of the EMPAX-CGE model is calibrated to data from a variety of economic and energy sources. The starting point is a Social Accounting Matrix, which is an expanded version of the traditional Input/Output table that contains information on the ownership of factors of production. Economic data necessary to develop a SAM for EMPAX-CGE are provided by the Minnesota IMPLAN Group (MIG), and the programs used to read these data were developed by Rutherford (2004). The IMPLAN data set contains SAM data for all 50 states and 509 sectors, which are then aggregated into the five model regions and 35 sectors. While IMPLAN data is derived from a variety of federal government sources, the final data sets are proprietary and are available for licensing through MIG.

The IMPLAN economic data are supplemented by additional data sources on energy production and consumption because the policies being investigated by EMPAX-CGE focus on energy markets. For this reason, it is essential to have the best possible characterization of these markets in the model. To integrate the Energy Information Agency (EIA) energy data and the IMPLAN economic data, Annual Energy Outlook (AEO) forecasts are combined with the state-level historical data sources from EIA to produce state-level energy consumption, production, and trade forecasts. Upon determining state-level energy forecasts, the energy data are aggregated into EMPAX-CGE regions. Once this is done, the energy data and AEO forecasts are integrated with the economic data. EMPAX-CGE uses a procedure developed by Babiker and Rutherford (1997) and described in Rutherford and Paltsev (2000) to combine these data. Once the data are integrated, a balanced SAM is generated that matches AEO forecasts for GDP, output, consumption, investment, and government spending. For more details on this process, refer to the model documentation [RTI (2008)].

## References


Babiker, M.H., and T.F. Rutherford. 1997. "Input-Output and General Equilibrium Estimates of Embodied Carbon: A Data Set and Static Framework for Assessment." University of Colorado at Boulder, Working Paper 97-2.

Rutherford, T.F., and S.V. Paltsev. 2000. "GTAP-Energy in GAMS: The Dataset and Static Model." University of Colorado at Boulder, Working Paper 00-2.

Rutherford, T.F. 2004. "Tools for Building National Economic Models Using State-Level IMPLAN Social Accounts." University of Colorado Web site <http://debreu.colorado.edu/implan98.htm>.

RTI International. 2008. "EMPAX-CGE Model Documentation." Available at http://www.epa.gov/ttnecas1/models/empax_model_documentation.pdf