

GAMS

# Optimization

www.gams.com

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gamsworld.org

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## High-Level Modeling

The General Algebraic Modeling System (GAMS) is a high-level modeling system for mathematical programming problems. GAMS is tailored for complex, large-scale modeling applications, and allows you to build large maintainable models that can be adapted quickly to new situations. Models are fully portable from one computer platform to another.

## Wide Range of Model Types

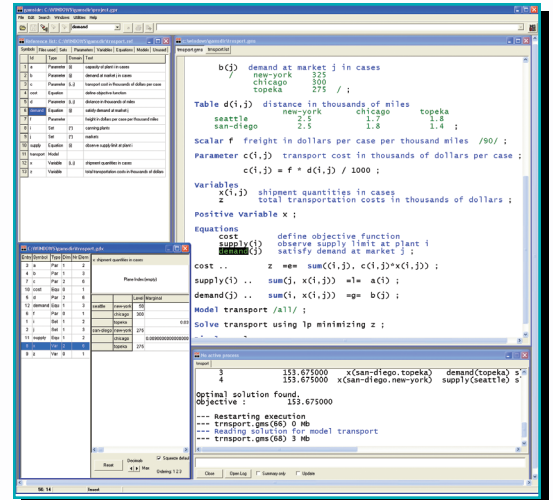
GAMS allows the formulation of models in many different problem classes, including

- Linear (LP) and Mixed Integer Linear (MIP)
- Quadratic Programming (QCP) and Mixed Integer QCP (MIQCP)
- Nonlinear (NLP) and Mixed Integer NLP (MINLP)
- Constrained Nonlinear Systems (CNS)
- Mixed Complementary (MCP)
- Programs with Equilibrium Constraints (MPEC)
- Conic Programming Problems
- Stochastic Linear Problems

## Climate Policy Modeling with GAMS

MERGE is a Model for Evaluating Regional and Global Effects of GHG reduction policies originally developed by Alan S. Manne from Stanford University and Richard Richels from the Electric Power Research Institute. MERGE provides a framework for thinking about climate change management proposals. The model is used to explore alternative views on a wide range of issues related to climate policy design, e.g., costs, damages, valuation, and discounting.

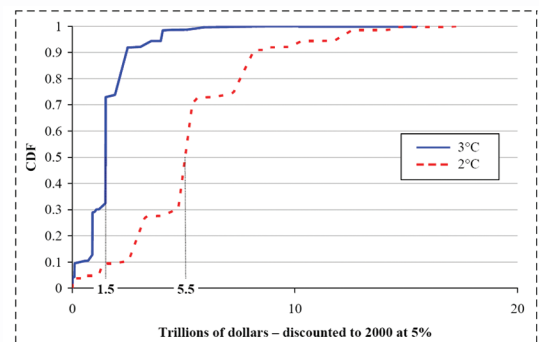
- The GAMS source code for MERGE is licensed by EPRI at zero cost and is available for public use. Current users include government & academic agencies worldwide. (See <http://www.stanford.edu/group/MERGE/>)
- MERGE is a multi-region, multi-commodity model combining both "top-down" and "bottom-up" elements of the global supply and demand for energy.
- A stochastic optimization formulation accommodates an explicit representation of uncertainty, although the model may also be operated in a deterministic mode.
- The model is solved using the CONOPT and MINOS nonlinear optimization solvers.



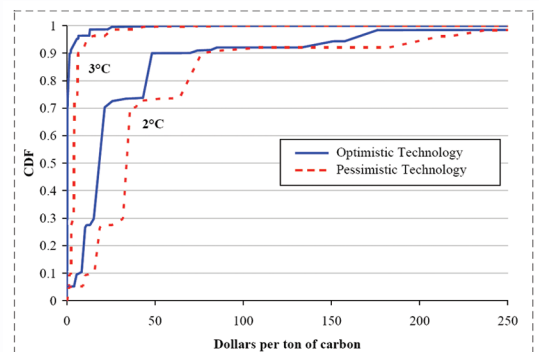
GAMS Integrated Developer Environment for editing, debugging and solving models and viewing data.

## State-of-the-Art Solvers

GAMS incorporates all major commercial and academic state-of-the-art solution technologies for a broad range of problem types, including global nonlinear optimization solvers.



Gross Benefits from R&D Program under Alternative Temperature Constraints (50th percentile values highlighted)



Carbon Prices in 2010 with 2° and 3°C Temperature Caps