Introduction to Temoa (Tools for Energy Model Optimization and Analysis)

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Problems with the status quo

- Inability to validate model results
- Increasing availability of data
- Moore’s Law
- Increasing model complexity
- Lack of openness
- Uncertainty analysis is difficult
- Inability to verify model results


What is Temoa?

Temoa is a **bottom up, technology explicit model with perfect foresight**, similar to the TIMES model generator.

**Features**

- Minimizes the present cost of energy supply
- Flexible time slicing by season and time-of-day
- Variable length model time periods
- Technology vintaging
- Technology-specific loan periods, lifetimes, and discount rates
Temoa Development Goals

Repeatable Analysis
• Code licensed under GPLv2
• Data and code stored in a publicly accessible web repository (github.com)
• Open source software stack

Rigorous treatment of uncertainty
• Framework designed to operate in a high performance computing environment
• Stochastic optimization; near optimal solutions

Flexibility
• Utilizes Pyomo, a Python-based programming environment with links to linear, mixed integer, and non-linear solvers
• Draws on rich open source Python ecosystem
### Temoa Capabilities

- Visualization of the energy system network (graphviz)
- Input/output data stored in a relational database (sqlite)
- Optional Excel output produced from database
- Configuration file used to specify model options

Project website: [http://www.temoaproject.org](http://www.temoaproject.org)
Source code: [https://github.com/TemoaProject/temoa](https://github.com/TemoaProject/temoa)