

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

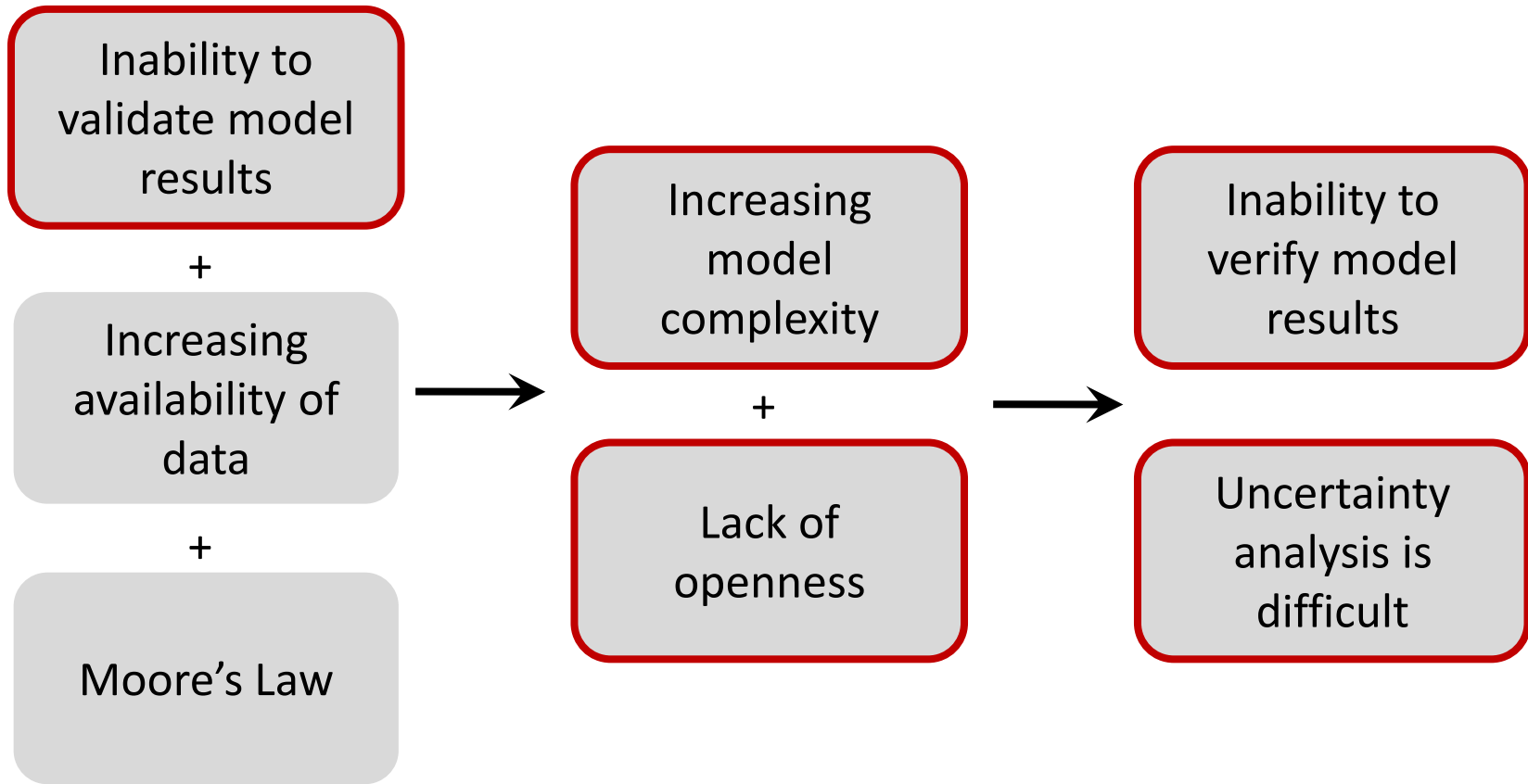
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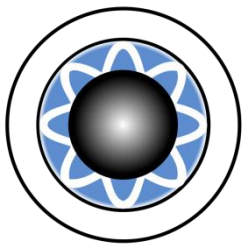
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Problems with the status quo



DeCarolis, J.F., K. Hunter, S. Sreepathi (2012). The case for repeatable analysis with energy economy optimization models. *Energy Economics*, **34**(6): 1845-1853.

Hunter, K., S. Sreepathi, J.F. DeCarolis (2013). Modeling for insight using Tools for Energy Model Optimization and Analysis (Temoa). *Energy Economics*, **40**: 339-349.

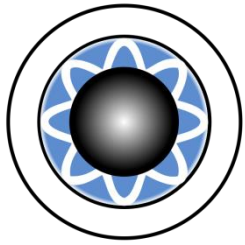


What is Temoa?

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

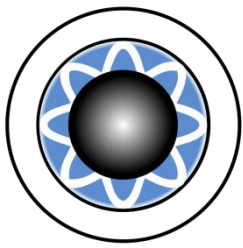
- Code licensed under GPLv2
- Data and code stored in a publicly accessible web repository (github.com)
- Open source software stack

Rigorous treatment of uncertainty

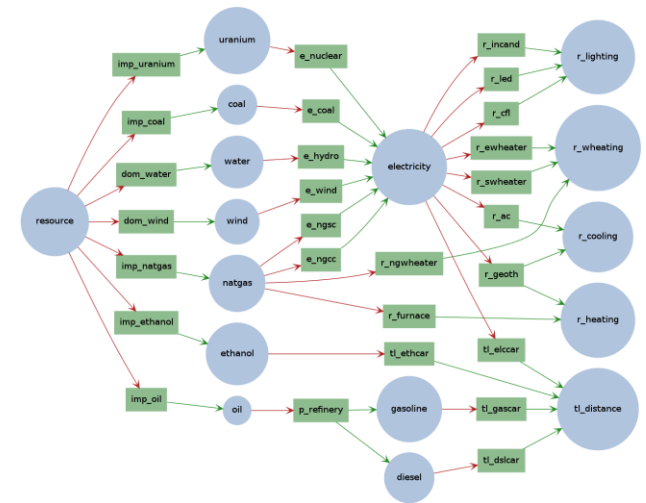
- Framework designed to operate in a high performance computing environment
- Stochastic optimization; near optimal solutions

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>

Source code: <https://github.com/TemoaProject/temoa>