

Building from First Principles of Good Energy Modeling: Second Annual Summit

NESCAUM, NASEO, NEMWI, ACEEE

***Energy and Economic Policy Models:
A Reexamination of Some Fundamentals***
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What are the “First Principles?” (1)

1. Modeling must accurately characterize the policy initiative(s) being designed and implemented
 - Seek direct input from the entities (e.g., states/regional groups) engaged in designing & implementing the policy
 - Document and disclose these communications along with modeling results

What are the “First Principles?” (2)

2. Use appropriate cost & performance characterization of technologies and policies associated with the initiative(s)
 - Avoid stylized representations or simplifications (typically assume economic costs and disregard potential for savings)
 - Use state/regional level data rather than generalized, economy-wide data whenever possible

What are the “First Principles?” (3)

3. Use appropriate algorithms that provide a reasonable, credible, and fair economic assessment of cost-effective technology and program deployment
 - Learning curves, economies of scale, technology penetration rates, etc.

What are the “First Principles?” (4)

4. Assess benefits as thoroughly as costs in modeling results
 - Direct benefits, e.g.,
 - Savings on energy bills from EE measures
 - Income from net metering of renewables
 - Indirect benefits, e.g.,
 - Greater business productivity
 - Job growth through enhanced technology development and deployment
 - Improved public health, quality of life

What are the “First Principles?” (5)

5. Make transparent all assumptions and inputs; clearly disclose known or likely biases

– Examples:

- Who designed the study; who paid for it?
- What purpose is the study designed to serve?
- Who is the intended audience?
- How were assumptions arrived at?
- What inputs were used and why?
- Others?

What are the “First Principles?” (6)

6. Characterize the principal sources of uncertainty in the model design, the expected magnitudes or variability of those uncertainties, and the anticipated influence of those uncertainties on the outcome of the analysis.