



energy
modeling
forum

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EMF 25: Efficiency and the Shape of Future Energy Demand

Summary:

The Energy Modeling Forum (EMF) 25 study is evaluating energy demand and economic growth and the opportunities for reducing electricity and fuel demand through energy conservation programs.

Major Questions:

- How does economic growth change energy service demands (household size, floor space, vehicle miles traveled and industrial mix)?
- How costly is it to substitute away from the use of carbon-based fossil fuels and petroleum?
- How do programs that improve end-use energy efficiency affect the final demand for electricity and fuels?

Motivation:

- Business-as-usual (BAU) energy demand projections are extremely uncertain, given major changes in economic growth and structure as well as recent energy price increases.
- Federal and state policies will emphasize end-use efficiency because many policymakers consider it quicker and less costly than other options.
- Energy demand options are often represented in aggregated ways in many climate change models and therefore may be less insightful for policymakers who want to promote improved end-use efficiency.

Analysis:

- Develop state of the art energy efficiency cost curves for residential, commercial, industrial and transportation sectors that can be compared with other, proprietary estimates (e.g., McKinsey).
- Provide these energy efficiency cost curves for insertion into major energy and climate change policy models.
- Compare model results for BAU scenarios incorporating different assumptions about economic growth, energy service demands, energy or carbon prices, and the cost of capital.

First-Round Scenarios:

- EMF baseline scenario based upon US Energy Information Administration's reference case in the 2009 Annual Energy Outlook.
- Carbon price case where carbon dioxide emissions cost \$30 per metric ton.
- Energy price case where BTU delivered energy costs are increased by the same amount as the carbon price case (used for evaluating the costs of reducing energy use).
- Petroleum price case where oil prices rise by the same amount as the carbon price case (used for evaluating the costs and impacts of policies that replace oil use).

- A non-price energy conservation program where the residential and commercial sectors adopt only the best available technologies (the highest available energy efficiency) in any given year.

Future Analysis:

- After reviewing the first round of results, the EMF working group will revise the above cases and add new simulations to cover important issues.
- New energy efficiency cost curves will be developed for possible inclusion in some or all models.
- Future scenario simulations will be based upon these cost curves to the extent feasible.

Current North American Modeling Teams Participating in the Study:

- Brookhaven (US Markal)
- Brookings Institution (McKibbin-Wilcoxon model)
- Central Research Institute for Electric Power Industry (CRIEPI, Japan)
- Charles River Associates
- Joint Global Change Research Institute, U. of Maryland
- MIT Joint Program on the Science and Policy of Global Change
- Onlocation, Inc. (NEMS-GRPA)
- Research Triangle Institute (ADAGE)
- Resources for the Future (HAIKU electricity model)
- Simon Fraser University (CIMS)
- University of Maryland Inforum Project (LIFT)
- US Energy Information Administration (NEMS)
- Other models expected to commit to simulating these cases

Communication of Findings:

- The study will communicate these results through
 - a summary final report for policymakers,
 - a more technical volume for modelers and other experts,
 - and testimony and presentations by study group participants.
- Additionally, the EMF is planning a website covering critical data, key study conclusions, and supporting and related papers on methodology and results.

Time Schedule:

- November 2008: kickoff meeting.
- April 2009: initial but still preliminary results from first round.
- November 2009: second round results.
- April-May 2010: preliminary report; decisions about future comparisons on topic.
- Summer 2010: final report describing key findings through May 2010.

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