Challenges for Long-Term Energy Modeling

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Outline of Session

- Moderator's initial identification of some key challenges in long term energy modeling
- Each of the distinguished speakers will discuss the challenges as they see them.
- The order of the presentations will be
  – Professor Bill Hogan
  – Professor Jim Sweeney
  – Professor John Weyant
- *Clarifying* questions for individual speakers only at end of each presentation
- Facilitator Comments
- Question and answer period at the end of our session

What Do We Mean By Long Term?

- Energy Commodity Traders: 1 month – 3 years
- Electric and Gas Utility Planners: 5 -15+ years
- Energy Information Administration and Commercial Forecasters: 10 – 25+ years
- R&D Investment Decisionmakers: 10 – 50 years
- Climate Change Interest: 50 – 100 years +

A Brief List of Some Key Challenges

- Data availability and quality is the first major challenge in modeling. Historical data is used to:
  - Develop a good starting point for any projection
  - Estimate consumer behavior -- preferences/choices for technologies and efficiency. What were the key factors that determined adoption?
  - Estimate rate of technological progress and how it might be affected by learning and R&D. Is there evidence of a statistical relationship between specific R&D and specific technological progress?
  - Identify and quantify market barriers and market hurdles: and how they affected technology/efficiency choices.

A Brief List of Some Key Challenges

- Modeling challenges– uncertainties in forecasting in the long term – estimating:
  - Changes in consumer and producer behavior
    - Rates of technology/efficiency adoption and investment behavior
  - Changes in the demand for energy services
  - Availability, character, and prices of future domestic supplies
  - Changes to geopolitical events affecting supply availability and prices (e.g., more/less hostile environment for foreign investment in resource rich regions)
  - Rates of technological progress – what affects it?
  - Anticipating specific technological breakthroughs?
  - Menu and characteristics of future technologies?
  - How will growth of biofuels impact other land uses and food prices? Should a full agricultural model be incorporated?
  - Importance of what was not modeled
  - New policies, laws and regulations (energy, economic, environmental)

End of Introductions and Presentations

Start of Q&A Session

With Philip Tseng

We all like to have a clear crystal ball for long term forecasting

But most of the time, the ball is not crystal clear

We have only limited means to penetrate the barriers of uncertainty in the future

Our Panelists

- Fortunately, the combined modeling experiences of our speakers exceed more than **100** years.

- They also specialize in different aspects of the energy markets and models.

Question and Answer Process

- Please use the standing microphone to ask questions

- Give your name and affiliation

- Indicate if the question is addressed to a specific speaker

- State your question briefly.

End of Session

Thank You for Your Participation