Introduction to REMI Macroeconomic Modeling & Potential Use for RGGI Program Review

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Presentation Focus

REMI macroeconomic modeling can be used to estimate regional economic impacts

• Background on consultant advisor
• Relevant past uses of the REMI model
• Overview of REMI Model capabilities
• Conceptual mapping of scenario data
About EDR Group

- Started in 1996, Boston-based staff of economists, engineers & regional planners

- Apply state-of-the-art analysis tools & techniques to address

  - Economic Impact Analysis -- *How can my project/program affect economic growth & attraction?* ... *How can I best target my efforts?*

  - Market / Strategy Analysis -- *How will I be affected by changes in the economy?* ... *What should I do to respond to them?*

  - Benefit / Cost Analysis -- *What will be the economic benefits & costs of my project / program?* ... *What should I do to maximize net value*
About EDR Group (cont’d)

- We support energy & environmental policy decision making through economic impact analyses studies for local, state and regional agencies across the US. These include studies of the economic impacts of:

  (1) energy efficiency programs,
  (2) renewable energy,
  (3) energy production, distribution and conservation policies,
  (4) air quality and safety policies, &
  (5) utility pricing and customer response.
Estimating Regional Economic Impacts

- Key outputs of a regional economic impact assessment include:
  - Changes in gross state (regional) product
  - Changes in employment, labor income
  - Changes in total economic production
  - Results address industry-specific and aggregate impacts state/region

- Our tool for the regional economic impact analysis will be the REMI© model, a 12-state economic and demographic forecasting model.
About the REMI Model

• Began in 1986 Amherst, MA - MA Dept. of Revenue was first customer

• REMI builds *regionally-calibrated* economic forecast/simulation software systems for clients in the U.S. (annual reporting through 2050)

• It is a *dynamic computable general equilibrium (CGE) economic analysis system* with significant (though not infinite) internal logic to specify how an economy moves forward/adjusts to numerous (*labor/capital/other inputs*) market conditions

• It has been used in *sequence* with other technical pre-processor analysis models (e.g. energy supply sector, GHG abatement solutions)

• The NESCAUM REMI model contains private-sector industry-detail equivalent to the 3-digit NAICS (industry) definitions
Depiction of REMI logic – single economy

Population & Labor Supply

Labor & Capital Demand

Wages, Prices, & Profits

Output

Market Shares

Investment changes tied to new technology mix

Fuel commodity & other energy price changes
Measuring Impacts with the REMI model

What are the effects of the Proposed Action?

The REMI Model

Baseline values for all Policy Variables

Policy → Action

Alternative Forecast

Control Forecast

Compare Forecasts

Economic Development Research Group

NESCAUM
Best Practices in Economic Analysis (2)

• Analysis of other impacts—
  – Analysis should also provide insights on the distribution of aggregate costs and benefits across different groups (e.g., relevant industries)

• The *distributive effects* of the initial cost & benefits* are decided *external* to the REMI model.

• The REMI analysis captures the scenario’s subsequent “+” and “-” economic transactions in the state/region for its households and business community, with an underlying industry-specific allocation.

* *those that are monetized and can be transacted within REMI*
REMI Scenario Implementation

1. Economic levers would be developed for each RGGI State (based predominantly on IPM outputs) – the *direct effects*
2. The *direct effects* would have a set of stated assumptions around them which the states would help define
3. Economic levers would convey to the model the annual “*deltas*” over the reference case
4. Economic levers are carefully selected to mimic (in the model) any expected *influence* a particular RGGI direct effect would exert on existing market conditions
What would we be mapping?

• Would translate the IPM model results into a set of information regarding economic transactions

• Those transactions may encompass
  1. capital investment (demand) shifts for Generating capacity,
  2. Ratepayer effects by customer segment
  3. Demand shifts for primary fuel purchases
  4. Demand shifts for new mix of facility O&M requirements
  5. Demand shifts related to pollution control equipment / energy-efficiency deployment
  6. Costs on businesses (households) related to new equipment purchases
From direct effect to total effect

- The REMI multi-state model considers the magnitude and allocation of each state’s direct effects and how that alters the overall cost of living, households’ ability to consume and cost-of-doing business.

- This affects overall GSP (and employment) vis a vis Consumption, and the state’s industries relative competitiveness to export domestically and overseas. The cost of living effect will influence working age migration which has labor market/utilization implications for area employers.

- The states would be differentially affected under any potential changes to RGGI. There would be subsequent interactions between them as a result, as well as with the rest of U.S.
Thank You

Your questions?