

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



March 20, 2012

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.

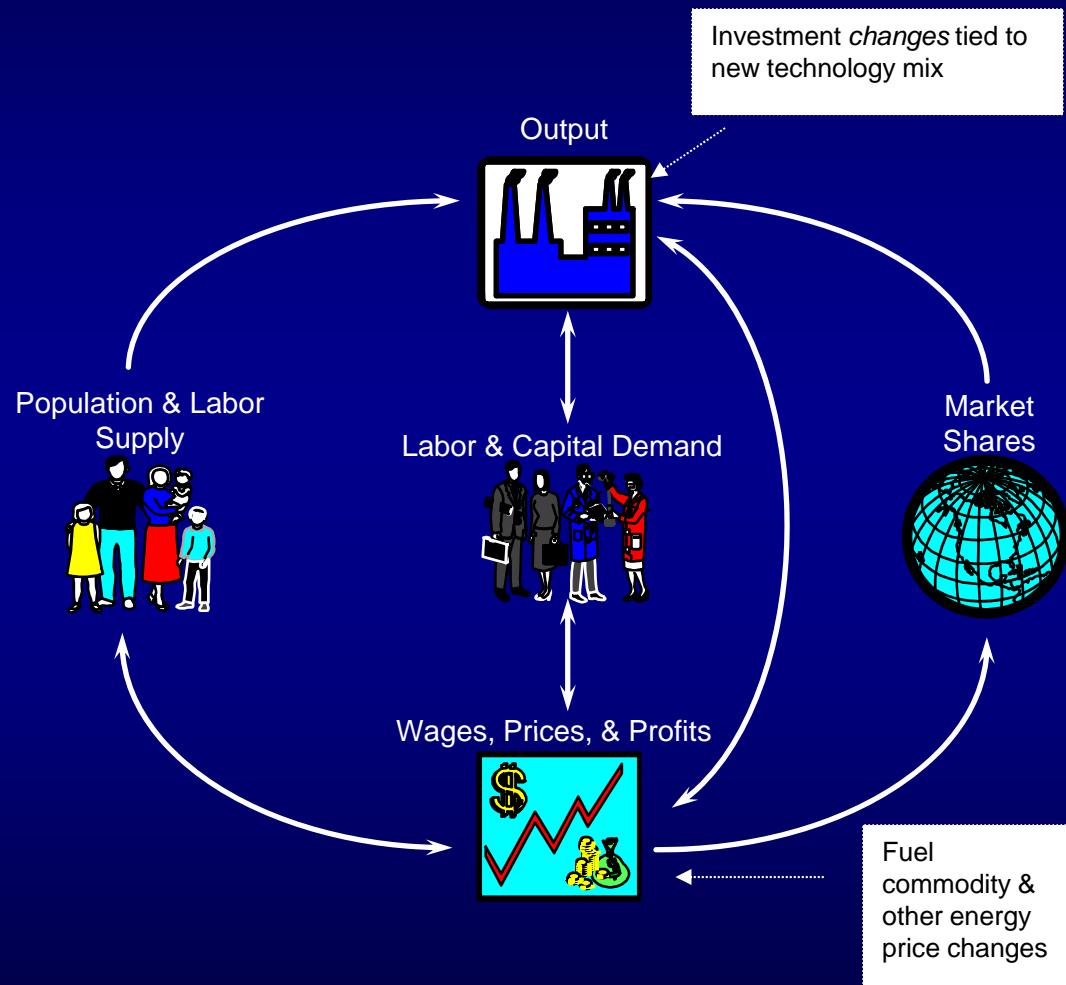
Estimating Regional Economic Impacts

- 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.

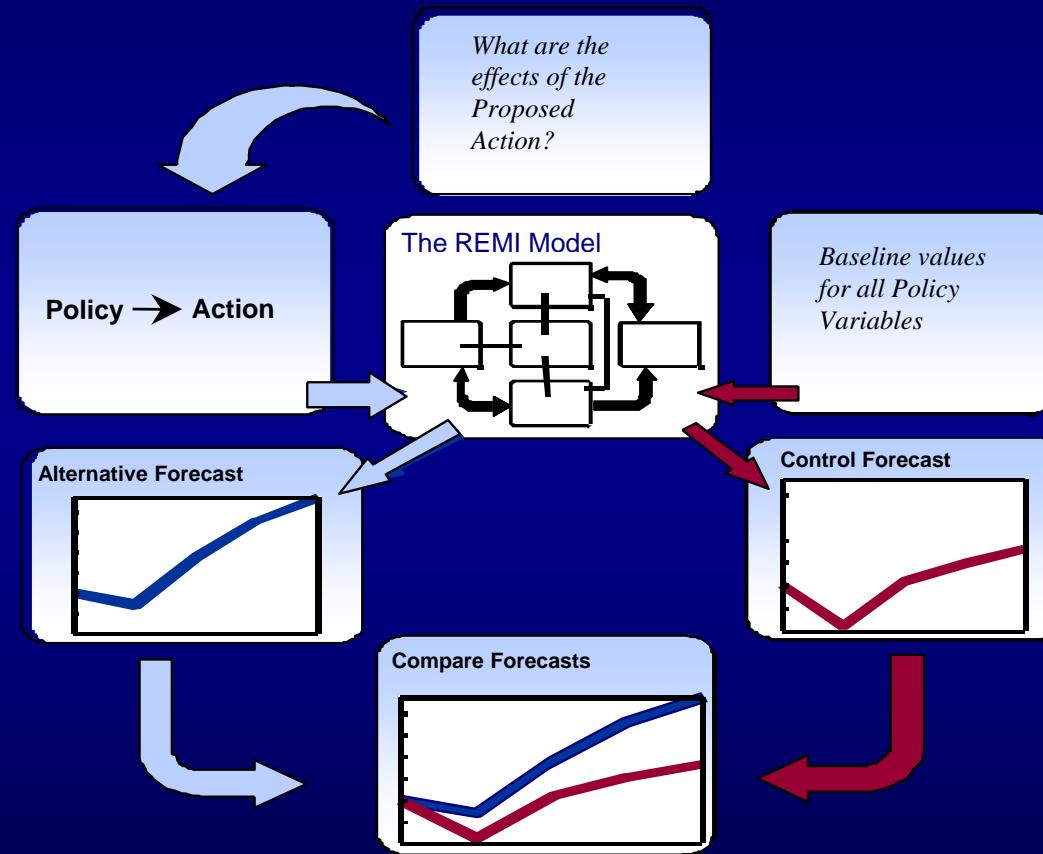
About the REMI Model

- 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*



Measuring Impacts with the REMI model



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 (& 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?