

Scenario Analysis Update

Connecticut Energy Advisory Board
August 9, 2007

Stephen Whitley
Senior Vice President & Chief Operating Officer, ISO New England

Scenario Analysis: Background

- Policymakers and electric consumers concerned about increasing electricity costs
- New England region in need of:
 - Additional resources (supply and demand)
 - Diversity of resources
 - Resources to meet environmental and renewable objectives
 - Balancing reliability with reasonably priced supply
- Lawmakers considering policies to address these issues
- All stakeholders are seeking information and solutions

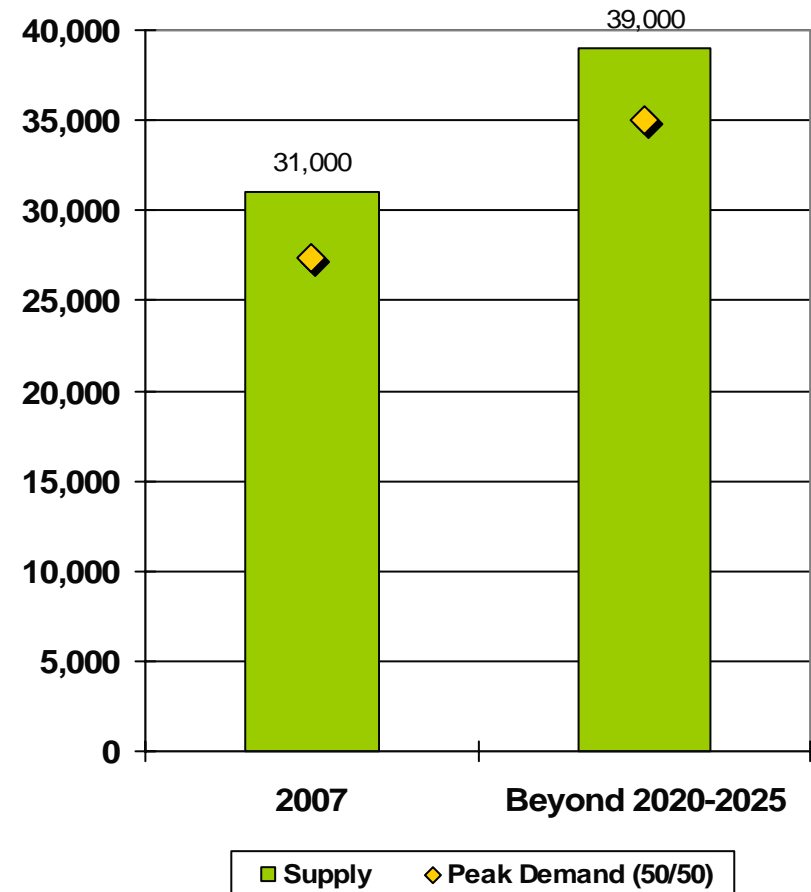
New England: Supply & Demand Outlook

• Supply

- 2007 supply is today's resources
- Future supply based on purchases in the Forward Capacity Market (includes demand resources)

• Demand

- Today's demand to be met with existing supply
- Ten-year regional planning process identifies need for additional 4,000 Megawatts ("MW") by 2016
- Longer term scenario analysis assumes a 35,000-MW peak demand beyond the 2020-2025 timeframe
 - Additional 8,000 MW of resources needed



Scenario Analysis

What it is:

- Information gathering and education about future resource options
- Snapshot of all hours in a single future year
- Tools to understand key drivers of electricity costs
- Data for further comparison, analysis and discussion

What it is not:

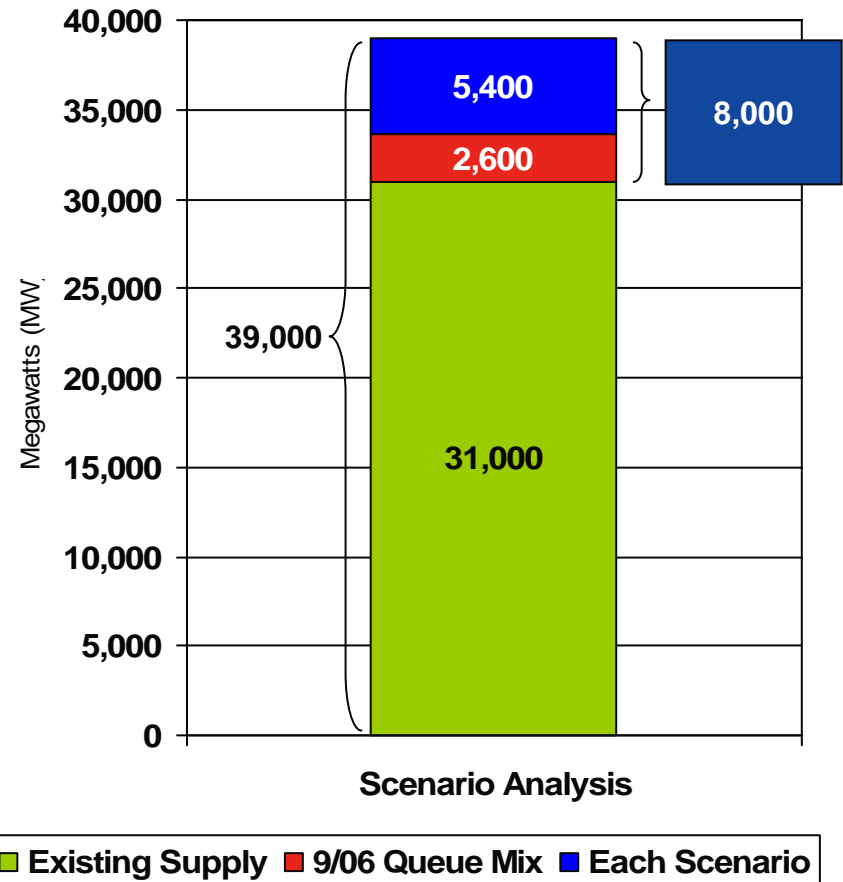
- Right or wrong technologies
- An integrated resource plan
- ISO's preferences for what types of technologies or resources should be developed
- An attempt to achieve a regional consensus
- A prediction of the future

Scenario Analysis: Process

- Led by Steering Committee
 - ISO-NE
 - New England Conference of Public Utilities Commissioners (NECPUC)
 - New England Power Pool (NEPOOL)
- Diverse set of regional stakeholders actively engaged on Scenario Analysis project
 - States
 - Utility and environmental regulators
 - Consumers
 - Electric industry, including suppliers, transmission companies, and demand-side resources
 - Efficiency and environmental advocates

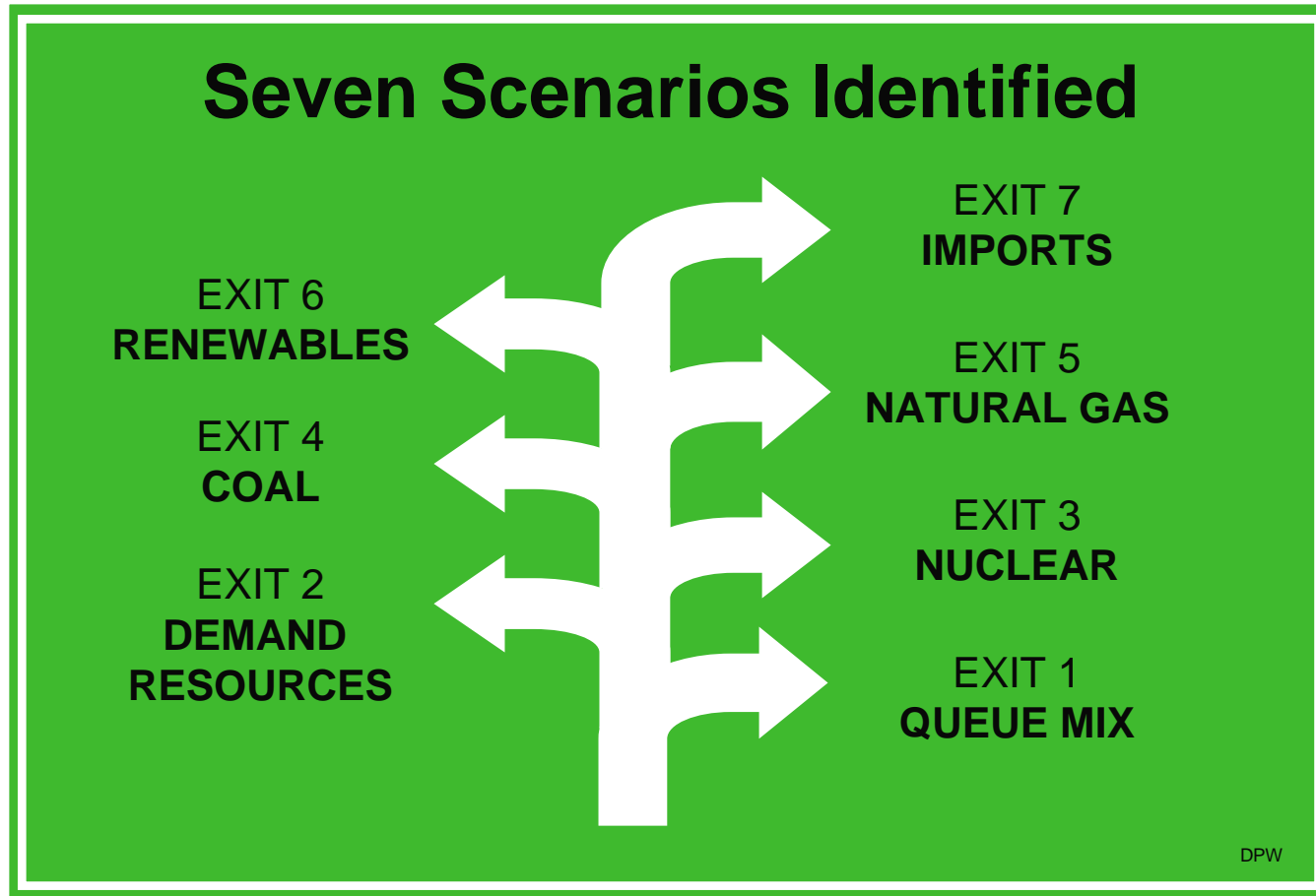
New England Scenario Analysis

- Seven future resource scenarios
- Each models 8,000-MW system expansion based on:
 - A representative mix of the resources currently being proposed, *plus*
 - A large concentration of a certain technology / resource option
- Measure and compare reliability, economic, and environmental performance of each
- Results can be used to begin discussions of policy choices and implications



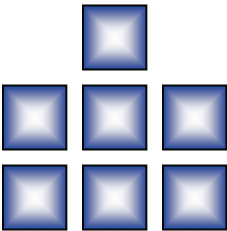
Many Routes to Meet Future Electricity Needs

Region most likely to choose a combination of these options



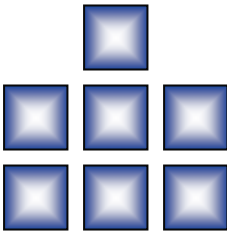
Numerous Simulations Conducted

Extensive data for further analysis (spreadsheet tool)



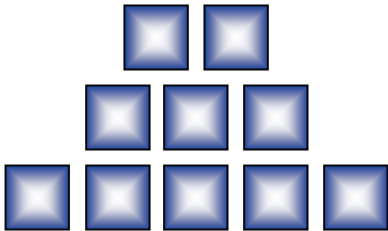
$$(7 \times 7)$$

Scenarios With Common Assumptions



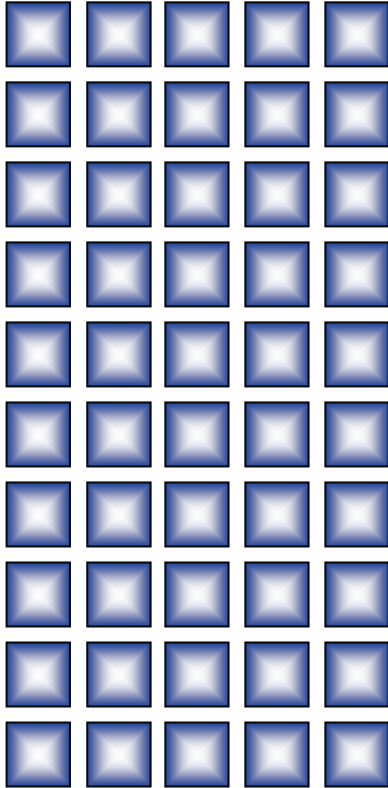
$$+ 4$$

Common Sensitivity Analyses



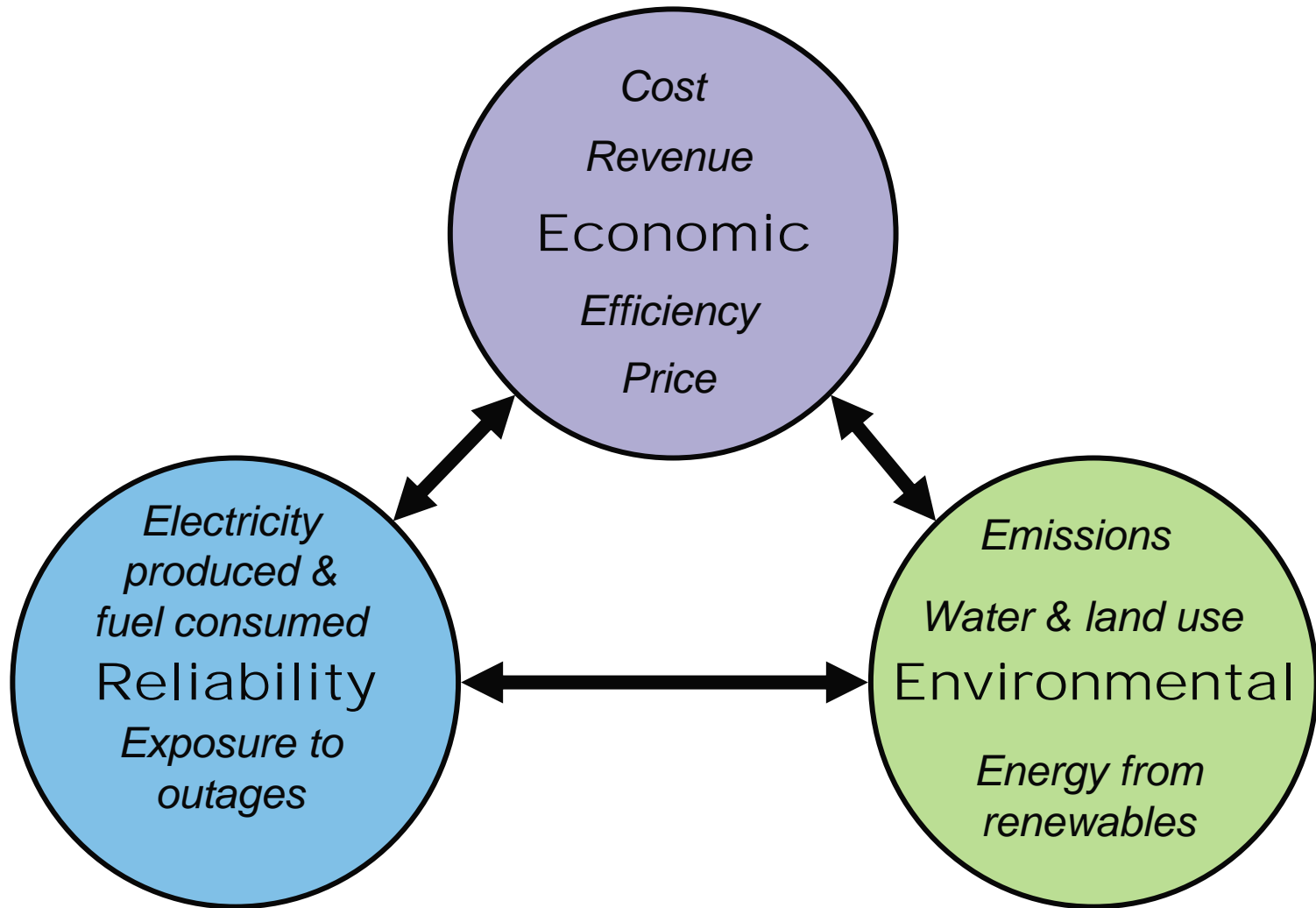
$$= 50+$$

Special Sensitivity Analyses



Total Simulations

20 Sets of Performance Metrics Developed in Three Policy Categories

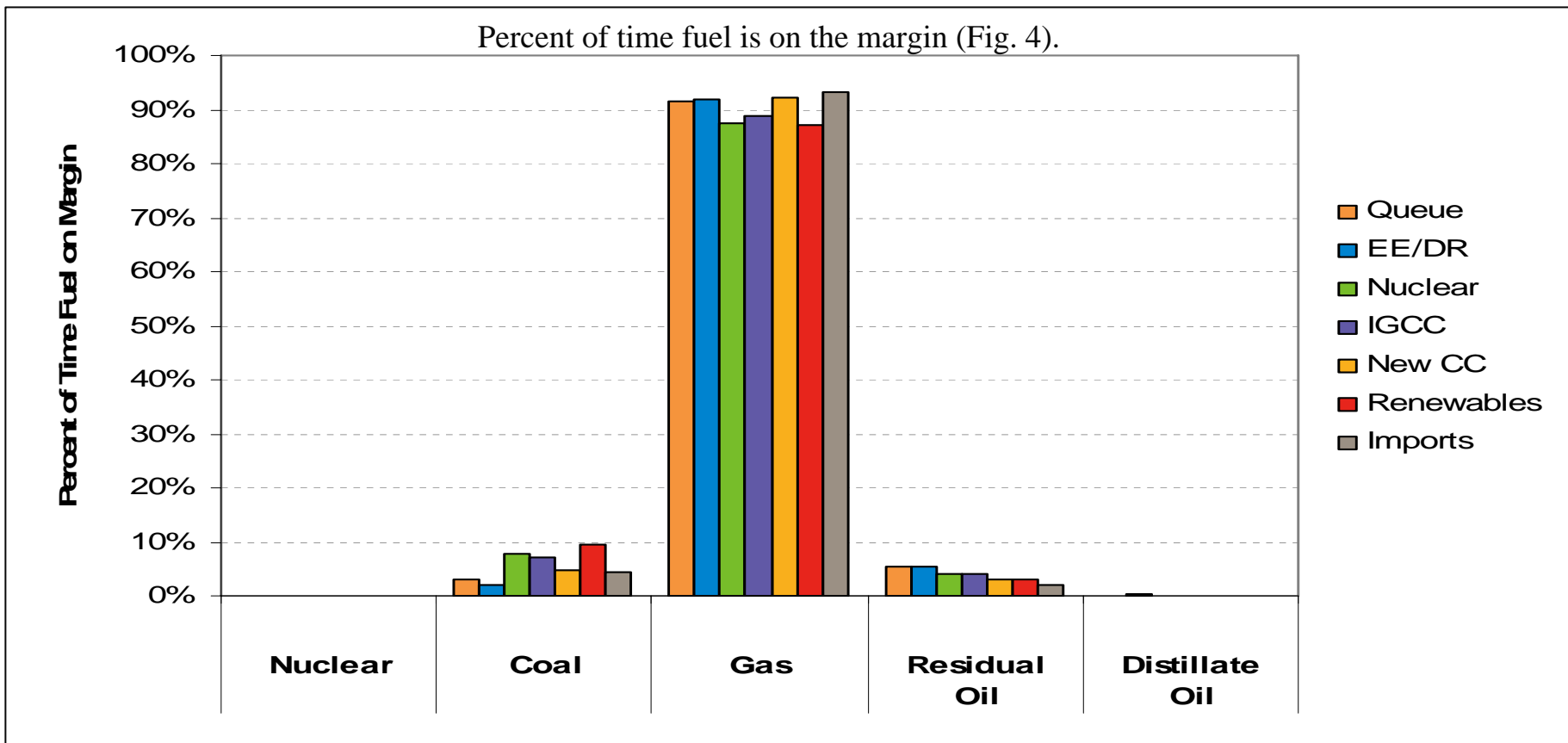


Some Initial Findings and Key Themes

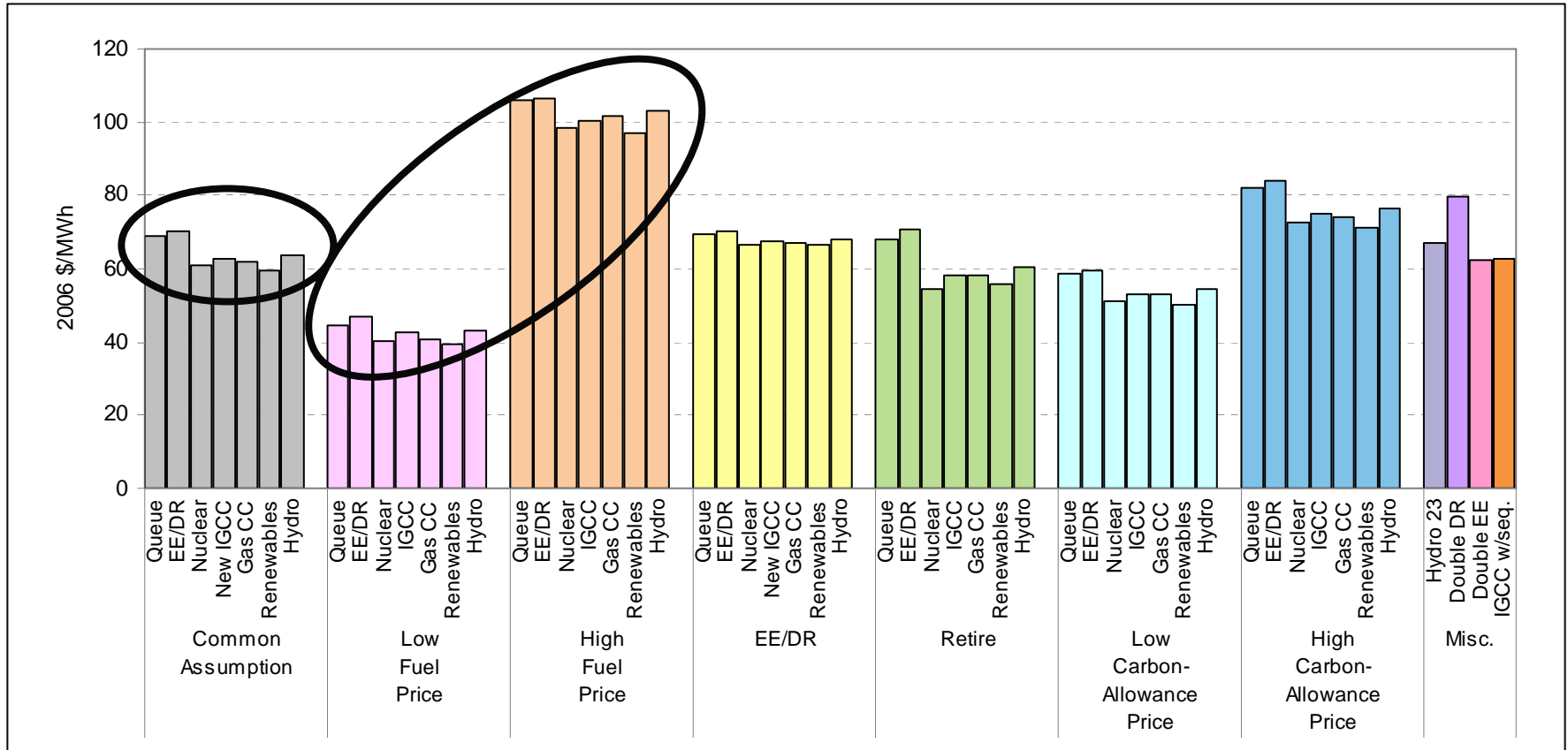
Wholesale Prices: Findings

Gas-fired plants set energy clearing prices ~90% of the time

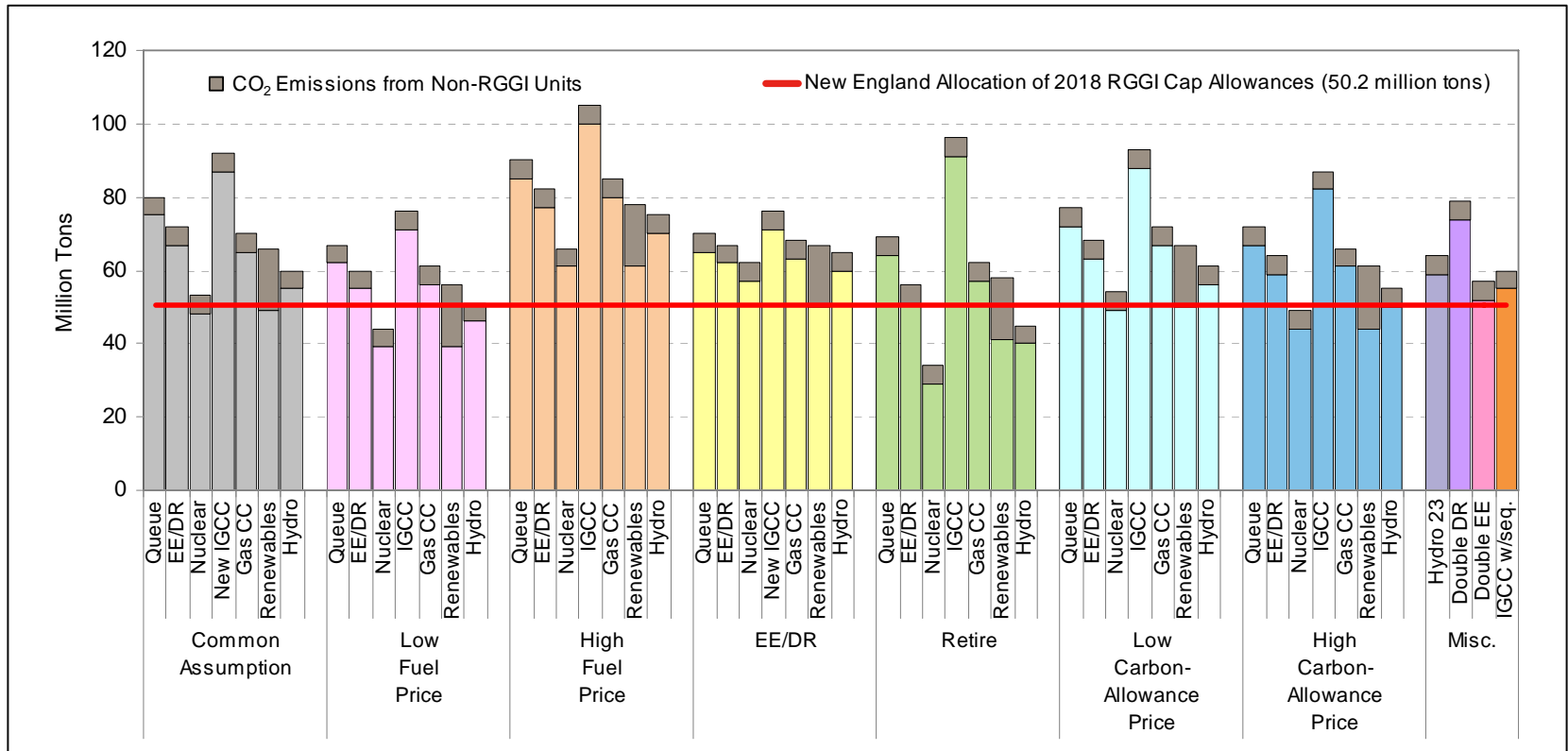
New, more efficient gas-fired resources likely to reduce marginal clearing prices



Low Variable Cost, Low Emitting, and High Energy Output Resources have the Lowest Average Clearing Prices for Wholesale Electric Energy (\$/MWh)



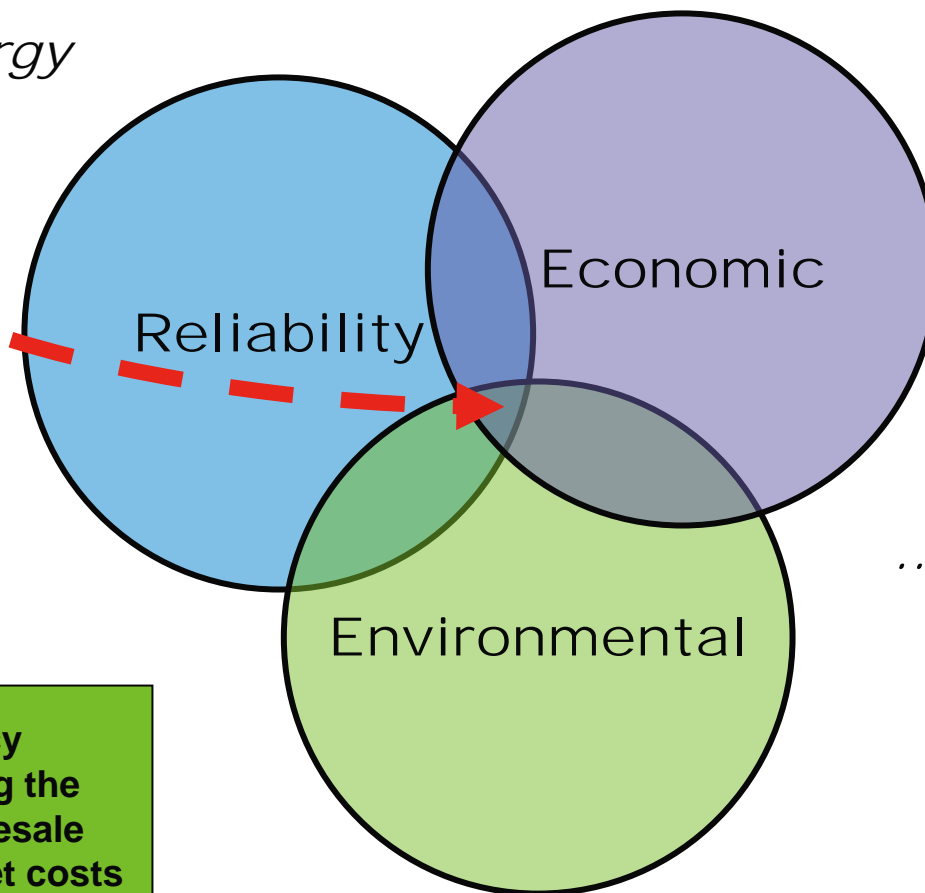
Challenges Meeting RGGI Requirements (New England CO₂ Emissions vs. RGGI*)



*Total annual CO₂ emissions, grouped by sensitivity case and showing the New England allocation of the RGGI cap allowance.

But Policy Categories Overlap, Metrics Should be Considered Together

Example: Energy efficiency scenario...

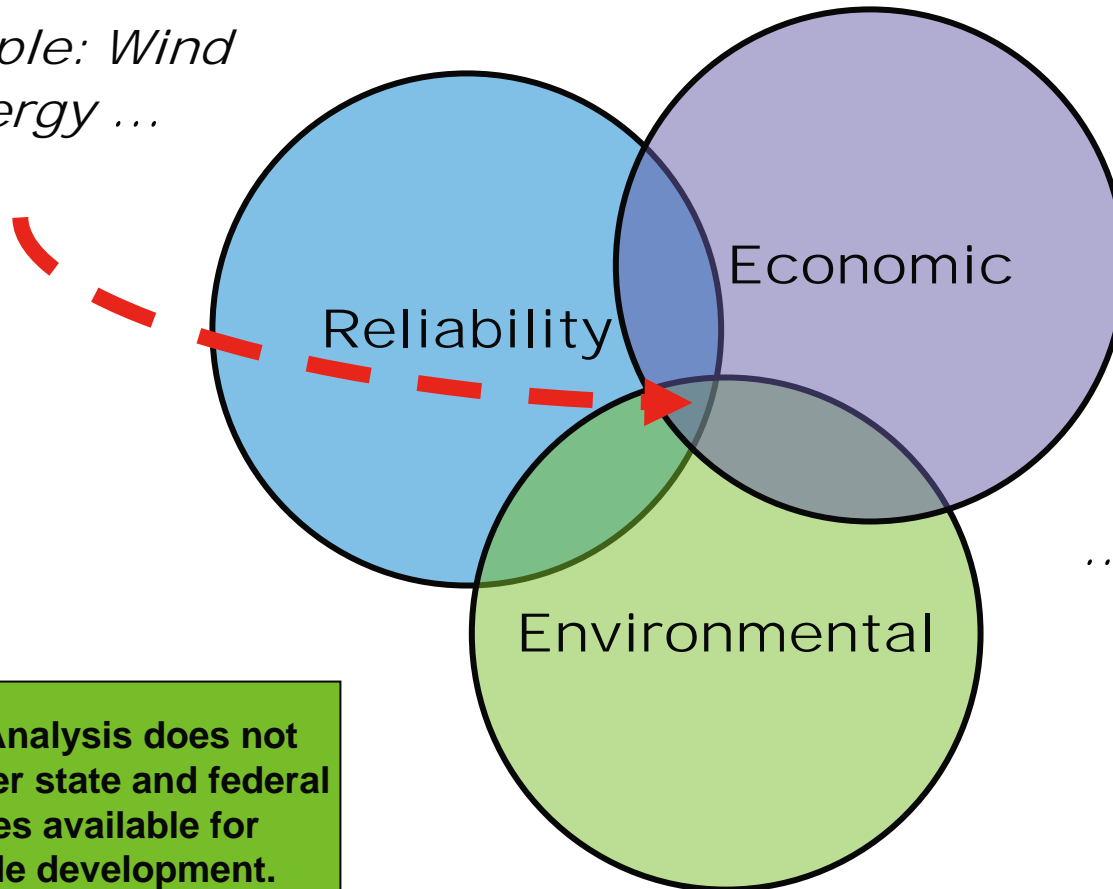


...has positive economic, reliability and environmental outcomes.

Energy-efficiency scenario has among the lowest annual wholesale electric energy market costs

High Energy and CO2 Allowances Prices Create a More Favorable Investment Climate for Some Renewables

Example: Wind Energy ...

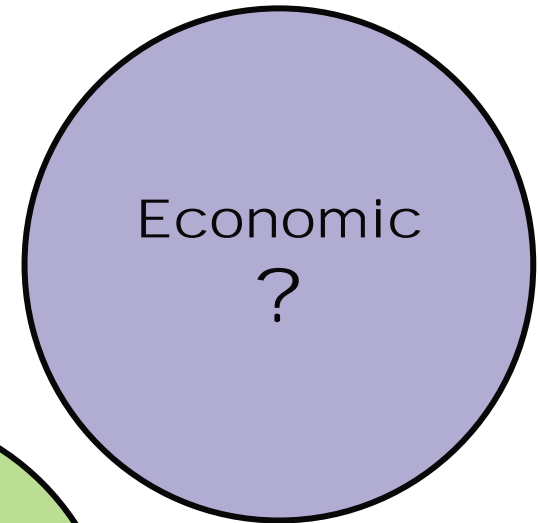
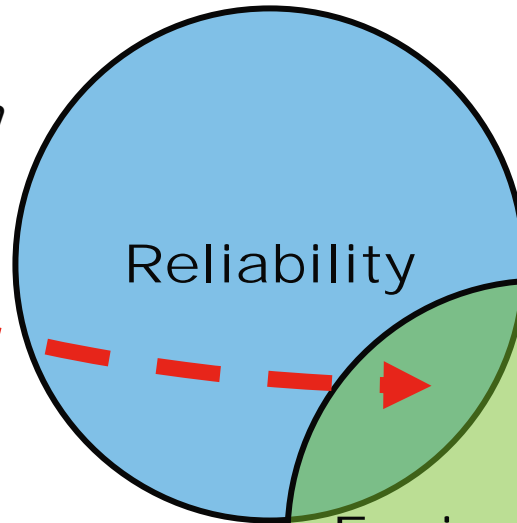


...performs well from an economic perspective when energy and carbon allowances prices are high.

Scenario Analysis does not include other state and federal incentives available for renewable development.

Import Scenario Uncertain about Overall Economic Impact

*Example:
Importing large
amounts of clean
energy ...*



*...has positive
reliability and
environmental
outcomes but
the economic
impact is
unknown.*

Only transmission needed in New England is factored into Import Scenario. The cost to New England consumers of energy and needed Canadian transmission unknown.