Summary of ISO New England's Electricity Scenario Analysis

Introduction

In 2006, ISO New England, state regulators, and other stakeholders launched the New England Electricity Scenario Analysis Initiative, an ambitious effort to examine how various ways to meet the region's future electricity needs might affect system reliability, the cost of electricity, and the environment.

The objective is to arm the region with information to help make decisions about how to address the sometimes conflicting challenges of the need for new resources, a desire for lower prices, and stronger environmental mandates, such as fulfilling Regional Greenhouse Gas Initiative (RGGI) requirements. The resulting report was completed after eight months of intensive analysis and more than a half dozen stakeholder workshops.

Approaching the Scenario Analysis

The report examines the reliability, economic, and environmental performance of a range of long-term resource alternatives for the region. Specifically, the analysis envisioned a peak system demand of about 35,000 megawatts (MW) by 2020 to 2025 and examined the addition of 8,000 MW for seven different resource scenarios. All scenarios assumed that 2,600 MW would reflect the mix of recently proposed power sources. The remaining 5,400 MW represented a large concentration of a certain technology, such as nuclear or renewables, to assess their impact.

The scenarios selected for analysis included:

- **The "Queue" Mix**, reflecting the current mix of proposed plants (as of September 2006)
- **Demand-Side Resources** and energy efficiency, which reduce electricity use, or shift use from on-peak to off-peak hours
- **New Nuclear Plants**
- **New Coal Plants** using Integrated Gasification Combined-Cycle (Coal IGCC) technology
- **New Natural Gas Plants**
- **New Renewable Plants**, including wind, hydro, biomass, fuel cells, landfill gas, and solar photovoltaic
- **Increased Imports** of hydroelectric power and other low-emission resources

Each scenario was tested against at least seven different sensitivities to determine the results of changing variables, like the implication of either low or high fuel prices, the need for 3,500 MW more of each scenario type to counteract power plant retirements, and low- or high-priced carbon-emission allowances. This resulted in the running of 52 different simulations to assess economic, reliability, and environmental impacts and provide a basis for comparison among the different scenarios.

The report details only specific assumptions and represents only a one-year snapshot in time using those assumptions. It does not account for every possible influence. For example, it does not consider how consumers or investors might react to the differences presented in each scenario. Stakeholders can utilize the ISO's study tool to mine voluminous amounts of data and conduct their own analysis with assumptions that they believe to be valid.

Key Findings

The numerous results of the Scenario Analysis provide a picture of how the electric power system's reliability, economic, and environmental impacts could vary given changes in the mix of supply and demand resources.

Based on the assumptions and other inputs developed with stakeholders, the results of the Scenario Analysis include the following:

- Lower systemwide wholesale electric energy prices and reduced air emissions seem possible by reducing demand or supplying large amounts of electric energy from low-cost fuel sources and fuels that emit few pollutants.
- New England likely will continue to depend heavily on natural gas to produce electricity.
- Fossil fuel prices drive the region's energy mix, electricity prices, and emissions; the relative costs of natural gas and oil strongly influence electric energy prices and air emissions.
- New England likely will face significant challenges in meeting its allocation of RGGI allowances.
- Demand-side resources appear to provide capacity and energy to the system at relatively low capital costs and with low emissions relative to other resources.

Consistent with the original objectives of this initiative, the Scenario Analysis stops short of indicating what steps the region should now take. The ISO is eager to continue to work with policymakers and stakeholders to define the next stage of this analysis.

The full report is available on ISO New England's Web site.