



ENERGY MARKET MODELING

The complexities in the energy industry are vast and increasing – consider the operational and strategy changes imposed by new EPA regulations, emerging technologies and sources of power, and ever-present economic uncertainties. To make well-informed decisions, energy producers, distributors, investors, and regulators need comprehensive analyses of electricity markets and systems.

Analysis Group consultants use a range of analytical approaches and tools – including software such as **PROSYM** and **GE Energy’s Multi-Area Production Simulation (MAPS)** program – to study the effects of making changes within bulk power systems. In these engagements, we examine a variety of outcomes, including locational prices, congestion, and other effects of siting new generation and transmission facilities in different locations; the cost-effectiveness of long-term power supply contracts; and the consequences of new policies and regulations.

Why Power System Modeling?

Effective power system models can provide granular information about prices, facility output, and transmission. These data allow for:

- **Financial Assessments.** The valuation of assets, including generation facilities and long-term contracts. *For resource acquisitions, investors, and in litigation matters*
- **Resource Assessments.** The identification of desired resources given existing resource options, such as the development of Integrated Resource Plans. *For regulated utilities*

Effective modeling provides granular data about prices, facility output, and transmission across power systems. The resulting information offers a reliable framework for market assessments and resource planning.

- **Policy Assessments.** The analysis of the market effects of new regulations or policies. This could include policies that directly affect resource decisions or regulatory matters related to market design or environmental mandates. *For stakeholders or government institutions*
- **Market Design Assessments.** The review of tariff and market-design issues and consideration of potential changes to improve efficiency and reliability. *For regional transmission organizations*

For nearly 30 years, Analysis Group has served electricity and gas companies; grid operators; oil producers; energy customers; utility and other regulators; Indian tribes; various public and private entities in the energy industry; and law firms engaged in energy litigation. In addition to quantitative modeling and assessments, our consultants have provided expert testimony before the U.S. Federal Energy Regulatory Commission (FERC), state commissions, and in litigation. We have also helped companies evaluate their energy asset decisions, market conditions, and other strategic factors.

Our professionals, who comprise former commissioners and academics, have deep regulatory and policy expertise and have done extensive research on policy design, institutions, and interactions with markets. We have coauthored reports and white papers, and have significant experience with valuation, M&A, and assessment of market conditions and trends. Our diverse Energy practice is distinguished by its expertise in economics, finance, regulatory issues, public policy analysis, environmental economics, and business strategy, including energy pricing and rate marking.

Our Power System Modeling Experience

Evaluating Electricity Markets

In several confidential engagements, we have developed integrated analytic frameworks for electricity markets. We have used MAPS and our own Forward Capacity Model to simulate outcomes in wholesale energy markets, evaluate investor and policy benefits arising from the development of new power-generation resources, and evaluate the economic impacts of various potential resource decisions.

Performing Cost-Benefit Analyses for Independent System Operators (ISO)

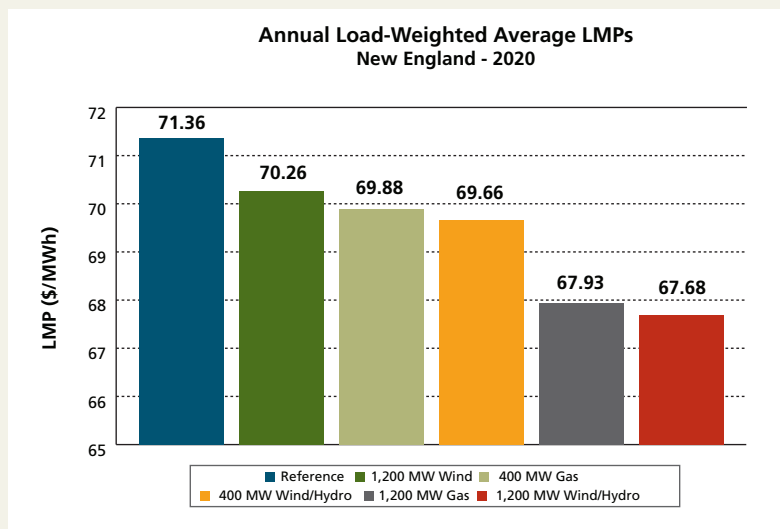
We have evaluated the benefits of forming ISOs, including the generation efficiencies created by integrating system operators across multiple utilities. We have performed such analyses for regional transmission organizations in the Northeast, simulating individual and collective outcomes.

Assessing Coal Retirements and Replacements

Analysis Group has evaluated the market and environmental implications of retiring coal-fired units and replacing them with alternative generating technologies, including natural gas, wind, and wind backed with dispatchable resources such as hydro power. For instance, to gauge the impact of competing resource outcomes on emissions and marginal prices in New England, we modeled the separate and combined effects of retiring coal-fired capacity and adding new capacity from either natural gas or renewable resources, in increments of either 400 MW or 1,200 MW (see the exhibit below).

The Price Impacts of Coal Retirements and Replacements

We used GE MAPS and data on energy loads, inputs, and market prices in New England to project various scenarios that assume retirement of coal-fired units as well as the addition of new capacity. As the data here show, the annual load-weighted average marginal price reductions are particularly significant when you compare the locational market prices (LMP) in the reference case (the blue bar) to the LMPs for the 1,200 MW wind/hydro scenario (the red bar). These price impacts translate into energy market cost reductions for the region's rate payers.



For more information about our modeling capabilities and our Energy practice, contact:

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