

ENERGY

Insights and Analysis for a Changing Industry

“ **There is growing evidence** that competition can lead to cost and price reductions if policymakers will support the regulatory and institutional changes needed to allow competitive market forces to work. However, the creation of competitive market forces has also encountered some significant and costly problems and it is important that future policies reflect the lessons learned from this experience. ”

“MARKETS FOR POWER IN THE UNITED STATES: AN INTERIM ASSESSMENT”
THE ENERGY JOURNAL, JANUARY 2006

From changing regulatory mandates to newly competitive industry structures, the challenges facing energy stakeholders are numerous and complex. Fact-based, clearly articulated, timely analyses are essential for policymakers evaluating regulatory issues, for companies seeking to pursue their business objectives, for consumers relying on the outcomes of sound market design and regulatory decisions, and for courts being asked to resolve disputes.

Going forward, the evolution of the energy industry will be shaped by the ways in which it confronts these challenges and pursues fresh perspectives on regulation and markets.

- Analysis Group has over two decades of experience in assisting electric, gas, and oil industry clients, including energy companies and their customers, regulators, other organizations involved in the energy industry, and law firms engaged in energy litigation.

Our practice is distinguished by expertise in economics, finance, regulatory issues, and public policy, as well as significant experience in environmental economics and energy infrastructure development. In addition, our staff and academic affiliates' extensive prior experience with state and federal regulatory agencies gives them a unique perspective on the ways in which economic analysis influences the outcome of the regulatory process.

● **VALUATION AND DAMAGES** We have been asked by energy industry clients to perform a variety of financial and economic studies relating to asset values in litigation and business consulting engagements.

Our experience includes assessing damages in contract disputes and regulatory investigations. We have also valued assets and enterprises in these contexts as well as Chapter 11 proceedings, mergers and acquisitions, regulatory matters, strategic planning, and other settings. In our valuation work, we have used a variety of techniques to value assets and contractual commitments, including advanced real options, and have used forecasting models to assess the value of new technologies. We have also conducted valuations for damages assessment – including valuation of power plants in commercial damages litigation –

often applying sophisticated statistical and econometric techniques to examine changing price and revenue expectations.

For example, we were asked to value a fleet of peaking generation units operating in the midwestern U.S. Using our own Monte Carlo-based model, we simulated the operation of these units over a 15-year period, based on the historical price dynamics in the region and on forward price data provided by the client. The model relied on a stochastic characterization of electricity and gas prices, as well as their correlation, to calculate expected operating profits.

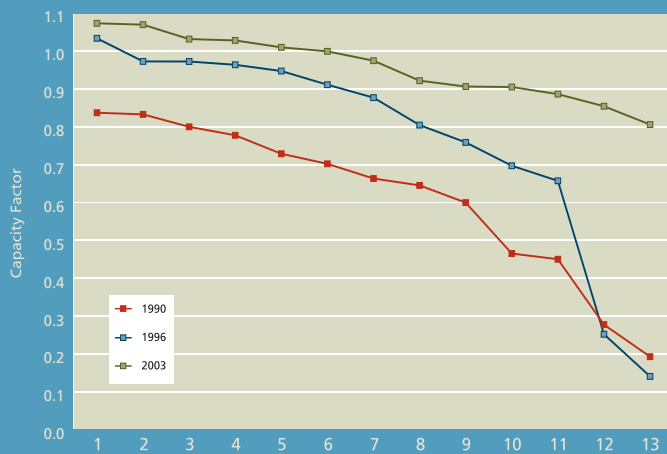
● **COMPETITIVE ISSUES** Analysis Group professionals have extensive experience in the many areas in which competitive issues arise in electricity and natural gas markets.

We have examined the competitive effects of proposed mergers and acquisitions; designed mitigation measures to address concerns arising from a transaction; assisted in the design of market rules for wholesale electricity supply and examined the competitive effects of these rules; and provided analyses supporting requests for market-based rate authority in wholesale electricity markets. Our professionals have examined allegations of price manipulation in both the wholesale electricity and natural gas markets. We have also assessed the competitive implications of auction designs and affiliate transactions, served as market monitors of competitive power procurements, and evaluated the benefits and costs of regions' adoption of competitive wholesale markets.

Our examinations of market power and competitive issues in antitrust actions have culminated in expert witness testimony before courts and regulators. Through these varied efforts, Analysis Group has acquired extensive knowledge of competitive conditions in markets nationwide and developed the computer models and detailed data to perform the required analyses.

NUCLEAR POWER PLANT PRODUCTIVITY: ANALYZING THE IMPACT OF POWER PLANT SALES

The trend toward ownership consolidation in the nuclear power industry appears to



Numbers on the horizontal axis represent individual nuclear generating units (with total number of units equaling 13). For each year's capacity factor curve, the units are reported in rank order, with the unit with the best capacity factor that year reported as Unit #1.

have had a positive effect on the productivity of nuclear power plants. We analyzed data on the annual capacity factor of U.S. nuclear units from 1990 through 2003 to determine whether there were performance differences between plants that were sold and those that were not. We determined that the sold plants were poorer performers on average before their sale. We also noted that, although the capacity factors of plants increased on average during the study period, the capacity factors of the sold plants improved disproportionately as compared with the U.S. nuclear industry as a whole.

MARKET DESIGN AND ANALYSIS Clients frequently seek our advice on market structure and design issues including transmission access and pricing policies; market monitoring approaches; design of markets for energy, capacity, and ancillary services; alignment of retail and wholesale market designs; design of emissions allowance markets; and codes of conduct.

On behalf of a Regional Transmission Organization (RTO), Analysis Group analyzed market monitoring approaches and practices. For regulators in the western states, we provided advice on approaches to market monitoring in a noncentralized wholesale market. For an independent generator, we evaluated capacity and ancillary product design.

Through our work with comprehensive generating-unit commitment and dispatch models of generating resources, we have developed a detailed understanding of wholesale pricing structures, subject to transmission constraints and contingencies. We have also quantified benefits from industry restructuring.

● **RESOURCE PLANNING AND PROCUREMENT** In both competitive and regulated contexts, clients have asked us to design resource procurement strategies including planning and forecasting analyses; comparison and benchmarking; development of generator bidding strategies; design of market monitoring and mitigation; and assessment of resource and product alternatives. We have helped design and support default service auctions and have served as the independent market monitor of short- and long-term resource procurements.

● **CLIMATE AND OTHER ENVIRONMENTAL POLICY ANALYSES** Our energy work often intersects with environmental issues. Analysis Group has been at the forefront of regional and national dialogues and policy development related to the physical, economic, and social risks of climate change and the control of carbon dioxide and other greenhouse gases. We have supported clients in strategic, regulatory, and litigation settings in matters related to emissions of National Ambient Air Quality pollutants, water use and discharge, and analysis of energy infrastructure development proposals.

Recent projects have included facilitation of regional CO₂ emission policy analysis for the electric sector; review and development of strategic and policy positions for several major electric utilities regarding their positions on national climate change policy; economic analysis of climate change policy options for a large electric company; and quantitative analysis of competing methods for allocation of emission allowances under a CO₂ cap

and trade program. In support of clients making regulatory filings for development of major natural gas and electric infrastructure proposals, we have conducted model-driven environmental analyses. Our experience also includes participation in regulatory proceedings related to water use, discharge permits, and coastal zone management approvals for power plants and natural gas pipelines.

SELECTED EXPERIENCE

Contract and Regulatory Disputes

We have analyzed issues related to power purchase contract disputes including value of replacement power, responsibility for costs, difference in locational prices, application of various price indices, liquidation of wholesale contracts, fuel price indices, and interpretation of disputed provisions. We also have worked with numerous clients involved in regulatory policy disputes.

Independent Market Monitoring

We have served as independent monitors of multiround resource solicitation processes for supply-side resources on behalf of several companies including Entergy, Southern California Edison, and Progress Energy – Carolinas. Our work has involved comprehensive review and understanding of resource planning; competitive bidding processes; contracting issues between suppliers (including affiliates) and utilities; interaction between individual bids for complex electricity products and system costs; and federal and state regulation of competitive wholesale procurements to meet retail customers' capacity needs.

Analysis of Alleged Price Index Manipulation

Analysis Group performed damages analyses in litigation involving claims of natural gas price index manipulation. We estimated damages using econometric models of alternative natural gas prices developed from market factors.

The work we do on behalf of clients covers a broad variety of areas including policy, regulatory, litigation, and planning and is used in many different contexts including expert witness testimony, reports, research, white papers, and affidavits, as well as consulting support for strategic decision-making.

Analysis in Support of Market-Based Rate Authority

We have analyzed the extent to which numerous electric companies have passed screen measures required by the Federal Energy Regulatory Commission (FERC) to demonstrate that these companies lacked market power in the relevant markets.

Energy Infrastructure Development

For the New England Energy Alliance, we analyzed policy incentives (and lack thereof) for investment in energy infrastructure in that region. For the National Commission on Energy Policy, we analyzed the vulnerability of energy infrastructure in the U.S. in light of lessons from the Gulf Coast hurricanes of 2005.

Auction Design: Procuring Wholesale Supply for Basic Energy Service Customers

For Commonwealth Edison, we have testified on the design of "descending clock" auctions for wholesale power procurement and compared this auction approach to the pay-as-bid model.

SELECTED EXPERIENCE

Analysis of Energy Rights-of-Way on Tribal Lands

We assisted the Ute Indian Tribe of the Uintah and Ouray Reservation in analyzing economic, policy, and development issues relating to use of tribal rights of way for energy infrastructure.

Distribution System Reliability

On behalf of Southern California Edison, we developed a more accurate method for measuring the reliability metrics SAIDI, SAIFI, and MAIFI. We used weighted-average and regression-based approaches derived from stratified random sampling. Edison has used our analysis and report in ratemaking filings at the California Public Utilities Commission and for internal planning purposes.

Energy Facility Siting

We have provided support before state siting agencies for reliability, need, public benefits, economic benefits, and environmental impacts of proposed energy facilities (e.g., electric transmission facilities, natural gas pipelines, and electric power plants). Our work includes a combination of economic studies, reliability studies, market analyses, testimony, and meetings with agency staff and various interested parties.

Asset Valuation

In litigation, we have valued energy assets and contracts using a combination of traditional discounted cash flow analysis and real options methodologies.

Market Monitoring and Mitigation

For PJM Interconnection, we analyzed the economic principles for efficient market monitoring and mitigation at the various RTOs that administer organized competitive wholesale electric markets. For the Committee on Regional Electric Power Cooperation in the western states, we have developed measures of market power in noncentrally administered wholesale markets.

Analysis of Net Societal Benefits from Wholesale Competition in Different Regions

Using a counterfactual case, we estimated benefits and costs of implementing a centralized energy market administered by an RTO in one region (New England). The analysis focused on long-term net efficiency gains in investment and operational performance of power generation in the regional market. For another RTO, we analyzed benefits associated with the introduction of centralized unit commitment and other aspects of RTO market administration.

Damages Analysis Regarding Price-Risk Management Strategy

A large energy company was sued by an industrial firm for damages resulting from implementation of a natural gas price-risk management purchasing strategy. We used NYMEX (New York Mercantile Exchange) data and mean reversion analysis to assess the reasonableness of the strategy and showed that, in contrast to the plaintiff's claim, for all years the proposed program helped to reduce the volatility of the plaintiff's purchase price for natural gas.

● **REGULATORY AND PUBLIC POLICY** A number of our clients require expertise in regulatory policy and practice ranging from expert testimony and advice related to rate regulation, market evolution, competition, and public policy to siting and permitting, power procurement, integrated resource planning, performance-based ratemaking, affiliate relations and codes of conduct, EPAct requirements, and traditional ratemaking policies.

Several of our staff have direct experience as regulators, and we have significant experience in assessing complex permitting processes, environmental tradeoffs, and a broad range of regulatory issues at the federal and state levels. Our experience includes testimony before FERC concerning the merits and limitations of various screen measures required of entities wishing to make wholesale sales of electricity at market-based rates. We have compared rates across jurisdictions, evaluated performance-based ratemaking

plans, and assessed appropriate standards for ratemaking treatment of certain costs. Our testifying experience also includes contract dispute litigation concerning regulatory changes that have affected the performance of the parties under contract. In these matters, we have addressed the prudence of contracts entered into as a result of competitive power procurement processes.

More information on our Energy practice, including staff and expert biographies and additional case experience, is available at www.analysisgroup.com.

SELECTED PROFESSIONAL STAFF

MANAGING PRINCIPALS

Brian S. Gorin

M.B.A., Graduate School of Business, Columbia University; M.S. chemical engineering, MIT



Mr. Gorin specializes in the creation and implementation of business and technology strategies to drive growth, sustain competitive advantage and create shareholder value. He has led client engagements across the strategy spectrum, from technology commercialization, acquisitions/alliances, business unit planning, and organizational design to the development of growth and diversification strategies. His clients in the energy sector include chemical, solar, oil, and gas companies.

Andrew Parece

M.B.A., Johnson Graduate School of Management, Cornell University



Mr. Parece has managed assignments in the area of industry restructuring, including asset divestitures and standard-offer service design and procurement. His experience also includes analyzing customers' choices of fuels and providers, evaluating demand-side management and real-time pricing programs, developing long-range integrated resource plans, and modeling the impact of rate changes on investments in energy-efficient equipment.

VICE PRESIDENTS

Donna Lau Brooks

M.B.A., Haas School of Business, University of California, Berkeley

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Ph.D. and M.S., operations research, Stanford University

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M.S., energy and resources, University of California at Berkeley

Michael J. Quinn

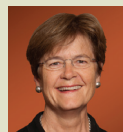
Ph.D. and M.A., economics, Princeton University



Dr. Quinn specializes in economic issues in the natural gas and electricity industries. He has served as an expert on matters involving natural gas transportation, distribution, and storage as well as electricity transmission and distribution. He has assessed damages in cases involving market power disputes and contract interpretation, analyzed valuation of contract portfolios, and provided advice and testimony on performance-based regulation proposals and total factor productivity studies.

Susan F. Tierney

Ph.D. and M.A., regional planning, public policy, Cornell University



Dr. Tierney has testified as an expert witness in private litigation and before state and federal regulatory commissions. She has provided strategic and advisory services to electric utilities, generation and transmission companies, independent system operators, investment companies, large power customers, and government agencies. She previously served as Assistant Secretary for Policy at the U.S. Department of Energy and Commissioner of the Massachusetts Department of Public Utilities.

Michael C. Hsu

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SELECTED ACADEMIC AFFILIATES AND EXPERTS

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A LEADING PROVIDER OF ECONOMIC ANALYSIS

Analysis Group provides economic, financial, and business strategy consulting to leading law firms, Fortune 500 companies, and government agencies.

Founded in 1981, with over 500 professional staff, we assist law firms with all aspects of litigation and advise corporations and government clients on business issues that require expert analysis and interpretation of economic and financial data.

We help organizations create strategies for innovation and growth.



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