

Attachment I

**UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION**

New York Independent System Operator, Inc.) Docket No. _____

**AFFIDAVIT OF
EUGENE T. MEEHAN**

Mr. Eugene T. Meehan declares:

1. I have personal knowledge of the facts and opinions herein and if called to testify could and would testify competently hereto.

I. Purpose of this Affidavit

2. NERA Economic Consulting (“NERA”) was retained by the New York Independent System Operator, Inc. (“NYISO”) to recommend a methodology for compensating generators that provide black start and system restoration service (“Restoration Services”) under the Consolidated Edison Company of New York, Inc. (“Consolidated Edison”) local Restoration Services plan (“Consolidated Edison Plan”). As part of its proposed revisions to the Restoration Services provisions in its tariffs, the NYISO is proposing to implement the compensation methodology recommended by NERA. The purpose of this affidavit is to describe the basis for this methodology.

II. Qualifications

3. I am a Senior Vice President with NERA and have more than thirty years experience consulting with electric and gas companies. I have testified as an expert witness before numerous state and federal regulatory agencies, and in federal court and arbitration proceedings.

4. My consulting practice at NERA focuses on the areas of electricity tariff design, electricity procurement, wholesale power market design, electricity costing and pricing, market power analysis and mitigation, power contract analysis, and power cost risk management. I have worked extensively on electric utility and electricity market issues in New York State.
5. A full statement of my qualifications is provided as Exhibit ETM-4 to this affidavit.

III. Overview of NERA's Role

6. It is my understanding that the NYISO has been working with its stakeholders to revise the terms under which generators provide Restoration Services under the Consolidated Edison Plan. NERA was retained by the NYISO to recommend a compensation methodology for generators that provide Restoration Services under the Consolidated Edison Plan.
7. NERA and the NYISO agreed that the methodology must satisfy the following criteria:
 - a. Provide a rate with a sound theoretical basis;
 - b. Incentivize generators' participation in the Consolidated Edison Plan;
 - c. Be capable of being rapidly implemented;
 - d. Enable the NYISO to administer the methodology without difficulty and to update the compensation amounts in the future based on an objective data source; and
 - e. Obtain consensus support from NYISO Market Participants.
8. NERA began work on this assignment in early February 2012.

IV. Selection of the Compensation Methodology and a Description of How the Methodology Satisfies NYISO Criteria

9. NERA reviewed the compensation methodologies for comparable Restoration Services that have been adopted by other entities, with an emphasis on those used by PJM Interconnection, LLC and ISO-New England, Inc. (“ISO-NE”).
10. NERA found that there are generally three types of methodologies for Restoration Services compensation. Under these methodologies, compensation is based on: (1) generator-specific embedded cost; (2) competitive procurement of incremental Restoration Services needs; or (3) the generic, incremental costs of adding Restoration Services capability to generating units.
11. As part of its review, NERA closely examined the methodology recently filed by ISO-NE and accepted by the Commission, along with the study supporting this methodology.¹ The ISO-NE methodology was based on the incremental costs of adding Restoration Services capability to generating units.
12. NERA determined that using the framework of the methodology adopted by ISO-NE for the NYISO’s methodology would satisfy the criteria agreed upon with the NYISO:
 - The ISO-NE compensation methodology could be implemented rapidly by the NYISO. ISO-NE has just completed and filed a study of the incremental costs of adding Restoration Services capability to generating units. As discussed below, the ISO-NE’s study results are readily adaptable to generating units participating in the Consolidated Edison Plan.

¹ ISO New England Inc. and New England Power Pool, Docket No. ER12-729-000; Revisions to Schedule 16 of the OATT (December 30, 2011); Commission letter order, Docket No. ER12-729-000 (February 17, 2012).

- The ISO-NE methodology has a sound theoretical basis, as it is conceptually equivalent to basing rates on Long Run Incremental Costs (“LRIC”). This is the methodology used, for example, to set access rates to unbundled system elements in the telecommunication industry and is presented as a theoretically preferable methodology of rate setting in highly regarded academic research.²
 - Customers (i.e., Load Serving Entities) would not have to pay more than the current incremental cost of Restoration Services capability. Customers currently pay the current marginal costs for energy and capacity in the NYISO wholesale energy and capacity markets.
 - The methodology should incentivize participation in the program as it will significantly increase compensation to existing providers.
 - The methodology can be administered by the NYISO without difficulty.
 - The compensation amount can be updated using an objective data source as the amount is based on new unit costs and these costs can be updated by reference to an index.
13. NERA reviewed the two other methods generally used for determining Restoration Services compensation: the generator-specific embedded cost methodology and the competitive procurement methodology.
- NERA ruled out the generator specific embedded cost methodology. Generators represented that because they acquired generating units that were all over twenty years old over a decade ago from Consolidated Edison, it would not be possible to

² See *The Economics of Regulation: Principles and Institutions* written by Alfred E. Kahn.

develop estimates of embedded cost. It appeared clear that a generator specific embedded cost methodology would not achieve a stakeholder consensus.

- NERA also ruled out the use of a competitive procurement methodology through the issuance of Request for Proposals (“RFPs”). It was not clear how such a procurement could be established in a manner that ensured sufficient competition as the existing units with Restoration Services capability are already participating in the Consolidated Edison Plan. One of the primary objectives in revising the compensation methodology is to induce their continued participation.

14. In light of its determination that adopting the framework of the ISO-NE methodology would satisfy the NYISO’s objectives, NERA recommended that the NYISO do so for generators providing Restoration Services under Consolidated Edison Plan. In addition, NERA recommended that the NYISO use the results of the recent cost study completed by ISO-NE, as adjusted for New York City specific costs, to implement the methodology in New York.

15. NERA presented its initial recommendation to NYISO stakeholders and developed its final recommendation following consideration of stakeholder input.

V. Implementation of Recommended Methodology

16. NERA developed specific quantitative recommendations to configure the framework of the ISO-NE methodology for use by the NYISO for the Consolidated Edison Plan.

17. The ISO-NE study identifies the starting engine required to black start a unit – *i.e.*, the small generator that supplies power to the larger unit for Restoration Services purposes. The starting engine could range in size from a very small diesel (*e.g.*, 2

MW) for a combustion turbine to a small gas turbine (*e.g.*, 15 MW) for a larger unit. The study then develops representative or “proxy” incremental capital and operating and maintenance (“O&M”) costs for a starting engine and the ancillary equipment needed to black start units of different sizes. The proxy costs represent the generic costs of adding incremental Restoration Services capability to new generating units of various sizes constructed in New England, as amortized over a 25 year period. Training, annual testing, and other program participation costs are included in O&M costs.

18. The ISO-NE study recognizes that there may be more than one unit at a plant site and that these units may all be using the same starting engine. ISO-NE first determines the “station-level” capital and O&M proxy costs, applicable to the unit at the plant site with the largest starting requirement, which includes the costs associated with the starting engine and the black start ancillary equipment. ISO-NE then determines the “additional” proxy capital and O&M costs applicable to all additional units at the plant site, which only includes the cost of the incremental black start ancillary equipment (excluding the starting engine) and any incremental O&M costs (*e.g.*, annual unit testing costs to provide Restoration Services). As the largest cost component is the starting engine, the proxy costs for additional units at a plant site are much lower than the proxy costs for the initial unit at the same site.
19. The ISO-NE study lists the capital and O&M costs for incremental Restoration Services capability at various size units and provides such costs for the first unit at a plant site and for additional units at the same site.

20. NERA configured the costs listed in the ISO-NE study to be specific to New York City. First, the ISO-NE study uses proxy capital and O&M costs on a RTO-wide basis, and does not identify the specific location within the RTO for which these costs were determined. NERA reviewed geographic cost indices and found that New England costs were most similar to costs for New York's Lower Hudson Valley ("LHV"), which is Load Zones G, H, and I of New York. As part of the "Independent Study to Establish Parameters of the ICAP Demand Curve for the New York Independent System Operator" filed in Docket No. ER11-2224-000 on November 30, 2010 ("2010 Demand Curve Reset"), Sargent and Lundy had developed construction and O&M costs for a like unit in the LHV and in New York City, which is Load Zone J of New York. NERA used these cost estimates by locality to adjust New England costs to New York City costs, by applying the ratio between New York City costs and LHV costs to the New England costs. The unit capital costs from the ISO-NE study adjusted to reflect the difference in construction costs between New England and New York City are provided in Exhibit ETM-1.
21. Next, NERA annualized the adjusted capital costs using the carrying charge from the 2010 Demand Curve Reset study and accounting for equipment insurance as well as for property tax abatement that would apply to certain black start equipment due to the expected number of hours it would run per start. NERA removed property taxes and equipment insurance expenses from the O&M costs in the ISO-NE study as it accounted for these costs when annualizing the capital costs.
22. On the basis of these adjustments, NERA provided the NYISO with New York City specific tables of the annual proxy capital and O&M cost amounts for generating units

providing Restoration Services under the Consolidated Edison Plan, with these amounts based on various unit sizes and whether the unit is the initial unit at a plant site or an additional unit at the same site. The tables with the recommended annualized capital and annual O&M costs, based on the ISO-NE study and adjusted to represent the appropriate New York City levels, are shown in Exhibits ETM-2 and ETM-3.

23. The ISO-NE methodology uses a Handy-Whitman Index to adjust cost levels in the future. NERA recommended that the NYISO use the “Gas Turbochargers” subcategory of the “Other Production Plant” category of the Handy Whitman Index for the North Atlantic Region to adjust cost levels in the future.
24. The ISO-NE study also provides generic cost estimates for compliance with NERC “Critical Infrastructure Protection” reliability standards (“CIP”). It appears that for ISO-NE it may be the case that participation in the Restoration Services program could trigger CIP requirements. New York City generators may already be required to meet certain CIP requirements for reasons other than their Restoration Services capability and may be recovering the costs associated with meeting these CIP requirements. Applying the generic CIP cost estimates in the ISO-NE study to such New York City generators could, therefore, overstate the incremental CIP costs for New York City units providing Restoration Services. For this reason, NERA recommended against using any proxy CIP costs in the compensation methodology.
25. The ISO-NE study examined the cost of black starting combustion turbine and newer large combined cycle units. Steam units were not examined. The Consolidated Edison Plan includes a significant quantity of large steam units. NERA concluded that

it is reasonable to use the ISO-NE proxy costs for a large combined cycle unit as applicable to these units. The primary cost is the cost of the starting engine. Both a large combined cycle with a high starting requirement and a large steam unit will use a similar starting engine, which is a small gas turbine.

VI. Application of the Adjusted Costs Data

26. NERA understands that the NYISO applies the proxy cost data described above in its proposed tariff revisions in the following manner to determine the compensation amount for generating units participating in the Consolidated Edison Plan:

- For each group of participating units at a site, the NYISO will determine which unit is the initial unit and which units are the additional units.
- The NYISO will identify the proxy capital and O&M payment amounts set forth in Exhibits 2 and 3 for each initial unit and additional units based on the unit's size.
- The NYISO will sum up the payment amounts for the initial unit and any additional units for each group of units at a plant site. The NYISO will divide this total by the number of units in each group designated by Consolidated Edison to participate in the Consolidated Edison Plan and will multiply this per unit amount by the number of units in the group actively participating in the Consolidated Edison Plan.
- The NYISO will update the payment values each year using the relevant Handy Whitman index.

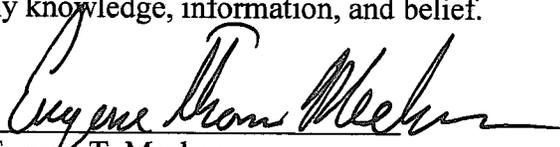
In my opinion, these are all reasonable implementation decisions.

27. Additionally, the NYISO's proposed revisions allow each generator to demonstrate its incremental CIP costs to the NYISO and be compensated for the incremental CIP cost it incurs as a result of its providing Restoration Services in the Consolidated Edison Plan. I believe that this is a reasonable approach.
28. The NYISO's proposed revisions also provide that any generator providing Restoration Services in the Consolidated Edison Plan that believes the compensation mechanism is non-compensatory may make a filing at the Commission and seek recovery of its actual, incremental costs incurred to provide Restoration Services. If approved by the Commission, these costs will be recovered through the NYISO tariffs. I believe this is a reasonable approach when using generic costs to compensate generators for their provision of Restoration Services capability.

This concludes my affidavit.

ATTESTATION

I am the witness identified in the foregoing Affidavit of Eugene T. Meehan (the "Affidavit"). I have read the Affidavit and am familiar with its contents. The facts set forth therein are true to the best of my knowledge, information, and belief.



Eugene T. Meehan
Senior Vice President
NERA Economic Consulting
August 22, 2012

Subscribed and sworn to before me
this 22nd day of August, 2012.



Exhibit ETM-1

NYISO CAPITAL PAYMENTS FOR BLACK START SERVICE

Black Start Resource Type	Initial Unit Black Start Capital Payment	Additional Unit Black Start Capital Payment
<u>Fossil Resources:</u>		
MVA ≤ 10	\$182,511.73	\$91,255.87
10 < MVA ≤ 60	\$1,799,026.40	\$91,255.87
60 < MVA ≤ 90	\$2,083,155.48	\$91,255.87
90 < MVA ≤ 300, Small Starting Requirement	\$3,479,332.79	\$91,255.87
90 < MVA ≤ 300, Medium Starting Requirement	\$8,031,514.99	\$91,255.87
90 < MVA ≤ 300, Large Starting Requirement	\$14,966,711.21	\$91,255.87
300 < MVA, Large Starting Requirement	\$15,374,803.46	\$273,767.60

Exhibit ETM-2

NYISO ANNUAL CAPITAL PAYMENTS FOR BLACK START SERVICE

Black Start Resource Type	Initial Unit Black Start Capital Payment (\$/year)	Additional Unit Black Start Capital Payment (\$/year)
<u>Fossil Resources:</u>		
MVA ≤ 10	\$21,770	\$10,880
10 < MVA ≤ 60	\$214,570	\$10,880
60 < MVA ≤ 90	\$248,460	\$10,880
90 < MVA ≤ 300, Small Starting Requirement	\$414,980	\$10,880
90 < MVA ≤ 300, Medium Starting Requirement	\$957,920	\$10,880
90 < MVA ≤ 300, Large Starting Requirement	\$1,785,080	\$10,880
300 < MVA, Large Starting Requirement	\$1,833,750	\$32,650

Exhibit ETM-3

NYISO O&M PAYMENTS FOR BLACK START SERVICE

Black Start Resource Type (Fossil plants)	Initial Unit Black Start O&M Payment (\$/year)	Additional Unit Black Start O&M Payment (\$/year)
MVA ≤ 10	\$22,335	\$6,040
10 < MVA ≤ 60	\$42,295	\$8,200
60 < MVA ≤ 90	\$49,850	\$10,140
90 < MVA ≤ 300, Small Starting Requirement	\$118,255	\$33,665
90 < MVA ≤ 300, Medium Starting Requirement	\$252,265	\$65,600
90 < MVA ≤ 300, Large Starting Requirement	\$388,865	\$65,820
300 < MVA Large Starting Requirement	\$414,540	\$77,685

Exhibit ETM-4

EUGENE T. MEEHAN **SENIOR VICE PRESIDENT**

Mr. Meehan is a Senior Vice President at NERA. He has over thirty years of experience consulting with electric and gas utilities and has testified as an expert witness before numerous state and federal regulatory agencies, as well as appeared in federal court and arbitration proceedings.

At NERA, Mr. Meehan's practice concentrates on serving energy industry clients, with a focus on helping clients manage the transition from regulatory to more competitive environments. He has performed consulting assignments for over fifty large electric, gas, and combination utilities in the areas of retail access, regulatory strategy, strategic planning, financial and economic analysis, merger and acquisition advisory services, power contract analysis, market power and market definition, stranded cost analysis, power pooling, power markets and risk management, ISO and PX development, and costing and pricing. In addition, he has advised numerous utilities on power procurement issues and administered power procurements on behalf of utilities and regulators.

Mr. Meehan has experience leading NERA's advisory work on several major restructuring and unbundling assignments. These assignments were multi-year projects that involved integration of regulatory and business strategy, as well as development of regulatory filings associated with the recovery of stranded cost and rate unbundling.

Education

Boston College, BA, Economics, *cum laude*
New York University (NYU), Graduate School of Business, completed core courses for the doctoral program.

Professional Experience

NERA Economic Consulting
1999- Senior Vice President
1996-1999 Vice President
1973-1980 Senior Economic Analyst; Research Assistant

Deloitte & Touche Consulting Group
1994-1996 Principal

Energy Management Associates, Inc.
1980-1994 Vice President

Areas of Expertise

Restructuring/Stranded Cost Recovery

Mr. Meehan has directed several multi-year projects associated with restructuring and stranded cost recovery. These projects involved facilitating the development of an integrated regulatory and business strategy and formulating regulatory filings to accomplish strategy. As part of these assignments, Mr. Meehan facilitated sessions with senior management to set and track filing strategy. Clients include Public Service Gas & Electric and Baltimore Gas and Electric.

Unbundling/Generation Pricing

Mr. Meehan has formulated unbundling strategies, with a specialization in generation pricing. He has advised several utilities in standard offer pricing and has testified on shopping credits on behalf of First Energy and Baltimore Gas and Electric.

Power Procurement

Mr. Meehan has been involved in power procurement activities for a variety of utilities and regulatory agencies. He has advised utilities in developing and implementing evaluation processes for new generation, with the objective of achieving the best portfolio evaluation. He has helped regulators in Ireland and Canada design and implement portfolio evaluation processes. He has testified before FERC and state regulatory agencies on competitive power

procurement. In addition, Mr. Meehan helped to design and implement the New Jersey BGS auction process.

Power Contracts

Mr. Meehan has extensive experience with power contracts and power contract issues. He has reviewed and testified on the three principal types of power contracts: integrated utility to integrated utility contracts, IPP to utility contract, and integrated or wholesale utility to distribution utility contracts. He has testified in power contracts disputes on behalf of Carolina Power and Light, Duke Power Company, Southern Company, Orange and Rockland Utilities, and Tucson Electric Power. He has also advised Oglethorpe Power Corporation in the reform of its wholesale contracts with its distributor cooperative members.

Retail and Wholesale Settlements

In addition to his expertise on power pooling issues, Mr. Meehan has significant experience with assignments related to the settlement process. He has focused on the issues of credit management as new entrants appear in retail and wholesale markets and has designed efficient specifications for retail settlement systems, including the use of load profiling, and examined the risk and cost allocation issues of alternative settlement systems.

Risk Management

Mr. Meehan has advised several large utilities on price risk management. These assignments have included evaluation of price management service offers solicited from power marketers in association with management of assets and entitlements, as well as provision of price managed service for various terms.

Marginal Costs

Mr. Meehan has provided comprehensive marginal cost analyses for over 25 North American Utilities. These assignments required detailed knowledge of utility operations and planning.

Power Supply and Transmission Planning

Mr. Meehan has advised electric utilities on economic evaluations of generation and transmission expansion. He has testified on the economics of particular investments, the prudence of planning processes, and the prudence of particular investment decisions.

Generation Strategy

Mr. Meehan has led NERA efforts on a client task force charged with developing an integrated generation asset/power marketing strategy.

Power Pooling

Mr. Meehan has in-depth working knowledge of the operating, accounting, and settlement processes of all United States power pools and representative international power pools. He has provided consulting services for New York Power Pool members on a continuous basis since 1980, advising the Pool and its members on production cost modeling, transmission expansion, competitive bidding and reliability, and marginal generating capacity cost quantification. In NEPOOL, he has quantified the benefits of continued utility membership in the Pool and the impact of the Pool settlement process on marginal cost. He has worked with a major PJM utility to explore the impact of PJM restructuring proposals upon generating asset valuation and examine the implications of alternative restructuring proposals. He has consulted for Central and Southwest Corporation, Entergy, and Southern Company on issues that involved the internal pooling arrangements of the utility operating companies of those holding companies, as well as for various utilities on the impact of pooling arrangements on strategic alternatives.

Representative Assignments

Worked with Public Service Electric & Gas Company (PSE&G) to direct a three year NERA advisory effort on restructuring. Facilitated a two-day senior management meeting to set regulatory strategy in 1997. Throughout 1997 and 1998, worked over half time at PSE&G to help implement that strategy and advised on testimony preparation, cross-examination, and briefing. Also advised PSE&G on business issues related to securitization, energy settlement and credit requirements for third party suppliers. During 1999, advised PSE&G during settlement negotiations and litigation of the settlement. PSE&G achieved a restructuring outcome that involved continued ownership of generation by an affiliate and the securitization of \$2.5 billion in stranded costs.

Worked on separate assignments for a large utility in the Northeast and a large utility in the Southeast, advising on the evaluation of risk management offers from power marketers. The assignments included reviewing proposals, attending interviews with marketers and providing advice on these, and the developing analytical software to evaluate offers.

Worked with government of Ontario beginning in 2004 to help design the RFP and economic evaluation process for the solicitation of 2500 Mw of new generating capacity. Supervising NERA's portfolio-based economic evaluation on behalf of the Ontario Ministry of Energy.

Testified on behalf of Pacific Gas & Electric Company before the FERC in a case benchmarking the PSA between the distribution utility and a soon-to-be-created generating company. This effort involved developing detailed expertise in applying the Edgar standard and a detailed review of DWR procurement during the western power crisis. In addition, this effort involved the review of more than 100 power contracts in the WECC.

Directed NERA's efforts, on behalf of the electricity regulator in Ireland, to design an RFP and implementation process for the purchase of 500 Mw of new generating capacity in 2003. NERA advised on the RFP, the portfolio evaluation method, and the power contract and also conducted the economic evaluation.

Reviewed the economic evaluation conducted by Southern Company Service for affiliated operating companies in connection with an RFP for over 2000 Mw of new generating capacity. Submitted testimony before FERC on behalf of Southern Company Service.

Worked with Baltimore Gas and Electric (BG&E) to conduct a one and one-half year consulting assignment that involved providing restructuring advice. The project began in March/April 1998 with senior management discussions and workshops on plan development and filing strategy. Advised BG&E in the development of testimony, rebuttal testimony, and public information dissemination. Worked to review and coordinate testimony from all witnesses and offered testimony on shopping credits and in defense of the case settlement. BG&E achieved a restructuring outcome enabling it to retain generation ownership. As part of this assignment, advised BG&E on generation valuation and unregulated generation business strategy.

Directed the efforts of a large Southeastern utility to develop a short-term power contract portfolio and to evaluate the relative value of power options, forwards, and unit contracts to determine the optimal mix of instruments to manage price risk.

Testified for XCEL Energy on the use of competitive bids for new generation needs. Examined whether XCEL was prudent not to explore a self-build plan and the reasonableness of relying on ten-year or shorter contracts as opposed to life-of-facility contracts, in order to meet needs and facilitate a possible future transition to competition. This project addressed the comparability of fixed bids to rate base plant additions.

Advised and testified on behalf of First Energy in the Ohio restructuring proceeding on the issues of generation unbundling and stranded cost. Defended the First Energy shopping credit proposal.

Advised Consolidated Edison and Northeast Utilities on merger issues and testified in Connecticut and New Hampshire merger proceedings. Testimony focused on retail competition in gas and electric commodity markets.

Directed NERA's effort to train selected representatives of a major European power company in American power marketing and risk management practices. The project involved numerous meetings and interviews with power marketing firms.

Led NERA's effort to advise the New England ISO on the development of an RTO filing. Examined performance-based ratemaking for transmission and market operator functions.

Examined ERCOT power market conditions during the period of time from 1997 to 1999 and testified on behalf of Texas New Mexico Power Company for the prudence of its power purchase activity.

Advised a Midwestern utility on restructuring of a wholesale contract with an affiliate. Involved forecasting of the unbundled wholesale cost-of-service and market prices, as well as development of a regulatory strategy for gaining approval of contract restructuring and the transfer of generation from regulated to EWG states.

Performed market price forecasts for numerous utility clients. These forecasts have employed both traditional modeling and newly developed statistical approaches.

Examined the credit issues associated with the entry of new entities into retail and wholesale settlement market. These assignments involved a review of current Pool credit procedures, examination of commodity and security trading credit requirements, coordination with financial institutions, and recommendations concerning credit exposure monitoring, credit evaluation processes, and credit requirements.

Oversight of EMA's consulting and software team in designing and implementing the LOLP capacity payment, a portion of the UK wholesale settlement system.

Advised Oglethorpe Power Corporation in the reform of its contracts with its distribution cooperative members and the evolution of full requirement power wholesale power contracts into contracts that preserve Oglethorpe's financial integrity and are suitable for a competitive environment.

Developed long run marginal and avoided costs of natural gas service, as well as avoided cost methods and procedures. These costs have been used primarily for the analysis of gas DSM opportunities. Clients include Consolidated Edison Company, Southern California Edison Company, Niagara Mohawk Power Corporation, and Elizabethtown Gas Company.

Review of power contracts and testimony in numerous power contract disputes.

Development of long run avoided costs of electricity service and avoided cost methods and procedures. These costs have been used to assess DSM and cogeneration, as well as to develop integrated resource plans. Clients include Public Service Company of Oklahoma, Central Maine Power Company, Duquesne Light Company, and the New York investor-owned utilities.

Advised Central Maine Power Company (CMP) on the development of a competitive bidding framework. This framework was implemented in 1984 and was the first of its kind in the nation. CMP adopted the framework outlined in EMA's report and won prompt regulatory approval.

Advised a utility in the development of an incentive ratemaking plan for a new nuclear facility. This assignment involved strategic analysis of alternate proposals and quantification of the financial impact of various ratemaking alternatives. Presented strategic and financial results in order to convince senior management to initiate negotiations for the incentive plan.

Advised and testified on behalf of the New York Power Pool utilities on the methodology for measuring pool marginal capacity costs. This work included development of the methodology and implementation of the system for quantifying LOLP-based marginal capacity costs.

Provided testimony on behalf of the investor-owned electric utilities in New York State, concerning the proper methodology to use when analyzing the cost-effectiveness of conservation programs. This methodology was adopted by the Commission and used as the basis for DSM evaluation in New York from 1982 through 1988.

Developed the functional design of a retail access settlement system and business processes for a major PJM combination utility. This design is being used to construct a software system and develop business procedures that will be used for retail settlements beginning January 1999.

Reviewed the power pool operating and interchange accounting procedure of the New York Power Pool, the Pennsylvania, New Jersey, Maryland Interconnection, Allegheny Power System, Southern Company, and the New England Power Pool as part of various consulting assignments and in connection with the development of production simulation software.

Summarized and analyzed the operational NEPOOL to examine the feasibility of incorporating NEPOOL interchange impacts with Central Maine and accounting procedure of the New England Power Pool Power Company's buy-back tariffs.

Developed and presented a two-day seminar delivered to electric industry participants in the UK (prior to privatization), outlining the structure and operation of power pools and bulk power market transactions in North America.

Benchmark analysis and FERC testimony of PGE's proposed twelve-year contract between PG&E and Electric Gen LLC (contract value in excess of \$15 billion).

Responsible for NERA's overall efforts in advising New Jersey's Electric Distribution Companies on the structuring and conduct of the Basic Generation Service auctions (the 2002 auction involved \$3.5 billion, and the 2003 and 2004 auctions involved over \$4.0 billion).

Publications, Speeches, Presentations, and Reports

Capacity Adequacy in New Zealand's Electricity Market, published in *Asian Power*, September 18, 2003

Central Resource Adequacy Markets For PJM, NY-ISO AND NE-ISO, a report written February 2004

Ex Ante or Ex Post? Risk, Hedging and Prudence in the Restructured Power Business, The Electricity Journal, April 2006

Distributed Resources: Incentives, a white paper prepared for Edison Electric Institute, May 2006

Restructuring Expectations and Outcomes, a presentation presented at the Saul Ewing Annual Utility Conference: The Post Rate Cap and 2007 State Regulatory Environment, Philadelphia, PA, May 21, 2007

Making a Business of Energy Efficiency: Sustainable Business Models for Utilities, prepared for Edison Electric Institute, August 2007

Restructuring at a Crossroads, presented at Empowering Consumers Through Competitive Markets: The Choice Is Yours, Sponsored by COMPETE and the Electric Power Supply Association, Washington, DC, November 5, 2007

Competitive Electricity Markets: The Benefits for Customers and the Environment, a white paper prepared for COMPETE Collation, February 2008

The Continuing Rationale for Full and Timely Recovery of Fuel Price Levels in Fuel Adjustment Clauses, The Electricity Journal, July 2008

Impact of EU Electricity Competition Directives on Nuclear Financing presented to: SMI – Financing Nuclear Power Conference, London, UK, May 20, 2009

Testimony

Forums

Arkansas Public Service Commission

Federal Energy Regulatory Commission

Florida Public Service Commission

Maine Public Utilities Commission

Minnesota Public Service Commission

Nevada Public Service Commission

New York Public Service Commission

Nuclear Regulatory Commission – Atomic Safety and Licensing Board

Oklahoma Public Service Commission

Public Service Commission of Indiana

Public Utilities Commission of Ohio

Public Utilities Commission of Nevada

Public Utilities Commission of Texas

Public Utilities Commission of New Hampshire

United States District Court

United States Senate Committee on Energy and Natural Resources

Various arbitration proceedings

Clients

Arkansas Power & Light Company

Baltimore Gas & Electric

Carolina Power & Light Company

Central Maine Power

Consolidated Edison Company of New York, Inc.

Dayton Power and Light Company

Florida Coordinating Group

Houston Lighting & Power Company

Minnesota Power and Light Company

Nevada Power Company

Niagara Mohawk Power Corporation

Northern Indiana Public Service Company

Oglethorpe Power Corporation

Pacific Gas and Electric Company

Power Authority of the State of New York

Public Service and Electric Company

Public Service Company of Oklahoma

Sierra Pacific Power Company

Southern Company Services, Inc.

Tucson Electric Power Company

Texas-New Mexico Power Company

Recent Expert Testimony and Expert Reports

Supplemental Testimony on behalf of Texas-New Mexico Power Company, Docket No. 15660, September 5, 1996.

Direct Testimony on behalf of Long Island Lighting Company before the Federal Energy Regulatory Commission, September 29, 1997.

Rebuttal Testimony on behalf of Texas-New Mexico Power Company, SOAH Docket No. 473-97-1561, PUC Docket No. 17751, March 2, 1998.

Prepared Testimony and deposition testimony on behalf of Central Maine Power Company, United States District Court Southern District of New York, 98-civ-8162 (JSM), March 5, 1999.

Prepared Direct Testimony Before the Public Service Commission of Maryland on behalf of Baltimore Gas & Electric Company, PSC Case Nos. 8794/8804, June 1999.

Rebuttal Testimony Before the Maryland Public Service Commission, on behalf of Baltimore Gas & Electric Company, PSC Case Nos. 8794/8804, March 22, 1999.

NORCON Power Partners LP v. Niagara Mohawk Energy Marketing, before the United States District Court, Southern District of New York, June 1999.

Prepared Supplemental Testimony Before the Maryland Public Service Commission, on behalf of Baltimore Gas & Electric Company, PSC Case Nos. 8794/8804, July 23, 1999.

Prepared Supplemental Reply Testimony Before the Maryland Public Service Commission, on behalf of Baltimore Gas & Electric Company, PSC Case Nos. 8794/8804, August 3, 1999.

Direct Testimony on behalf of Niagara Mohawk, Before the New York State Public Service Commission, PSC Case No. 99-E-0681, September 3, 1999.

Rebuttal Testimony on behalf of Niagara Mohawk, PSC Case No. 99-E-0681 Before the New York State Public Service Commission, November 10, 1999.

Arbitration deposition on behalf of Oglethorpe Power Corporation, last quarter of 1999.

Direct Testimony Before the Public Utilities Commission of Ohio on behalf of FirstEnergy Corporation, Ohio Edison Company, The Cleveland Electric Illuminating Company and The Toledo Edison Company, Case No. 99-1212-EL-ETP re: Shopping Credits.

Direct Testimony on behalf of Niagara Mohawk, Before the New York State Public Service Commission, PSC Case No. 99-E-0990, February 25, 2000.

Testimony on behalf of Consolidated Edison Company of New York, Inc., State of Connecticut, Department of Public Utility Control, Docket No.: 00-01-11, April 28, 2000 and June 30, 2000.

Testimony on behalf of Texas-New Mexico Power Company, Fuel Reconciliation Proceeding before the Texas PUC, June 30, 2000.

Testimony on behalf of Consolidated Edison Company of New York, Inc., Before the New Hampshire Public Service Commission, Docket No.: DE 00-009, June 30, 2000.

Rebuttal Testimony Before the Public Utilities Commission of the State of Colorado, Docket No. 99A-549E, November 22, 2000.

Testimony Before the Public Utilities Commission of the State of Colorado, Docket No. 99A-549E, January 19, 2001.

DETM Management, Inc. Duke Energy Services Canada Ltd., And DTMSI Management Ltd., Claimants vs. Mobil Natural Gas Inc., And Mobil Canada Products, Ltd., Respondents. American Arbitration Association Cause No. 50 T 198 00485 00, August 27, 2001.

State of New Jersey Board of Public Utilities, In the Matter of the Provision of Basic Generation Service Pursuant to the Electric Discount and Energy Competition Act of 1999, Before President Connie O. Hughes, Commissioner Carol Murphy on Behalf of the Electric Distribution Companies (Public Service Electric and Gas Company, GPU Energy, Consolidate Edison Company and Conectiv) Docket No.: EX01050303, October 4, 2001.

Direct Testimony Before the Federal Energy Regulatory Commission on behalf of Pacific Gas and Electric Company, Docket No.: ER02-456-000, November 30, 2001.

Fourth Branch Associates/Mechanicville vs. Niagara Mohawk Power Corporation, January 2002 (Expert Report).

Arbitration Deposition on behalf of Oglethorpe Power Corporation, March 2002.

Direct Testimony and Deposition Testimony Before the Federal Energy Regulatory Commission on behalf of Electric Generation LLC in Response to June 12 Commission Order, Docket No.: ER02-456-000, July 16, 2002.

Rebuttal Testimony Before the Federal Energy Regulatory Commission on behalf of Electric Generation LLC in Response to June 12 Commission Order, Docket No.: ER02-456-000, August 13, 2002.

Direct Testimony Before the Public Utilities Commission of Nevada on behalf of Nevada Power Company, in the matter of the Application of Nevada Power Company to Reduce Fuel and Purchased Power Rates, PUCN Docket No. 02-11021, November 8, 2002 and subsequent Deposition Testimony.

Direct Testimony Before the Public Utilities Commission of Nevada on behalf of Sierra Pacific Power Company's Deferred Energy Case, Docket No. 03-1014, January 10, 2003.

Direct Testimony Before the Public Utility Commission Of Texas on behalf of Texas-New Mexico Power Company, Application Of Texas-New Mexico Power Company For Reconciliation Of Fuel Costs, April 1, 2003.

Rebuttal Testimony Before the Public Utilities Commission of Nevada on behalf of Nevada Power Company, PUCN Docket No. 02-11021, April 1, 2003.

Rebuttal Testimony Before the Public Utilities Commission of Nevada on behalf of Sierra Pacific Power Company, Docket No. 03-1014, May 5, 2003.

Testimony on behalf of Consolidated Edison Company of New York, Inc., Before the Public Service Commission of New York, Case No.: 00-E-0612, September 19, 2003.

State of New Jersey Board of Public Utilities, In the Matter of the Provision of Basic Generation Service Pursuant to the Electric Discount and Energy Competition Act of 1999, Before President Connie O. Hughes, Commissioner Carol Murphy on Behalf of the Electric Distribution Companies (Public Service Electric and Gas Company, GPU Energy, Consolidate Edison Company and Conectiv), September 2003.

Direct Testimony Before the Public Utilities Commission of Nevada on behalf of Nevada Power Company's Deferred Energy Case, November 12, 2003.

Direct Testimony Before the Public Utilities Commission of Nevada on behalf of Sierra Pacific Power Company's Deferred Energy Case, January 12, 2004.

Rebuttal Testimony Before the Public Utilities Commission of Nevada on behalf of Sierra Pacific Power Company's Deferred Energy Case, May 28, 2004.

Direct Testimony on behalf of Texas-New Mexico Power Company, First Choice Power Inc. and Texas Generating Company LP to Finalize Stranded Cost under PURA § 39.262, January 22, 2004.

Rebuttal Testimony on behalf of Texas-New Mexico Power Company, First Choice Power Inc. and Texas Generating Company LP to Finalize Stranded Cost under PURA § 39.262, April, 2004.

State of New Jersey Board of Public Utilities, In the Matter of the Provision of Basic Generation Service Pursuant to the Electric Discount and Energy Competition Act of 1999, Before President Connie O. Hughes, Commissioner Carol Murphy on Behalf of the Electric Distribution Companies (Public Service Electric and Gas Company, GPU Energy, Consolidate Edison Company and Conectiv), September 2004.

Direct Testimony Before the Public Utilities Commission of Nevada on behalf of Nevada Power Company's Deferred Energy Case, November 9, 2004.

Direct Testimony Before the Public Utilities Commission of Nevada on behalf of Sierra Pacific Power Company's Deferred Energy Case, January 7, 2005.

Expert Report on behalf of Oglethorpe Power Corporation, March 23, 2005.

Arbitration deposition on behalf of Oglethorpe Power Corporation, April 1, 2005.

Direct Testimony Before the Public Utilities Commission of Nevada on behalf of Sierra Pacific Power Company's December 2005 Deferred Energy Case.

Direct Testimony Before the Public Utilities Commission of Nevada on behalf of Nevada Power Company's 2006 Deferred Energy Case, January 13, 2006.

Remand Rebuttal for Public Service Company of Oklahoma before the Corporation Commission of the State of Oklahoma, Cause No. PUD 200200038, **Confidential**, March 17, 2006

Answer Testimony on behalf of the Colorado Independent energy Association, AES Corporation and LS Power Associates, LP, Docket No. 05A-543E, April 18, 2006.

Cross-Answer Testimony on behalf of the Colorado Independent energy Association, AES Corporation and LS Power Associates, LP, Docket No. 05A-543E, May 22, 2006.

Distributed Resources: Incentives, a report prepared for Edison Electric Institute, May 2006

Rebuttal Testimony Before the Public Utilities Commission of Nevada on behalf of Nevada Power Company's 2006 Deferred Energy Case, Docket No. 06-01016, June 2006.

Direct Testimony Before the Public Utilities Commission of Nevada on behalf of Sierra Pacific Power Company's Deferred Energy Case, December 2006.

Direct Testimony Before the Public Utilities Commission of Nevada on behalf of Sierra Pacific Power Company's Application for Recovery of Costs of Achieving Final Resolution of Claims Associated with Contracts Executed During the Western Energy Crisis, December 2006.

Direct Testimony Before the Public Utilities Commission of Nevada on behalf of Nevada Power Company's Application for Recovery of Costs of Achieving Final Resolution of Claims Associated with Contracts Executed During the Western Energy Crisis, December 2006.

Direct Testimony Before the Public Utilities Commission of the State of Hawaii, on behalf of Hawaiian Electric Company, Inc., Docket No. 2006-0386, December 22, 2006.

Direct Testimony Before the Public Utilities Commission of the State of Hawaii, on behalf of Hawaiian Electric Company, Inc., Docket No. 05-0315, December 29, 2006.

Rebuttal Testimony Before the Public Utilities Commission of Nevada on behalf of Nevada Power Company's 2007 Deferred Energy Case, January 2007.

Declaration Before the State of New York Public Service Commission, on behalf of Consolidated Edison Company of New York, Inc.'s Long Island City Electric Network, Case 06-E-0894 – Proceeding on Motion of the Commission to Investigate the Electric Power Outage and Case 06-E-1158 – In the Matter of Staff's Investigation of Consolidated Edison Company of New York, Inc.'s Performance During and Following the July and September Electric Utility Outages. July 24, 2007

Direct Testimony Before The Public Utilities Commission of Colorado, In The Matter of the Application of Public Service Company of Colorado for Approval of its 2007 Colorado Resource Plan, April 2008

Answer Testimony Before the Public Utilities Commission of the State of Colorado on behalf of Trans-Elect Development Company, LLC, and The Wyoming Infrastructure Authority, Docket No. 07A-447E, April 28, 2008

Direct Testimony Before the Public Utilities Commission of Nevada on behalf of Sierra Pacific Power Company's 2008 Deferred Energy Case, February 2009.

Direct Testimony Before the Public Utilities Commission of Nevada on behalf of Nevada Power Company's 2008 Deferred Energy Case, February 2009.

Direct Testimony Before the Public Utilities Commission of Texas, on behalf of Entergy Texas, Inc. Docket No. 33687, April 29, 2009

Direct Testimony Before The Public Utilities Commission Of Nevada On Behalf of Nevada Power Company D/B/A Nevada Energy, 2010 – 2029 Integrated Resource Plan, June 26, 2009

Before the Public Service Commission of New York, Case 09-E-0428 Consolidated Edison Company of New York, Inc. Rate Case, Rebuttal Testimony, September 2009

Direct Testimony Before the Public Utilities Commission of Nevada on Behalf of Sierra Pacific Power Company's 2009 Deferred Energy Case, February 2010.

Direct Testimony Before the Public Utilities Commission of Nevada on behalf of Nevada Power Company's 2009 Deferred Energy Case, February 2010

Direct Testimony Before the Public Utilities Commission of Nevada on behalf of Nevada Power Company's 2010 – 2029 Integrated Resource Plan, Docket No. 09-07003, July 2010

Direct Testimony Before the Public Utilities Commission of Nevada on behalf of Sierra Pacific Power Company's Eighth Amendment to its 2008 – 2027 Integrated Resource Plan, Docket No. 10-03023, July 2010

Rebuttal Testimony Before the Public Utilities Commission of Nevada, Application of Nevada power Company d/b/a NV Energy Seeking Acceptance of its Triennial Integrated Resource Plan covering the period 2010-2029, including authority to proceed with the permitting and construction of the ON Line transmission project, Docket No. 10-02009

Rebuttal Testimony Before the Public Utilities Commission of Nevada, Petition of Nevada Power Company d/b/a NV Energy requesting a determination under NRS 704.7821 that the terms and conditions of five renewable power purchase agreements are just and reasonable and allowing limited deviation from the requirements of NAC 704.8885, Docket No. 10-03022

Rebuttal Testimony Before the Public Utilities commission of Nevada, Application of Sierra pacific Power Company d/b/a/ NV Energy Seeking Acceptance of its Eight Amendment to its 2008-2007 Integrated Resource Plan, Docket No. 10-02023

Direct Testimony Before the Public Utilities Commission of Nevada, on behalf of Sierra Pacific Power Company, d/b/a NV Energy, Docket No. 11-03 ____ 2011 Electric Deferred Energy Proceeding, February 2011

Direct Testimony Before the Public Utilities Commission of Nevada, on behalf of Nevada Power Company, d/b/a NV Energy, Docket No. 11-03 ____ 2011 Electric Deferred Energy Proceeding, February 2011

February 2011