SUBJECT: Qualifications and Experience

QUESTION:

Please file the curriculum vitae for each member of your firm who has participated in the preparation of your report and the curriculum vitae of each third party (if any) retained to assist in preparation of your report. Please specify those individuals who intend to appear to give evidence during the oral portion of the proceeding.

RESPONSE:

Paul Chernick was the primary author of Sections 2 and 3 of the report. His CV has been submitted as part of GAC's evidence. He was assisted by Susan Geller and Ben Griffiths, whose CVs are attached as Attachments 1 and 2 respectively. Mr. Chernick will be available to give oral evidence.

The primary author Section 4 of the report was Wesley Stevens, who is available to give oral evidence. His CV has been submitted as part of GAC's evidence. In addition to Mr. Stevens, John Dalton, President of Power Advisory assisted with the preparation of the report and review of Manitoba Hydro's NFAT Application. His CV is attached as Attachment 3.

Exhibit SCG-1

Qualifications of

SUSAN C. GELLER

Resource Insight, Inc.
5 Water Street
Arlington, Massachusetts 02176

SUMMARY OF PROFESSIONAL EXPERIENCE

1992–Present **Senior Research Associate, Resource Insight**. Reviews cost-allocation, rate-design, and marginal-cost methodologies. Determines avoided costs for screening of conservation and distributed-generation investments. Assesses prudence of generation-plant investment, power purchases, and power-procurement decision processes. Reviews performance-based ratemaking proposals. Evaluates utilities' least-cost resource planning and long-range demand forecasts.

1978–91 **Utility Rate Analyst, Utilities Division, Massachusetts Department of the Attorney General.** Presented expert testimony before the Massachusetts Department of Public Utilities, the Massachusetts Energy Facilities Siting Council, and the Atomic Safety and Licensing Board, on economic issues in electric and gas utility regulation. Included testimony on reliability and reviewability of load forecasting methodologies, proposals for embedded cost allocation methodologies, measurement of marginal cost of gas and electric supply, evaluation and design of utility retail rate structure, financial incentives for utility funding of conservation programs, evaluation of need for and economics of new electric generation plant, and design of gas transportation tariffs.

Formulated strategy and litigation issues in cases concerning economic and econometric questions, including efficiency and equity of gas and electric rate design proposals; financial incentives and program development for utility-funded conservation and load management; validity of long range demand forecasts; implementation of least cost supply planning and methods of cost recovery; economics of new plant construction; design of resource bidding systems. Formulated and advocated policy positions for the Utilities Division in the areas of least cost supply planning, resource bidding and deregulation, rate treatment of costs of future supply and demand resources, and rate design.

Prepared discovery and briefs. Developed lines of cross-examination and provided technical assistance to attorneys in their preparation of cross-examination. Participated in negotiations with utilities. Acted as information resource for the Utilities Division on utility planning, operations and regulatory history.

PROFESSIONAL AFFILIATIONS

Member, International Association for Energy Economics

EDUCATION

MA, Public Policy Program, Harvard University Kennedy School of Government, June, 1978.

BA, Economics, magna cum laude, Harvard University, June, 1974.

REPORTS

"Avoided Energy Supply Costs for Demand-Side Management in Massachusetts" (with Rachel Brailove, Paul Chernick, Bruce Biewald, and David White). 1999. Northborough, Mass.: Avoided-Energy-Supply-Component Study Group, c/o New England Power Supply Company.

"Performance-based Regulation in a Restructured Utility Industry" (with Bruce Biewald, Tim Woolf, Peter Bradford, Paul Chernick, and Jerrold Oppenheim). 1997. Washington: NARUC.

"Restructuring the Electric Utilities of Maryland: Protecting and Advancing Consumer Interests" (with Paul Chernick, Jonathan Wallach, John Plunkett, Roger Colton, Peter Bradford, Bruce Biewald, and David Wise). 1997. Baltimore, Maryland: Maryland Office of People's Counsel.

"Estimation of Market Value, Stranded Investment, and Restructuring Gains for Major Massachusetts Utilities" (with Paul Chernick, Jonathan Wallach, Rachel Brailove, and Adam Auster). 1996. On behalf of the Massachusetts Attorney General (Boston).

"Review of the Elizabethtown Gas Company's 1992 DSM Plan and the Demand-Side Management Rules" (with Jonathan Wallach, Paul Chernick, John Plunkett, James Peters, Blair Hamilton, and A. Shapiro). 1992. Report to the New Jersey Department of Public Advocate.

"Review of Jersey Central Power & Light's 1992 DSM Plan and the Demand-Side Management Rules" (with Jonathan Wallach, et al.); Report to the New Jersey Department of Public Advocate, June 1992.

PRESENTATIONS

"Cost Allocation for Utility Ratemaking." With Paul Chernick. Day-long workshop for the staff of the Connecticut Department of Public Utility Control, October, 1993.

EXPERT TESTIMONY

1. **EFSC** 78-12/DPU 19494, Phase I; Boston Edison Company's 1978 Demand and Energy Forecast; June 12, 1978.

   Review of and adjustments to Boston Edison's end-use and econometric forecast, including effect on projections of electric price increases. Joint testimony with P. Chernick.

2. **EFSC** 78-4; 1978 Long Range Forecast of New England Gas and Electric Association ("NEGEA"); November 10, 1978.

   Reviewability and reliability of judgmental forecasts; shortcomings of simple time-trending, and important factors to consider in forecasting electric sales.

3. **EFSC** 78-1; 1978 Long Range Forecast of Massachusetts Municipal Wholesale Electric Company ("MMWEC"); September 1, 1978.

   Evaluation of judgmental forecasting, simple time-trending, and modeling of "conservation."

4. **MDPU** 19494, Phase II; Boston Edison's Construction Program and Capacity Needs; April 1, 1979.

   Evaluation of the 1978 forecasts of ten New England utilities which constituted 92% of projected NEPOOL demand. Joint testimony with P. Chernick.

5. **ASLB, NRC** 50-471; Boston Edison Company, Pilgrim Nuclear Generating Station, Unit No. 2; June 29, 1979.

   Evaluation of two New England regional demand forecasts, an Oak Ridge National Laboratory econometric forecast and the NEPOOL end-use and econometric forecast, and cost-effectiveness of investment in a nuclear generating unit. Joint testimony with P. Chernick.

6. **MDPU** 19845; Boston Edison Company's Time-Of-Use Rates; December 4, 1979.

   Formulation of marginal cost pricing principles; analysis of BECo rate design proposals and marginal cost study; development of alternative costing methodology and rate design proposals. Joint testimony with P. Chernick.

7. **MDPU** 20055; Petition of Eastern Utilities Associates, New England Gas and Electric, and Fitchburg Gas and Electric to Purchase Additional Shares of Seabrook Nuclear Plant; January 23, 1980.

   Evaluation of New Bedford Gas and Electric forecast as a basis for the Company's "need for power" argument.

8. **MDPU** 20248; Petition of MMWEC to Purchase Additional Shares of Seabrook Nuclear Plant; June 2, 1980.

   Evaluation of reviewability and reliability of 29 demand forecasts (for the 29 members of MMWEC), the basis for the Company's "need for power" argument. Focused on the use of subjective data, interviews as a basis for forecasting, simple time-trending, and specific modeling assumptions.

9. **EFSC** 79-4; 1979 NEGEA Long Range Forecast; July 16, 1980.

   Evaluation of judgmental forecasting approach; recommended standards for use of subjective data; evaluated specific data input and modeling assumptions.

10. **EFSC** 80-4; 1979 Long Range Forecast and Supply Plan of New England Electric System; November 5, 1980.

    Review of end-use and econometric forecast. Presented general principles of econometric forecasting and documentation. More specific issues include space heating penetration projections, conservation, and commercial model specification.

11. **MDPU** 81-12; 1981 Long Range Forecast of Boston Edison Company; May 15, 1981.

    Review of end-use and econometric forecast. General principles of econometric forecasting and documentation, including model specification, use of statistical tests, subjective adjustments to econometric results, and role of judgment. Specific issues include demographic projection, appliance penetration and usage projections, and impact of appliance efficiency improvements and price increases.

12. **MDPU** 702; Nantucket Electric Company Request for General Rate Increase; October 2, 1981.

    Proposal of change in method of adjusting existing rate structures to collect allowed rate increase.

13. **MDPU** 800; Massachusetts Electric Company Request for General Rate Relief; October 9, 1981.

    Efficiency and equity of declining block rate structures, customer charges, demand charges and ratchets. Development of alternative rate design proposals.

14. **MDPU** 906; Boston Edison Company Request for General Rate Relief; December 31, 1981.

    Statement of general principles of cost allocation and rate design; efficiency and equity of Company's proposed declining block rate structures and demand charges; estimation of marginal cost; development of alternative rate design proposals.

15. **MDPU** 1015; Cambridge Electric Light Company Request for General Rate Relief; May 18, 1982.

    Economic efficiency of Company's proposed declining block rate structures and demand charges; development of alternative rate design proposals.

16. **MDPU** 955; Massachusetts Electric Light Company Proposals for Load Management and Conservation Rates; June 7, 1982.

    Evaluation of cost-effectiveness of storage heating as a load management measure; comparison of bill reductions versus system cost savings under the Company's rate design proposals. Evaluation of Company's marginal cost estimates; specific issues include average versus marginal loss factors, externalities, marginal distribution capacity costs of off-peak loads.

17. **MDPU** 1133; Massachusetts Electric Light Company Request for General Rate Increase; August 6, 1982.

Economic efficiency of Company's proposed declining block rate structures and demand charges; development of alternative rate design proposals.

18. **MDPU** 1350; Boston Edison Company Request for General Rate Increase; February 1, 1983.

Evaluation of Company's marginal cost estimates; development of rate design proposals based on revised estimate of marginal cost.

19. **MDPU** 1530; Nantucket Electric Company Request for General Rate Increase; July 22, 1983.

Development of marginal cost estimate and rate design proposals for Nantucket system. Evaluation of Company's plans to install a new diesel unit; specific issues include reliability value of smaller generation units and of demand-side management alternatives to new generation, in particular resetting of water heater time clock controls. Contribution of winter, spring and fall loads as well as summer loads to need for capacity and implications for rate design. Evaluation of effectiveness of Company's rate design proposals in controlling summer peak load growth.

20. **MDPU** 84-25; Western Massachusetts Electric Company Request For General Rate Increase; April 11, 1984.

Development of long run marginal cost estimate. Evaluation of Company's short run marginal energy cost estimates. Marginal cost issues also addressed are Company's exclusion of marginal transmission and distribution capacity costs and marginal loss factors. Economic efficiency of demand charges and ratchets.

No-loser's test as a standard for evaluating conservation programs. Critique of Company's cost-benefit analysis of conservation. Recommendations for program design and cost allocation.

21. **MDPU** 84-145; Fitchburg Gas and Electric Light Company Request for General Rate Increase; September 28, 1984

Evaluation of embedded cost of service study. Specific issues include reliability of borrowed load data; validity of class maximum demand as allocator for demand-related distribution plant, of allocation of revenue losses associated with water heater rentals to residential classes, and of allocation of low-income subsidy entirely to residential classes.

22. **MDPU** 84-145; Fitchburg Gas and Electric Light Company Request for General Rate Increase; October 1984

Evaluation of marginal cost study.

23. **MDPU** 84-55/EFSC 83-28; Nantucket Electric Company Long Range Forecast and Supply Plan; March 15, 1985

Evaluation of forecast methodology (including plausibility of regression models, failure to distinguish seasonal from annual customers, failure to reflect future C&LM, and error on definition of customer number variables) and plausibility of forecast results.

24. **MDPU** 84-276; Rules Governing Rates and Conditions for Utility Purchases of Power from Qualifying Facilities; April 1, 1985.

Long run versus short run marginal cost as the basis for payments to small power producers; distortions in proposed production target formula.

25. **MDPU** 84-276; Rules Governing Rates and Conditions for Utility Purchases of Power from Qualifying Facilities; October 18, 1985.

Evaluation of ratepayer risk associated with long term fixed price contracts; long run versus short run marginal cost as the basis for the long term contract price.

26. **MDPU** 85-271; Boston Edison Company Request For General Rate Increase; March 7, 1986

Examination of long run versus short run costs as basis for setting retail energy rates; evaluation of demand charges as an effective and appropriate rate design mechanism.

27. **MDPU** 85-270; Western Massachusetts Electric Company Request For General Rate Increase; March 26, 1986.

Examination of long run versus short run costs as basis for setting retail energy rates; evaluation of demand charges as an effective and appropriate rate design mechanism.

28. **MDPU** 86-27; Colonial Gas Company Partial Requirements and Cogeneration Rate Proposals; April 18, 1986.

Economic efficiency and equity of using marginal cost rather than embedded cost to set class revenue requirement solely for these special rates; cost justification of proposed end-use rate classification; evaluation of Company's marginal cost estimates (including issues involving interruptible sales, cost of liquefaction of LNG, use of simulation model which assumes perfect foresight, effect of design year reliability standard on normal year costs, and marginal distribution cost estimates).

29. **MDPU** 85-178; Investigation by the Department Regarding Charges and Service for Transportation of Natural Gas for Industrial End-Users; May 12, 1986.

Proposed method of calculating transportation rates that credits transporting customers with no more than savings to retail distribution company.

30. **MDPU** 86-82; Berkshire Gas Company Request For General Rate Increase; July 28, 1986.

Evaluation of marginal cost methodology. Addressed effect on marginal energy cost of load uncertainty, hedging, and hedging; increases in storage volumes as a component of capacity cost; and inclusion of reserve margin in calculation of capacity cost. Identified calculational error in Company translation of marginal capacity cost estimate into rate design. Recommended alternative to use of average daily weather to develop "normal" year. Addressed economic efficiency and equity of lower rates for specific end-uses, namely off-peak transportation, dual fuel and cogeneration customers. Potential conflicts of interest in Company's proposal to broker gas.

31. **MDPU** 86-280; Western Massachusetts Electric Company Request For General Rate Increase; March 11, 1987.

Long run versus short run costs as basis for setting retail energy rates.

32. **MDPU** 87-122; Commonwealth Gas Company Request For General Rate Increase; October 6, 1987.

Evaluation of marginal cost methodology. Addressed and quantified effect on marginal energy cost of load uncertainty, hedging of supplemental gas supplies, and storage. Addressed and quantified effect of interruptible sales on marginal cost. Identified calculational error in Company translation of marginal capacity cost estimate into charges in rate design. Evaluation of Company's interruptible sales policy, in general, and of pricing of sales to COM/Energy electric generation facilities, in particular.

33. **MDPU** 87-169; Investigation of the Adequacy of Plans to Ensure Reliable Service in the Summer of 1987 and Thereafter; December 4, 1987.

Long run versus short run costs as basis for setting retail rates. Price setting as a regulatory tool for controlling demand.

34. **MDPU** 87-221; Cambridge Electric Light Company Request for General Rate Increase; February 16, 1988.

Evaluation of Company's supply plan and need for new capacity, including use of average rather than seasonal capacity ratings and treatment of availability uncertainties. Validity of the discounted peaker method. Market-clearing price as the basis for short run marginal cost pricing. Other marginal cost issues include effect of summer derating on cost of peaker, appropriateness of discounting transmission costs based on in-service date rather than year of deficiency, payments for transmission by others as a component of marginal cost, and error in translation of marginal cost estimate into rate design.

35. **MDPU** 88-135/151; Commonwealth Electric Company Request For General Rate Increase; October 21, 1988.

Evaluation of Company's supply plan and need for new capacity, including reliability of load forecast and treatment of uncertainty in plant availability, life extensions, and demand-side versus supply-side resources. Validity of the discounted peaker method. Discussion of a number of marginal costing issues including the accurate use of price indices, lumpiness in marginal transmission capacity cost estimates, effect of uncertainty in plant availability, utility conservation, outage power from the power pool, and unit start-up costs on estimate of marginal energy cost.

36. **MDPU** 89-21; Massachusetts Electric Company Request For General Rate Increase; July 21, 1989.

Cost-effectiveness of demand-metering; demand charge incentive structure; validity of time-of-use literature as basis for estimate of non-TOU demand charge effects; evaluation of Company use of statistical results and cost-effectiveness methodology.

37. **MDPU** 89-195; Massachusetts Electric Company; December 22, 1989.

Evaluation of Company's proposed cost recovery and incentives for conservation and load management programs.

38. **EFSC** 90/12/90-12A; Boston Edison Company Request For Approval Of Long-Range Forecast Of Electric Needs And Requirements and Request For Approval Of Proposal To Construct A 306 MW Natural Gas/Distillate Oil-Fired Combined Cycle Generation Station At Its Edgar Station Site; March 4, 1991.

Evaluation of the need for and the economics of the Company's proposed new generation facility.

Qualifications of

BENJAMIN GRIFFITHS

Resource Insight, Inc.
5 Water Street
Arlington, Massachusetts 02476

SUMMARY OF PROFESSIONAL EXPERIENCE

2012–Present **Research Assistant, Resource Insight, Inc.** Supporting investigations into costs of operating and retrofitting energy facilities with quantitative data synthesis and qualitative research.

2010–2012 **Logistics Manager, WindPole Ventures.** Founding member of the operations group at a provider of wind information to the power sector.

EDUCATION

BA, Classical Civilization and History (double major) with honors, Boston University, 2010.

REPORTS

"Affordability of Pollution Control on the Apache Coal Units: Review of Arizona Electric Power Cooperative's Comments on Behalf of the Sierra Club" (with Paul Chernick). 2012. Filed as part of comments in Docket EPA-R09-OAR-2012-0021 by National Parks Conservation Association, Sierra Club, et al.

John Dalton

John Dalton
President

Power Advisory LLC
212 Thoreau Street
Concord, MA 01742
Cell: 978-831-3368
Tel: 978-369-2465

jdalton@poweradvisoryllc.com

Professional History

- Navigant Consulting
- Reed Consulting Group
- R.J. Rudden Associates Inc., 1987-1988
- Massachusetts Energy Facilities Siting Council, 1984-1987
- Massachusetts Department of Environmental Protection, 1981-1984

Education

- Boston University, MBA, 1987
- Brown University, AB, Economics, 1980

A senior electricity market analyst and electricity policy consultant with over twenty five-years of experience in energy market analysis, power procurement, project valuation, and strategy development. Experienced in the evaluation and analysis of electricity markets and the competitive position of generation technologies and projects within these markets including the assessment of the competitiveness of the underlying market, the development of power market price forecasts, the implementation of power procurement processes, and the development and evaluation of renewable energy policies. Frequent speaker on these subjects at energy industry conferences.

As President of Power Advisory LLC, he led the firm's assessment of the Western Grid transmission project which would interconnect Manitoba and Alberta and has evaluated a number of different electricity market opportunities for Manitoba Hydro in his extensive consulting career. He has testified in approximately 20 different cases focusing on the need for generation facilities, the cost of these facilities relative to alternatives, electricity market price forecasts, and the appropriate assumptions for establishing the cost of renewable energy technologies. Since 2009 he has advised the Vermont Public Service Board on the development of its renewable energy standard offer program and testified in five different proceedings regarding the cost of the various renewable energy technologies covered by this program. In addition, he led the firm's NRCan projects which: (1) evaluated a Continental RPS and evaluated the potential for increased electricity trade attributable to relaxing RPS eligibility provisions that prohibit large scale Canadian hydroelectric projects from participating; and (2) assessed the role that storage hydro projects can play in integrating additional variable output renewable energy resources. He has developed electricity price forecasts for virtually all of the major wholesale power markets in North America for major electricity products including energy, capacity and a range of ancillary services. He has developed wholesale electricity market price forecasts for the MISO market, evaluated the performance of generating units in the MISO market, and drafted market reports focussing on the MISO market. He has advised clients on the design of wholesale electricity power markets and evaluated the performance and risks of these markets; and has drafted market reports reviewing generation asset sales opportunities across North America. In addition, John has been actively involved with the development and evaluation of over 50 generation power projects representing over 10,000 MW, with services provided ranging from market assessment, financial and pricing analyses, and facility permitting. Prior to consulting, John served as Senior Economist for the Massachusetts Energy Facilities Siting Council, where his primary responsibilities included analyzing and critiquing the demand forecasting and supply planning methodologies of electric and gas utilities. He was

formerly employed by the Massachusetts Department of Environmental Protection as an environmental planner and economist. John served on the Board of the New England Cogeneration Association.

Professional Experience

Market Assessment

» Developed and supported numerous market price forecasts for wholesale power markets across North America. Price forecasts were used to support generation project development efforts, project financings and acquisitions, regulatory policy development, and power procurement efforts.

» Demonstrated the need for electric generation projects in filings submitted to various state and provincial regulatory agencies. Evaluated the cost of a wide range of different generation technologies for a number of clients. Defended analyses in prepared and oral testimony before these state agencies.

» Conducted wholesale power market analyses across North America for a wide range of market participants. Analysis included identifying likely competitors and pricing, security provisions, and general terms and conditions of various power supply options. Evaluated pricing required to compete in the market.

» Advised the Ontario Electricity Financial Corporation with the management of its non-utility generation contracts. Advice included addressing the policy issues associated with balancing concerns with the sanctity of existing contracts and the desire to minimize stranded debt as well as to use the contracts as a source of competitive discipline for the incumbent provincial electric utility.

» Managed a team that was retained by a large power generation company to develop a market assessment and wholesale power market price forecast for the Alberta market. Our assessment focused on issues affecting the fundamentals of the Alberta power market, including the future demand supply balance, growth in demand, market interconnections, and potential new generation capacity additions.

» Retained by the financial advisors for the developer of a proposed new combined cycle gas turbine project in Alberta to establish the toll between the Corporate entity participating in the income fund and the parent. Defended forecast assumptions and the modelling approach before investors as part of a public offering.

» Directed the use of ProSym in a proceeding before the Alberta Energy and Utilities Board (AEUB) to estimate the costs of transmission congestion and the benefits of increasing the transfer capability of the North South transmission interface. Modeling assumptions and methodology were successfully defended before the AEUB.

» Advised numerous generation project developers across North America on opportunities offered by participating in the relevant wholesale power market and various power supply procurement RFPs. Evaluated market risks and outlined strategies for managing these risks most efficiently.

» Analyzed and critiqued the supply planning methodologies of electric and gas utilities, focusing on the appropriateness of the supply planning models and methods. Provided recommendations for improving supply planning methods which were designed to assist the utilities in addressing the uncertainties associated with long-range planning. Prepared recommendations for the refinement of demand forecasting methods for electric and natural gas utilities. Analyzed and evaluated the statistical and quantitative projection methods used, including end-use and econometric forecasting techniques.

» Evaluated electric generating technologies on the basis of the capital and operating costs, technological risk, and environmental impact, identifying a preferred alternative in light of these considerations. Defended the selection process before a regulatory agency.

» Prepared strategic plan for a number of electric and natural gas market participants which evaluated the state/provincial and federal regulatory climate for cogeneration and generation projects, market prices and risks and recommended a competitive strategy.

Market Structure Development and Evaluation

» Advised the governments of Ontario, New Brunswick, Nova Scotia, Western Australia, and Manitoba regarding the restructuring of their wholesale power markets and possible market structures to achieve a workably competitive wholesale market.

» Responsible officer for market design project for the Province of New Brunswick. Navigant Consulting assisted the Market Design Committee and its subcommittees in providing the Minister of Natural Resources and Energy with recommendations on the implementation of electricity restructuring. Issues addressed included developing a market design that addresses concerns with the potential for the exercise of market power and enables New Brunswick to integrate with its interconnected markets. The Market Design Committee addressed development of the electricity market including its design, structure and rules. Navigant Consulting provided advice on the issues to be addressed, prepared issue papers and presentations, created strawmen for resolution of issues, and developed guidelines and direction for the creation of market design rules and protocols.

» Project manager for an assignment with the Province of New Brunswick to assist with the development of its ten-year energy policy. The cornerstone of this energy policy was the framework for restructuring its wholesale and retail electric markets. Advised regarding developments in other wholesale and retail markets and the prospects for meaningful competition in New Brunswick's wholesale and retail markets. Navigant Consulting advised regarding benefits offered by wholesale and retail competition; strategies for protecting New Brunswick consumers from market dislocations and higher prices; appropriate regulatory frameworks for the wires businesses and the prospects for achieving a workably competitive wholesale market in New Brunswick and the resulting market design requirements; and policies for addressing stranded costs raised by market restructuring.

» Markets and economics expert for a project with Western Power, the state-owned fully integrated utility that serves the vast majority of Western Australia. Advised regarding potential changes to the wholesale and retail electric power markets to enhance the competitiveness of these markets. Alternative market structures were evaluated and assessed in an effort to determine the market structure that offers the greatest societal net benefits. Offered proposed market structure changes that would accommodate government policy objectives of allowing greater levels of retail contestability and new entrants to satisfy the market's need for additional capacity. Evaluated restructuring reforms that had been implemented in a range of different markets that were of a similar size as Western Australia.

» Advised the Energy Strategy Working Group regarding the development of an electricity restructuring policy for the Province of Nova Scotia. Reviewed the experience with respect to the wholesale and retail market restructuring in California, New England, PJM, and Alberta and based on this experience outlined lessons learned and potential implications for electric restructuring Nova Scotia. Outlined the arguments for considering the restructuring of Nova Scotia's electricity market, reviewed contrasting market models, and discussed the critical constraints on wholesale and retail market restructuring in Nova Scotia.

» .Provided numerous presentations regarding the experiences with the restructuring of wholesale power markets and the lessons learned. Markets evaluated have included California, Alberta, New York, New England, PJM, Victoria, and England and Wales.

Project Valuation

» Served as Project Manager for assignments requiring the development of valuation estimates for numerous energy projects. Projects typically entailed modeling revenues and costs to predict cash flows and calculate the cumulative present worth of after-tax cash flows. The overall viability of projects were assessed by reviewing the status of project permitting efforts and financial commitments, the major provisions of power purchase agreements and steam purchase agreements.

» Managed a project to provide an independent valuation of a multi-unit generating portfolio as part of a refinancing for the portfolio. Oversaw and managed the development of an electricity market price forecast and estimate of the fair market value of the proposed portfolio. Defended analyses before credit rating agencies and lenders.

» Completed a comprehensive valuation of an oil-sands cogeneration project. As part of this effort, the team examined various market scenarios and potential spot market volatility and the subsequent impact on the client's electricity commodity costs.

» Performed detailed analyses of numerous generation projects' financial feasibility. Analyses considered alternative financing schemes and identified strategies for enhancing project values.

» Evaluated the economic and financial feasibility of a number of different generation projects for project developers, project hosts, and a gas utility. Assisted in the development of a cogeneration feasibility assessment model.

» Developed an estimate of the capital and operating costs of a wide range of generating technologies as part of a comprehensive assessment of the costs of new entry. Also estimated the appropriate cost of equity using the capital asset pricing model and debt and capital structure based on market information for merchant generators.

» Oversaw the development of numerous electricity distribution company valuation models. Used models to derive an estimate of the fair market value of the LDCs. Defended analysis before utility boards and management.

» Developed quantitative and qualitative analyses of generating assets in support of numerous generation asset acquisitions. Assisted in the management and coordination of multiple facets of the due diligence process, including technical engineering assessments, environmental, fuel supply, etc. Experience includes a broad range of fuels / technologies, including wind and other renewables.

Competitive Procurement Support

» Advised on the development of over 25 RFPs for power supplies and demand-side resources for electric utilities across North America, serving as project manager for well over half of these RFPs. Support covered the full range of RFP support services including advising regarding the appropriate form of the RFP and evaluation process to secure resources that best satisfy the client's objectives, drafting the RFP, developing the evaluation framework, marketing the RFP process to prospective bidders and negotiating with bidders.

» Testified before the Alberta Utilities Commission on the appropriate structure for the Alberta Electric System Operator's competitive procurement process. The applicant adopted the many of the recommendations made in rebuttal testimony and the Commission directed the applicant to revise its proposal to conform to other recommendations. A primary focus of the testimony was how to enhance competitive tension in the procurement process for the benefit of electricity consumers.

» Managed a multi-disciplinary team that served as the Renewable Electricity Administrator for the Province of Nova Scotia responsible for procuring 300 GWh of renewable energy through a competitive procurement process.

» Advised the Vermont Public Service Board on the development of a market-based mechanism for the procurement of renewable energy. Legislation identified a reverse auction as a possible procurement mechanism. This along with other procurement methods were evaluated to determine the method that would be serve customers. Alternatives were evaluated by contrasting the product and other distinguishing characteristics, degree of price transparency, requirements for bidders, with each alternatives evaluated in terms of efficiency of outcomes given the anticipated level of competition.

» Advised on commercial issues for power purchase agreements.

» Offered testimony before the Massachusetts Department of Public Utilities on a utility RFP process. Authored reports on the evaluation of proposals.

» Reviewed the performance of the Alberta PPA Auction and critically assessed elements of the PPAs and the auction design which caused the auction to reduce the value secured for the generation assets that were auctioned.

» Outlined the pro and cons of different frameworks that could be used for the sale of surplus energy and reviewed whether these sales frameworks were appropriate for the products being offered and the relevant market.

» Advised the Western Australia Electricity Restructuring Task Force with respect to the performance of auctions in Ireland for the sale of capacity and energy. Reviewed the structure of the auction how it could be employed in Western Australia to mitigate the market power of the incumbent state generator.

» Managed numerous competitive solicitations for renewable energy resources and energy efficiency projects. Projects involved the development of frameworks for evaluating these energy alternatives and for comparing them on a consistent basis with conventional electricity supplies. Analyses considered the relative environmental impacts, reliability benefits, and cost-effectiveness of alternatives.

» Acted as Project Manager for several assignments to serve as the independent evaluator of conventional generation, renewable resource and demand-side RFPs. Responsible for determining whether proposals satisfy the threshold requirements in the RFP and for scoring all proposals. Also responsible for identifying the short-list of proposals, conducting bid clarification meetings with shortlisted bidders, and recommending to the selection of winning bidders.

Transmission Facility Review and Pricing Proceeding Support

» Advised the staff of the Ontario Energy Board on the evaluation of the proposal for a 1,250 MW HVDC line between Quebec and Ontario and served as a participating staff member for the Massachusetts Energy Facilities Siting Board's evaluation of the 2,000 MW HVDC interconnection between Massachusetts and Quebec.

» Advised OEB staff on the review of evidence presented by Hydro One in its application for two 240 kV transmission lines to alleviate the Queenston Flow West constraint.

» Advised clients in Saskatchewan, Newfoundland and Labrador, and Alberta on transmission pricing issues. Testified in the Alberta Transmission Congestion Pricing Principles proceeding.

» Led a consulting team that assisted with the preparation of the East-West Electrical Transmission Grid Study. Authored subsequent updates to this study for Natural Resources Canada.

» Advised a client regarding the elements of a comprehensive electricity export policy framework. Advice focussed on economic and social issues arising from the development of export oriented transmission infrastructure to support the development generation for export.

» Provided testimony on Northeast power markets and transmission issues and consequential damages in a civil case in New York. Evaluated the implications of the loss of a transmission facilities on the power system adequacy.

» Advised a number of clients on the issues associated with the development of merchant transmission facilities. Projects included reviewing the status of merchant project development efforts, merchant project structures, key success factors for merchant plant development and a review of merchant plant development opportunities worldwide.

Renewable Energy Policy Development and Evaluation

» Advised governments of Ontario, New Brunswick, Nova Scotia, and Manitoba on policies for the promotion of renewable energy technologies.

» Advised the Ontario Select Committee on Alternative Fuels on the most promising renewable technologies, identified barriers to their development and adoption and proposed policies for overcoming these barriers.

» Directed a project for a group of municipalities in Manitoba that evaluated the economic opportunity offered by wind projects in Manitoba and identified policies to promote the development of Manitoba's wind resources.

» Advised the Ontario Power Authority on the development of a standard offer for renewable energy technologies.

» Delivered a presentation on Canadian policies to promote the development of wind energy projects. Presentation reviewed federal and all relevant provincial programs and policies to promote the development of wind energy projects.

» Developed recommendations for the Manitoba Sustainable Energy Association on policies to promote the adoption of renewable energy technologies in Manitoba. Reviewed the relative advantages and disadvantages of standard offers versus RFPs and made recommendations regarding the appropriate applications of each.

» Advised numerous electricity generation development companies on the implications and opportunities presented by renewable energy policies. Developed strategic plans for a wide range of renewable energy technologies including large scale wind, landfill gas, biomass, anaerobic digestion, and small hydro.

» Evaluated electricity wholesale market and REC prices that would apply to landfill gas projects and reviewed US federal policies that benefited these projects including the production tax credit.

» Reviewed the general market for the development of renewable energy projects in Canada and contrasted market conditions with those in other countries.

» Led the development of a multi-client study that evaluated the opportunities for wind project development in Ontario under existing federal and provincial programs.

» Contrasted state RPS programs by identifying eligible technologies, eligibility requirements for projects in different jurisdictions, strategies for assessing compliance, RPS targets, and penalty provisions for failure to achieve the target.

Speaking Engagements

» "Strategies for Enhancing the Value of Your Asset", IBC Conference, (November, 1999)

» "Electricity Restructuring Lessons Learned: Implications for Ontario", Ontario Energy Marketers Association (April, 2001)

» "Electricity Power Prices in the Deregulated Ontario Market, 2001 CERI Conference, (October, 2001)

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Massachusetts Energy Facilities Siting Council: Review of Application by Northeast Energy Associates to build an electric generating facility, testified on behalf of Northeast Energy Associates on the impacts and costs relative to alternative generation technologies (16 DOMSC 335 (1987))

REFERENCE: Page 4-3

PREAMBLE: On page 4-3, GAC states "Power Advisory recommends using the Department ofEnergy's average of $1,760/kW for the Interior region as a reasonable estimate of wind capital costs in 2012. This includes both project and interconnection costs;…"

QUESTION:

Please define interconnection costs.

RESPONSE:

The Department of Energy report states "In general, reported project costs reflect turbine purchase and installation, balance of plant, and any substation and/or interconnection expenses" (p. 34). Elsewhere in the report, a distinction is made between "transmission and interconnection facilities" (Footnote 6, p. 6). Interconnection expenses therefore appear to include substation and related expenses, but to exclude transmission line expenses.