



Todd Williams

Todd Williams
Managing Director

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A highly capable professional with over twenty-five years of domestic and international energy market experience. He has expertise across a broad range of disciplines, including energy market restructuring, financial analysis, generation development and demand management. Mr. Williams has been intimately involved with the restructuring of Ontario's electricity market and has advised the government, various agencies and a wide variety of market participants including generators, retailers, aggregators and distribution utilities on rates, contracting and valuation matters.

Professional History

- Managing Director, Navigant Consulting
- Manager, Resource Management International
- Manager, SRC International Pty. Ltd.
- Supervisor, Energy Management, Ontario Hydro

Education

- MBA – Ivey School of Business, University of Western Ontario, Canada
- B.Sc. (Honours) – Engineering Physics, Queen's University, Canada

Professional Experience

» Supporting Nalcor in exploring export opportunities for Lower Churchill power in Ontario, New Brunswick, Nova Scotia and New England. This work required in-depth knowledge of the supply / demand balance, supply mix projections and underlying legislative and policy framework in order to determine the maximum value for Lower Churchill power in each of the jurisdictions of interest.

- » Supported the New Brunswick Market Design Committee (MDC) charged with the responsibility to address *“development of the electricity market including its design, structure and rules, and make recommendations to the province.”*
- » Developed a peak demand forecast as well as estimates of the impact of various conservation and demand management scenarios on peak demand for the Ontario Power Authority's Integrated Power System Plan.
- » Provided an estimate of the cost of new entry in the Ontario market for a variety of different generation technologies based on detailed research into underlying cost components, emission rates and performance characteristics.
- » Direct Navigant Consulting's ongoing support to the Ontario Energy Board's Regulated Price Plan. This project involves forecasting electricity costs for Ontario residential and small business electricity consumers responsible for approximately half of Ontario's electricity consumption.



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- » Principal author of a study to determine avoided energy, generation capacity and transmission capacity costs for Ontario for the use of Hydro One. This report was accepted by the Ontario Energy Board and was used by over 80 Ontario utilities to determine the cost-effectiveness of various demand management programs.
- » Led Navigant's assessment of the planned smart metering initiative for over 4 million residential and small business consumers in Ontario. The project included analysis of the impact of Time-of-Use rates on customer demand and new capacity requirements as well as a comprehensive analysis of the operational benefits of smart metering for Ontario's distribution utilities.
- » Developed a cost of service model for a vertically integrated Ontario electric utility that had to "unbundle" its rates according to Ontario's new market rules. Scope of work included establishing fair and equitable distribution rates based on the utility's costs in a manner that was consistent with that of the Ontario Energy Board's rate-unbundling model, but reflected the unique operations of this vertically-integrated utility. Also supported the client in developing rate impact mitigation strategies for presentation to the Ontario Energy Board.
- » Serving as expert witness to a provincial government with respect to a lawsuit filed by the former owner of a privately-held distribution utility. At issue is the impact of restructuring on the utility, the degree to which the utility took steps to mitigate restructuring costs and risks and the government's response to various requests for accommodations and exemptions from regulations and legislation for the utility.
- » Serving as expert witness to a provincial government with respect to a lawsuit filed by a non-utility generator (NUG). At issue is the avoided costs upon which the purchase rates in the NUG's power purchase agreement are based and the application of certain provisions within the contract with respect to recalculating the purchase rates based on new information regarding avoided costs.
- » Explored the impact of a retail electricity price freeze on forecast gas volumes for a large Canadian gas distribution utility. The study combined cross-elasticity estimates from other jurisdictions with end-use characteristics and gas penetration of the local market.
- » Developed cost recovery model and compliance strategy for the OEB.

Non-Utility Generation and Power Purchase Agreements

- » Provided strategic advice to the Ontario Power Authority (OPA) on procurement process for 1,000 MW of CHP (cogeneration) capacity, including support in development of the RFP, project qualification and proposal evaluation criteria, development of the CHP proposal evaluation model, communications with stakeholders at technical sessions, and development of the CHP contract and CHP Power Purchase Agreement.



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- » Supported negotiation of a power purchase agreement (PPA) with the OPA, including assessment of the financial implications of alternative contract terms and conditions.
- » Strategic review of ownership options for a private/public partnership district energy corporation. Review covered development of a natural gas hedging strategy and electricity contracting strategies (including potential benefits of a “behind-the-fence” transaction), assessment of green power marketing thermal energy marketing opportunities, valuation under various scenarios and determination of most appropriate ownership/governance options given the municipal client’s investment parameters and risk tolerance.
- » Advised numerous clients on generation opportunities, ranging from a comprehensive assessment of a district energy corporation, financial analysis of natural gas and biomass cogeneration facilities, development of strategies to capture the value of standby generators in a volatile electricity market.
- » Developed a forecast for distributed generation resources in California in response to rate hikes and rolling blackouts and assessed various options to increase the interruptible load capacity available in the California market for the summer of 2001, based on expanding eligibility criteria for existing programs and allowing inclusion of back-up generators.

Strategic Planning and Financial Evaluation

- » Provided recommendations to improve the competitiveness of Alberta’s small business and residential retail electricity market to Alberta Energy.
- » Provide ongoing strategic and regulatory advice on energy market issues to utilities, competitive affiliates, governments, energy service providers and equipment providers across Canada.
- » Provided due diligence and valuation support to a US utility in a successful \$1 billion bid for an electricity distributor/retailer being privatized in Victoria, Australia. This assignment included market valuation of potential growth strategies and value-added services based on an assessment of the current competitive market situation, possible market entry strategies, target market segments, and key success factors.
- » Participated in a major international energy company’s due diligence for a gas distribution/retail company. Identified the most promising asset based on synergies with the client’s current retail strengths. Estimated the post-privatization rationalization potential and refined the company’s market entry strategy based on a comprehensive assessment of the current and expected market dynamics.
- » Supported a variety of utilities on divestiture, lease and purchase transactions, including due diligence, valuation, bid preparation, bid evaluation and negotiations.



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- » Led numerous strategic assessments for a variety of electric utilities, their Boards of Directors and shareholders. The assessments included valuations based on discounted cash flow and market comparables, risk analysis, exploration of competitive business opportunities and identification of potential cost savings in response to performance-based regulation. These assessments involved significant interaction with municipal councils and staff to fully explore each municipality's strategic objectives and risk tolerance.
- » Developed a comprehensive business plan for a group of electric utilities to enter the retail energy market. The plan covered both commodity sales and value-added products and services. Key elements of the strategy include direct sales and affinity marketing as well as partnering with other providers to minimize capital requirements.
- » Provided strategic advice to numerous electric utilities on potential competitive business opportunities following the introduction of retail electricity market competition. These business opportunities include appliance sales and servicing, water heater rental, metering service provision, distribution and streetlighting maintenance services.

Demand Management

- » Served as expert witness for a number of Ontario natural gas and electric utilities on a variety of matters including restructuring issues with respect to customer rates, rate-setting and other technical matters related to conservation and demand management.
- » Advised the OPA on implementation of a \$400 million fund for utility conservation and demand management (CDM) programs, including contract and payment terms, and program design issues.
- » Developed a demand-side management (DSM) regulatory strategy for Enbridge Gas Distribution, with a focus on risk management through the target and budget-setting process, and performance incentives.
- » Provided recommendations to Union Gas for its 2006 DSM regulatory strategy, including DSM budget and incentive framework.



Dawei Zhou, P.E.

Dawei Zhou
Associate Director

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Professional History

- Associate Director, Navigant Consulting, Inc.
- Managing Consultant, Navigant Consulting, Inc.
- Senior Consultant, Navigant Consulting, Inc.
- Electrical Engineer, American Superconductor

Education

- M.S., Electrical Engineering, University of Wisconsin-Madison
- B.E., Power and Energy Engineering, Xi'an Jiaotong University, China
- Completed New York ISO Market Training
- Completed PROMOD Basic and Advanced Training by Ventyx
- Completed Expert Witness Training

Professional Associations

- Senior Member, Institute of Electrical and Electronics Engineers
- Member, Institute of CFA (Chartered Financial Analyst)

Certifications

- Professional Engineer (P.E.) – Licensed in State of New York (#089834)
- CFA Level 2 Candidate

Dawei Zhou, P.E. is an Associate Director with extensive experience in the areas of transmission/distribution planning, energy market analysis, power procurement, strategic planning, asset valuation and risk management. He has expertise in load flow, voltage instability, generation deliverability, risk analysis, transmission asset evaluation and financial analysis. At Navigant Consulting, he provides services in support of electricity markets modeling, business risk analysis, generation/load deliverability, generation interconnection, HVDC technical evaluation and renewable energy procurement. Prior to joining Navigant Consulting, he worked with American Superconductor and was actively involved in T&D planning and power electronic system design as well as related cost estimation and financial analysis. Mr. Zhou is a registered Professional Engineer licensed in New York State and a CFA (Chartered Financial Analyst) level II candidate. He holds a Master's degree in Electrical Engineering from University of Wisconsin-Madison and Bachelor degree in Power and Energy Engineering from Xi'an Jiaotong University. In year 2011, he was elected as IEEE Senior Member, which is an industry-wide recognition for technical and professional excellence.

Professional Experience

Recent Projects

- » **New Jersey Solar Renewable Energy Credits ("SREC") program to Diamond Castle Holdings.** Provided a detailed market analysis of the New Jersey "SREC" program to Diamond Castle Holdings, a private equity investment firm with \$1.85 billion of committed capital under management that targets investment in the energy and power sector. Develop a REC Price Estimator Tool© (RECPET) to forecast SREC price for the New Jersey market with multiple sensitivities.



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- » **Firm Point-to-point Transmission Service Study for GE Energy Financial Services.** Performed a transfer capability study utilizing proprietary tools in PSS/E and the FERC 715 databases. Evaluated the thermal and voltage violations under normal and contingency conditions while transferring power from source to sink. Also summarized the import/export capability to provide insight on the future transfer capabilities.
- » **NYPA Great Lake Offshore Wind (“GLOW”) RFP.** Prepared the quantitative analysis for proposals offering utility-grade wind capacity, energy and associated renewable energy credits to be sold to the New York Power Authority.
- » **Midwest ISO (MISO) Generation Interconnection System Impact Study.** Recently engaged to conduct the MISO official interconnection system impact study (SIS) for a wind power plant and conventional CC units.
- » **Review of Alberta Electric System Operator Studies.** Reviewed various transmission planning studies conducted by the Alberta Electric System Operator (AESO) on behalf of the AESO for the Edmonton – Calgary HVDC Project (“Project”). Verified both steady state and transient studies results and provided insights and recommendations.

T&D Planning and Operations

- » **Transmission Fatal Flaw Analysis for GE Energy Financial Services.** Performed a deliverability assessment of all proposed power plants, utilizing FERC 715 database to determine whether there was adequate transmission to allow the facilities to serve as a network resource. Summarized the import/export capability to provide insight on the ability of plants external to load pocket to compete with the subject plants to serve the load.
- » **Nuclear Power Plant Siting and Market Study for Exelon.** Assisted client in their site selection for a nuclear power plant. Performed a deliverability analysis and interconnection study to rank the feasibility of multiple candidate sites. Performed cost analysis based on identified system upgrades to determining the most feasible and economic site for the proposed power plant. Also, participated in the forward market modeling and study.
- » **Dominion Fatal Flaw Analysis for Generation Unit Upgrades.** Assisted Dominion Virginia Power to evaluate the impacts of potential generation upgrade projects on the PJM transmission system to determine if transmission upgrades would be required to implement the project. Tasks included analyzing system upgrades necessary to accommodate the proposed up rates as network/capacity resource in accordance with FERC Order 2003/2003A (deliverability study); and conceptual estimation of the system upgrade costs as identified in the PJM generation interconnection process.



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- » **ITC 120-kV Transmission System Voltage Instability Study.** As project lead engineer, quantified the exact nature of the voltage problems of the 120-kV loop, its impact on the underlying 41.6-kV sub-transmission system and identified solutions required to mitigate for the voltage instability problems utilizing dynamic reactive power devices and transmission capacitors.
- » **Pacific Gas & Electric 115-kV Transmission System Voltage Instability Analysis.** As project engineer, carried out a voltage study on the 115-kV transmission system. Developed substation model and modified DSMES model by using PLSF. Also performed dynamic simulation for the voltage instability study and identified solution options to solve the voltage problems. Project required working with sales department to provide cost effective solution for PG&E.
- » **Optimal Load Shedding Against Voltage Instability.** Analyzed a power system from the viewpoint of dynamic stability. Utilized utility load flow data for simulating the active and reactive power flows and the bus voltages. Modeled the power system by using specialized software such as Power World and Matlab. Several types of load shedding schemes were studied and compared in terms of performances and complexity. An optimal solution for load shedding was presented based on a balance between computing time, over fitting and effectiveness.
- » **Computational Simulation of Dynamic Behaviors in Sub-transmission Systems and Power Plants.** As research staff, worked with a team on an EPRI project sponsored by DOE and Duke Energy. Numerically modeled a power system including the sub-transmission system, traditional power plants and nuclear power plants. Task required transmission/distribution planning, scientific computation, dynamic simulation, power electronics and control scheme design.

Competitive Power Markets

- » **NYPA Hudson Transmission Partners (“HTP”) HVDC Project Technical Support and Cost Evaluation.** Developed the projected cost exposure associated with PJM transmission enhancements and expansions. Review all proposed individual RTEP related upgrades that have been filed with PJM and employed the same procedure used by PJM to determine the impact of each upgrade on the HTP project.
- » **LIPA Neptune HVDC Project Technical Support.** Provided technical support to an expert witness testimony for issues related to LIPA’s Neptune HVDC project. Analyzed cost exposure associated with PJM transmission enhancements and expansions and evaluated the system impact of this HVDC cable.
- » **LIPA Cross Sound Cable (“CSC”) HVDC Project Technical Support.** From the view point of system stability, analyzed Cross Sound Cable’s performance and dynamic characteristics as well as the reactive power supporting capabilities.



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- » **Dominion Capacity Bid Advisory.** Assisted Dominion Power on capacity bidding in the PJM capacity market and evaluated the power deliverability status based on the transmission system analysis and future generation forecasts.
- » **NSTAR Transmission Asset Evaluation.** Currently performing a comprehensive Pool Transmission Facilities (PTF) assessment of NSTAR's electric transmission system under the current ISO New England Transmission, Markets and Services Tariff, Section II - Open Access Transmission Tariff (Controlling Document). The overall objective is to ensure that transmission plant accounting records are current and assure that the NSTAR Regional Network Service (RNS) transmission investment has been accurately computed in conformance with the applicable provisions of the Controlling Document.
- » **Energy Market Price Analysis and Forecast.** Studied the location-based market price (LMP) for multiple projects, including historical data analysis and documentation, price statistical analysis and price discrepancy analysis. Utilized the GEMAPS to forecast the LMP for NYISO, ISO-NE and PJM areas.
- » **North American Power Markets Comparison.** Performed power market assessment and comparison of North American Power Markets, including NYISO, ISO-NE, PJM, MISO, West Connect, Grid West and CA-ISO. Studied and compared their markets rules, market features, monitoring & mitigation programs and ancillary services.
- » **NERC Reliability Criteria Review and Comparison.** Compared the reliability criteria among the 10 reliability councils within NERC as far as System Adequacy and Security, System Modeling Requirements, System Protection and Control, System Restoration and operating policies.
- » **KEYSPAN Transmission System Data Auditing.** Performed review of line and transformer rating data, as well as impedance data, to ascertain if appearances of inconsistency across a variety of data sets were correct. The purpose of this audit was to ensure the accuracy of data assumptions used in performance of planning studies, which were key driver to capital project recommendations by KeySpan Energy.

Generation Interconnection

- » **Support Shaw Expert Witness Testimony.** As part of the expert testimony, investigated the generator's deliverability to be connected to the system based on PJM Generator Deliverability criteria.
- » **Deliverability Study of Long Island Power Authority's Future Generation Units.** Participated sensitivity studies of deliverability for combinations of **Long Island Power Authority's** (LIPA) proposed units. Analyzed the potential overload problems under contingencies and recommended solutions.



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- » **Generation Feasibility Study for British Gas.** Performed load flow analysis to determine if it was deliverable to inject 550 MW or 1200 MW onto the Southern Company transmission system from the proposed project.
- » **Generation Deliverability Study for Union Power.** Performed a load flow analysis under peak load conditions to determine if the Union Power Plant could meet FERC's deliverability requirement for capacity/network resources.
- » **Generation Facility Site Selection for NuStart Energy.** Assisted Nustart Energy in their site selection process for the next-generation nuclear reactor. Performed a load flow analysis to rank the viability and attractiveness of the six selected sites for the proposed nuclear power plant transmission upgrades to support the network resource where identified through load flow studies. Associated cost were also estimated for determining the most feasible and economic site for the proposed power plant
- » **Nuclear Power Plant Site Selection for Progress Energy.** Performed a load flow analysis to rank the viability and attractiveness of the candidate sites for the proposed nuclear power plant transmission upgrades to support the network resource where identified through load flow studies.

Renewable Energy

- » **PJM RECS Pricing Modeling.** Developed a multi-state RECS pricing forecast model utilizing linear optimization program. Areas studied include New Jersey, Maryland, Pennsylvania, Delaware, Ohio and Illinois.
- » **PECO Renewable Credits Procurement.** Assistant to prepare the Independent Consultant Report for the PECO Renewable Credits Procurement, including development of a baseline price forecast of alternative energy credits for purposes of baseline comparison.
- » **Grid Connection of 120-MW Wind Farm, Alberta, Canada.** As Project Engineer, analyzed and developed a DVAR solution for a Canadian wind farm to satisfy the utility grid connection requirements. Performed interconnection study including deliverability and system impact studies. Also worked with sales personnel on the RFP and pricing.

Strategic Planning

- » **Long Island Power Authority T&D Business Model.** Developed and updated Long Island Power Authority's (LIPA) T&D business model for capital budget analysis and marginal cost analysis. Projected the future T&D expense and revenue based on sensitivity analysis and scenario simulations.



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- » **Contract Management System.** Developed a contract management system to monitor and manage the provisions of Management Services Agreement between Long Island Power Authority (LIPA) and KeySpan. Functions include contract dashboard management, automatic email notification, data query and report generation.

Power Electronics Technology

- » **Design of Power Quality and Voltage Restore System.** Worked as Electrical Engineer with a group to develop a new electronic power support system based on IGBT technology. Project required embedded system design, analog circuit design and circuit testing.

Publications and Presentations

- » "Application of EV GIS Mapping Tools in Renewable Energy Industry", Seminar of Navigant Renewable Energy Group, March 16, 2011.
- » "Innovation and Enterprise Culture", Seminar of NYS Association of Chinese Professionals and China visitor delegation, December 16, 2010.
- » "Integrating New Nuclear Plants into Transmission Grids", The Canadian Institute Nuclear Symposium, March 24, 2010 (coauthor: Laurie Opper)
- » "Introduction to Energy Velocity", internal speech and presentation for entire energy practice of Navigant Consulting, Inc. May 27, 2008.
- » "Simulation of Boron Holdup and Axial Offset Anomaly in PWRs", ICON-10 (ASME), FL, 2002 (coauthor: B.G. Jones).
- » "Control Behavior and Intelligent Simulation of Once-through SG", Power Industry Control and Simulation, China, 2000 (co-authors: Y. Cao and F. Zhao).
- » "Optimal Control of Load-following Operations in a Pressurized Water Reactor", Chinese Journal of Nuclear Science and Engineering, Vol. 20 No. 3, pgs. 274-281, 2000 (co-author: Z. Fuyu).



James J. Peterson

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Director, Energy Practice

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Professional History

- Director, Navigant Consulting, Inc.
- Director of Power Contracts, Long Island Power Authority
- Director of Power Contracts and Billing, New York Power Authority
- Associate Engineer, American Electric Power
- Case Analyst, New York Public Service Commission

Education

- MBA, Economics, Pace University
- Bachelor of Engineering (Industrial), Pratt Institute

Mr. Peterson is a Director in the Energy practice of Navigant Consulting, Inc. He has more than 38 years of utility experience with a focus on the electric, gas and water sectors. His principal areas of responsibility have involved (i) procuring power supply and transmission service, (ii) negotiating contracts for the purchase and sale of power and energy, transmission service and gas transportation, (iii) developing wholesale and retail rates and (iv) overseeing the operation of customer billing systems. Mr. Peterson has also testified in both regulatory and legal proceedings.

Professional Experience

- » Managed all aspects of a utility Power Markets organization (including power procurement and contracts, project management, planning, fuel supply and energy scheduling) of a large electric utility that was responsible for meeting the energy requirements of more than one million retail customers.
- » Oversaw the procurement process for more than 2,500 megawatts of generating and transmission capacity that was required to meet the growing peak load requirements of retail electric customers of a large electric utility.
- » Responsible for the negotiation of long term power purchase agreements ("PPAs") and firm transmission capacity purchase agreements, some of which are valued in excess of one billion dollars. Secured the requisite senior management and governmental approvals for such agreements. Negotiated gas transportation agreements for PPAs which were tolling arrangements.
- » Administered new PPAs and vintage agreements with independent power producers; resolved issues pertaining to the interpretation of those agreements; and negotiated amendments to agreements as required.



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- » Along with representatives of a co-owning utility of a submarine high voltage transmission cable between New York and Connecticut, administered a procurement process and negotiated an EPC contract with the selected high voltage cable vendor for the removal and replacement of such facility.
- » Negotiated and administered numerous long term agreements totaling in excess of 3,000 megawatts for the sale of low cost hydropower, nuclear power and pumped storage capacity to municipal electric utilities, neighboring state bargaining agencies, investor-owned utilities and large industries.
- » Negotiated energy service agreements providing for the installation of solar generating facilities at twelve water filtration and wastewater treatment plants.
- » Prepared Requests for Expressions of Interest and Requests for Proposals and administered the related procurement processes for large scale renewable energy projects including hydropower, wind, solar, fuel cells and landfill gas.
- » Oversaw the administration of primarily wholesale long term power contracts and related transmission contracts involving the sale of more than 4,000 megawatts.
- » Negotiated a Facilities and Marketing Agreement with the local electric utility for the installation and commercial operation of a 600 MW high voltage transmission cable between Westchester and Long, Island.
- » Negotiated a Capacity Supply Agreement with the local electric utility providing for the construction of the first state-of-the-art combined cycle power plant to be installed on Long Island.
- » Developed and negotiated agreements with investor-owned utilities for the transmission and distribution of low cost power that was made available to designated retail business customers throughout New York State pursuant to State law.
- » Negotiated wheeling agreements with investor-owned utilities, including the development of applicable transmission rates, for the transmission of wholesale power and energy to municipal electric systems and rural electric cooperatives in New York State and in states neighboring New York State.
- » Managed utility billing operations associated with the collection of more than two billion dollars in annual electric revenue.
- » Coordinated the preparation and administration of wholesale and retail rate increase applications to be filed by investor-owned utilities with state and federal regulatory bodies.



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- » Prepared draft Administrative Law Judge Recommended Decisions in connection with retail rate increase applications filed by electric and gas investor-owned utilities with State regulatory authority.

- » Testified in utility regulatory proceedings on power allocation and cost-of-service issues.



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APPENDIX

Major Procurements Managed and Contracts

Negotiated for the Long Island Power Authority

Off-Island Resource RFP for up to 1,000 MW – Issued 2005

Pursuant to this procurement, 1,000 MW of capacity and energy was sought from generators located in the PJM and ISO – New England control areas. The ultimate selection process resulted in awards to the FPL Marcus Hook Combined Cycle Power Plant (685 MW) in PJM and the Bear Swamp pumped storage/hydro portfolio (345 MW). Long term Power Purchase Agreements (“PPAs”) were negotiated with both parties.

2007 Generation and Transmission RFP – Issued 2003

Proposals for generating projects and/or merchant transmission lines (between 250 MW and 600 MW) to neighboring control areas were the subject of this RFP. After a thorough evaluation of all proposals pursuant to a multi-phase review process developed by Navigant, awards were granted to the Caithness Long Island Energy Center (new 326 MW combined cycle power plant) and the Neptune Regional Transmission System (new 660 MW DC cable between Sayreville, New Jersey and New Cassel, New York). A PPA was completed with Caithness and a Firm Transmission Capacity Purchase Agreement was negotiated Neptune, along with numerous ancillary agreements with both parties. The Neptune project became commercial in June 2007 and Caithness is expected to commence operations in second quarter of 2009.



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2005 Combined Cycle Generation RFP – Issued 2004

Bids for combined cycle generation projects of 80 MW each were requested under this RFP. The projects needed to be constructed on an expedited basis to be commercial by the summer of 2005. To meet the ambitious schedule the procurement was conducted in an accelerated fashion. Two projects were selected (Pinelawn Power and Calpine Bethpage Energy Center) out of the 15 proposals received. PPAs were negotiated and both projects commenced commercial service on schedule.

Mobile Generation RFP - Issued 2003

To assist in meeting supper peak demands pending the completion of permanent solutions, an RFP for up to 120 MW of temporary generation for a period of four years. The multi-phase procurement process resulted in the selection of Cummins Metropower to install 88 MW of diesel generation at two locations. An agreement was negotiated with Cummins and the units provided service for the summers of 2004 through 2007.

Renewable Energy RFP – Issued 2007

In order to meet Renewable Energy Portfolio Standard commitments, an RFP seeking 300 GWH/year for ten years was issued. A thorough selection process was completed and proposals from Brookfield Power (hydro) and PPL EnergyPlus (landfill gas) were chosen. Two PPAs with Brookfield were completed and a PPA with PPL is currently under negotiation.

Power Supply Management RFP – Issued 2007

With the impending expiration of an Energy Management Agreement with KeySpan Energy Trading Services, the RFP for a new Power Supply Management service provider was issued. Among other things, the Power Supply Manager is responsible



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for bidding the generation from the 92 generating units under contract into the markets administered by the New York Independent System Operator. The multi-phase procurement process resulted in the selection of Con Edison Energy (for Front and Back Offices) and Pace Global (for Mid Office). Contracts were negotiated with Con Edison and Pace and the transition is currently underway.

Other RFPs

RFPs for Off-Shore Wind (2002), Fuel Cell Generation (2005) and Fuel Cell Cogeneration (2007) were also developed and administered, but did not result in contracts primarily due to pricing issues.

Competitive Negotiations

Employing competitive negotiations, PPAs were negotiated with the following developers during the 2001 through 2003 period, all for which projects were completed:

<u>Developer</u>	<u>Project</u>	<u>MW</u>
FPL	Bayswater	55
FPL	Jamaica Bay	55
KeySpan Generation	Glenwood	80
KeySpan Generation	Port Jefferson	80
Calpine	Bethpage	45
PPL	Brentwood	80
PPL	Shoreham	80
Equus Power	Freeport	45
Global Common	Greenport	52
Village of Freeport	Freeport	10



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General Electric	Temporary	230
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Frank Stern

Frank Stern
Director

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Professional History

- Principal, Board Member, Summit Blue Consulting
- PA Consulting Group
- PHB Hagler Bailly, Inc.
- Hagler Bailly Consulting, Inc.
- Colorado Office of Energy Conservation
- Battelle/Pacific Northwest Laboratories

Education

- MS, Civil Engineering, emphasis in Energy Engineering, University of Colorado at Boulder
- Bachelors, Environmental Design – Architecture, University of Colorado at Boulder

Professional Associations

- Professional engineer (mechanical), Colorado

Thought Leadership

- Invited speaker by American Wind Energy Association, Infocast, EUCI, Association of Energy Services Professionals, Electric Power Research Institute, Colorado Public Utilities Commission, and PowerGen.
- Over two dozen publications in journals and conference proceedings

Mr. Stern is a Director in the Energy Practice at Navigant Consulting. His area of expertise is electric utilities. He advises energy providers on choosing resources that will enable them to be more sustainable and profitable. Mr. Stern has over 20 years of experience.

Areas of Expertise

Mr. Stern has advised some of the world's largest energy companies and utilities. He has significant experience in both supply and demand sides of the electric utility industry, giving him insights into the multi-faceted problems that frequently arise in the industry. On the supply side, he has forecasted wholesale market and renewable energy credit prices, valued fossil, nuclear and renewable assets, evaluated competitive bids for meeting generation requirements, and assessed the potential for renewable resources. On the demand side, he has managed multi-year, multi-program evaluations of energy efficiency and demand response programs, and assessed the potential for such programs going forward. His work frequently involves complex modeling using various types of tools.

Representative Experience

Appraisal of Northeast Renewable Assets – On behalf of a renewable generator, Mr. Stern managed a project to forecast gross margins and determine the market value of a group of biomass and hydroelectric facilities, including facilities in the Maritimes. The results of the analysis were the basis of a project financing. The project involved projection of renewable energy credit prices and power prices.

Generation Strategy Development. For NV Energy, Mr. Stern managed a comprehensive review and analysis of various strategic options to meet its ongoing and forecasted load at the least cost for customers while still meeting shareholder obligations. The review used the Strategist model to consider significant investment in its existing generation fleet to meet forecasted operations under current environmental and other



policy requirements such as the Regional Haze Regulation and the Nevada renewable portfolio standard. The analysis also considered legislative and/or regulatory emission limitations that would require additional investment beyond the current requirements. The effort involved stakeholders from 14 different departments at NV Energy. A key step in the process entailed constructing a set of coherent and plausible scenarios of the future, reflecting combinations of fuel prices, load growth, GHG prices, capital costs, and other parameters.

Survey of Treatment of DSM Risk in Resource Planning. For Puget Sound Energy, Mr. Stern managed a comprehensive literature review, survey of methodologies, and best practices review of approaches to assessing DSM risk as a component of resource planning. As DSM becomes an increasingly important component of resource plans, characterizing and understanding the performance, market, and technology risks associated with DSM programs is becoming increasingly important.

Regional Environmental Constraints Modeling. The Los Angeles Basin faces challenging problems in meeting its electricity needs. Growing demand, transmission constraints, elimination of once-through cooling, a moratorium on the issuance of emission reduction credits to new and repowered plants, and a requirement for development of renewable resources create a complex set of constraints. Working with Aspen Environmental Group, Mr. Stern led a team that developed a model for the California Energy Commission to address the potential need for new gas-fired generation over 2011-2015 in the SP-26 and Los Angeles load areas given uncertainties related to these constraints.

Survey of Integrated Resource Planning Issues—For Maui Electric, Mr. Stern managed a project to review the integrated resource plan process of several utilities in the United States to support the work of MECO's own IRP development activities. Navigant Consulting worked with MECO to refine, prioritize, and elucidate the issues of interest. A total of 16 utilities were reviewed for appropriateness, with six utilities resource plans selected for closer scrutiny.

Integrated Resource Plan Public Participation Process—For Public Service Company of New Mexico, Mr. Stern facilitated the public participation process providing input to the integrated resource planning. This task included providing expertise and research on best practices in the industry on topics such as climate change policy and power plant cost assumptions and treatment of demand-side management and renewables.

Independent Evaluator—For San Diego Gas & Electric, Mr. Stern was part of team that was the Independent Evaluator for SDGE. Mr. Stern reviewed proposals and the modeling of those proposals to determine reasonableness. Due diligence activities included site visits for prospective facilities.

Selection of Full Power Requirements Provider—Mr. Stern managed this project for Xcel Energy to independently evaluate the selection of a provider of its full power requirements for Cheyenne Fuel and Light for the next three to 15 years. He developed a customized model to fairly compare the different bids received. The project considered both the net present value and the relative risks of the bids. The analysis used a PROSYM market price forecast to facilitate comparison of bids of different terms, as well as to consider whether a "select none" option might be best.

Analysis of Bids to Supply Capacity—In response to needs for capacity, Public Service Company solicited bids for capacity. Mr. Stern analyzed bids received using the PROVIEW/PROSCREEN modeling system and simplified spreadsheets. He was responsible for analyzing the more complex bids involving restructuring of existing contracts. The analysis accounted for differences in contract length, transmission constraints and costs, and synergies between bids.



Ralph Zarumba

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Professional History

- Director, Navigant Consulting
- Director, Science Applications International Corporation
- President, Zarumba Consulting
- Management Consultant, Sargent & Lundy Consulting Group
- President, Analytical Support Network, Inc.
- Manager, Pricing Practice, Synergic Resources Corporation

Education

- MA, Economics, DePaul University, Chicago, IL
- BS, Economics, Illinois State University, Normal, IL

Professional Associations

- The American Economic Association

Mr. Zarumba is a Director with Navigant in the Energy Practice's Power Systems, Markets and Pricing group. With 26 years of experience performing economic, regulatory and financial analysis, Mr. Zarumba specializes in theoretical and applied techniques of electricity cost and pricing analysis, market analysis, and regulatory policy. Mr. Zarumba has performed a variety of due diligence analyses for asset transactions, trained regulatory commission staff, and has testified as an expert witness in multiple legal jurisdictions on regulated and deregulated activities.

Mr. Zarumba has appeared as an expert witness in a number of regulatory and legal proceedings addressing the topics of pricing, cost of service, functional separation or regulated and unregulated operations of utility holding companies, asset valuation and regulatory treatment of Smart Grid investments. He has also assisted clients in other matters including Depreciation Studies, Transfer Pricing Mechanisms and evaluation of the results of competitive bidding for electric generation services.

For the past several years Mr. Zarumba's assignments have included advising on strategic energy matters, state and federal electric regulatory issues, requests for proposals for long-term electric capacity reviews of annual cost of service, transmission and distribution rate requests, and developing strategies for providing electric and thermal services.

Mr. Zarumba has testified as an expert witness before the Federal Energy Regulatory Commission ("FERC"), the Massachusetts Department of Public Utilities, the Rhode Island Public Utilities Commission, the Illinois Commerce Commission, the Wisconsin Public Service Commission, the Ontario Energy Board and a number of other venues including city councils. Mr. Zarumba has given a variety of papers and presentations on the saturation of generation technologies in the United States under various market conditions and currently is coauthoring a study on the effect of various Green House Gas legislative proposals on electric prices in the United States.

Mr. Zarumba's expertise includes:

- » Electric Marginal Costs Analysis;
- » Electric Embedded Cost of Service Analysis;



Ralph Zarumba

- » Regulated Electric Utility Pricing;
- » Depreciation Studies;
- » Transfer Pricing;
- » Decoupling Mechanisms;
- » Utility Resource Planning;
- » Electric Transmission Policy and Planning;
- » Market Design;
- » Regulatory Policy;
- » Electric Market Price Analysis and Long-Term Wholesale Price Forecasts;
- » Valuation of Merchant Electric Generation Assets;
- » Valuation of Regulated Utility Assets; and
- » Training of Regulatory Commission Staff.

Selected Professional Experience

Regulatory and Pricing:

- » Prepared a white paper on rate mitigation mechanisms for the Ontario Energy Board.
- » Managed a project team which completed a Remaining Life Study for the Western Minnesota Municipal Power Agency.
- » Performed a Transfer Pricing Study for Greater Sudbury (Ontario) Utilities. This study was performed in compliance with an order from the Ontario Energy Board and submitted to that venue.
- » Led a team that prepared a cost of service, rate design, legal evaluation and financial analysis for the Puerto Rico Electric Power Authority.
- » Performed a Pricing Strategy for the South Carolina Public Service Company (Santee Cooper).
- » Prepared a financial plan, electric rate design and phase-in plan for a new electric generation plan for Fayetteville (North Carolina) Public Works Commission.
- » Assisted Commonwealth Edison Company in their Electric Rate Request (Illinois Commerce Commission Docket No. 10-467). Mr. Zarumba is currently supervising the witness supporting Commonwealth Edison's Work Capital Analysis.
- » Prepared proposals for Retail Conjunctive Billing Pricing filed in Illinois and Wisconsin which were filed before the Illinois Commerce Commission and the Wisconsin Public Service Commission.



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- » Mr. Zarumba developed the Wisconsin Electric Power Company's first Curtailable Electric Tariff available to commercial customers.
- » Mr. Zarumba has negotiated complex service contracts with thermal energy customers which led to a major expansion of the Wisconsin Electric Steam System.
- » Assisted Indianapolis Power & Light in preparing a cost recovery plan for Energy Efficiency and Demand Side Management Expenditures.
- » Trained regulatory staffs in the Republic of Macedonia, Bosnia and Herzegovina, Croatia and Albania.
- » Prepared proposals for ancillary services pricing based upon market-based mechanisms for San Diego Gas and Electric Company.
- » Completed the development of wholesale and retail rate designs for a southeastern G&T, an analysis of stranded cost exposure for a northeastern utility, and prepared a strategic plan for a large municipal utility.
- » Developed a proposal for electric generation transfer pricing that would be used as a transition mechanism between the existing vertically integrated utility and a deregulated environment.
- » Filed testimony in Wisconsin proposing that state's first Demand Response Program.

Electric Transmission:

- » Assisting the Building Owners and Managers of Chicago (BOMA/Chicago) develop a program where they can bid demand response based ancillary services into the PJM market.
- » Assisted the Long Island Power Authority to purchase distribution, transmission and regulatory assets and prepared its non-jurisdictional open-access transmission tariff.
- » For the Manitowoc Public Utilities prepared an analysis that evaluated the divestiture of its transmission assets to the American Transmission Company.
- » Prepared the pricing portion of a FERC open access tariff (Docket No. ER96-96-43.000) for San Diego Gas and Electric Company; testified on revenue requirements and pricing including opportunity costs.

Generation Market Forecasts:

- » Prepared a number of electric market price forecasts for many regions of the United States and Central America.



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- » Supported the electric pricing and infrastructure analysis for a Least-Cost Resource Plan for San Diego County.
- » Prepared an analysis of the saturation of coal-fired electric generation technology in the Western Electric Coordinating Council.
- » Developed a long-run electric expansion plan for the Railbelt System in Alaska.
- » Managed a team that prepared a long-term capacity and energy forecast for a medium-sized municipal utility.
- » For Manitowoc Public Utilities prepared a resource plan evaluating various generation expansion options.

International:

- » Currently assisting the electric regulator in the Republic of Macedonia with various regulatory issues including pricing design, revenue requirements and privatization issues.
- » As a team member working for USAID, prepared a tariff review and constructed a tariff model for the Republic of Macedonia.
- » Co-authored a report on electric market design for the Republic of Macedonia.
- » Completed a tariff implementation plan proposal for the privatization of the distribution companies of the Bulgarian Electric Utility.
- » Led a team to implement regulatory procedures and methodology for the electric power industry in Bosnia and Herzegovina.
- » Conducted a study of the electric power market in El Salvador including a quantification of the level of generation market power using the Lerner Index.