

## ALIEA AFNAN, Ph.D.

SOUTH HADLEY, MA 01075

[ALIEAFNAN@GMAIL.COM](mailto:ALIEAFNAN@GMAIL.COM)

(413) 221-2183

### SUMMARY

I thrive in a team setting both as an individual contributor and as a leader. I am highly motivated to reach my goals and always strive for excellence. I grasp new ideas quickly and clearly convey information with a strong attention to detail, particularly in a technical and scientific setting. Many of my advisors and supervisors have commended my reliability and trustworthiness. I am very interested in working in the areas of compliance, auditing and quality control and assurance. I believe that my training and educational experience as well as my presentation, writing, and editing abilities make me a strong candidate for a position in these fields.

### EDUCATION

**WESTERN NEW ENGLAND UNIVERSITY, Springfield, MA** **Oct. 2016**

**Ph.D. Engineering Management (Industrial Engineering)**

- Doctoral Dissertation consisted in quality control and process improvement for determining substandard pharmaceuticals resulting in a novel concept in order to ascertain the quality of pharmaceuticals in the field for the developing world (*Research Patent Pending*).

**UNIVERSITY at ALBANY (SUNY), Albany, NY**

**M.S. Chemistry**

**Aug. 2012**

**B.S. Chemistry with Math minor, graduated cum laude**

**May 2011**

### RESEARCH EXPERIENCE

**WESTERN NEW ENGLAND UNIVERSITY College of Engineering, Springfield, MA** Oct. 2012 – Oct. 2016

**Research Assistant**

- Researched, analyzed, integrated and organized information from diverse sources for a comprehensive research background; with pharmaceuticals and analytical chemistry.
- Wrote and edited grant proposals and manuscripts for publication using Microsoft Word and PowerPoint with proficiency.

**UNIVERSITY AT ALBANY, Department of Chemistry, Albany, NY**

**Research Assistant**

Jan. 2010 – May 2012

- Investigated a new method of a confirmatory blood test for traces being washed with all-purpose bleach and compared with conventional biochemical methods.
- Wrote and edited publications, grant proposals and poster presentations.

### WORK EXPERIENCE

**DAYMARK ENERGY ADVISORS, Worcester, MA**

**Analyst**

Aug. 2013 – May 2016

- Performs analysis of wholesale and retail electricity and gas markets.
- Supports the firm's market modeling and consulting activities.

**WESTERN NEW ENGLAND UNIVERSITY, Springfield, MA**

**College of Engineering**

**Graduate Student Staff Assistant**

Aug. 2013 – May 2016

- Support office staff and faculty as well as undergraduate and graduate programs.
- Maintain student databases and performed analytical and statistical analyses using Microsoft Excel.
- Aid in planning and implementation of seminars and events using Microsoft Word, PowerPoint, and Publisher.

**Teaching Assistant, Industrial Engineering - Probability and Statistics**

Jan. 2015 – May 2015

- Guest lecturer for statistical program Minitab, graded homework and quizzes

**Department of Physical & Biological Sciences**

Jan. 2013 – May 2013

**Adjunct Professor**

- Taught General Chemistry Lab II for undergraduate students.

**UNIVERSITY AT ALBANY, Albany, NY**

**Department of Chemistry**

**Teaching Assistant**

Aug. 2011 – May 2012

- Taught general Chemistry Lab I & II for undergraduate students

**Conference Host**

Jan. 2010 – Aug 2010

- Coordinated with the local committee for the Second International Conference on Vibrational Optical Activity (VOA-2) and Bio-Medical Applications of Raman Spectroscopy (BMARS).

**CENTER FOR ACHIEVEMENT, RETENTION & STUDENT SUCCESS, Albany, NY**

**Tutor**

Dec. 2010 – May 2012

- Taught study sessions and exam reviews for General Chemistry I students.

**ISO NEW ENGLAND, Holyoke, MA**

**Summer Intern**

May. 2008 – Aug. 2008

- Implemented documents into Microsoft SharePoint – being utilized as a document management system.
- Trained other personnel outside the department in using Microsoft SharePoint.

**SKILLS**

- Experience and training with Microsoft Office Tools: Excel, Word, and PowerPoint at an advanced level.
- Experience in using Minitab
- Trained in analytical applications of instruments including: Agilent Cary 60 UV/Vis spectrophotometer, Hitachi Elite HPLC, Shimadzu GCMS-QP2010S Gas Chromatograph Mass Spectrophotometer, and inVia Confocal Raman Spectrophotometer.

**MEMBERSHIPS**

- Served as membership chair in the forming committee for the graduate student chapter of Western New England University's (WNE) American Society of Engineering Management (ASEM) 2014; elected Vice-President and subsequently Interim President for WNE Graduate Student Chapter of ASEM 2015, and elected Secretary for ASEM 2015-16

**PUBLICATIONS/PRESENTATIONS**

- "Baseline Spectral Absorbance Profile (B-SAP): A Methodology for Detecting Counterfeit Pharmaceuticals in Resource Scarce Settings" Aliea Afnan, Christian M. Salmon, Ronny Priefer, Margaret Salmon. *Consortium of Universities for Global Health*, Poster Presentation. Boston, MA, 2015
- "A system to Identify Substandard Pharmaceuticals in a Low-Resourced Healthcare Setting" Shaine Spencer, Nicolas Striglio, Aliea Afnan, Christian M. Salmon, Michael Rust. *American Society for Engineering Education -- Northeast Section*, Poster Presentation. Providence, RI, 2016
- "The Application of Raman Spectroscopy as a Confirmatory Blood Test in the Presence of Sodium Hypochlorite Cleaners in Comparison with Presumptive Blood Tests" Aliea Afnan. *University at Albany Master's Thesis*. Albany, NY, 2012
- "Forensic Applications of Vibrational Spectroscopy and Characterization of Tissues." Ozek, Nihal S., Aliea Afnan, Justin Bueno, Greg McLaughlin, Megan Ralbovsky, Aliaksandra Sikirzhytskaya, Vitali Sikirzhytski, Feride Severcan, and Igor K. Lednev. *Vibrational Spectroscopy in Diagnosis and Screening*. Washington, D.C.: IOS, 2012
- "The Application of Raman Spectroscopy on Body Fluids with Non-Biological Contaminants" Aliea Afnan, Igor K. Lednev. *Third Annual Life Sciences Research Symposium*, Poster Presentation. University at Albany, NY, 2011



## Christine M. Maddalo

### Marketing Content Manager

Christine Maddalo supports Daymark's marketing and sales, internal operations, and communication activities. She develops proposal content, including sales-focused material and commercial terms and performs research and analysis to inform proposal deliverables, such as client due diligence and benchmarking. She creates and updates content for our team's website, LinkedIn page, and related collateral material to reflect our capabilities and value proposition. She assists consulting project teams by writing reports, developing presentations, and preparing content.

### AREAS OF EXPERTISE

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Writing & Editing | Data Visualization | Sales & Marketing  
Project Management | Organization & Operational Effectiveness

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#### **Writing & Editing**

- Reviewed and edited PowerPoint and Word-based client deliverables from technical, grammatical, and layout perspectives, including benchmarking studies, energy resource cost and benefit analyses, and regulatory-support reviews
- Led the detailed editing, sourcing, and fact-checking review of several energy market-based due diligence reports, including the potential acquisition of several biomass-fueled generation resources in the New England and California power markets, coal and natural gas-fired generation resources in a Canadian power market, and a geothermal resource in Hawaii, as examples
- Supported the development of a multi-faceted electric resource plan to meet the energy needs of Long Island, including managing the documentation and communication of several deliverables meant for a range of internal executive audiences and external public audiences

#### **Data Visualization**

- Created easy-to-understand data visualizations and story-based presentations to communicate complex topics and trends, including time-series charts, benefit/cost demonstrations, electrical schematics, internal dashboards, industry heat maps, business projections, project plans, and project status reports

#### **Sales & Marketing**

- Launched a company's first LinkedIn profile, including designing governance processes
- Developed more than 225 client-centric proposals
- Championed new lead generation and proposal development processes, tools, and tracking systems
- Supported a targeted business process review of the key marketing and proposal development practices of an organization to better align organizational achievement and practices with management expectations and market demands. Recommended several areas for immediate improvement and documented action items to be addressed.

### **Project Management**

- Led an 11-person project team of database administrators, value-added resellers, and business process experts through a 7-month technology implementation, plus continuing responsibility to own the resulting work and asset management system
- Served as project manager for 9 consulting engagements, managing project scope, schedule, and budget, communicating with internal and external management teams, and designing solutions to address project barriers
- Managed a client engagement that featured numerous individual projects, coordinating input from several subcontractors, managing documentation of project progress and status across several parallel initiatives, and organizing invoice development and review that featured multiple subcontractors

### **Organization & Operational Effectiveness**

- Identified and recommended process improvement opportunities in several business process reviews; participated as a trusted member of select change management implementation teams
- Supported organizational effectiveness and business process reviews of the power delivery, power supply, and power generation organizations of a cooperative utility, as well as several internal services functions such as purchasing, information systems, records management, and safety resulting in recommendations for changes in communication, staffing, and reporting, and participation in change management initiatives
- Worked on behalf of a majority investor to review the sales trajectory of a manufacturing company selling primarily to the energy industry and to inform the forecast with insights and analysis of the demand for emission control systems
- Facilitated executive planning through thoughtful process design, providing relevant research and analysis
- Worked with senior management of a chemical technology licensing company to facilitate a strategic planning process aimed at developing organizational and market strategy

## **EMPLOYMENT HISTORY**

<b>Daymark Energy Advisors, Inc.</b> <i>Marketing Content Manager</i>	Worcester, MA 2017 – Present
<b>Lummus Consultants International, Inc.</b> <i>Senior Consultant</i> <i>Consultant</i>	Canton, MA 2013 – 2015 2008 – 2012

## **EDUCATION**

<b>Villanova University</b> <i>B.S., Mechanical Engineering</i>	Villanova, PA 2008
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## **PUBLICATIONS & PRESENTATIONS**

*“Innovative Approaches to a Win-Win Renewable Solution”*; developed paper and presentation content for Renewable Energy World, December 2014.



## Daniel E. Peaco

Principal Consultant

### SUMMARY

Daniel Peaco is a Principal Consultant, Chairman, and Past-President at Daymark Energy Advisors, a leading provider of integrated policy, planning and strategic decision support services to the North American electric and natural gas industries.

Mr. Peaco has 35 years of experience in the electric industry, both as a utility planning practitioner and, for the past 20 years, as a consultant to the industry. His consulting practice has included engagements relating to strategic planning, competitive electric markets, integrated resource planning evaluation of generation asset investments, renewable energy policy, transmission planning, competitive procurement and power contracts, and industry restructuring.

Prior to joining Daymark Energy Advisors, he held management and planning positions in power supply planning at Central Maine Power, CMP International Consultants, Pacific Gas & Electric, and the Massachusetts Energy Facilities Siting Council. He holds degrees from M.I.T. and Dartmouth College.

### EMPLOYMENT HISTORY

<b>Daymark Energy Advisors, Inc.</b>	<i>Boston, MA</i>
<i>Chairman</i>	Aug 2015-current
<i>President</i>	2002-July 2015
<i>Managing Director</i>	1996-2002
<b>Central Maine Power Company</b>	<i>Augusta, ME</i>
<i>Manager, Industrial Marketing and Economic Development</i>	1995-96
<i>Principal, CMP International Consultants</i>	1993-95
<i>Director, Power Supply Planning</i>	1987-93
<i>Power Supply Planning Analyst</i>	1986-87
<b>Pacific Gas &amp; Electric Company</b>	<i>San Francisco, CA</i>
<i>Power Supply Planning, Hydropower Planning, Cogeneration Contracts</i>	1981-86
<b>Massachusetts Energy Facilities Siting Council</b>	<i>Boston, MA</i>
<i>Planning Engineer</i>	1978-79

### EDUCATION

<b>Thayer School of Engineering, Dartmouth College</b>	<i>Hanover, NH</i>
<i>M.S. in Engineering Sciences, Resource Systems and Policy Design</i>	1981
<b>Massachusetts Institute of Technology</b>	<i>Cambridge, MA</i>
<i>B.S. in Civil Engineering, Water Resource Systems</i>	1977

## PUBLICATIONS, PRESENTATIONS & CONFERENCES

*Independent Expert Consultant Report: Export Pricing and Revenues Review*; Confidential Report prepared for the Manitoba Public Utilities Board regarding Manitoba Hydro's 20 year forecast of its export revenues submitted in its 2017/18 and 2018/19 General Rate Application, November 16, 2017. Lead Consultant and Principal Author.

*The Opportunities and Risks for Developing Energy Infrastructure in New England (2017-2022)*; presentation provided at the Inaugural Pierce Atwood Energy Infrastructure Symposium, October 20, 2017.

*Natural Gas in Power Generation*; presentation provided at the 5<sup>th</sup> Annual Natural Gas Conference Natural Gas: Powering Maine's Future, September 28, 2017.

*NECEC Transmission Project: Benefit to Maine Ratepayers*, Report prepared for Central Maine Power regarding the benefits accruing to Maine ratepayers of the New England Clean Energy Connection, 1200 MW HVDC transmission expansion accompanied by 1090 MW of hydropower and wind energy project development offered in the Massachusetts RFP for Clean Energy Resources, September 27, 2017. Lead Consultant and Principal Author.

*MCPC Project Benefits; Quantitative and Qualitative Benefits*, Confidential Report prepared for Central Maine Power regarding the benefits of the Maine Clean Power Connection, a 345 kV transmission expansion accompanied by 1100 MW of wind energy project development offered in the Massachusetts RFP for Clean Energy Resources, July 27, 2017. Lead Consultant and Principal Author.

*NECEC Project Benefits; Quantitative and Qualitative Benefits*, Confidential Report prepared for Central Maine Power and H.Q. Energy Services regarding the benefits of the New England Clean Energy Connection, 1200 MW HVDC transmission expansion accompanied by 1090 MW of hydropower and wind energy project development offered in the Massachusetts RFP for Clean Energy Resources, July 27, 2017. Lead Consultant and Principal Author.

*Evolving Practices in Electric Company Resource Planning: Key Insights from a Review of 15 Recent Electric Company Resource Plans*, report prepared for the Electric Power Research Institute. May 2017. Lead Consultant and Principal Author.

*Clean Energy Procurement Mechanisms*, instructor for Post-Conference Workshop at the EUCI 3<sup>rd</sup> Annual U.S./Canada Cross-Border Energy Trade Summit, Boston, Massachusetts, March 2, 2017.

*CHP Economic Factors: Electric and Natural Gas Market Trends*, keynote presentation for the Efficiency Maine Combined Heat & Power Conference, Portland, Maine, September 29, 2016.

*Changes in IRP in Market Transitions, Where Has It Happened?*, presentation to the EUCI 16<sup>th</sup> Annual Integrated Resource Planning Conference, Long Beach, March 22, 2016.

*MREI Project Benefits; Direct, Indirect, Qualitative and Other Benefits*, prepared for Central Maine Power Company and Emera Maine regarding the benefits of the Maine Renewable Energy Initiative, a 345 kV transmission expansion accompanied by 1200 MW of wind energy project development. January 28, 2016. Lead Consultant and Principal Author.

*MCPC Project Benefits; Direct, Indirect, Qualitative and Other Benefits*, prepared for Central Maine Power Company regarding the benefits of the Maine Clean Power Connection, a 345 kV transmission expansion accompanied by nearly 600 MW of wind energy project development. January 28, 2016. Lead Consultant and Principal Author.

*Independent Valuation Opinion for the Bellows Falls Station in the Town of Rockingham, VT*, prepared for the TransCanada Hydro regarding the value of a 49 MW hydropower asset. July 2013 (Updated April 2015). Lead Consultant and Principal Author.

*Review of Georgia Power Company Solar Projects at Forts Benning, Stewart, and Gordon*, Report for the Georgia Public Service Commission. October 14, 2014. Lead Consultant and Principal Author.

*Maine Power Connection: Analysis of Benefits in Maine and New England*, Report for Central Maine Power. September 5, 2014. Lead Consultant and Principal Author.

*Need For and Alternative To (NFAT) Review of Manitoba Hydro's Proposal for the Keeyask and Conawapa Generating Stations*, Initial Expert Analysis Report prepared for the Manitoba Public Utilities Board. January 24, 2014. Supplemental Report. February 28, 2014. Lead Consultant and Principal Author.

*Evaluation of the Transaction to Transfer the Entergy Corp. Transmission Business to ITC Holdings, Inc.*, Initial Report prepared for the General Staff of the Arkansas Public Service Commission. April 19, 2013. Lead Consultant and Principal Author.

*Regarding Tri-State G&T's Cost to Serve Its Nebraska Loads and the Nebraska Power Supply Issues Group Loads*, prepared for the Nebraska Power Supply Issues Group, two public power districts and two member-owned electric utilities in Western Nebraska. December 2012. Lead Consultant and Principal Author.

*Independent Valuation Opinion for the Vernon Station in the Town of Hinsdale, NH*, prepared for the TransCanada Hydro regarding the value of a 32 MW hydropower asset. November 2012. Lead Consultant and Principal Author.

*Independent Valuation Opinion for the Comerford and McIndoes Stations in the Town of Monroe, NH*, prepared for the TransCanada Hydro regarding the value of 179 MW hydropower assets. November 2012. Lead Consultant and Principal Author.

*Independent Opinion Regarding the Market Value of Brassua Hydro LP Assets*, prepared for the Owners of Brassua Dam regarding the value of a 4 MW hydropower asset. November 2012. Lead Consultant and Principal Author.

*Independent Opinion Regarding Amortization Reserve of Brassua Hydro LP*, prepared for the Owners of Brassua Dam regarding the amortization reserve value of a 4 MW hydropower asset. November 2012. Lead Consultant and Principal Author.

*Regional Framework for Non-Transmission Alternatives*, Report prepared for the New England States Committee on Electricity. October 2012. Lead Consultant and Principal Author.

*Renewable Energy and Energy Efficiency Portfolio Standards(REPS) And Sustainable Energy in North Carolina, Lessons from the 2011 Energy Policy Committee Study*, presentation to the 9<sup>th</sup> Annual Sustainable Energy Conference, Raleigh, North Carolina April 20, 2012.

*Transmission Planning for the Next Generation, Some Implications for Generators in the New England Region of FERC Order 1000*, presentation to the Connecticut Power and Energy Society's Energy, Environment, and Economic Development Conference, Cromwell, Connecticut March 14, 2012.



*Entergy Arkansas, Inc.'s Withdrawal from the Entergy System Agreement, Response to EAI's Analysis of All Strategic Options*, Supplemental Initial Report prepared for the General Staff of the Arkansas Public Service Commission. July 12, 2011. Lead Consultant and Principal Author.

*North Carolina's Renewable Energy Policy, A Look at REPS Compliance To Date, Resource Options for Future Compliance, and Strategies to Advance Core Objectives*, prepared for the North Carolina Energy Policy Council. June 2011. Lead Consultant and Co-Author.

*Energy Policy Implementation, Framework Overview: Paying for the Policies*, presentation to the NECA/CPES 18<sup>th</sup> Annual New England Energy Conference, Groton, Connecticut, May 18, 2011.

*Entergy Arkansas, Inc.'s Withdrawal from the Entergy System Agreement*, Initial Report prepared for the General Staff of the Arkansas Public Service Commission. February 11, 2011. Lead Consultant and Principal Author.

*Non-Transmission Alternatives Assessment for the Lewiston-Auburn Area*, Report for Central Maine Power. August 27, 2010. Co-Author.

*Emerging Regional Energy Issues, How RPS Requirements will Affect Vermont's Energy Future*, presentation to the Vermont's Renewable Energy Future Conference, Burlington, Vermont October 1, 2010.

*2010 Comprehensive Plan for the Procurement of Energy Resources*, Report prepared for the Connecticut Energy Advisory Board. April 27, 2010. Lead Consultant and Principal Author.

*Phase I Report: Assessment of Energy Supply Options for the Town of Millinocket*, report to the Town of Millinocket, Maine. December 18, 2009. Lead Consultant and Principal Author.

*2009 Comprehensive Plan for the Procurement of Energy Resources*, Report prepared for the Connecticut Energy Advisory Board. May 1, 2009. Lead Consultant and Principal Author.

*Evaluation of the Grid Solar Proposal, Review of the Economics of the Proposal as an Alternative to the Maine Power Reliability Program*, Report prepared for Central Maine Power. April 3, 2009. Lead Consultant and Principal Author.

*An Analysis of the Connecticut Light and Power Company's Proposed Greater Springfield Reliability Project and Manchester to Meekville Project and the Non-Transmission Project Proposed as Alternatives*, Report prepared for the Connecticut Energy Advisory Board. February 17, 2009. Lead Consultant and Principal Author.

*Preparing A State-Centric IRP in a Multi-State Power Market*, presentation to the EUCI Conference on Resource and Supply Planning, Scottsdale, Arizona, February 11, 2009.

*Resource Considerations of Transmission Planning*, half-day workshop presented to the EUCI Conference on Resource and Supply Planning, Scottsdale, Arizona, February 11, 2009.

*2008 Comprehensive Plan for the Procurement of Energy Resources*, Report prepared for the Connecticut Energy Advisory Board. August 1, 2008. Lead Consultant and Principal Author.

*Maine Power Reliability Project: Non-Transmission Alternatives Assessment and Economic Evaluation*, Report for Central Maine Power. June 30, 2008. Lead Consultant and Principal Author.



*Maine Power Connection: Locational Marginal Price and Production Cost Implications in Maine and New England*, Report for Central Maine Power and Maine Public Service Company. June 30, 2008. Lead Consultant and Principal Author.

*Impact of Aroostook Wind Energy on New England Renewable Energy Certificate Market*, Report for Horizon Wind Energy. June 25, 2008. Lead Consultant.

*Initial Review of Integrated Resource Plan for Connecticut*, Report for the Connecticut Energy Advisory Board. January 28, 2008. Lead Consultant and Principal Author.

*Connecticut's Long-Term Electric Capacity Requirements*, Report of the Connecticut Energy Advisory Board. April 7, 2006. Lead Consultant and Principal Author.

*Technical Audit – Phase III: Review of Increase in Fuel Component of Power Budget FY 2007 relative to FY 2006*, prepared for the New Brunswick Power Distribution and Customer Service Corp., October 5, 2005. Lead Consultant and Principal Author.

*Preliminary Assessment of Connecticut's Electric Supply and Demand: Near Term Requirements for Reliability and Mitigation of Federally Mandated Congestion Charges*, The Connecticut Energy Advisory Board. September 2, 2005. Lead Consultant and Principal Author.

*Technical Audit – Phase II: Review of Increase in Fuel Component of Power Budget FY 2006 relative to FY 2005*, prepared for the New Brunswick Power Distribution and Customer Service Corp., July 7, 2005. Lead Consultant and Principal Author.

*Technical Audit: Purchased Power Budget April 2005 – March 2006*, prepared for the New Brunswick Power Distribution and Customer Service Corp., May 18, 2005. Lead Consultant and Principal Author.

*Retail Choice Study: Issues and Options for Electric Generation Service*, the Belmont Electricity Supply Study Committee, Belmont, Massachusetts. June 2, 2004. Lead Consultant and Principal Author.

*California Energy Markets: The State's Position Has Improved, Due to Efforts by the Department of Water Resources and Other Factors, but Cost Issues and Legal Challenges Continue*, California Bureau of State Audits, April 2, 2003. Lead Consultant and a Principal Author.

*California Energy Markets: Pressures Have Eased, but Cost Risks Remain*, California Bureau of State Audits, December 21, 2001. Lead Consultant and a Principal Author.

*Development of Competition in Electric Markets and the Impact on Retail Consumers in Arkansas, Arkansas General Staff's Report*, In The Matter of a Progress Report to the Arkansas General Assembly on the Development of Competition in Electric Markets and the Impact, if any, on Retail Consumers, Docket No. 00-190-U, September 4, 2001. Principal Author.

*Preliminary Market Value Assessment of PP&L Maine Hydroelectric Plants*, August 2001. Proprietary report prepared for American Rivers, the Atlantic Salmon Federation, the Natural Resources Council of Maine, the Penobscot Indian Nation, and Trout Unlimited. Principal Author.

*Development of Competition in Electric Markets and the Impact on Retail Consumers in Arkansas, Arkansas General Staff's Report*, In The Matter of a Progress Report to the Arkansas General Assembly on the Development of Competition in Electric Markets and the Impact, if any, on Retail Consumers, Docket No. 00-190-U, September 29, 2000. Principal Author.

*Wholesale Market Development: Timing and Issues Survey of Activity in Other Regions, FERC Initiatives,* In The Matter of a Progress Report to the Arkansas General Assembly on the Development of Competition in Electric Markets and the Impact, if any, on Retail Consumers, Docket No. 00-190-U, September 29, 2000. Principal Author.

*Retail Market Development: Timing and Issues Survey of Other States,* In The Matter of a Progress Report to the Arkansas General Assembly on the Development of Competition in Electric Markets and the Impact, if any, on Retail Consumers, Docket No. 00-190-U, September 29, 2000. Principal Author.

*The Progression toward Retail Competition in Arkansas' Neighboring States,* In The Matter of a Progress Report to the Arkansas General Assembly on the Development of Competition in Electric Markets and the Impact, if any, on Retail Consumers, Docket No. 00-190-U, September 29, 2000. Principal Author.

*Arkansas General Staff Proposal and Initial Comments, In The Matter of a Generic Proceeding to Establish Uniform Policies and Guidelines for a Standard Service Package,* Docket No. 00-148-R, June 13, 2000. Principal Author.

*Arkansas General Staff Initial Comments, In The Matter of a Generic Proceeding to Determine if Metering, Billing, and Other Services Are Competitive Services,* Docket No. 00-054-U, March 31, 2000. Principal Author.

*Arkansas General Staff Initial Comment and Proposed Market Power Analysis Minimum Filing Requirements, In The Matter of a Generic Proceeding to Establish Filing Requirements and Guidelines Applicable to Market Power Analyses,* Docket No. 00-048-R, March 28, 2000. Contributing Author.

*Vermont Electricity Prices: Regional Competitiveness Outlook; Implications of Restructuring in New England and New York,* February 2000 Edition, prepared for Central Vermont Public Service. Principal Author.

*Projected Retail Price of Electricity for Massachusetts Electric Company, Boston Edison Company, and Western Massachusetts Electric Company,* September 1999, prepared for Massachusetts Municipal Wholesale Electric Company. Principal Author.

*Comments of the Commonwealth of Massachusetts Division of Energy Resources, in the Investigation by the Department of Telecommunication and Energy into Pricing and Procurement of Default Service,* July 1999 (Initial and Reply Comments). Contributing Author.

*Need for Power Supply: The New England Power Pool and the State of Rhode Island,* March 1999, prepared for Indeck – North Smithfield Energy Center.

*Vermont Electricity Prices: Regional Competitiveness Outlook; Implications of Restructuring in Northeast States,* a Report to the Working Group on Vermont's Electricity Future, November 1998, prepared for Central Vermont Public Service. Principal Author.

## EXPERT TESTIMONY

Public Service Commission of Utah Docket No. 17-035-39	Division of Public Utilities Department of Commerce	Expert testimony regarding PacifiCorp's application for pre-approval of its proposed repowering of 999 MW of existing wind turbines, including issues regarding PTC qualification, economic benefits analysis, and project risks.
		Prefiled Testimony                      September 20, 2017 Surrebuttal Testimony                      November 15, 2017
Superior Court Windham Unit State of Vermont	TransCanada Hydro Northeast, Inc.	Expert testimony regarding the headwater benefits value of Moore Station, a 190 MW hydropower facility in appeal of appraised value in the Town of Waterford, Vermont.
		Valuation Report                      November 11, 2016 Deposition testimony                      December 13, 2016
Superior Court Windham Unit State of Vermont	TransCanada Hydro Northeast, Inc.	Expert testimony regarding the valuation of a Harriman Station, a hydropower facility (39 MW) in appeal of appraised values in the town of Whitingham, VT.
Docket No. 413-9-13 Wmcv		Valuation Report                      September 19, 2016 Deposition                      November, 2016
Massachusetts Energy Facilities Siting Board Docket No. EFSB 15-06	NRG Energy NRG Canal 3 Development LLC	Testimony regarding NRG's application for siting approval of a proposed 350 MW dual-fueled combustion turbine. Testimony addressed alternative technology assessment and consistency with energy and environmental policies of the Commonwealth, considering reliability, regional fuel diversity, global warming solutions policy, and renewable energy integration.
		Direct Testimony                      December 2, 2015 Pre-filed Testimony                      April 4, 2016 Oral Testimony                      September 9 & 14, 2016
Georgia Public Service Commission Docket No. 40161	Georgia Public Service Commission Public Interest Advocacy Staff	Witness sponsoring testimony regarding integrated resource planning methods, renewable energy economics and policy, fuel diversity considerations in resource planning.
		Written Testimony                      May 6, 2016 Oral Testimony                      May 18, 2016
Superior Court Windham Unit State of Vermont	TransCanada Hydro Northeast, Inc.	Expert testimony regarding the headwater benefits value of the Somerset Reservoir in the Deerfield River. Headwater benefits determination were raised as a key issue in the Town of Somerset's valuation of the facility for property tax assessment.
Docket No. 470-10-13 Wmcv		Headwater Benefits Report                      November 13, 2015 Deposition testimony                      February 2, 2016
Superior Court Windham Unit State of Vermont	TransCanada Hydro Northeast, Inc.	Expert testimony regarding the valuation of a the Bellows Falls hydropower facility (49 MW) in appeal of appraised values in the town of Rockingham VT.
Docket No. 547-11-12 Wmew		Valuation Report                      April 23, 2015 Deposition                      February 4, 2014 Oral Testimony                      May 11, 12 and 13, 2015

Rhode Island Superior Court PC No. 2012-1847	TransCanada; Ocean States Power Holdings, Ltd.	Expert testimony regarding the valuation of a 540 MW combined cycle power plant in appeal of an appraisal conducted for the Town of Burrillville, RI. Prepared analysis of unit operations and revenue forecasts.
		Report for 12/31/2010                      December 19, 2012 Report for 12/31/2011                      July 17, 2014 Deposition Testimony                      May 2, 2015
Oklahoma Corporation Commission Cause No. PUD 201400229	OK Cogeneration	Testimony regarding Oklahoma Gas & Electric Company Application for pre-approval of its Mustang Modernization Plan, addressing planning for retirement of 430 MW of gas-fired steam generation and addition of 400 MW of Combustion turbine generation, cost pre-approval, and Requirements for competitive procurement and alternatives analysis.
		Pre-filed Testimony                      December 16, 2014 Oral Testimony                              March 18-19, 2015
Maine Public Utilities Commission Docket No. 2014-048	Central Maine Power	Testimony regarding CMP's application for approval Maine Power Connection Transmission Project. Testimony addressed economic benefits associated with Interregional transmission connection and associated wind energy development benefits.
		Expert Report                              September 5, 2014 Rebuttal Report                              February 27, 2015 Oral Testimony                              September 18, 2014 March 31, 2015
US District Court Colorado Civil Action No. 10-CV-02349-WJM-KMT	Nebraska Power Supply Issues Group	Expert testimony regarding Tri-State G&T cost to serve five Nebraska members.
		Expert Report                              December 31, 2012 Deposition Testimony                      February 27, 2013 Oral Testimony                              May 19, 2014
Public Utilities Board Manitoba, Canada Needs For and Alternatives To (NFAT)	PUB NFAT Panel	Independent Expert (IE) for the review of Manitoba Hydro's Hydropower and Transmission Development Plan for 2,160 MW of hydro capacity at two locations, a 500 kV transmission line to Minnesota, and associated export contracts.
		Expert Reports I                              January 24, 2014 Expert Reports II                              February 28, 2014 Oral Testimony                              April 8, 9, 10, 11, 2014
Superior Court State of Vermont  Docket No. 423-9-12 Wmcv Docket No. 547-11-12 Wmev Docket No. 244-9-12 Cacv Docket No. 245-9-12 Cacv	TransCanada Hydro Northeast, Inc.	Expert testimony regarding the valuation of a four hydropower facilities totaling 260 MW in appeal of appraised values in the towns of Vernon, Rockingham, and Barnet VT.
		Valuation Report                              July 15, 2013 Deposition                                      February 4, 2014

Arbitration AAA Case No. 11 198 Y 002014 12	City of Burlington, VT Burlington Electric Dept.	Expert testimony regarding the valuation of a 7 MW hydropower facility and the determination of fair value for transfer of ownership of the asset.								
		<table border="0"> <tr> <td>Valuation Report</td> <td style="text-align: right;">June 21, 2013</td> </tr> <tr> <td>Rebuttal Report</td> <td style="text-align: right;">July 26, 2013</td> </tr> <tr> <td>Deposition Testimony</td> <td style="text-align: right;">September 12, 2013</td> </tr> <tr> <td>Oral Testimony</td> <td style="text-align: right;">October 4, 2013</td> </tr> </table>	Valuation Report	June 21, 2013	Rebuttal Report	July 26, 2013	Deposition Testimony	September 12, 2013	Oral Testimony	October 4, 2013
Valuation Report	June 21, 2013									
Rebuttal Report	July 26, 2013									
Deposition Testimony	September 12, 2013									
Oral Testimony	October 4, 2013									
Arkansas Public Service Commission Docket No. 12-069-U	General Staff of the AK Public Service Comm.	Testimony regarding the evaluation of Entergy Arkansas's proposed divestiture of its transmission business to ITC Holdings.								
		<table border="0"> <tr> <td>Direct Testimony</td> <td style="text-align: right;">April 19, 2013</td> </tr> <tr> <td>Surrebuttal Testimony</td> <td style="text-align: right;">June 7, 2013</td> </tr> <tr> <td>Supplemental Testimony - Rate Mitigation</td> <td style="text-align: right;">Aug 15, 2013</td> </tr> </table>	Direct Testimony	April 19, 2013	Surrebuttal Testimony	June 7, 2013	Supplemental Testimony - Rate Mitigation	Aug 15, 2013		
Direct Testimony	April 19, 2013									
Surrebuttal Testimony	June 7, 2013									
Supplemental Testimony - Rate Mitigation	Aug 15, 2013									
Arbitration AAA Case No. 11 153 Y 02133 11	Owners of Brassua Dam FPL Hydro Maine LLP Madison Paper Industries Merimil Ltd Partnership	Expert testimony regarding the valuation of a 4 MW hydropower facility and the determination of amortization reserve obligations under FERC license provisions.								
		<table border="0"> <tr> <td>Valuation Report</td> <td style="text-align: right;">November 1, 2012</td> </tr> <tr> <td>Amortization Reserve Report</td> <td style="text-align: right;">November 1, 2012</td> </tr> <tr> <td>Amortization Reserve Rebuttal</td> <td style="text-align: right;">November 15, 2012</td> </tr> <tr> <td>Oral Testimony</td> <td style="text-align: right;">December 5, 2012</td> </tr> </table>	Valuation Report	November 1, 2012	Amortization Reserve Report	November 1, 2012	Amortization Reserve Rebuttal	November 15, 2012	Oral Testimony	December 5, 2012
Valuation Report	November 1, 2012									
Amortization Reserve Report	November 1, 2012									
Amortization Reserve Rebuttal	November 15, 2012									
Oral Testimony	December 5, 2012									
Arkansas Public Service Commission Docket No. 10-011-U	General Staff of the AK Public Service Comm.	Testimony regarding the evaluation of Entergy Arkansas's strategic reorganization options and request for authorization to transfer control of its transmission asset to the Midwest ISO.								
		<table border="0"> <tr> <td>Oral Testimony</td> <td style="text-align: right;">May 31, 2012</td> </tr> <tr> <td>Surrebuttal Testimony</td> <td style="text-align: right;">April 27, 2012</td> </tr> <tr> <td>Direct Testimony</td> <td style="text-align: right;">March 16, 2012</td> </tr> </table>	Oral Testimony	May 31, 2012	Surrebuttal Testimony	April 27, 2012	Direct Testimony	March 16, 2012		
Oral Testimony	May 31, 2012									
Surrebuttal Testimony	April 27, 2012									
Direct Testimony	March 16, 2012									
Burrillville Board of Review	TransCanada; Ocean States Power Holdings, Ltd.	Expert testimony regarding the valuation of a 540 MW combined cycle power plant in appeal of an appraisal conducted for the Town of Burrillville, RI.								
		<table border="0"> <tr> <td>Valuation Report</td> <td style="text-align: right;">January 4, 2012</td> </tr> <tr> <td>Oral Testimony</td> <td style="text-align: right;">March 1, 2012</td> </tr> </table>	Valuation Report	January 4, 2012	Oral Testimony	March 1, 2012				
Valuation Report	January 4, 2012									
Oral Testimony	March 1, 2012									
Oklahoma Corporation Commission Cause No. PUD 201100186	OK Corporation Commission OK Attorney General	Testimony regarding a 60 MW Wind Energy Purchase Agreement and Cogeneration deferral Agreement proposed by Oklahoma Gas & Electric Company, addressing cost pre-approval, and a requested waiver from competitive procurement requirements.								
		<table border="0"> <tr> <td>Pre-filed Testimony</td> <td style="text-align: right;">February 8, 2012</td> </tr> </table>	Pre-filed Testimony	February 8, 2012						
Pre-filed Testimony	February 8, 2012									
Arkansas Public Service Commission Docket No. 10-011-U	General Staff of the AK Public Service Comm.	Testimony regarding the evaluation of Entergy Arkansas's strategic reorganization options upon its exit from the Entergy System Agreement.								
		<table border="0"> <tr> <td>Oral Testimony</td> <td style="text-align: right;">September 9, 2011</td> </tr> <tr> <td>Surrebuttal Testimony</td> <td style="text-align: right;">August 18, 2011</td> </tr> <tr> <td>Supplemental Initial Testimony</td> <td style="text-align: right;">July 12, 2011</td> </tr> <tr> <td>Initial Testimony</td> <td style="text-align: right;">February 11, 2011</td> </tr> </table>	Oral Testimony	September 9, 2011	Surrebuttal Testimony	August 18, 2011	Supplemental Initial Testimony	July 12, 2011	Initial Testimony	February 11, 2011
Oral Testimony	September 9, 2011									
Surrebuttal Testimony	August 18, 2011									
Supplemental Initial Testimony	July 12, 2011									
Initial Testimony	February 11, 2011									

State Corporation Commission of the State of Kansas	The Landowner Group	Testimony regarding the application of ITC Great Plains for a siting permit for a 345-kV Transmission Line addressing project need and route selection methodology.
		Initial Testimony April 18, 2011
Federal Energy Regulatory Commission (FERC) RM10-23-000	Maine Public Utilities Commission, et. al.	Expert Affidavit regarding economic analysis methodology for transmission project evaluation. Provided in reply comments on the FERC Transmission Planning and Cost Allocation NOPR.
		Affidavit November 12, 2010
Maine Public Utilities Commission Docket No. 2008-255	Central Maine Power	Testimony regarding CMP's application for approval the Lewiston Loop 115kV Transmission Project. Testimony addressed non-transmission alternatives.
		Oral Testimony November 16, 2008 December 14, 2010
		Rebuttal Testimony November 8, 2010 August 27, 2010
Oklahoma Corporation Commission Cause No. PUD 201000092	OK Corporation Commission OK Attorney General	Testimony regarding a 99.2 MW wind farm power purchase agreement and green energy choice tariff proposed by Public Service Company of Oklahoma, addressing cost pre-approval, resource need, and competitive procurement requirements.
		Pre-filed Testimony October 5, 2010
		Oral Testimony November 3, 2010
Oklahoma Corporation Commission Cause No. PUD 201000037	Oklahoma Attorney General	Testimony regarding a 198 MW wind farm proposed by Oklahoma Gas & Electric, addressing cost pre-approval, resource need, and competitive procurement requirements.
		Pre-filed Testimony June 11, 2010
Connecticut Dept. of Public Utilities Control (DPUC) Docket No, 10-02-07	Connecticut Energy Advisory Board (CEAB)	Lead witness sponsoring the CEAB's <i>2010 Comprehensive Plan for the Procurement of Energy Resources.</i>
		Oral Testimony June 2 & 3, 2010
Georgia Public Service Commission Docket No. 31081	Georgia Public Service Commission Public Interest Advocacy Staff	Witness sponsoring testimony regarding integrated resource planning methods, renewable energy, solar PV demonstration projects, and uncertainty analysis.
		Written Testimony May 7, 2010
		Oral Testimony May 18, 2010

Maine Public Utilities Commission Docket No. 2008-255	Central Maine Power	Testimony regarding CMP's application for approval \$1.5 B Maine Power Reliability Transmission Project. Testimony addressed non-transmission alternatives and economic benefits, economics of proposed solar alternative, wind energy development benefits. Oral Testimony October 10, 2008 November 19, 2008 December 21, 2009 February 4, 2010 Rebuttal Testimony December 4, 2009 April 3, 2009
Oklahoma Corporation Commission Cause No. PUD 200900167	Oklahoma Attorney General	Testimony regarding a 102 MW wind farm proposed by Oklahoma Gas & Electric, addressing cost pre-approval, resource need, and competitive procurement. requirements.  Pre-filed Testimony Sept 29, 2009
Oklahoma Corporation Commission Cause No. PUD 200900099	Oklahoma Industrial Energy Consumers (OIEC)	Testimony regarding a power contract pre-approval and recovery of Independent Evaluator costs of Public Service Company of Oklahoma.  Pre-filed Testimony July 14, 2009
Connecticut Dept. of Public Utilities Control (DPUC) Docket No, 09-05-02	Connecticut Energy Advisory Board (CEAB)	Lead witness sponsoring the CEAB's <i>2009 Comprehensive Plan for the Procurement of Energy Resources</i> .  Oral Testimony June 30, 2009
Connecticut Dept. of Public Utilities Control (DPUC) Docket No, 08-07-01	Connecticut Energy Advisory Board (CEAB)	Lead witness sponsoring the CEAB's <i>2008 Comprehensive Plan for the Procurement of Energy Resources</i> . This Plan is the first prepared under the State's new integrated resource planning statute.  Oral Testimony August 28, 2008 September 22, 2008 October 3, 2008
Maine Superior Court Civil Action Docket No. cv-06-705	Worcester Energy Co., Inc.	Expert opinion regarding renewable energy and power procurement services.  Pre-filed Report January 30, 2008 Oral Testimony March 18, 2009
Massachusetts Dept. Of Telecommunications And Energy Docket No. DTE/DPU-06-60	Russell Biomass	Testimony regarding economic, reliability and environmental need for renewable power in the Massachusetts and New England in support of Russell Biomass petition for a zoning exemption.  Pre-filed Testimony June 2007 Oral Testimony October 30, 2007
Hawaii Public Utilities Commission Docket No. 04-0046	Hawaii Division of Consumer Advocacy	Testimony regarding Hawaii Electric Light Company's integrated resource plan.  Pre-filed Testimony September 28, 2007 Oral Testimony November 26, 2007



Nevada Public Utilities Commission Docket No. 06-12002	Nevada Attorney General Bureau of Consumer Protection	Testimony regarding the prudence of Sierra Pacific Power Company in its purchased power expenses for the period December 2001 through November 2002.
		Pre-filed Testimony                      September 14, 2007
Oklahoma Corporation Commission Cause No. PUD 2005516 Cause No. PUD 2006030 Cause No. PUD 2007012	Oklahoma Attorney General	Testimony regarding a 950 MW coal-fired generation facility proposed by Public Service of Oklahoma and Oklahoma Gas & Electric, including IRP, competitive procurement, and construction financing issues.
		Pre-filed Testimony                      May 21, 2007 Rebuttal Testimony                      June 18, 2007 Oral Testimony                              July 26, 2007
Oklahoma Corporation Commission Cause No. PUD 2002-038 REMAND	Oklahoma Industrial Energy Consumers (OIEC)	Testimony regarding a power contract proposal of Lawton Cogeneration and the pricing analysis of Public Service Company of Oklahoma.
		Pre-filed Testimony                      October 28, 2005 Rebuttal Testimony                      March 17, 2006 Oral Testimony                              May 9, 2006
New Brunswick Board of Commissioners of Public Utilities (PUB) Ref: 2005-002	New Brunswick Power Distribution Company	Testimony regarding La Capra Associates' three technical audits of the NBP-Disco purchased power budget and variance analyses for FY 2004 – 2006.
		Oral Testimony                              February 14-22, 2006
Connecticut Department of Public Utility Control Docket No. 05-07-14 Phases I and II	Connecticut Energy Advisory Board	Testimony regarding Connecticut's need for electric capacity to meet reliability requirements and to mitigate congestion charges in the wholesale markets.
		Oral Testimony                              February 14-22, 2006 May 1, 2006 June 15, 2006 September 26, 2005
Hawaii Public Utilities Commission Docket No. 03-0372	Hawaii Division of Consumer Advocacy	Testimony regarding competitive bidding rules and integrated resource planning.
		Oral Testimony                              December 12-16, 2005
Oklahoma Corporation Commission Cause No. PUD 2005-151	Oklahoma Industrial Energy Consumers (OIEC)	Testimony regarding resource planning, prudence of generation investment of Oklahoma Gas & Electric Company.
		Pre-filed Testimony                      September 12, 2005 Rebuttal Testimony                      September 29, 2005 Oral Testimony                              October 18, 2005
Oklahoma Corporation Commission Cause No. PUD 2003-076	Oklahoma Industrial Energy Consumers (OIEC)	Testimony regarding resource planning, prudence of generation investment and fuel and purchased power expenses of Public Service Company of Oklahoma.
		Pre-filed Testimony                      January 4, 2005

Oklahoma Corporation Commission Cause No. PUD 2003-633/4	Oklahoma Industrial Energy Consumers (OIEC)	Testimony regarding power contract proposal for Blue Canyon wind development and avoided costs of Public Service Company of Oklahoma.  Pre-filed Testimony August 16, 2004
Civil Litigation Maine Superior Court Docket No. CV-01-24	Central Maine Power Co.	Factual and expert witness in litigation regarding pricing provisions of a purchased power agreement between Central Maine Power and Benton Falls Associates. Deposition Testimony April 28, 2004
Oklahoma Corporation Commission	Oklahoma Attorney General	Testimony regarding power contract proposal for PowerSmith Cogeneration and avoided cost analysis of Oklahoma Gas & Electric Company.  Pre-filed Testimony February 18, 2004 Rebuttal Testimony March 16, 2004 Oral Testimony August 4, 2004
Nevada Public Utilities Commission	Nevada Attorney General Bureau of Consumer Protection	Testimony regarding the Nevada Power Company's Integrated Resource Plan and associated financial plan.  Pre-filed Testimony September 19, 2003 Oral Testimony October 15, 2003
Massachusetts Energy Facilities Siting Council Docket No. EFSB-02-2	Cape Wind	Testimony regarding economic, reliability and environmental need for power in the Massachusetts and New England power markets regarding the need for new wind power facility.  Pre-filed Testimony February 14, 2003 Oral Testimony August 6&7, 2003
Maine State Board of Property Tax Review	United American Hydro	Testimony regarding the Maine and New England power market prices pertaining to the valuation of a hydro-electric power facility in Winslow, Maine.  Oral Testimony June 18, 2003
Nevada Public Utilities Commission Docket No. 03-1014	Nevada Attorney General Bureau of Consumer Protection	Testimony regarding the prudence of Sierra Pacific Power Company in its purchased power expenses for the period December 2001 through November 2002.  Pre-filed Testimony April 25, 2003
Oklahoma Corporation Commission Cause No. PUD 2002-038	Oklahoma Attorney General	Testimony regarding a power contract proposal of Lawton Cogeneration and the pricing analysis of Public Service Company of Oklahoma.  Pre-filed Testimony December 16, 2002 Oral Testimony May 22, 2003
Arkansas Public Service Commission	General Staff of the AK Public Service Comm.	Testimony regarding the Development of Competition in Electric Markets and the Impact on Retail Consumers in Arkansas.  Pre-filed Testimony September 4, 2001
Arkansas Public Service Commission	General Staff of the AK Public Service Comm.	Testimony regarding the Development of Competition in Electric Markets and the Impact on Retail Consumers in

		Arkansas.	
		Pre-filed Testimony	September 29, 2000
Arkansas Public Service Commission	General Staff of the AK Public Service Comm.	Testimony regarding the establishment of uniform Policies and guidelines for a Standard Service Package.	
		Staff Proposal and Comments	June 13, 2000
		Reply Comments	July 21, 2000
		Sur reply Comments	August 2, 2000
		Oral Testimony	August 8, 2000
		Petition for Rehearing	
		Rebuttal Testimony	November 15, 2000
		Oral Testimony	November 29, 2000
Arkansas Public Service Commission	General Staff of the AK Public Service Comm.	Testimony regarding the determination of the merits of declaring retail billing services competitive effective At the start of retail open access.	
		Oral Testimony	June 27, 2000
		Pre-filed Rebuttal Testimony	June 23, 2000
		Pre-filed Testimony	June 16, 2000
		Oral Testimony	May 10, 2000
Arkansas Public Service Commission	General Staff of the AK Public Service Comm.	Testimony regarding the minimum filing requirements for market power studies to be filed by the Arkansas Electric utilities and affiliated retail companies.	
		Oral Testimony	June 1, 2000
Amer. Arb. Assoc. No. 50T 198 00197-98	Vermont Joint Owners	Testimony regarding economic damages resulting from alleged breach of a long-term purchase power agreement between Hydro-Quebec and Vermont utilities (VJO).	
		Oral Testimony	May 25, 2000
		Pre-filed Rebuttal Testimony	February 10, 2000
		Pre-filed Testimony	August 13, 1999
Rhode Island Energy Facilities Siting Board	Indeck-North Smithfield, L.L.C.	Testimony regarding economic, reliability and environmental need for power in the Rhode Island and New England power markets regarding the need for new, merchant power facility.	
		Pre-filed Testimony	August 16, 1999
		Oral Testimony	August 17, 2000
		Pre-filed Testimony	January 26, 2001
		Oral Testimony	March 23, 2001
Civil Litigation Maine Superior Court Docket No. CV-98-212	Central Maine Power Co.	Factual and expert witness in litigation regarding pricing provisions of a purchased power agreement between Central Maine Power and Regional Waste Systems.	
		Deposition Testimony	May 5, 1999
Connecticut Energy Facilities Siting Council Docket No. 190	PDC – El Paso Meriden LLC	Testimony regarding economic, reliability and environmental need for power in the Connecticut and New England power markets regarding the need for new, merchant power facility.	
		Pre-filed Testimony	January 25, 1999

Rhode Island Energy Facilities Siting Council Docket No. SB-98-1	R. I. Hope Energy, L. P.	Testimony regarding economic, reliability and environmental need for power in the Massachusetts and New England power markets regarding the need for new, merchant power facility.
		Oral Testimony November 4, 1998 Pre-filed Testimony October 30, 1998
Massachusetts Energy Facilities Siting Council Docket No. EFSB-91-101A	Cabot Power Corp.	Testimony regarding economic, reliability and environmental need for power in the Massachusetts and New England power markets regarding the need for new, merchant power facility.
		Oral Testimony May 27, 1998 Pre-filed Testimony August 15, 1997
Massachusetts Energy Facilities Siting Council Docket No. EFSB-97-2	ANP Blackstone Energy	Testimony regarding economic, reliability and environmental need for power in the Massachusetts and New England power markets regarding the need for new, merchant power facility.
		Oral Testimony April 6, 1998 Pre-filed Testimony January 23, 1998
Massachusetts Energy Facilities Siting Council Docket No. EFSB-97-1	ANP Bellingham	Testimony regarding economic, reliability and environmental need for power in the Massachusetts and New England power markets regarding the need for new, merchant power facility.
		Oral Testimony February 3, 1998 January 28, 1998
Rhode Island Energy Facilities Siting Board Docket No. SB-97-1	Tiverton Power Associates LP	Testimony regarding economic, reliability and environmental need for power in the Rhode Island and New England power markets regarding the need for new, merchant power facility.
		Oral Testimony October 15, 1997 Pre-filed Testimony October 1, 1997
Maine Public Utilities Commission Docket No. 92-102	Central Maine Power	Testimony regarding CMP's avoided cost methods and practices pertaining to the prudence of power purchase contract decisions with regard to contract awards and contract management.
		Oral Testimony July 1993 Deposition Testimony February 25, 1993 March 1, 1993 Pre-filed Rebuttal Testimony June 7, 1993 Pre-filed Testimony June 15, 1992
Maine Public Utilities Commission Docket No. 92-315	Central Maine Power	Testimony regarding CMP's avoided cost methods and practices pertaining to the setting of long-term avoided costs, CMP's Energy Resource Plan, and the relationship of marginal costs of generation to embedded costs.
		Supplemental Pre-filed Testimony April 20, 1993 Pre-filed Testimony February 17, 1993

Maine Public Utilities  
Commission  
Docket No. 87-261  
Docket No. 88-111

Central Maine Power

Testimony regarding CMP's avoided cost methods and practices  
pertaining to the setting of long-term avoided costs, CMP's  
Energy Resource Plan, and the proposal for a 900 MW power  
Contract with Hydro Quebec.

Oral Testimony  
Pre-filed Testimony

Summer 1988  
October 31, 1987



## Dwarakesh Nallan Chakravartula

Consultant

Dwarakesh Nallan Chakravartula has system planning and power markets experience. He works with clients on matters including transmission, distribution and integrated resource planning, renewable energy integration, grid modernization, energy and capacity markets, and stakeholder support. Prior to joining Daymark Energy Advisors, Mr. Nallan Chakravartula worked for five years at ISO New England on the system planning team, concentrating on projects related to system reliability and market efficiency and two years at National Grid in the transmission planning department. Mr. Nallan Chakravartula has an M.S. in Electrical Engineering from Clemson University in South Carolina, as well as a B.E. in Electrical and Electronics Engineering from Anna University in Chennai, India.

### SELECTED PROFESSIONAL EXPERIENCE

#### *System Planning and Renewable Energy Integration*

- Led modeling efforts in evaluation of integrated resource plans produced by electric utilities and identified alternative resource planning options under numerous planning constraints and variable renewable integration forecasts.
- Performed detailed steady-state interconnection studies for potential new merchant transmission projects interconnecting to the New England grid and identified expected transmission system constraints.
- Developed innovative methodology to identify transmission system congestions under operational limitations for renewable resources and developed a stochastic approach to address curtailment arising out of these constraints.
- Advised transmission developers in understanding the impact of new transmission development in New England by ranking various projects based on a number of qualitative and quantitative metrics.
- Performed analysis to determine impact of peak load reduction due to solar generation addition on the transmission, distribution and generation costs/benefits for a portion of a region under a Regional Transmission Operator (RTO/ISO).
- Led the power flow analysis team in identifying the impact of additional elective transmission upgrades on the transmission system under no outage and selective outage conditions.
- Provided technical guidance in identifying potential for addition renewables on the distribution network based on existing distribution feeder capabilities as well as potential for deferment of upgrades on the distribution system based on this renewable addition.
- Performed detailed nodal-level economic dispatch/production-cost modeling for generation developers to identify transmission system congestions and the impacting locational marginal prices.
- Developed and performed new and innovative grid modernization and power supply expansion analyses including Non-Transmission Alternatives (NTAs)/Market Resource Alternatives (MRAs) and

Deliverability Mapping for the benefit of the market participants in New England:

- MRA analyses for Greater Hartford Central Connecticut (GHCC).
  - MRA analyses for South Eastern Massachusetts and Rhode Island (SEMA-RI).
  - Pilot Deliverability Mapping study for South Eastern Massachusetts region.
  - Identified and evaluated transmission system reinforcements required to resolve additional reliability issues.
- Performed key components of system impact studies under ISO New England interconnection standards set forth in Schedules 22/23/25 of the Open Access Transmission Tariff for new renewable (solar/wind/hydro).
  - Performed transmission system planning for National Grid's Western NY and Genesee NY transmission systems.
  - Performed system impact studies in coordination with New York State Independent System Operator (NY-ISO).
  - Developed and presented loss savings calculations and the incremental benefits due to power factor improvements for New York State Public Service Commission (NYPSC).
  - Developed reliability strategies and analyses metrics to ensure that the New England power system met established criteria set-forth in planning procedures.

### **Wholesale Power Markets**

- Developed alternative approaches for capacity zone evaluation with respect to the NY capacity markets using a combination of deterministic and probabilistic analyses.
- Led engineering analyses and project management activities related to new generation resource qualification to support ISO New England's Forward Capacity Market (FCM) primary/reconfiguration auctions.
- Prepared and presented engineering study analysis results, FCM-related trainings including FCM 101 and methodology seminars in coordination with internal ISO New England (ISO-NE) departments, New England stakeholders and external participants on a wide range of topics.
- Provided generation developers with an overview of the evolving interconnection standards for Midwest ISO and a comparison of deliverability standards utilized across various capacity markets as part of the generator interconnection process.

### **Due Diligence & Project Review**

- Evaluated transmission operations and maintenance qualifications of prospective transmission companies to develop regional transmission projects under Florida Reliability Coordinating Council's biennial transmission planning process.
- Reviewed transmission planning studies and system impact studies performed by a utility with respect to a proposed combined wind/transmission project to identify accuracies and limitations.
- Performed detailed review of the backward-looking and forward-looking analyses submitted by a utility to its corresponding regulatory authority in regard to its membership into Midwest ISO and submitted recommendations to the regulatory authority on the cost/benefit calculations.



## EMPLOYMENT HISTORY

<b>Daymark Energy Advisors, Inc.</b> <i>Power Systems Consultant</i>	Boston, MA 2016 – Present
<b>ISO New England</b> <i>Senior Engineer, Resource Analysis &amp; Integration</i>	Holyoke, MA 2011 – Oct. 2016
<b>National Grid</b> <i>Associate Engineer, Transmission Planning</i>	Waltham, MA 2009 – 2011

## EDUCATION

<b>Clemson University</b> <i>M.S. Electrical Engineering</i>	Clemson, SC 2009
<b>Anna University</b> <i>B.E. Electrical and Electronics</i>	Chennai, India 2006

## AFFILIATIONS

- Member, IEEE Power and Energy Society Boston (2016-Present)
- Disaster Action Team (DAT) Supervisor, American Red Cross - MA region (2012-Present)
- Executive Committee Member, IEEE Springfield Power and Energy Society (2014-2016)

## PRESENTATIONS

- *FCM Show of Interest for New Generation and Imports* presented at ISO New England, Holyoke, MA, 2014-2016
- *New Capacity Qualification for Generation and Imports* presented at ISO New England, Holyoke, MA, 2014-2016
- *Market Resource Alternatives (MRA): SEMA-RI* presented at the Planning Advisory Committee, Westborough, MA, 2015
- *Report on Estimate of System-wide Loss Savings for 100 RkVA Customer-Sited Correction* presented at New York State Public Service Commission, Albany, NY, 2009
- *A Genetic Approach to Voltage Collapse Mitigation* presented at Clemson University, SC, 2009

## POWER SYSTEM APPLICATIONS

- PowerWorld Simulator (power flow – steady state, custom-based graphical representations)
- Siemens PTI PSS/E (power flow – steady state and dynamics, LineProp)
- PowerGem TARA (power flow – steady state, security-constrained dispatch, market deliverability applications, clustering)
- Siemens PTI PSS MUST (transfer capability applications)
- EPIS AURORA (production-cost modeling, security-constrained nodal level economic dispatch, energy market modeling)
- MathWorks MATLAB (R2010b – MATPOWER package)



## **Dimitri Kordonis**

Senior Consultant

Dimitri Kordonis has experience in market operations, financial and power system analyses, and project management. He works with clients on matters including transmission planning, energy markets operations and procurement, renewable energy system integration and economics, market analytics, and stakeholder support. Prior to joining Daymark Energy Advisors, Mr. Kordonis worked six years for ISO New England in the market operations department, where he was responsible for power system analyses, Day-Ahead Market, Financial Transmission Right, and Forward Reserve Market administration.

### **SELECTED PROFESSIONAL EXPERIENCE**

#### ***Market modeling and Market design***

- Advises the New York State Utility Intervention Unit (NY UIU) regarding the design of New York ISO's energy, ancillary service and capacity market structures and the coordination of gas-electric infrastructure and market issues in New York. (2015-present)
- Assisted in preparing expert testimony to the FERC on behalf of generation suppliers in New England providing analysis, critique, and recommended revisions on proposed changes to the ISO-NE Tariff provisions regarding capacity market design and mitigation rules.
- Responsible for developing models and methods for integrated supply and demand-side resource analysis. Developed and performed an analysis of the ISO-NE, PJM and MISO capacity markets under uncertainty using Monte Carlo techniques.
- Forecasted capacity market prices (in New England, New York, and PJM) for use in project evaluation and impacts on retail rates. Included discussion of bidding strategies for generators given different projections for auction clearing prices. Forecast work included determination of future implementation levels of energy efficiency and other demand-side resources as capacity resources.
- Assisted in various enhancements to ISO-NE's simultaneous feasibility test (SFT) and Scheduling, Pricing and Dispatch (SPD), that included introduction of the Combined Cycle generators, Wind assets and Demand Response in the Day Ahead and Real Time Markets.

#### ***Transmission/Planning***

- Performed short term load flow transmission studies to assess system reliability to support NEPOOL and ISO-NE requests.
- Performed daily economic impact analysis of short term transmission outages to minimize economic impact in accordance with the ISO's market rules and operating procedures.
- Supported and assisted in special studies to determine reliable operating limits for internal and external interfaces to ISO-NE.
- Assessed technical thermal analysis of transmission and generation outages focused on specific asset or transmission element.

- Implemented NERC CIP program and conducted NERC risk based methodology assessment for all Edison Mission Energy's critical assets and critical cyber assets.
- Evaluated Non Transmission Alternatives for major transmission enhancements to determine whether they met the region's reliability criteria and assessed their cost.
- Reviewed capital plans and cost recovery mechanisms for capital expenditures that included engineering review of construction budgets and system performance.

### **Procurement/Market Analytics**

- Prepared projections of Locational Marginal Prices (LMP), Financial Transmission Rights/Congestion Revenue Rights (FTR/CRR) Clearing Prices, Reserve Market Clearing Prices and FCM Clearing Prices using market simulation tools and analyzed the results.
- Contributed subject matter expert content for published reports circulated by ISO-NE to Market Participants describing strategic market initiatives and potential issues.
- Identified new areas of enhancements to improve asset management in various de-regulated markets such as PJM, MISO and ERCOT.
- Contributed in the valuation of assets (Coal and Wind) that included financial modeling, forecasting, and market analysis.
- Assisted in evaluating and submitting bids to various markets in the US. This included bids for Day Ahead and Real Time markets, Reserve markets, Financial Transmission Rights and Capacity markets.

### **Due Diligence & Project Review**

- Reviewed and evaluated generation projects submitted per PSEG Long Island 2015 RFP. Focused on conformance with technical requirements and expected technology reliability, cost and operational benefits.
- Established minimum qualifications for transmission developers for the Florida Reliability Coordinating Council. Evaluated multiple qualifications packages to determine consideration for the regional transmission bidding process per FERC Order 1000.
- Provided asset management services to private equity firms and generation developers. Advised on the state of the market in various RTOs/ISOs and discussed potential acquisition and development opportunities.

### **Renewable Energy**

- Currently providing NEPOOL-GIS third-party verification services for NEPOOL-GIS for hydroelectric, landfill gas, solar, and wind facilities.
- Contributed to Wind integration at ISO-NE. This included market and operations enhancements in addition to market testing and operator training.
- Researched forward capacity market rules in New England regarding qualification requirements, auction administration, financial assurance, and resource availability adjustments as regards to renewable resources and other intermittent generators.
- Assisted in the valuation of new Wind assets in the MISO and ERCOT markets.
- Key contributor to Wind integration, demand response integration and Long Term Financial Transmission Rights integration efforts at ISO-NE.

- Implemented real time dispatch and curtailment logic at Edison Mission Energy's Big Sky (PJM Market) and Goat Wind (ERCOT) assets.

### **Stakeholder Process**

- Involved as an active participant in the working groups refining the New York Independent System Operator, Inc. ("NYISO") market structure and developing methods to improve the market design, including all aspects of its energy, ancillary services and capacity markets.
- Assisted in presenting enhancements to the Financial Transmission Rights market at the ISO-NE's market committee.
- Conducted data analyses and evaluations to correctly implement proposed Market Rules for the Forward Reserve and Forward Capacity markets.
- Attended multiple ISO-NE Market Committee meetings as a subject matter expert and responded to market participant questions related to proposed market rule changes.

## **EMPLOYMENT HISTORY**

<b>Daymark Energy Advisors, Inc.</b>	Boston, MA
<i>Senior Consultant</i>	Mar. 2017 – Present
<i>Consultant</i>	2013 – Feb. 2017
<b>Edison Mission Marketing &amp; Trading</b>	Boston, MA
<i>Applications Analyst</i>	2012 – 2013
<b>ISO New England, Inc.</b>	Holyoke, MA
<i>Senior Market Operations Analyst</i>	2011 – 2012
<i>Market Operations Analyst</i>	2008 – 2011
<i>Associate Market Operations Analyst</i>	2007 – 2008

## **EDUCATION**

<b>University of Massachusetts</b>	Amherst, MA
<i>Masters of Business Administration</i>	2011
<b>Rutgers School of Engineering</b>	New Brunswick, NJ
<i>M.S. Electrical and Computer Engineering</i>	2007
<i>B.S. Electrical and Computer Engineering</i>	2005
<i>Minor Degree in Economics</i>	2005
<b>United States Navy</b>	Norfolk, VA
<i>Gas System Engineering School</i>	2000

## **PRESENTATIONS**

- *Challenges of Contingency Analysis in the Day and Real Time Markets* presented at the AREVA Winter Conference, Seattle, WA, 2009.
- *Unit Commitment and Dispatch- Wholesale Electricity Markets (WEM 201)* presented at ISO-NE Training facility, Northampton, MA, 2010.
- *Swiss RE conference NYC, Pay for Performance* presented at Swiss RE offices, New York City, NY, 2016

## EXPERT TESTIMONY

<u>Forum</u>	<u>On Behalf of:</u>	<u>Topic</u>
State of Connecticut Public Utilities Regulatory Authority (Docket No. 15- 02-6 )	Yale University	Expert testimony in regards to potential rate payer benefits as a result of the replacement of Yale's aging Central Cogeneration Power Plant. April 2015.
Federal Energy Regulatory Commission (Docket No. ER16-1404), May 2016	New York Utility Intervention Unit (NY UIU)	Affidavit regarding the revision of the buyer-side capacity market power mitigation measures ("BSM Rules") to exempt certain narrowly defined renewable and self-supply resources from Offer Floor mitigation
Federal Energy Regulatory Commission (Docket No. ER17-386-000), December 2016	New York Utility Intervention Unit (NY UIU)	Affidavit regarding the appropriate values for determining the NYISO Installed Capacity Demand Curves
State of Vermont Public Service Board (Docket No. 8847)	Green Mountain Power	Expert testimony regarding the engineering and economic impact of the Vermont Green Line – a 400 MW high voltage direct current (HVDC) electric transmission project – to Vermont and Green Power's assets



## **Douglas A. Smith**

Managing Consultant and Treasurer

Doug Smith has over thirteen years of experience in the electric industry, bringing diverse strengths to Daymark's project teams by applying his extensive technical and analytical skills. A business professional with over twenty years of increasing responsibility as a consultant to multiple industries, Mr. Smith has a solid background in analysis, finance and accounting, database and software development, quality assurance, and project management.

Mr. Smith leads the firm's Market Analytics team which is responsible for maintaining Daymark's wholesale power market model and wholesale market outlook, researching energy and capacity markets throughout North America, and producing a variety of forecasts used to provide decision support for client needs including asset valuation, integrated resource planning, non-transmission alternative analysis and other similar projects. He has strong experience in market and power system dispatch analysis, and has been responsible for projecting market valuation, power costs, and emissions impacts for a number of clients.

### **SELECTED PROFESSIONAL EXPERIENCE**

- Led an analysis of wind energy congestion for a potential New England wind and transmission project; reported on potential local and regional congestion
- Led an offshore wind siting feasibility study related to a potential investment in offshore leasing. Investigated interconnection and market risks and opportunities
- Led an analysis of the regional benefits related to a proposed dual-fuel fired peaker plant in New England; assisted the team in analyzing and reporting on emissions impact scenarios, with the plant operating as either an energy unit or a reserve unit; investigated state emissions policies and their potential impact on plant operations
- Led an analysis of a combined proposal for wind energy and transmission in northern New England; assisted team members in understanding the impacts of various quantities of wind energy and the respective transmission needed to deliver wind energy and provided scenario analysis to quantify the range of potential benefits, which resulted in two public reports as components of responses to a regional energy procurement effort
- Managed the creation of a proof of concept model of the Southern Company balancing authority and surrounding areas, including benchmarking to available public data and forecasting of potential future capacity expansion futures
- Assisted in asset valuation modeling work, including modeling of long term energy and capacity values for a number of coal, natural gas and hydro facilities
- As an input to several economic studies for NYSERDA, provided review and analysis of a third-party, long-term forecast of New York's energy and capacity markets
- Managed the review of a large generation owner's price forecasting process; provided recommendations for process improvements designed to more-closely align forecasting efforts with internal requirements and updated and extended the client's New York modeling capabilities

using the AURORA production cost model; recommended key benchmarking tools for evaluation of specific forecasting results

- Assisted in the assessment of a request to the Arkansas Public Service Commission for a declaratory order; the request sought a finding that installation of environmental controls at the Flint Creek power plant was in the public interest
- Assisted in assessing requests to the North Dakota Public Service Commission for Advanced Determinations of Prudence; requests were sought by the Montana Dakota Utilities GT and the Big Stone Air Quality Control System
- Assisted in a review of Entergy Arkansas's strategic planning for post-System Agreement operation on behalf of the General Staff of the Arkansas Public Service Commission
- Assisted a Vermont-based utility in the evaluation of a potential generation purchase; designed an analytical model for use in evaluating potential revenue and cost streams under a variety of scenarios
- Assisted in evaluating non-transmission alternatives (NTAs) as compared to a set of proposed transmission upgrades in Vermont; assisted in the development of an economic scorecard designed to facilitate the comparison of transmission and non-transmission solutions on equal footing and compared potential rate impacts of the proposed solutions
- Assisted in evaluating non-transmission alternatives (NTAs) as compared to a set of proposed transmission upgrades in Maine; evaluated the economics of transmission and non-transmission solutions and leveraged market simulation models to estimate the impact of solutions on energy clearing prices in Maine and in New England
- On behalf of Vermont-based utility, developed and analyzed non-transmission alternatives (NTAs) to a set of proposed transmission upgrades that would impact the distribution-level supply system; developed an economic tool to evaluate the cost of operating "pre-contingency" generation options
- Analyzes budgetary and other cost-related data on behalf of the National Railroad Passenger Corporation (Amtrak); interacts with the client on a monthly basis to provide analysis of power cost drivers, track monthly power costs, and deliver other accounting and electric consulting services; provides assistance in periodic power procurement activities
- Assisted in planning, managing, and performing an audit of actual and hypothetical purchased power costs for a Michigan utility; issues included market valuation of potential sales, proper treatment of a pumped storage unit, and validation of commitment/dispatch logic; this project also involved a process audit and the review of large volumes of data involved in determining hypothetical system costs
- Assisted in maintaining an Allocated Cost of Service model, including modifying allocators and introducing new methodology
- Researched issues related to state, regional, and Federal environmental regulations and their impacts on energy generation; modeled environmental variables including current SO<sub>2</sub>, NO<sub>x</sub> and CO<sub>2</sub> rates and allowance prices, emission control technologies, and likely future changes
- Participated in developing revenue projections for valuation of power plants



## PUBLICATIONS

*MCPC Project Benefits; Quantitative and Qualitative Benefits*, Confidential Report prepared for Central Maine Power regarding the benefits of the Maine Clean Power Connection, a 345 kV transmission expansion accompanied by 1100 MW of wind energy project development offered in the Massachusetts RFP for Clean Energy Resources, July 27, 2017. Lead Analyst and Contributing Author.

*NECEC Project Benefits; Quantitative and Qualitative Benefits*, Confidential Report prepared for Central Maine Power and H.Q. Energy Services regarding the benefits of the New England Clean Energy Connection, 1200 MW HVDC transmission expansion accompanied by 1090 MW of hydropower and wind energy project development offered in the Massachusetts RFP for Clean Energy Resources, July 27, 2017. Lead Analyst and Contributing Author.

*MREI Project Benefits; Direct, Indirect, Qualitative and Other Benefits*, prepared for Central Maine Power Company and Emera Maine regarding the benefits of the Maine Renewable Energy Initiative, a 345 kV transmission expansion accompanied by 1200 MW of wind energy project development, January 28, 2016. Lead Analyst and Contributing Author.

*MCPC Project Benefits; Direct, Indirect, Qualitative and Other Benefits*, prepared for Central Maine Power Company regarding the benefits of the Maine Clean Power Connection, a 345 kV transmission expansion accompanied by nearly 600 MW of wind energy project development, January 28, 2016. Lead Analyst and Contributing Author.

## EMPLOYMENT HISTORY

<b>Daymark Energy Advisors Inc.</b>	Boston, MA
<i>Treasurer</i>	2016 – Present
<i>Managing Consultant</i>	2017 – Present
<i>Senior Consultant</i>	2008 – 2017
<i>Analyst</i>	2004 – 2008
<b>The Sports Authority</b>	Ft. Lauderdale, FL
<i>Senior POS/EDP Programmer/Analyst</i>	2002 – 2004
<b>University of Colorado</b>	Boulder, CO
<i>Instructor, Oracle SQL*Plus Class</i>	2001 – 2001
<b>SHL USA Inc.</b>	Boulder, CO
<i>Software Engineer</i>	2000 – 2001
<b>Strategic Technologies Group</b>	Boulder, CO
<i>Senior Consultant</i>	1995 – 2000

## EDUCATION

<b>Syracuse University</b>	Syracuse, NY
<i>B.S., Accounting, Summa Cum Laude</i>	1991



## Jeffrey D. Bower

### Senior Consultant

Jeffrey Bower joined Daymark Energy Advisors in 2010. Mr. Bower is an integral part of the Market Analytics team responsible for wholesale electricity market modeling and analysis. His work has included energy market modeling for a variety of applications, including congestion pricing and economic benefits analyses of generation and transmission resources. He also has experience in economic resource planning, renewable resource assessment, and transmission project evaluation. Mr. Bower is experienced with resource needs analysis and integrated resource plan (IRP) evaluation. He has analyzed renewable energy potential studies as well as renewable portfolio standard (RPS) regulations and “value of distributed energy resource” studies. Mr. Bower has contributed to various projects related to transmission facility development and evaluation, including benefits analysis, congestion impact evaluation, and facility siting.

Mr. Bower received a Master’s Degree in Environmental Management from the Nicholas School of the Environment at Duke University and a B.A. from Tufts University. He has a certificate in Geospatial Analysis and has advanced experience applying geographic information systems (GIS) spatial data sets and software to energy analysis, including renewable resource potential studies and demand forecast analyses.

### SELECTED PROFESSIONAL EXPERIENCE

- Evaluated system impacts of potential new gas-fired peaking plant in New England, evaluating CO<sub>2</sub> emissions reductions, displaced generation, and energy market impacts.
- Prepared evaluation of quantitative and qualitative benefits of multiple wind and transmission proposals in response to a New England multi-state competitive procurement for incremental clean energy and transmission.
- Analyzed resource needs and alternative resource plans in support of the firm's evaluation of economic benefits related to a large proposed hydroelectric generation project in Canada.
- Performed system modeling and cost allocation analysis to evaluate economic benefits of a portfolio of transmission projects in SPP.
- Provided extensive research and analytical support for expert witness testimony in federal litigation regarding membership of cooperative utilities in a multi-state generation and transmission association.
- Evaluated a Midwest utility proposal to join a regional transmission organization (RTO). Analyzed impacts of transition on transmission and generation resource adequacy and planning, as well as retail rate impacts.
- Performed analysis of hydroelectric generator sales in support of power plant asset valuation. Evaluated plant comparability and overall energy and capacity market trends to estimate asset value.
- Evaluated a statewide renewable portfolio standard and modeled emissions and generation portfolio impacts of multiple renewable build out scenarios. Assessed comparative emissions impacts of changes to non-renewable resource portfolios.

- Performed a review of a proposed Midwest transmission project, reviewing project need and evaluating GIS siting criteria and alternative route scoring mechanisms.
- Analyzed LMP and congestion price impacts of unplanned generator outages in NYISO system.
- Developed customer-sited small wind power potential analysis. Utilized spatial data sets including wind speed, land cover, and demographics to develop specific regional potential estimates.
- Performed meta-analysis on economic energy efficiency potential, incorporating impacts of state and federal legislation as well as escalating utility avoided costs.
- Performed GIS analysis on wave power potential in North Carolina's offshore waters and assessed site-specific cost of electricity using economic modeling. Presented results to Governor Beverly Perdue's Scientific Advisory Panel on Offshore Energy.
- Researched and composed a comprehensive guide to community wind power development in North Carolina.

## EMPLOYMENT HISTORY

<b>Daymark Energy Advisors Inc.</b> (formerly La Capra Associates)	Boston, MA
Senior Consultant	Mar. 2017 – Present
Consultant	2013 – Feb. 2017
Analyst	2010 – 2013
<b>Duke University</b>	Durham, NC
Masters Project: Spatial Analysis of Wave Power Potential	2009 – 2010
<b>Climate Change Policy Partnership</b>	Durham, NC
Transportation Research Assistant	2009 – 2010
<b>North Carolina Sustainable Energy Association</b>	Durham, NC
Wind Power Research Analyst (Internship)	2009

## EDUCATION

<b>Duke University</b>	Durham, NC
Master of Environmental Management, Nicholas School of the Environment	2010
<b>Duke University</b>	Durham, NC
Certificate in Geospatial Analysis, Nicholas School of the Environment	2010
<b>Tufts University</b>	Medford, MA
BA (Cum Laude) with Major in Sociology	2004



## Jinjin Lu

### Analyst

Jinjin Lu joined Daymark Energy Advisors in 2016. Ms. Lu is part of the Market Analytics team responsible for the analysis of wholesale and retail electricity, renewable energy, and natural gas markets. She is experienced in developing models of locational pricing for distributed energy resourced that can be integrated into the power grid, as well as evaluating the impact of rooftop photovoltaics on the power system at the operational level.

## SELECTED PROFESSIONAL EXPERIENCE

### *Selected Professional Experience*

- Maintains and runs Daymark's Basis Model to forecast natural gas price delivered to New England.
- Developed Electric Market Model AURORAxmp in various systems including ISONE, NYISO, AND Southern Company and neighboring Balancing Authority Areas, for analytical support on multiple projects. The modeling effort include generation, demand, and fuel forecast, as well as production cost analysis and risk analysis.
- Conducts analysis on rate re-design for Kauai Island Utility Cooperative (KIUC), to address the issue of widespread installation of distributed energy resources.
- Provides research and analytical support on advising the design of New York ISO's energy, ancillary service, and capacity market structure.
- Researched Integrated Resource Planning (IRP) issues on wholesale market interactions and risk perspectives from a selection of IRPs.
- Reviewed Capital Expenditure plan on generation for Nova Scotia Power Inc.
- Provided research and analysis on current net energy metering rate structure for New Hampshire Public Utility Commission.
- Conducted energy efficiency analysis for Blackstone Gas Company.
- Performed financial analysis to value hydropower assets in New Hampshire.
- Developed a dynamic system model in Stella to analyze the impacts of studied policy actions on levelized cost of energy for offshore wind projects in New York State.
- Provides electric energy and natural gas advisory services to the Massachusetts Port Authority.
- Performed analysis on evaluating the production cost improvements from more efficient commitment and dispatch of resources that can be achieved by more accurate wind and solar generation forecast.
- Studied renewable energy development, with a focus on the solar program in Georgia Integrated Resource Planning. Reviewed solar framework for Georgia Public Service Commission Staff.

- Performed cost comparison of distributed solar, Canadian hydro, and natural gas pipeline to assess the impact of cost/benefits to ratepayers in New England.
- Joined the analysis group of a prior energy consulting firm to develop competitive electricity markets and pricing structure for NYSERDA to implement its Reforming the Energy Vision (REV) initiative. Modeled the Distribution Locational Marginal Price with Distributed Energy Resources integrated into the power system.

## EMPLOYMENT HISTORY

<b>Daymark Energy Advisors Inc.</b> <i>Analyst</i>	Boston, MA 2016 – Present
<b>Tabors Caramanis Rudkevich</b> <i>Summer Analyst (Internship)</i>	Boston, MA 2015

## EDUCATION

<b>Dartmouth College</b> <i>Master of Engineering Management, Thayer School of Engineering</i>	Hanover, NH 2014-2015
<b>Smith College</b> <i>BS (Cum Laude) with Major in General Engineering</i> <i>Honor Thesis: Demand Response Actualization In The Energy Market</i>	Northampton, MA 2010-2014