STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
PUBLIC UTILITY COMMISSION

| | | |
|---|---|---|
| IN RE: THE NARRAGANSETT ELECTRIC COMPANY D/B/A RHODE ISLAND ENERGY PROPOSED REVISIONS TO RFP FOR LONG-TERM CONTRACTING STANDARD FOR RENEWABLE ENERGY AND RENEWABLE ENERGY CERTIFICATES | : | Docket No. 23-50-EL |

# PRE-FILED DIRECT TESTIMONY OF

# ELLEN G. COOL

On behalf of:

Rhode Island Division of Public Utilities & Carriers
89 Jefferson Boulevard
Warwick, Rhode Island 02888

April 16, 2024

## EXECUTIVE SUMMARY

Ellen G. Cool, Ph.D, is a Vice President and Principal of Levitan & Associates, Inc. and testifies on behalf of the Rhode Island Division of Public Utilities and Carriers ("Division"). The Division, with the assistance of Dr. Cool, has reviewed the Proposed Revisions to the Long-Term Contracting Standard Request for Proposals ("RFP") for Renewable Energy and Renewable Energy Certificates filed by The Narragansett Electric Company d/b/a Rhode Island Energy ("RIE") for review and approval by the Rhode Island Public Utilities Commission (the "Commission"). The RFP was issued under the Long Term Contracting Standard ("LTCS"), R.I. Gen. Laws § 39-26.1, and incorporates updates relative to the LTCS RFP that was approved by the Commission in 2019 in Docket No. 4822. Dr. Cool has reviewed the RFP requirements under the LTCS and under the Rules and Regulations Governing Long-Term Contracting Standards for Renewable Energy, 810-RICR-40-05-1, ("Regulations") and concludes that the RFP filed by RIE is fully consistent with the requirements of the LTCS and the Regulations. Moreover, the revisions to this RFP incorporate lessons learned from other renewable resource procurements across the Northeast, which are expected to enable expanded competition and facilitate a fair and objective evaluation of proposals.

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
PUBLIC UTILITIES COMMISSION

| | | |
|---|---|---|
| In Re: The Narragansett Electric Company | : | |
| d/b/a Rhode Island Energy Proposed Revisions | : | Docket No. 23-50-EL |
| To RFP for Long-Term Contracting | : | |
| Standard for Renewable Energy and | : | |
| Renewable Energy Certificates | : | |

**RHODE ISLAND DIVISION OF PUBLIC UTILTIES AND CARRIERS AND OFFICE OF ENERGY RESOURCES'**
**PRE-FILED DIRECT TESTIMONY OF ELLEN G. COOL**

**Q. Please state your name, title, and business address.**

A. I am Ellen G. Cool, Ph.D., Vice President and Principal of Levitan & Associates, Inc. ("LAI"), and my business address is 20 Custom House Street, Suite 830, Boston, Massachusetts, 02110.

**Q. Please summarize your educational background and professional experience.**

A. I have an A.B. degree in geological sciences from Harvard University, and an M.S. and Ph.D. in geological sciences from the University of Washington. From 1985 to 1999 I was an environmental consultant for several environmental engineering firms, attaining the level of principal and regional manager. I am currently a Vice President and Principal at LAI, which I joined in 1999. I have 39 years of consulting experience in the energy and environmental industries. I have advised clients on competitive procurement options for wholesale power supply, including high-voltage, direct current transmission projects, natural gas-fired plants, and renewable generation projects. My experience includes advising clients on design and implementation of competitive procurements, siting and permitting of generation, transmission, and pipeline projects, cogeneration development, contract restructuring, acquisition of deregulated energy service companies and the net emissions impact of new and repowered

generation projects. In addition to my participation in this procurement, I also participated in a prior LTCS procurement in Rhode Island, filed in Dockets 4822 and 5011. I have participated in competitive procurements for renewable resources on behalf of the Connecticut Department of Energy and Environmental Protection, the Massachusetts Department of Energy Resources, the New York State Energy Research and Development Authority, the New Jersey Board of Public Utilities, and the Maryland Public Service Commission. A detailed description of my experience and educational background is in my curriculum vitae in Exhibit EGC-1.

**Q. Please describe LAI.**

A. LAI is a management consulting firm specializing in power market design, power and fuel project evaluations, pipeline infrastructure, and competitive energy economics. Since its founding in 1989, LAI has conducted numerous assignments in New England and other markets throughout the United States and Canada on diverse matters pertaining to generation and transmission project evaluations, wholesale energy and capacity price forecasts, retail price impacts, electric sector decarbonization strategies, asset valuation, bulk power security, power and fuel procurements, transaction structures, gas/electric interdependencies, natural gas infrastructure, and risk management. LAI's clients include electric and gas utilities, generators, Independent System Operators, Regional Transmission Organizations, energy end-users, state energy policy agencies and regulatory commissions, and financial institutions.

**Q. Have you previously testified before the Rhode Island Public Utilities Commission and if so, in what matters?**

A. Yes. I testified on behalf of the Division and the Rhode Island Office of Energy Resources

("OER") in Docket No. 4822, which was the docket in which the Commission approved the RFP to solicit contracts for renewable resources pursuant to the LTCS. I subsequently testified in Docket No. 5111, in which the Commission reviewed and approved the selected contract to fulfill the outstanding LTCS requirement. I also submitted a memorandum and testified before the Commission in Docket 4764, which involved a request by National Grid to approve eight competitively-solicited long-term renewable power purchase agreements ("PPAs").

**Q. Have you previously provided expert testimony before any other regulatory commission, board, or agency and if so, in what matters?**

A. Yes. I testified before the Rhode Island Energy Facilities Siting Board in Docket SB-2015-06 regarding a certificate application for a proposed combined cycle power plant. I have testified on multiple occasions before the Connecticut Public Utilities Regulatory Authority regarding the integrity of procurements for renewable resources including offshore wind under long term contract, for peaking resources under cost of service, and for standard service supplies. I testified before the Massachusetts Energy Facilities Siting Board on the economic benefits, environmental impacts, and non-transmission alternatives of a new 345 kilovolt transmission line in southeast Massachusetts, and I testified before the New Jersey Board of Public Utilities regarding the environmental impact, including greenhouse gas emissions, associated with the proposed construction of three gas-fired combined-cycle plants.

**Q. On whose behalf are you testifying?**

A. My testimony is on behalf of the Division.

**Q. What is your role in this proceeding?**

A. Through my firm, LAI, I was engaged by the Division to review the RFP titled "Proposed Revisions to the Long-Term Contracting Standard Request for Proposals for Renewable Energy and Renewable Energy Certificates" filed by Rhode Island Energy ("RIE") on December 29, 2023 in Docket No. 23-50-EL and to provide testimony in this proceeding.

**Q. What is the purpose of your testimony?**

A. The purpose of my testimony is to report my observations and conclusions with respect to whether RIE's RFP is consistent with requirements under the LTCS (R.I. Gen. Laws § 39-26.1-1 *et seq.*) and the regulations governing the LTCS, 810-RICR-40- 05-1 ("Regulations"). In addition, I also considered whether the RFP is likely to result in a competitive procurement for Commercially Reasonable resources, as defined in the Regulations, 810-RICR-40-05-1-1.3(A.1).

**Q. Did you prepare this testimony yourself?**

A. Yes, I personally prepared this testimony.

**Q. Did you discuss this testimony with the Division as you were preparing it?**

**A.** Yes, I did.

**Q. Did you participate in any aspect of the preparation of the RFP?**

A. No, I did not. RIE was responsible for the drafting of the RFP that was filed with the Commission.

**Q. What is the purpose of RIE's RFP?**

A. The purpose of the RFP was to set forth a timetable and method for solicitation, evaluation, and execution of long-term contracts to satisfy RIE's remaining obligation under the LTCS. The RFP is a revision and update to the RFP approved under Docket No 4822, and seeks up to 150

MW of nameplate capacity of qualified renewable resources.

**Q. What is your understanding of RIE's remaining obligation under the LTCS?**

A. My understanding is that the LTCS requires RIE to procure a minimum long term contract capacity of 90 MW, where the total MW is expressed as the equivalent of a 100% capacity factor.[1] The RFP reports that as of November 17, 2023, RIE had executed contracts for approximately 81% of the minimum long-term contract capacity required by the LTCS, or the equivalent of approximately 73 MW, expressed in terms of 100% capacity factor. RIE's minimum remaining LTCS obligation is 17.22 MW at 100% capacity factor, or 150,772 MWh. The LTCS allows RIE to voluntarily solicit more than the minimum requirement. Thus, the RFP solicits up to 150 MW of nameplate capacity, and explains that this RFP will support the purposes of the 2021 Act on Climate, R.I. Gen. Laws § 42-6.2-1, *et seq*., which mandates a statewide, economy-wide 45% reduction in greenhouse gas emissions by 2030 relative to 1990 emissions levels, 80% by 2040, and net-zero emissions by 2050.

**Q. Do you conclude that the RFP solicitation method, bidder requirements, and selection criteria are consistent with the LTCS and the Regulations?**

**A.** Yes. The RFP meets the statutory requirements with respect to solicitation method, eligibility, and selection criteria. Specifically:

1. Consistent with R.I. Gen. Laws § 39-26.1-3(a), the RFP (Section 2.2.2.2b) requires that projects offered into this RFP meet the definition of a "newly developed renewable energy

[1] At 100% capacity factor, 90 MW is the equivalent of 788,400 MWh.

resource" as defined in R.I. Gen. Laws § 39-26.1-2(6). The RFP further clarifies that a project is considered "newly developed" if the proposed facility "must not have begun operation, and developers must not have implemented investment or lending arrangements to finance construction."

2. The RFP (Section 2.2.2.2a) requires that an electric generation facility offered in response to the solicitation must be an "eligible renewable energy resource." This requirement is consistent with R.I. Gen. Laws § 39-26.1-2(4), § 39-26-5 and 810-RICR-40-05-1.6(B) of the Regulations.
3. The RFP (Section 2.2.2.4) limits the allowable contract term to 15 years, but permits longer contracts with Commission approval. This is consistent with R.I. Gen. Laws § 39-26.1-3(a).
4. The RFP (Sections 1.1, 1.2, and 2.2.3.8) states that bids must be "commercially reasonable" in order to be selected for a contract. This is consistent with R.I. Gen. Laws § 39-26.1-3(a).
5. The RFP clarifies that projects must provide other direct economic benefits to the State, such as job creation, increased property tax revenues, or other similar revenues, or pricing benefits (RFP Section 2.3.1). This is consistent with R.I. Gen. Laws § 39-26.1-5(e), and 2810-RICR-40-05-1.5(B) of the Regulations,

The Regulations, in 810-RICR-40-05-1.4(B) set forth seven items which must be included in a company's filing supporting the timetable and methods for solicitation of contracts. Based on my review of these requirements, I conclude that the RFP addresses each of these requirements. LAI

has not reviewed and cannot comment on any of the documents to be attached as appendices to the RFP which have not been filed, including the draft PPA and bidder response package.

**Q. Please describe the material revisions to this RFP relative to the LTCS RFP that was approved by the Commission in 2019, and provide your opinion on whether these revisions are reasonable and likely to advance the goals of a competitive procurement.**

A. The RFP allows offshore wind projects to bid into this RFP, and several of the new provisions have been added to facilitate participation of offshore wind. The procurement limit of 150 MW nameplate capacity is surely too small to attract a competitively priced, stand-alone offshore wind project. However, following the conclusion of the offshore wind procurement currently being conducted by Rhode Island, Massachusetts, and Connecticut, it is possible that a small portion of incremental capacity of a larger project may remain uncontracted and available to bid into this RFP. In this instance offshore wind energy may be competitively procured at good value for customers. In order to accommodate such bids and ensure that sufficient information is provided by bidders so that RIE can adequately evaluate such bids, several revisions have been incorporated. *First*, while the contract term under the LTCS is generally limited to 10 to 15 years, the RFP allows bidders to submit non-conforming bids of up to 30 years, as long as at least one conforming bid is submitted. If a bidder offers a small, uncontracted portion of a larger project, a 20-year term will be consistent with other contracts awarded in the region. *Second*, the RFP requires bidders of offshore wind projects to provide additional information to support the logistical viability of the project, including a construction plan covering the necessary specialized equipment, conformance with the Jones Act, and availability of local port facilities. *Third*, the

RFP includes additional requirements regarding site control and property rights for the landing point, transmission right of way, and other onshore facilities. *Fourth*, assuming that an offshore wind bidding into this RFP will be a portion of a larger project interconnecting at a single point of interconnection, the RFP describes how the delivered energy will be allocated through the ISO-NE settlement process. *Fifth*, a footnote to Section 2.2.4.3 of the RFP states that a successful bidder of an offshore wind project may be required to execute a commitment agreement that requires the developer to negotiate in good faith with another developer who requests interconnection service on the bidder's transmission facilities. This mechanism anticipates a potential future scenario where multiple offshore wind projects share an offshore or onshore grid to optimize the transmission system. Based on lessons learned from recent offshore wind procurements, these are all beneficial additions to the RFP and will increase the likelihood of participation of offshore wind to diversify the eligible technologies competing in this procurement.

**Q. Are there other noteworthy revisions to the RFP?**

A. Yes. In Section 2.2.3.7, the development period security was increased from $20,000/MW to $30,000/MW. In recent years, a significant number of renewable projects have canceled their contracts, and either forfeited development period security or been allowed to rebid and reprice their project. Canceled projects have included not only offshore wind but also solar and onshore wind projects. As a consequence, other jurisdictions across the region have increased the development period security and also imposed a higher level of development period security for developers who have previously terminated a contract prior to commercial operation. For

example, Connecticut Department of Energy and Environmental Protection's recent RFP for Zero Carbon Resources includes the following provision:

> "The required level of development period security is $40,000 multiplied by the contract maximum amount in MWs for the project; provided, however, if the Bidder or its affiliate has terminated power purchase agreement(s) prior to commercial operation for (i) five (5) or more projects, or (ii) projects with facility sizes, in aggregate, of 100 MW or greater, which were awarded under a Connecticut Class 1 or Zero Carbon solicitation, then, for such Bidder, the development period security shall be $60,000 multiplied by the contract maximum amount in MWs for the project."

Consistent with current business practices, it would be reasonable for RIE to include a provision in the RFP or contract that allows RIE to impose a higher level of development period security for developers who have a history of one or more canceled contracts.

**Q. Please comment on any other material revisions to the RFP.**

A. In Section 2.2.4.4.2, bidders are instructed to provide their assumptions regarding the availability of federal or state tax credits, subsidies, grants, or other incentives. If such credits, subsidies, grants, or other incentives subsequently become available after bid submission, the bidder must state how they would share the benefits with RIE's customers through an adjustment to the contract price or some other mechanism. Because Internal Revenue Service guidance on the applicability of investment tax credits continues to evolve, this is an important revision to the RFP, can benefit customers, and is also consistent with best practices around the region.

**Q. Please summarize your conclusions.**

A. Based on my review of RIE's RFP, I am satisfied that the RFP will support a fair and competitive procurement process. The RFP that RIE issued provides clear instructions for bidders, clearly explains the evaluation process, clearly sets forth the selection criteria, allows

sufficient time for bidders to prepare responsive proposals, and includes provisions to safeguard customers' interests**.** The revisions to the RFP will increase the likelihood that a diversity of technologies will compete, and will be able to compete on a level playing field. My only suggestion is that the RFP allow RIE to increase the development period security for bidders who have a history of cancelling one or more contracts prior to commercial operation. This suggestion is consistent with standard practice across the region.

**Q. Does this conclude your testimony?**

A. Yes.

# ELLEN G. COOL

## SUMMARY

A consultant with over 35 years of experience advising electric and gas companies, state regulatory authorities, and large energy end users. Principal expertise includes procurement of wholesale power, fuel, and renewable resources, project financial management, avoided emissions analysis, environmental compliance, project siting and permitting, regulatory policy and analysis, and working group facilitation.

## PROFESSIONAL EXPERIENCE

1999 - **Levitan & Associates, Inc.**
Vice President & Principal
Managing Consultant
Executive Consultant
Senior Consultant

1990 - 1999 **Harding Lawson Associates / ABB Environmental Services, Inc.**
Principal and Northeast Area Manager
Senior Program Manager

1988 - 1990 **TRC Consultants**
Project Manager

1986 - 1988 **Woodward Clyde Consultants, Inc.**
Project Manager

1985 - 1986 **Converse Environmental East**
Project Hydrogeologist

1982 **Chevron Resources Company**
Geologist

1979 - 1980 **U.S. Environmental Protection Agency**
Staff Scientist

## CONSULTING ASSIGNMENTS

Supported the New Jersey Board of Public Utilities (NJ BPU) on three solicitations for offshore wind pursuant to the state's Offshore Wind Economic Development Act. Worked closely with NJBPU and NJDEP to develop minimum environmental and fisheries protection

measures required of all qualified projects. Evaluated the non-price aspects of rival proposals, including project viability, potential environmental impacts, and avoided emissions. Participated in bidder interviews and contributed to a report to the NJ BPU.

On behalf of the NJ BPU, evaluated the comparative environmental impacts and benefits of an ocean grid versus separate generator lead lines for offshore wind projects.

Providing technical support and expert witness services to the Rhode Island Division of Public Utilities and Carriers (RI DPUC) in its oversight of Rhode Island Energy's procurement for up to 1,200 MW of offshore wind.

Managed LAI's provision of technical support to the MA Department of Energy Resources (DOER) in three rounds of offshore wind procurements, authorized under Part 83C of the Green Communities Act. Reviewed the price and non-price evaluation of proposals conducted by the electric distribution companies and their advisors, and analyzed economic benefits and transmission and interconnection issues.

Provided technical support to DOER in its beneficial determination regarding a proposed 1,000 MW onshore wind project and a 1,200 MW merchant transmission project.

Managed LAI's provision of technical support to the CT Department of Energy and Environmental Protection (DEEP) in its procurement of up to 2,000 MW of offshore wind. Developed and implemented the quantitative analysis of proposals, analyzed transmission and interconnection issues, and participated in bidder interviews.

Supported NYSERDA in three rounds of offshore wind procurement to meet the state's target of 9,000 MW by 2035. Developed RFP documents, including inflation adjustment mechanism, OREC transaction structure and evaluation metrics, and supported quantitative evaluation of proposals.

Advisor to MA DOER in preparing the Offshore Wind Study, as required by statute, to evaluate the necessity, benefits and cost of procuring an additional 1,600 MW of offshore wind. Participated in stakeholder engagement and provided analysis of wholesale market and impact and environmental benefits of increased offshore wind penetration.

Advisor to CT DEEP on multiple procurements for offshore wind, fuel cells, solar plants, anaerobic digester, and other zero-carbon resources under long term contract, pursuant to Public Acts 13-303, 15-107, 17-3, 17-144, and 19-71. Developed qualitative and quantitative evaluation criteria consistent with authorizing legislation. Analyzed of bid prices and market value of products and ranked proposals based on established criteria. Procurements resulted in the selection of contracts for energy and environmental attributes from the Millstone and Seabrook nuclear power stations, several utility-scale solar projects, and a total of 304 MW

from the Deepwater Wind offshore wind project. Provided testimony before CT Public Utilities Regulatory Authority (PURA) on the net benefits of the contracts.

Advisor to the MA DOER on the procurement of up to 9.45/yr TWh of clean energy resources under long term contract, pursuant to Section 83D of the Green Communities Act. The procurement resulted in a contract for incremental hydropower delivered from Quebec into the New England market via the New England Clean Energy Connect HVDC transmission project.

Advisor to CT DEEP and to Rhode Island Office of Energy Resources (RI OER) and RI DPUC on the Clean Energy RFP, a regional procurement undertaken by CT, MA, and RI to procure long term contracts for new renewable resources, transmission, and large-scale hydropower resources.

Advisor to the Rhode Island OER and DPUC and on the procurement of up to 400 MW of new clean energy resources under long term contract. Provided testimony to the RI PUC on the consistency of the RFP with statutory requirements in Docket No. 4822, and in Docket No. 5011 following contract selection and execution.

Managed LAI's support to CT PURA and CT DEEP in the agencies' joint proceeding on the Value of Distributed Energy Resources, Docket No. 19-06-29. Developed value stacks for six distributed energy resource use cases, participated in technical meetings with stakeholders, and collaborated on report.

Advisor to the RI OER regarding the greenhouse gas impacts ascribable to the operation of a proposed 1,000 MW combined cycle plant. Participated in a public workshop, supported the preparation of OER's Advisory Opinion to the Energy Facilities Siting Board, and provided testimony before the EFSB.

As a subcontractor to the Kaye Scholer law firm, engaged by the Maryland Public Service Commission to assist in the development of regulations implementing the Maryland Offshore Wind Energy Act of 2013. Prepared qualitative and financial criteria for the screening and selection of offshore wind projects, consistent with statute and state policy objectives.

On behalf of CT PURA, have provided technical support since 2006 for quarterly wholesale procurements by the state's two investor-owned utilities, including full requirements for default service. Support design of auction, development of wholesale purchase agreements, portfolio design, calculation of benchmark prices, and establishment of credit and collateral requirements. Provided testimony before the Commission regarding procurement integrity and compliance of the procurement with PURA procedures and statutory criteria.

On behalf of CT PURA, facilitated a Working Group charged with developing a Procurement Plan for Standard Service to serve residential and small C&I customers who rely on the distribution company for electric supplies.

Managed LAI's participation as extension of Staff and as the Prosecutorial Unit for CT PURA's procurement of new in-state peaking generation. Identified the quantity and operating performance criteria to provide requisite ancillary services for the load zone. Supported a collaborative effort to develop the RFP, proposal selection criteria, model terms and conditions, and pricing algorithm for a long-term Contract for Differences (CfD). Conducted bidder due diligence and quantitatively evaluated net benefits to ratepayers of competing proposals over a 30-year contract term. Provided written and verbal testimony before the Commission regarding our recommended projects for selection during the contested phase of the proceeding. Resulted in the development of 520 MW of peaking generation under long-term CfDs with the utilities.

Participated in scenario analysis and evaluated permit requirements for dual fuel operation as part of LAI's assignment on behalf of the Eastern Interconnection Planning Collaborative, a comprehensive study of pipeline and storage adequacy affecting bulk power security.

On behalf of the CT PURA, participated in settlement discussions and provided technical support regarding modifications to the CfDs for peaking generation necessitated by ISO New England market rule changes.

On behalf of CT PURA, provided oversight and technical assistance in the utilities' solicitation of long term contracts for energy, capacity and RECs. Developed methods for evaluation of bids from wind farms and wood biomass plants. Provided written and oral testimony before the Commission regarding the hedge benefits of long term contracts within the utilities' portfolios, as well as other procurement options.

Advised the Connecticut Office of Consumer Counsel in the merger proceedings involving Northeast Utilities and NStar.

On behalf of the Connecticut Office of Consumer Counsel, reviewed the Integrated Resource Plans filed by the state's two investor-owned utilities and by the Connecticut Energy Advisory Board. Provided written and oral testimony before the Connecticut Commission regarding the policy and planning recommendations over a 10-year horizon.

Assisted the NJ BPU and the Governor's Office prepare the state's Energy Management Plan. The Plan broadly considered the buildout of backbone transmission projects, in-state supply and demand-side resources, including the prospective retirement of Oyster Creek nuclear facility, the environmental and job-creation benefits of the state's RPS including the solar carve-out, and expansion of the state's natural gas infrastructure.

Assisted the Long Island Power Authority with multiple competitive solicitations for new generation and HVDC transmission to serve the Island. Performed due diligence on respondents, coordinated LAI's financial analysis of rival bids, evaluated the feasibility of fuel delivery alternatives and the permitability of cable projects and gas interconnections.

On behalf of the NJ BPU, designed and implemented a solicitation to procure up to 2,000 MW of new combined cycle capacity under the Long Term Capacity Agreement Pilot Program. Evaluated permit and other development risks. Quantified net environmental benefits due to displacement of less efficient fossil generation across the region. Testified before the BPU regarding the outcome of the procurement and net environmental benefits to New Jersey.

On behalf of an investor-owned utility in the Northeast, prepared a strategic evaluation of options for its fossil generation fleet. Prepared ranges of capital and operating costs associated with probable new environmental requirements under a range of future scenarios.

On behalf of Allegheny Power, served as Independent Procurement Monitor during the solicitation of full requirements wholesale power supplies for eligible customers in Virginia. Reviewed procurement documents and protocols, monitored procurement integrity through the evaluation and award of bids, and prepared a procurement report for filing with the Virginia State Corporation Commission.

On behalf of the four Massachusetts investor owned utilities, prepared long term forecasts of energy, capacity, and REC prices to be used as benchmarks in the utilities' solicitation of renewable energy under long-term contracts as required by the Green Communities Act of 2008. Advised the utilities regarding potential energy market price suppression impacts of long-term renewable contracts.

Conducted due diligence on a portfolio of wind projects located in New England and New York on behalf of an investment bank. Evaluated energy production and deliverability issues affecting project revenues.

On behalf of NSTAR, prepared filings to the Massachusetts Energy Facilities Siting Board for a proposed 345-kV transmission line. Evaluated the need and quantified the economic benefits of the proposed project versus project alternatives, including generation and demand response. Assisted counsel with discovery and provided written and oral testimony before the Board.

On behalf of the Rhode Island Economic Development Corporation, developed a database of off-shore wind PPA prices, net metering tariff rates, and feed-in tariffs across the U.S. and Europe in connection with the economic evaluation of the Deepwater Block Island offshore wind project.

On behalf of PowerOptions, advised the non-profit corporation regarding the development of a program to install solar photovoltaic facilities on member institutions' sites across Massachusetts under PPA arrangements.

On behalf of the Maryland Public Service Commission, evaluated alternative strategies for meeting the state's growing power demands and meet its Renewable Portfolio Standards through contracting alternatives, new generation, transmission expansion, and demand-side options. Prepared long-term forecasts for the cost of environmental compliance, including greenhouse gas controls and RECs.

On behalf of a large New England water utility, managed a competitive procurement for retail power supplies for all of its pumping, reservoir, and office facilities. Projected the savings offered by competitive retail supplier relative to the electric utility's standard offer service. Worked with counsel to negotiate contract terms and conditions.

Assisted a developer prepare filings to the Massachusetts Energy Facilities Siting Board for a proposed peaking generation project. Evaluated net impact on regional air emissions ascribable to the project and the need for new quick-start resources in northeastern Massachusetts to provide locational forward reserves. Evaluated alternative fueling strategies and fuel assurance for the project.

On behalf of the Long Island Power Authority, prepared an independent analysis of the environmental impacts and benefits of the Broadwater floating storage and regasification unit proposed for the middle of Long Island Sound.

Assisted Cornell University develop its Energy Master Plan. Evaluated the risk-adjusted economic value-added of technology alternatives for expanding the steaming capacity of the university's central heating plant, and assessed the environmental benefit of each alternative in terms of net emissions.

Prepared an expert report regarding valuation of a high-deliverability gas storage project. Advised client on opportunities for enhanced trading, marketing and contract administration.

Facilitated collaborative meetings among diverse stakeholders chartered by Connecticut Public Act 02-95. Provided a comprehensive plan and environmental policy recommendations to the State Legislature regarding submarine cables and gas pipelines across Long Island Sound and aboveground and underground transmission lines in Southwest Connecticut.

On behalf of ISO New England, analyzed fuel diversity, reliability issues, and compliance costs arising from environmental and other regulatory initiatives.

Assisted New York University with a competitive solicitation to select an on-site cogeneration project developer. Advised client on alternative project delivery structures.

Researched biomass fuel supply economics for a proposed cogeneration project to be fueled by a combination of waste wood and woody crop.

Evaluated environmental permit conditions and regulatory requirements that restrict or limit backup fuel oil use for new and existing gas-fired generation, as part of a reliability study of the natural gas infrastructure in ISO New England.

Evaluated revenue and earnings forecasts for two energy services companies as part of a due diligence assessment for the acquisition of non-regulated affiliates of a northeast utility company.

Advised a recycled paper manufacturer on electricity procurement and production alternatives, technologies for utilizing the mill's rejects stream, natural gas transportation alternatives, and permitability of proposed on-site energy projects. Managed a competitive procurement to construct on-site generation. Evaluated requirements with respect to New York State's SEQRA process, air permit modifications, Article VII, wetlands regulations, and SPDES.

Evaluated alternative energy production strategies and related environmental permitting constraints for the State University of New York campuses as part of a university system-wide review of energy procurement opportunities in New York's competitive energy market.

Analyzed non-utility generator contract reformation initiatives for Potomac Electric Power Co.

Evaluated environmental constraints associated with the feasibility of inside-the-fence cogeneration for Phelps Dodge at a primary rod mill production plant, including NEPA requirements for gas pipeline construction.

Provided litigation support, including project viability assessment, following termination of a Purchase and Sale Agreement for the acquisition of a nuclear power plant.

Analyzed effluent and flow data for three of NYSEG's coal-fired power plants in New York for compliance with the facilities' SPDES water discharge permit requirements.

Assessed risk profile and contract alternatives associated with construction of a natural gas lateral to a proposed cogen plant for National Institutes of Health.

Advised Massachusetts Water Resources Authority on reliability requirements for back-up generator systems under the EPA NPDES program.

Evaluated incremental costs of the Holyoke Hydroelectric Project resulting from conditions imposed by the Massachusetts DEP Water Quality Certification.

Developed engineering approaches and designs to comply with environmental regulations pertaining to former manufactured gas plant sites in Massachusetts, Maine, New Hampshire, and New Jersey for Bay State Gas Company, NEES, and PSE&G.

Quantified potential environmental liabilities in numerous due diligence reviews for acquisitions and divestitures of energy, railroad, and manufacturing company assets, both in the U.S. and Europe.

Evaluated and optimized engineering design of product recovery system for environmental compliance at Mobil and Coastal refineries in New Jersey.

Provided expert witness testimony for a pump manufacturer's defense against the local water department's groundwater contamination damage claim.

Evaluated risk/reward profile for site restoration and redevelopment options of a 40-acre parcel in Providence, R.I.

## EDUCATION

Harvard University, Cambridge, MA
A.B., Geological Sciences

University of Washington, Seattle, WA
M.S., Ph.D., Geological Sciences

## PRESENTATIONS & PUBLICATIONS

2014. "Business Opportunities in the Energy Industry and Response to Climate Change," Air &Waste Management Association, New England Section, Fall 2014 Conference.

2012. "Influence of State Policymaking on New England's Wholesale Markets – RGGI" Northeast Energy and Commerce Association, 11th Annual Power Markets Conference, Westborough, MA, October 24, 2012.

2009. "How to Shop for Power." MassBusiness, p. 16 (with M.J. DeCourcey).

2000. "Backup Power Risk Factors Impacting the Commercial Merit of Combined Heat and Power": Proceedings, 91st Annual Conference of the International District Energy Association, Montreal, Quebec, June 10-13, pp. 169-182.

1998. "Innovative and Cost-Effective Dual Phase Extraction using a Vacuum Truck and Standard Monitoring Wells": Amherst Soils Conference, October (with D.M. McCabe, R.K. Maggiani, F. W. Lilley).

1994. "The 1,000-Mile-Long Site: Managing and Evaluating Environmental Liabilities for the Railroad Industry." Presented at the New England Environmental Expo, Boston, MA, April (with K.A. Nelson).

1993. "Integrated Risk Management: A Tool for Strategic Decision-Making." Presented at Air & Hazardous Waste Management Conference. Hartford, CT, October 20 (with M.J. Murphy).

1992. "Reduce Sampling Errors: Careful Extraction Method Can Improve Accuracy of Soil Analyses" *Soils*; January-February; pp. 16-18.

1990. "The Interpretation of Free-Phase Floating Toluene Contamination at a Hydrologically Complex Site"; New England Environmental Expo, Proceedings (with McCabe, D.M.).

1989. "Vein Formation, Fluid Flow, and Wall Rock Geochemistry at the Lucky Friday Mine, Coeur d'Alene Mining District, Idaho"; 28th International Geological Congress, Washington, D.C. Proceedings; Vol. 1; pp. 1-323 - 1-324.

1985. (Gitlin, E.C.). "Sulfide Remobilization During Low Temperature Alteration of Seafloor Basalts", *Geochimica et Cosmochimica Acta,* 49; pp. 1567-1580.

1985. (Gitlin, E.C.). "Alteration and Fluid Flow Around a Sulfide-Carbonate-Quartz Vein, Lucky Friday Mine, Northern Idaho"; Geological Society of America, Abstracts with Program 17; pp. 593.

1985. (Gitlin, E.C.). "Small-Scale Heterogeneities in Stillwater Anorthosite II". Lunar and Planetary Science XVI; Lunar and Planetary Institute; Houston, Texas (with P.A. Salpas, I.S. McCallum, and L.A. Haskin).

Trainer, ABB Project Risk Workshop, July 1994

## ASSOCIATIONS

ISO New England Environmental Advisory Group