

Elson Advocacy

December 20, 2024

Ms. Nancy Marconi

Registrar

Ontario Energy Board

2300 Yonge Street, 27th Floor

Toronto, Ontario M4P 1E4

Dear Ms. Marconi:

**Re: Enbridge Gas Inc. 2024 to 2028 Rates Application
EB-2024-0111**

I am writing to respond to the objection by Energy Probe to qualifying Dr. Hill and Mr. Neme as experts in this proceeding pursuant to the invitation to do so by the OEB during the hearing yesterday.¹

Expertise and Qualifications

Energy Probe challenges the expertise and qualifications Dr. Hill and Mr. Neme. Its arguments are factually and legally incorrect. Energy Probe suggests that Mr. Hill's academic qualifications are limited to a bachelor's degree. In fact, Dr. Hill has a master's degree as well as a Ph.D. in Energy Management and Policy Planning. He also has over 30 years of experience in the energy sector as outlined in his attached CV.

Energy Probe suggests that Mr. Neme lacks qualifications and expertise in economics. In fact, Mr. Neme has a Master's in Public Policy, which had a heavy focus on applied economics and statistics, and over 30 years of experience in energy economics. Mr. Neme has worked for energy regulators, utilities, government agencies and other organizations in more than 30 states, 7 Canadian provinces and several European countries. He has defended expert witness testimony in approximately 70 cases before regulatory commissions in 13 different jurisdictions. He has also testified before several state legislatures.

Mr. Neme is one of the co-authors of the 2020 National Standard Practice Manual for Benefit-Cost Analysis of Distributed Energy Resources (NSPM for DERs),² as well as one of the co-authors of its 2017 predecessor, the National Standard Practice Manual for Assessing Cost-Effectiveness of Energy Efficiency Resources (NSPM for EE).³ Mr. Neme has presented on the principles, processes and methods recommended in those manuals to dozens of audiences across

¹ Hearing Transcript, December 19, 2024, p. 54.

² <https://www.nationalenergyscreeningproject.org/national-standard-practice-manual/>.

³ <https://www.nationalenergyscreeningproject.org/the-national-standard-practice-manual-for-energyefficiency/>.

the U.S. and Canada. These are the leading manuals on conducting economic cost-effectiveness assessments for energy efficiency and distributed energy resources in North America.

Mr. Neme also has decades of experience specific to Ontario and its gas system. Mr. Neme served on the Enbridge and Union natural gas demand side management audit/evaluations committees since their inception approximately two decades ago and currently sits on the gas DSM Evaluation Committee, the gas Integrated Resource Planning (IRP) Technical Working Group (IRP TWG), and the Demand Side Management Stakeholder Advisory Group (SAG). He has also previously served as an external reviewer of efficiency potential and carbon pricing studies. He has earned broad respect and trust from the Ontario regulatory community and has been elected to these committee roles by other intervenors and/or appointed by the OEB. Mr. Neme has provided expert testimony in approximately 25 OEB cases.

Further details on Mr. Neme's expertise can be found in the attached CV.

Energy Transition Expertise

Energy Probe argues that nobody can be an expert in relation to the energy transition. However, in Phase 1 of this proceeding, Mr. Neme was accepted as "an expert witness on energy transition planning in the gas sector."⁴ At that time, no party opposed Mr. Neme being qualified as such, including Energy Probe.

The energy transition is a relatively new topic. However, it remains vitally important that testimony regarding the impacts of the energy transition is provided by witnesses with actual knowledge and expertise in the area. The Energy Futures Group has been involved in proceedings relating to the impact of the energy transition on gas systems across North America, including so-called "future of gas" proceedings. This includes proceedings in Massachusetts, Vermont, Delaware, Illinois, and Michigan, as well as a review of gas industry decarbonization studies across the United States. A document highlighting further details on their experience with energy transition issues is attached.

Energy Probe describes Mr. Neme as a jack of all trades. However, this merely reflects the fact that Mr. Neme has expertise in multiple areas. This wide-ranging expertise is rare and extremely valuable when considering multi-faceted issues like the impact of the energy transition on the gas system.

Independence

Energy Probe argues that Mr. Neme is not independent because he was a "representative" of the Green Energy Coalition ("GEC") in Phase 1 of the proceeding. In Phase 1, Mr. Neme was a consultant to the GEC and Mr. Poch was its legal counsel. Mr. Neme was referenced in the GEC's intervention request to ensure that he was included on the email distribution list. This does not make him a partisan advocate or otherwise disqualify him as an independent expert.

⁴ EB-2022-0200, Hearing Transcript, Volume 6, July 19, 2023, p. 169, ln. 23 to p. 170, ln. 3.

Energy Probe also alleges that Mr. Neme is a partisan advocate for the GEC in various OEB committees. However, Mr. Neme does not participate in OEB committees, such as the gas Demand Side Management (“DSM”) Evaluation Committee, as an advocate for Environmental Defence or the Green Energy Coalition. Instead, his role is to act as an independent expert who is extremely knowledgeable about DSM in general and in Enbridge’s specific programs. He has earned broad respect and trust from the Ontario regulatory community and has been elected to these committee roles by other intervenors and/or appointed by the OEB.

Expert Qualification and Weight

On day one, the Panel correctly ruled that ability to provide opinion evidence is based on either formal qualifications, or experience, or some combination of these things, and that weight should be determined at the end of a proceeding. No parties objected to the qualification of Mr. Neme and Dr. Hill as experts in energy transition planning and analysis for the gas sector (aside from Energy Probe) and we ask that they be accepted as expert witnesses as such.

To the extent that the Panel considers formal qualifications and experience when assessing the weight given to the evidence, we respectfully submit that the extensive qualifications and expertise of these witnesses, as well as the respect that they have earned with OEB staff and intervenors, strongly supports weighing their evidence heavily.

The appropriate weight given to expert evidence is also a function of the cogency of the expert report, their participation in all aspects of the proceeding (e.g. interrogatories and hearing testimony), and the thoughtfulness of their responses to cross-examination questions. The EFG reports were highly rational and were fully tested through the OEB’s processes. Indeed, the EFG Phase 1 report even went through two rounds of cross-examination due to its use in both phases of the proceeding. The responses to cross-examination questions by EFG were non-partisan, thoughtful, and well-reasoned. Contrary to Energy Probe’s assertions, all of the relevant factors support weighing EFG’s evidence heavily.

Yours truly,



Kent Elson

cc: Parties to the above proceeding

Professional Summary

Chris specializes in analysis of markets for energy efficiency, demand response, renewable energy and strategic electrification measures, as well as the design and evaluation of programs and policies to promote them. During his 25+ years in the industry, he has worked for energy regulators, utilities, government agencies and advocacy organizations in 30+ states, 7 Canadian provinces and several European countries. He has filed expert witness testimony in 60+ cases before regulatory commissions in 13 different jurisdictions; he has also testified before several state legislatures. Chris has authored numerous reports and papers on clean energy policies and programs, including the National Standard Practice Manual for Benefit Cost Analysis of Distributed Energy Resources (2020), the predecessor NSPM for energy efficiency (2017), and several reports on electric non-wires and gas non-pipe alternatives.

Experience

2010-present: Principal, Energy Futures Group, Hinesburg, VT

1999-2010: Director of Planning & Evaluation, Vermont Energy Investment Corp., Burlington, VT

1993-1999: Senior Analyst, Vermont Energy Investment Corp., Burlington, VT

1992-1993: Energy Consultant, Lawrence Berkeley National Laboratory, Gaborone, Botswana

1986-1991: Senior Policy Analyst, Center for Clean Air Policy, Washington, DC

Education

M.P.P., University of Michigan, 1986

B.A., Political Science, University of Michigan, 1985

Selected Projects

- **Natural Resources Defense Council (Illinois, Michigan and Ohio)**. Critically review efficiency, demand response, electrification, distribution system investment and integrated resource plans filed by IL, MI and OH utilities. Draft/defend regulatory testimony on critiques. Represent NRDC in regular stakeholder-utility engagement processes. Represent NRDC in collaborative development of non-wires solution pilots. Support development of Illinois clean energy legislation. (2010 to present)
- **E4TheFuture**. Co-authored National Standard Practice Manual Benefit Cost-Analysis of Distributed Energy Resources (2020) and NSPM for efficiency (2017). Present the NSPM to audiences across the U.S. and Canada; helping several to assess how to use it to refine current practices. (2016-present)
- **Vermont Agency of Natural Resources**. Supported EFG/Cadmus team in analysis of pathways for achieving the state's Global Warming Solutions Action emission reduction requirements, including marginal abatement cost curve development (2022). Supporting new assessment of emissions and cost tradeoffs between policy options for decarbonizing buildings and industry sectors (2023).

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- **Connecticut Energy Efficiency Board.** Part of team providing on-going review and input on utility efficiency program planning and related policy issues. Lead role in providing input on New England Avoided Energy Supply Cost study and cost-effectiveness screening policy issues. (2019-present)
- **Ontario Energy Board.** Appointed to serve on provincial gas DSM Evaluation Advisory Committee, providing input on multi-year evaluation plans, scopes of work for evaluation studies and independent evaluator assessments of utilities' annual gas savings claims. Also serve on gas IRP committee, providing input on non-pipe alternatives, including cost-effectiveness analyses and selection of pilot projects. Previously also appointed to advisory committees on gas and electric efficiency potential studies and advisory committee on carbon price forecast studies. (2015-present)
- **Green Energy Coalition (Ontario).** Represent coalition of environmental groups in regulatory proceedings, utility negotiations and stakeholder meetings on DSM policies, utility proposed DSM Plans, integrated resource planning and rules governing non-pipe alternatives. (1993 to present)
- **Energy Action Network (Vermont).** Co-authored a white paper on the concept of a "Clean Heat Standard" – a kind of renewable portfolio standard that would impose increasing obligations on Vermont Gas and wholesale suppliers of fuel oil and propane to reduce greenhouse gas emissions from burning of fossil fuels in homes and businesses, consistent with the state's Global Warming Solutions Act requirements (e.g., 40% reduction by 2030). Co-leading related voluntary working group of interested parties providing input on the design of the policy. Testified before Vermont House Energy and Technology Committee on Clean Heat Standard legislation. (2020-present)
- **Sierra Club (Massachusetts).** Supported Sierra Club's participation in an year-long process in which the Massachusetts' gas utilities engaged with stakeholders to discuss and consider the future of the gas industry in the context of decarbonization policy goals. Reviewed draft inputs to technical study of options for decarbonizing the gas industry presented to the group and assisted in drafting regulatory comments on final study results as well as gas utility policy proposals. (2021-2022).
- **Environmental Law and Policy Center.** Filed expert witness testimony supporting AEP Ohio's initial proposal to run a portfolio of efficiency programs and in opposition to a proposed rate case settlement agreement to eliminate such programs. (2021)
- **Sierra Club (Maryland).** Provided strategic support on testimony on cost-effectiveness and other rules governing expansion of gas infrastructure to connect additional customers. (2021)
- **New Jersey Board of Public Utilities.** Served on management team responsible for statewide delivery of New Jersey Clean Energy Programs. Led strategic planning; support regulatory filings, cost-effectiveness analysis & evaluation work. (2015 to 2020). Served on management team for start-up of residential and renewables programs for predecessor project. (2006-2010)
- **Regulatory Assistance Project - U.S.** Provided guidance on efficiency policy and programs. Lead author on strategic reports on program options for decarbonizing Vermont buildings, achieving 30% electricity savings in 10 years, using efficiency to defer T&D system investments, & bidding efficiency into capacity markets. (2010 to 2020)
- **Energy Efficiency Alberta.** Assisted EEA in providing input to Alberta Utilities Commission on the role efficiency resources can play in reducing electric system costs. (2019 to 2020)

- **Consumers Association of Canada (Manitoba) and Winnipeg Harvest.** Critically reviewed and filed regulatory testimony on Efficiency Manitoba's first three-year plan (2020-2023), with particular emphasis on the extent to which the plan supported advanced heat pump technology as both an electric efficiency measure and a key to future building electrification. (2019-2020).
- **Citizens Action Coalition of Indiana.** Critically reviewed how energy efficiency resources were modeled in utility IRPs, as well as the design of energy efficiency program portfolios. (2018 to 2020)
- **Efficiency Vermont.** Provided technical support in review of avoided cost assumptions, as well as related policies on cost-effectiveness analyses of efficiency resources (2019).
- **Earth Justice and Southern Alliance for Clean Energy.** Helped critically review Florida utilities' efficiency potential studies and proposed 2020-2024 energy efficiency savings targets. (2019)
- **New Hampshire Office of the Consumer Advocate.** Drafted expert witness testimony on the merits of utilities adding a pilot non-wires solution project to their efficiency program plans. (2018)
- **Regulatory Assistance Project - Europe.** Provide on-going support on efficiency policies and programs in the United Kingdom, Germany, and other countries. Reviewed draft European Union policies on Energy Savings Obligations, EM&V protocols, and related issues. Drafted policy brief on efficiency feed-in-tariffs and roadmap for residential retrofits. (2009 to 2018)
- **Green Mountain Power (Vermont).** Supported development and implementation of GMP's first compliance plan for Vermont RPS Tier 3 requirement to reduce customers' direct consumption of fossil fuels, with significant emphasis on strategic electrification strategies. Also developed 10-year forecast of sales that could result from three different levels of policy/program promotion of residential electric space heating, electric water heating and electric vehicles. (2016 to 2018)
- **Alberta Energy Efficiency Alliance.** Drafted white paper how treatment of "efficiency as a resource" could be institutionalized in Alberta. The paper followed several presentations to government agencies and others on behalf of the Pembina Institute. (2017 to 2018)
- **Southern Environmental Law Center.** Assessed reasonableness of Duke Energy's historic efficiency program savings claims, as well as the design of their efficiency program portfolios for 2019. Filed expert witness testimony on findings in North Carolina dockets (2018).
- **Toronto Atmospheric Fund.** Helped draft an assessment of efficiency potential from retrofitting of cold climate heat pumps into electrically heated multi-family buildings (2017).
- **Northeast Energy Efficiency Partnerships.** Helped manage Regional EM&V forum project estimating savings for emerging technologies, including field study of cold climate heat pumps. Led assessment of best practices on use of efficiency to defer T&D investment. (2009 to 2015)
- **Ontario Power Authority.** Managed jurisdictional scans on leveraging building efficiency labeling/disclosure requirements and non-energy benefits in cost-effectiveness screening. Supported staff workshop on the role efficiency can play in deferring T&D investments. Presented on efficiency trends for Advisory Council on Energy Efficiency. (2012-2015)
- **Vermont Public Interest Research Group.** Conducted comparative analysis of the economic and environmental impacts of fuel-switching from oil/propane heating to either natural gas or efficient, cold climate electric heat pumps. Filed regulatory testimony on findings. (2014-2015)

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- **New Hampshire Electric Co-op.** Led assessment of the co-op's environmental and social responsibility programs' promotion of whole building efficiency retrofits, cold climate heat pumps and renewable energy systems. Presented recommendations to the co-op Board. (2014)
- **National Association of Regulatory Utility Commissioners (NARUC).** Assessed alternatives to 1st year savings goals to eliminate disincentives to invest in longer-lived savings. (2013)
- **California Investor-Owned Utility.** Senior advisor on EFG project to analyze 10 leading U.S. utility portfolios to determine if there are differences in the cost of saved energy related to utility spending in specific non-incentive categories, including administration, marketing, and EM&V. (2013)
- **DC Department of the Environment (Washington DC).** Part of VEIC team administering the DC Sustainable Energy Utility (SEU). Helped characterize the DC efficiency market and supporting the design of efficiency programs that the SEU will be implementing. (2011 to 2012)
- **Ohio Sierra Club.** Filed and defended expert witness testimony on the implications of not fully bidding all efficiency resources into the PJM capacity market. (2012)
- **Regulatory Assistance Project – Global.** Assisted RAP in framing several global research reports. Co-authored the first report – an extensive “best practices guide” on government policies for achieving energy efficiency objectives, drawing on experience with a variety of policy mechanism employed around the world. (2011)
- **Tennessee Valley Authority.** Assisted CSG team providing input to TVA on the redesign of its residential efficiency program portfolio to meet aggressive new five-year savings goals. (2010)
- **New York State Energy Research and Development Authority (NYSERDA).** Led residential & renewables portions of several statewide efficiency potential studies. (2001 to 2010)
- **Ohio Public Utilities Commission.** Senior Advisor to a project to develop a web-based Technical Reference Manual (TRM). The TRM includes deemed savings assumptions, deemed calculated savings algorithms and custom savings protocols. It was designed to serve as the basis for all electric and gas efficiency program savings claims in the state. (2009 to 2010)
- **Vermont Electric Power Company.** Led residential portion of efficiency potential study to assess alternatives to new transmission line. Testified before Public Service Board. (2001-2003)
- **Efficiency Vermont.** Served on Sr. Management team. Supported initial project start-up. Oversaw residential planning, input to regulators on evaluation, input to regional EM&V forum, development of M&V plan and other aspects of bidding efficiency into New England's Forward Capacity Market (FCM), and development and updating of nation's first TRM. (2000 to 2010)
- **Long Island Power Authority Clean Energy Plan.** Led team that designed the four major residential programs (three efficiency, one PV) incorporated into the plan in 1999. Oversaw extensive technical support to the implementation of those programs. This involved assistance with the development of goals and budgets, development of savings algorithms, cost-effectiveness screening, and on-going program design refinements. (1998 to 2009)

Selected Publications and Reports

- *Cost Savings and CO₂ Emission Reductions of Residential Electrification in Peoples Gas Territory*, prepared for the Natural Resources Defense Council, November 2022 (with David Hill & Liz Bourguet)
- *Tip of the Spear: How Efficiency Programs Supporting Cold Climate Heat Pumps in Low Income Multi-Family Buildings Could Help Lay the Foundation for Building Decarbonization in Michigan and Illinois*, 2022 ACEEE Summer Study on Energy Efficiency in Buildings (with Laura Goldberg, Valeria Rincon and Samantha Williams)
- *The Clean Heat Standard*, Vermont Energy Action Network (EAN) White Paper, December 2021 (with Richard Cowart)
- *National Standard Practice Manual for Benefit Cost Analysis of Distributed Energy Resources*, August 2020, (with Tim Woolf and others)
- *Reducing CO₂ Emissions from Vermont Buildings: Potential and Cost-Effectiveness of Select Program Options*, Regulatory Assistance Project, February 13, 2019 (with Richard Faesy)
- *Pumping Energy Savings: Recommendations for Accelerating Heat Pump Adoption in Ontario's Electrically Heated Multi-Residential Buildings*, Toronto Atmospheric Fund, July 2018 (with Devon Calder, Brian Purcell and Judy Simon)
- *National Standard Practice Manual for Assessing Cost-Effectiveness of Energy Efficiency Resources*, Edition 1, Spring 2017 (with Tim Woolf, Marty Kushler, Steven Schiller and Tom Eckman)
- *The Next Quantum Leap in Efficiency: 30% Electricity Savings in 10 Years*, Proceedings of the 2016 ACEEE Summer Study on Energy Efficiency in Buildings, Volume 9, pp. 1-14 (with Jim Grevatt, Rich Sedano and Dave Farnsworth)
- *The Next Quantum Leap in Efficiency: 30% Electricity Savings in Ten Years*, published by the Regulatory Assistance Project, February 2016 (with Jim Grevatt)
- *Energy Efficiency as a T&D Resource: Lessons from Recent U.S. Efforts to Use Geographically Targeted Efficiency Programs to Defer T&D Investments*, published by Northeast Energy Efficiency Partnerships, January 9, 2015 (with Jim Grevatt)
- *Unleashing Energy Efficiency: The Best Way to Comply with EPA's Clean Power Plan*, Public Utilities Fortnightly, October 2014, pp. 30-38 (with Tim Woolf, Erin Malone and Robin LeBaron)
- *The Resource Value Framework: Reforming Energy Efficiency Cost-Effectiveness Screening*, published by the National Efficiency Screening Project, August 2014 (with Tim Woolf et al.)
- *U.S. Experience with Participation of Energy Efficiency in Electric Capacity Markets*, Regulatory Assistance Project, August 2014 (with Richard Cowart)
- *The Positive Effects of Energy Efficiency on the German Electricity Sector*, IEPEC 2014 Conference, September 2014 (with Friedrich Seefeldt et al.)

- *Final Report: Alternative Michigan Energy Savings Goals to Promote Longer Term Savings and Address Small Utility Challenges*, prepared for the Michigan Public Service Commission, September 13, 2013 (with Optimal Energy)
- *Energy Efficiency Feed-in-Tariffs: Key Policy and Design Considerations*, Proceedings of ECEEE 2013 Summer Study, pp 305-315 (with Richard Cowart)
- *Can Competition Accelerate Energy Savings? Options and Challenges for Efficiency Feed-in-Tariffs*, published in *Energy & Environment*, Volume 24, No. 1-2, February 2013 (with Richard Cowart)
- *An Energy Efficiency Feed-in-Tariff: Key Policy and Design Considerations*, published by the Regulatory Assistance Project, March/April 2012 (with Richard Cowart)
- *U.S. Experience with Efficiency as a Transmission and Distribution System Resource*, published by the Regulatory Assistance Project, February 2012 (with Rich Sedano)
- *Achieving Energy Efficiency: A Global Best Practices Guide on Government Policies*, published by the Regulatory Assistance Project, February 2012 (with Nancy Wasserman)
- *Residential Efficiency Retrofits: A Roadmap for the Future*, published by the Regulatory Assistance Project, May 2011 (with Meg Gottstein and Blair Hamilton)
- *Is it Time to Ditch the TRC?* Proceedings of ACEEE 2010 Summer Study on Energy Efficiency in Buildings, Volume 5 (with Marty Kushler)
- *Energy Efficiency as a Resource in the ISO New England Forward Capacity Market*, in *Energy Efficiency*, published on line 06 June 2010 (with Cheryl Jenkins and Shawn Enterline)
- *A Comparison of Energy Efficiency Programmes for Existing Homes in Eleven Countries*, prepared for the British Department of Energy and Climate Change, 19 February, 2010 (with Blair Hamilton et al.)
- *Energy Efficiency as a Resource in the ISO New England Forward Capacity Market*, Proceedings of the 2009 European Council on an Energy Efficient Economy Summer Study, pp. 175-183 (with Cheryl Jenkins and Shawn Enterline)
- *Playing with the Big Boys: Energy Efficiency as a Resource in the ISO New England Forward Capacity Market*, Proceedings of ACEEE 2008 Summer Study Conference on Energy Efficiency in Buildings, Volume 5 (with Cheryl Jenkins and Blair Hamilton)
- *Recommendations for Community-Based Energy Program Strategies, Final Report*, developed for the Energy Trust of Oregon, June 1, 2005 (with Dave Hewitt et al.)
- *Shareholder Incentives for Gas DSM: Experience with One Canadian Utility*, Proceedings of ACEEE 2004 Summer Study on Energy Efficiency in Buildings, Volume 5 (with Kai Millyard)
- *Cost Effective Contributions to New York's Greenhouse Gas Emission Reduction Targets from Energy Efficiency and Renewable Energy Resources*, ACEEE 2004 Summer Study Proceedings, Volume 8 (with David Hill et al.)
- *Opportunities for Accelerated Electric Energy Efficiency Potential in Quebec: 2005-2012*, prepared for Regroupement national des conseils regionaux de l'environnement du Quebec, Regroupement des organismes environnementaux energie and Regroupement pour la

responsabilite sociale des enterprises, May 16, 2004 (with Eric Belliveau, John Plunkett and Phil Dunsky)

- *Review of Connecticut's Conservation and Load Management Administrator Performance, Plans and Incentives*, for Connecticut Office of Consumer Counsel, October 31, 2003 (with John Plunkett, Phil Mosenthal, Stuart Slote, Francis Wyatt, Bill Kallock and Paul Horowitz)
- *Energy Efficiency and Renewable Energy Resource Development Potential in New York State*, for New York Energy Research and Development Authority, August 2003 (with John Plunkett, Phil Mosenthal, Stave Nadel, Neal Elliott, David Hill and Christine Donovan)
- *Assessment of Economically Deliverable Transmission Capacity from Targeted Energy Efficiency Investments in the Inner and Metro-Area and Northwest and Northwest/Central Load Zones*, for Vermont Electric Power Company, Final Report: April 2003 (with John Plunkett et al.)
- *Residential HVAC Quality Installation: New Partnership Opportunities and Approaches*, Proceedings of ACEEE 2002 Summer Study Conference on Energy Efficiency in Buildings, Volume 6 (with Rebecca Foster, Mia South, George Edgar and Put Murphy)
- *A Modified Delphi Approach to Predict Market Transformation Program Effects*, Proceedings of ACEEE 2000 Summer Study Conference on Energy Efficiency in Buildings, Volume 6 (with Phil Mosenthal et al.)
- *Using Targeted Energy Efficiency Programs to Reduce Peak Electrical Demand and Address Electric System Reliability Problems*, published by the American Council for an Energy Efficient Economy, November 2000 (with Steve Nadel and Fred Gordon)
- *Energy Savings Potential from Addressing Residential Air Conditioner and Heat Pump Installation Problems*, American Council for an Energy Efficient Economy, February 1999 (with John Proctor and Steve Nadel)
- *Promoting High Efficiency Residential HVAC Equipment: Lessons Learned from Leading Utility Programs*, Proceedings of ACEEE 1998 Summer Study Conference on Energy Efficiency in Buildings, Volume 2 (with Jane Peters and Denise Rouleau)
- *PowerSaver Home Program Impact Evaluation*, report to Potomac Edison, February 1998 (with Andy Shapiro, Ken Tohinaka and Karl Goetze)
- *A Tale of Two States: Detailed Characterization of Residential New Construction Practices in Vermont and Iowa*, Proceedings of ACEEE 1996 Summer Study Conference on Energy Efficiency in Buildings, Volume 2 (with Blair Hamilton, Paul Erickson, Peter Lind and Todd Presson)
- *New Smart Protocols to Avoid Lost Opportunities and Maximize Impact of Residential Retrofit Programs*, in Proceedings of ACEEE 1994 Summer Study on Energy Efficiency in Buildings (with Blair Hamilton and Ken Tohinaka)
- *Economic Analysis of Woodchip Systems and Finding Capital to Pay for a Woodchip Heating System*, Chapters 6 and 8 in *Woodchip Heating Systems: A Guide for Institutional and Commercial Biomass Installations*, published by the Council of Northeastern Governors, July 1994

- *PSE&G Lost Opportunities Study: Current Residential Programs and Relationship to Lost Opportunities*, prepared for the PSE&G DSM Collaborative, June 1994 (with Blair Hamilton, Paul Berkowitz and Wayne DeForest)
- *PSE&G Lost Opportunities Study: Preliminary Residential Market Analysis*, prepared for the PSE&G DSM Collaborative, May 1994 (with Blair Hamilton, Paul Berkowitz and Wayne DeForest)
- *Long-Range Evaluation Plan for the Vermont Weatherization Assistance Program*, prepared for the Vermont Office of Economic Opportunity, February 1994 (with Blair Hamilton and Ken Tohinaka)
- *Impact Evaluation of the 1992-1993 Vermont Weatherization Assistance Program*, prepared for the Vermont Office of Economic Opportunity, December 1993 (with Blair Hamilton and Ken Tohinaka)
- *Electric Utilities and Long-Range Transport of Mercury and Other Toxic Air Pollutants*, published by the Center for Clean Air Policy, 1991
- *Coal and Emerging Energy and Environmental Policy*, in *Natural Resources and Environment*, 1991 (with Don Crane)
- *Acid Rain: The Problem*, in *EPA Journal*, January/February 1991 (with Ned Helme)
- *An Efficient Approach to Reducing Acid Rain: The Environmental Benefits of Energy Conservation*, published by the Center for Clean Air Policy, 1989
- *The Untold Story: The Silver Lining for West Virginia in Acid Rain Control*, published by the Center for Clean Air Policy, 1988
- *Midwest Coal by Wire: Addressing Regional Energy and Acid Rain Problems*, published by the Center for Clean Air Policy, 1987
- *Acid Rain: Road to a Middle Ground Solution*, published by the Center for Clean Air Policy, 1987 (with Ned Helme)

EFG Experience with Energy Transition Issues

Decarbonization Pathways Studies

- EFG has led or played major roles in the conduct of several decarbonization studies
 - **Massachusetts 2050 Decarbonization Roadmap.** EFG was part of the Cadmus team that analyzed economy-wide decarbonization pathways for the state's Executive Office of Energy and Environmental Affairs.
 - **Vermont Pathways Analysis Report.** EFG was part of Cadmus team that analyzed economy-wide decarbonization pathways for the Vermont Agency of Natural Resources and the Vermont Climate Council. EFG led the buildings/thermal sector work.
 - **Vermont Thermal Sector Decarbonization Analysis.** EFG led a study for the Vermont Agency of Natural Resources to assess the emission reduction, cost, and other trade-offs between different policy approaches to decarbonizing buildings and industry in the state.
 - **Delaware Comprehensive Energy Plan.** EFG conducted scenario analysis of decarbonization pathways for the Delaware Department of Natural Resources and Environmental Control.
- EFG has helped clients critically review decarbonization studies performed by other parties, particularly those sponsored by gas utilities.
 - **Illinois Future of Gas Proceedings:** EFG is supporting Natural Resources Defense Council in the multi-year, multi-stakeholder, Future of Gas workshops convened by the Illinois Commerce Commission.
 - **Massachusetts Gas Utilities Study:** EFG helped Sierra Club participate in a year-long utility-stakeholder collaborative process for assessing and modeling options for decarbonization. This included drafting numerous comments on the utilities' consultants' proposed analysis scenarios, draft modeling assumptions, and draft reports.
 - **Assessment of Common Biases in Gas Utility Decarbonization Studies.** EFG helped the Natural Resources Defense Council review and critique numerous gas industry-funded decarbonization studies across a range of different U.S. states.

Renewable Gas Potential

- EFG was part of a consultant team that critiqued a Michigan RNG potential study on behalf of the Natural Resources Defense Council.

Building Decarbonization Policy and Economics

- **Vermont Clean Heat Standard.** EFG Principal Chris Neme was one of two authors of the Vermont Energy Action Network's 2021 white paper on the concept of a Clean Heat Standard, which was born out of a nearly year-long multi-stakeholder working group that Chris also co-led (and included the CEO of Vermont Gas). The concept was subsequently adopted in the Affordable Heat Act legislation. The legislation requires rulemaking and an impact report to the legislature, now underway, prior to enactment.
- **Other Vermont climate policy whitepapers.** EFG co-led the development of a "Weatherization at Scale" proposal which followed a year of work by a multi-stakeholder working group.

- **Support for Consumer Decision Making (Canada):** EFG is conducting a review and comparative analysis of online calculators that support consumer decision making and home heating and cooling choices for a court proceeding in Canada.
- **Michigan Healthy Climate Plan.** EFG Principal Chris Neme represented the Natural Resources Defense Council (NRDC) in a couple of working groups organized by the state's Department of Environment, Great Lakes and Energy to develop a state climate plan.
- **Illinois Climate Legislation.** EFG has supported NRDC in developing legislative policy proposals for advancing decarbonization in the state.
- **Customer Economics of Electrification in Chicago.** EFG published a report analyzing the economics and greenhouse gas emission impacts of residential electrification in Chicago. The analysis was based on current and forecast future retail energy prices for gas and electricity; capital costs of heat pumps, heat pump water heaters and other electric and gas appliances; current average gas consumption by end use; performance of high efficiency gas and electric equipment; and various other factors.

Regulatory Testimony

- **White Paper on shorter-term Depreciation of new gas infrastructure investments (Rhode Island).** EFG drafted a white paper which the Conservation Law Foundation filed with the Rhode Island Public Utilities Commission on the merits of shorter-term (e.g. 20 years) amortization of new gas utility investments to reduce risk of stranded assets in the context of evolving climate policies.
- **Liquid Natural Gas Vaporization Project (Rhode Island).** EFG filed testimonies on behalf of Conservation Law Foundation with the Rhode Island Public Utilities Commission, and Energy Facilities Siting Board critiquing the need for a permanent LNG vaporization plant to serve Aquidneck Island.
- **Gas Line Extension Allowances (Massachusetts).** EFG filed comments on behalf of the Environmental Defense Fund critiquing gas company proposals for line extension allowances in Massachusetts DPU 20-80B.
- **Nicor Gas RNG Pilots (Illinois).** EFG filed testimony on behalf of the Environmental Defense Fund in opposition to proposed RNG pilot projects.
- **Northwest gas pipeline (FERC).** EFG drafted a report filed with the U.S. Federal Energy Regulatory Commission, on behalf of the Washington state Attorney General, on the lack of demonstrated need for and adverse environmental consequences of a proposed expansion of an interstate gas pipeline by Gas Transition Northwest (GTN).
- **Illinois and Michigan electrification programs.** EFG has supported – in testimony and then from a technical and programmatic perspective – the development of residential electrification programs, funded initially through energy efficiency programs, and more recently through rate cases. The testimony analyzed the customer economics and electric rate impacts of such programs.
- **Fortis BC RNG purchases to offset emissions from new construction of gas heated homes.** EFG was hired by the BC Sustainable Energy Association to critique a Fortis proposal to meet provincial requirements for net zero emission new construction by contracting for the amount of RNG any new gas homes would consume and socializing the cost of such purchases across all gas customers.

Professional Summary

David Hill joined EFG as a Managing Consultant at the start of 2020, after 22 years of employment with VEIC, most recently as Director of Distributed Resources and a VEIC Policy Fellow. He is known nationally for his advancement of sustainable energy program design and evaluation, and renewable energy policy. David has been the principal investigator and led analysis teams for multi-year stakeholder informed studies on solar market and decarbonization pathways and scenarios. David provides expert testimony and regulatory support; participates in international, national, and state boards; leads policy committees and conferences; provides comprehensive studies of the economic, technical, and achievable potentials for sustainable energy programming; and supports program budget planning and implementation. He has led or significantly contributed to the design and development of efficiency and renewable energy programs with annual budgets of \$100+ million for initiatives in New Jersey, Washington DC, New York, Vermont, Arizona, and Maryland. Recent work includes expert testimony and whitepaper analyses related to gas infrastructure investments, pilot programs and planning. He has clients in more than a dozen states and six countries; several of them are international organizations.

Experience

January 2020 – present: Managing Consultant, Energy Futures Group, Hinesburg, Vermont (VT)

2014 – 2019: Director, Distributed Energy Resources, Policy Fellow, VEIC, Burlington, VT

2010 – 2014: Managing Consultant, VEIC, Burlington, VT

2008 – 2010: Deputy Director, Planning and Evaluation, VEIC, Burlington, VT

2000 – 2008: Senior Consultant, VEIC, Burlington, VT

1998 – 2000: Consultant, VEIC, Burlington, VT

1993 – 1998: Research Associate, Tellus Institute and the Boston Center of the Stockholm Environment Institute

Testimony as Expert Witness

Expert witness and reports for technical working groups and before commissions on renewable energy, energy efficiency, and gas infrastructure, in Illinois, Vermont, New York, Rhode Island, New Jersey, Maryland, Pennsylvania, North Carolina, South Carolina, for the Federal Energy Regulatory Commission, Nova Scotia and Ontario.

2024 Appearances on behalf of Conservation Law Foundation before the Rhode Island Public Utilities Commission and Energy Facilities Siting Board in regards Rhode Island Energy's proposed portable liquified natural gas vaporization project on Aquidneck Island, Rhode Island PUC Docket No. 22-42-NG.

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- 2024 Comments in Massachusetts DPU 20-80B, regarding proposed gas line extension allowances. On behalf of Environmental Defense Fund, September, 2024.
- 2023 In the Matter of Application of Duke Energy Progress, LLC For Adjustment of Rates and Charges Applicable to Electric Service in North Carolina and Performance-Based Regulation, Docket No. E-2 Sub 1300, on behalf of North Carolina Justice Center, North Carolina Housing Coalition, Natural Resources Defense Council, Sothern Alliance for Clean Energy and Vote Solar. March 27, 2023.
- 2022 In the Matter of: Application of Duke Energy Progress, LLC for Authority to Adjust and Increase its Electric Rate Schedules and Charges Docket No. 2022-254-E, on behalf of South Carolina Coastal Conservation League, Southern Alliance for Clean Energy, and Vote Solar, South Carolina Public Service Commission, December 1, 2022.
- 2022 In the Matter of the Merger of South Jersey Industries, Inc. and Boardwalk Merger Sub, Inc. in Docket No. GM22040270, on behalf of Environmental Defense Fund, State of New Jersey Board of Public Utilities, November 10, 2022.
- 2022 *GTN Xpress Project: A Critical Review of Need, Cost and Impacts*, prepared for the Washington State Office of the Attorney General, and filed with the Federal Energy Regulatory Commission in Docket No. CP22-2-00, on behalf of the States of Washington, California, and Oregon.
- 2022 In the Matter of Avoided Costs for EfficiencyOne's 2023-2025 Demand Side Management Plan Application, before the Nova Scotia Utility and Review Board, on behalf of EfficiencyOne. February 11, 2022.
- 2022 Appearance before the Rhode Island Energy Facilities Siting Review Board, Docket SB-2021-03, regarding a declaratory Order filed by Sea 3 Providence. LLC. Hearing appearance in support of Direct Testimony of Gabrielle Stebbins of Energy Futures Group, on behalf of the Conservation Law Foundation.
- 2021 Nicor Smart Neighborhood and Total Green Pilots. Expert witness testimony on behalf of Citizens Utility Board, Environmental Defense Fund and Natural Resources Defense Council, Docket 21-0098 before the Illinois Commerce Commission.
- 2021 Nicor Renewable Natural Gas Pilot. Expert witness testimony on behalf of Citizens Utility Board and Natural Resources Defense Council, Docket 20-0722 before the Illinois Commerce Commission.
- 2020 *NH Saves 2021-2023 Triennial Plan*. Expert witness testimony reviewing joint gas and electric triennial efficiency plan before the New Hampshire Public Service Commission submitted on behalf of Clean Energy New Hampshire, DE 20-092.
- 2020 *Dominion Energy South Carolina, 2020 Integrated Resource Plan*. Expert witness testimony before the South Carolina Public Service Commission submitted on behalf of Southern Alliance for Clean Energy and the South Carolina Coastal Conservation League on the characterization and analysis of energy efficiency and demand response in Dominion's 2020 IRP. Docket No. 2019-226-E.

- 2019 *Efficiency One 2020-2022 DSM Plan: Portfolio Diversification and Lighting Transition*. Expert Witness Testimony submitted on behalf of Efficiency Nova Scotia, to the Nova Scotia Utility and Review Board, Matter 09096.
- 2018 *In the Matter of an Application by Nova Scotia Power for Approval of its Advanced Meter Infrastructure Project*. Expert Witness Testimony submitted on behalf of Ecology Action Center, to the Nova Scotia Utility and Review Board, Matter 08349.
- 2018 *Becoming an Advanced Solar Economy*. Testimony before the Vermont House Committee on Energy and Technology, Montpelier.
- 2017 Maryland Public Service Commission. On behalf of Office of People’s Counsel on EmPOWER Maryland Utilities 2018-2020 plans. Presentation and testimony, October 25-26, 2017.
- 2016 Maryland Office of People’s Counsel, EmPOWER Maryland. *Written Comments on 2015 Semi Annual (Q3 and Q4) Review*. Presentation and testimony, May 4, 2016.
- 2015 Maryland Office of People’s Counsel, EmPOWER Maryland. *Written Comments on 2015 Semi Annual Review*. Presentation and testimony, October 14-15, 2015.
- 2014 Maryland Office of People’s Counsel, EmPOWER Maryland. *Written Comments on 2015-2017 Utility Proposed Plans*. Presentation and testimony, October 21-22, 2014.
- 2014 Maryland Office of People’s Counsel, EmPOWER Maryland. Evaluation of Semi-Annual Reports - Case Nos. 9153-9157. Presentation and testimony, April 7, 2014.
- 2013 Pennsylvania Public Utility Commission. On behalf of the Office of Consumer Advocate, regarding Petitions of the Pennsylvania Power Company for Approval of its Act 129 Phase II Energy Efficiency and Conservation Plan (Docket Nos. M-2012-2334395 and M-2012-2334392); Petition of Metropolitan Edison Company (Docket No, M-2012-2334387); and Petition of West Penn Power Company (Docket No. M-2012-2334398). Written testimony. January 8, 2013.
- 2013 Maryland Office of People’s Counsel, EmPOWER Maryland. *Written comments on 2012 Q3-Q4 Semi-Annual Report*. Presentation and testimony, October 2-3, 2013.
- 2011 Maryland Office of People’s Counsel. *Utility-Specific Comments on the 2012-2014 EmPOWER Maryland Program Plans*. Case Nos. 9153-9157. Written testimony. October 19, 2011.
- 2011 Maryland Office of People’s Counsel. *Written Comments on 2010 Annual Reports, and Q4 2010 reports*. Case Nos. 9153-9157. Presentation and testimony. March 31, 2011.
- 2011 Maryland Public Service Commission. On behalf of the Maryland Office of People’s Counsel. *Comments on the 2012-2014 EmPOWER Maryland Utility Program Plans*. October 2011.
- 2009 Pennsylvania Public Utility Commission. On behalf of the Office of Consumer Advocate, regarding Petition of Duquesne Light Company for Approval of Its Energy Efficiency and Conservation and Demand Response Plan, Docket No. M-2009-2093217. August 7, 2009.
- 2005 Ontario Energy Board. On behalf of Green Energy Coalition, regarding Hydro One Networks and Brampton Conservation and Demand Management Plans. February 4, 2005 (written comments) and February 17-18, 2005 (testimony).
- 2005 Pennsylvania Public Utility Commission. On behalf of Penn Future, regarding net metering standards. Written comments and testimony. June 2005.

- 2005 Pennsylvania Public Utility Commission. On behalf of Penn Future. Written testimony and comments on interconnection standards. April 2005.
- 2005 Testimony to the Vermont State Legislature House Committee on Energy and Natural Resources on Vermont's Solar and Small Wind Incentive Program. February 9, 2005.

Selected Projects (from more than 100)

Vermont Agency of Natural Resources. Co-leader of Vermont Pathways Analysis team providing technical support and quantitative modeling to the Vermont Climate Council, leading to adoption of Vermont Climate Action Plan.

Conservation Law Foundation. Lead author, for "*Rhode Island's Investments in Gas Infrastructure A Review of Critical Issues*", discussing renewable gas potential, gas planning in relation to greenhouse gas reduction goals and, depreciation periods for gas new infrastructure.

Institute for Energy Economics and Financial Analysis. Lead author, for "*Critical Elements in Short Supply: Assessing the Shortcomings of National Grid's Long-Term Capacity Report*", study calling into question proposed natural gas pipeline investment for New York City region.

Massachusetts Executive Office of Energy and Environmental Affairs. Senior advisor for team creating Low Emissions Analysis Platform (LEAP) integrated scenario modeling to inform Massachusetts efforts to reach greenhouse gas reduction targets.

Pennsylvania Department of Environmental Protection. Led team creating scenario modeling using the Low Emissions Analysis Platform (LEAP) model in support of two- and half-year study "*Pennsylvania's Solar Future*". Presentations for modeling review and collaborative stakeholder feedback at more than half a dozen stakeholder meetings and webinars.

U.S. Department of Energy. Principal Investigator for a three-year SunShot Initiative Solar Market Pathways study, investigating the technical, regulatory, and business model implications of getting 20 percent of Vermont's total electric supply from solar by 2025.

Sun Shares. Created and launched, and responsible for management and business development of, a community solar business subsidiary to provide "Easy and Affordable Solar for Employers and their Employees," 2015 – present.

New Jersey Clean Energy Program. Program design and policy advisor for the renewable energy program for more than a decade.

Rhode Island Office of Energy Resources. Strategic Advisor on State Energy Plan and System Reliability Procurement and Distributed Generation programs.

Alaska Energy Authority. Principal consultant for two studies on renewable and energy efficiency financing and funding strategies.

New York State Energy Research and Development Authority (NYSERDA). Twice led the renewable energy analysis for 20-year forecast of energy efficiency and renewable energy potential, 2003 and 2012.

World Bank. Expert consultant on a short-term study of efficiency and micro- / mini-grid opportunities in Tanzania, 2014.

Arizona Public Service. Managed a rapid assessment and redesign of PV and solar hot water incentives, 2009.

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Selected Presentations

- 2017 Sun Shares, Easy and Affordable Solar for Employers and their Employees, American Solar Energy Society, Solar 2017, Denver.
- 2017 Vermont Solar Market Pathways, American Solar Energy Society, Solar 2017, Denver.
- 2016 *Oxymoron: Harmonizing Distributed Energy Integration Realities with Policy Frameworks*. Solar Power International.
- 2015 World Bank, International Conference on Energy Efficiency in Cities, Puebla New Mexico. Invited Panel speaker on Efficiency Vermont and Third-Party Administration Model. February, 2015.
- 2015 *Vermont Solar Market Pathways*. Presentations at Solar 2015 (State College, Pennsylvania), and Renewable Energy Vermont Conference.
- 2014 New York State Energy Research and Development Authority (NYSERDA), Renewable Energy Potential Study Results, Albany, NY.
- 2013 *Transformative Energy Planning*. Invited speaker at Innovations in Renewable Energy Symposium, Metcalf Institute for Marine and Environmental Reporting, Narragansett, Rhode Island.
- 2012 World Renewable Energy Forum, 2012 – Welcome Address and Introduction of Keynote Plenary Speakers. American Solar Energy Society, Denver.
- 2012 *Efficiency Vermont: A Successful Statewide Clean Energy Utility Model*. Presented at the 2012 Business of Clean Energy in Alaska Conference, Anchorage.
- 2011 Nova Scotia Feed In Tariff Forum: Invited speaker for two panels addressing Regional Coordination and Export Potential and International Feed-in Tariffs.
- 2011 *Integrating Renewable Energy and Efficiency Services*. Presentation to the Clean Energy States Alliance Fall 2011 Meeting, Washington, DC.
- 2010 *The Potential for Energy Efficiency and Renewables as Resources in Wholesale Capacity Markets*, Presentation at EUEC 2010 Conference, Phoenix, AZ.
- 2008 “Technology and Policy; Getting it Right.” Solar Power International, Invited panel speaker. San Diego, California.
- 2008 *Solar Market Transition in New Jersey: Promise and Progress towards Sustained Growth*. Solar 2008, American Solar Energy Society.
- 2008 *Review of Efficiency Vermont Administrative Structure and Experience*. Penn Future 2008 Clean Energy Conference, May 2008.
- 2006 *Scoping Analysis of Potential Photovoltaic Contributions Towards Offsetting Transmission System Upgrades in Southern Vermont*. Solar 2006, American Solar Energy Society.
- 2006 *Growing New Construction Markets for Photovoltaics: Recent Strategies and Activities from LIPA’s Solar Pioneer Program*. Solar 2006, American Solar Energy Society, 2006.
- 2005 *Market Response to Photovoltaic Incentive Offerings: An Analysis of Trends and Indicators*. Presented at the International Solar Energy Society Solar World Congress, 2005.

- 2003 *Solar Energy Value and Opportunities in Vermont*, Invited Session Panel Moderator and Speaker, 2nd Annual Power for a New Economy Conference, Burlington, Vermont, October 8, 2003. Renewable Energy Vermont.
- 2003 *Renewable Energy Case Studies: Redefining the Models, Refining the Messages, and Getting the Word Out*, Invited Session Panel Moderator, Solar 2003 National Solar Energy Conference, Austin, Texas June 22, 2003. American Solar Energy Society.
- 2002 *Transforming Markets for Customer Sited Clean Renewable Energy: Connecting Field Experience with Lessons from the Efficiency World*, Invited Session Panel Moderator, Solar 2002 National Solar Energy Conference, Reno, Nevada June 18, 2002. American Solar Energy Society.
- 1997 *IDENTIFY: Improving Industrial Energy Efficiency and Mitigating Global Climate Change*. Software and paper prepared for the United Nations Industrial Development Organization, presented at the 1997 ACEEE Summer Study on Energy Efficiency in Industry.
- 1997 *E2/FINANCE: A Software System for Evaluating Industrial Eco-Efficiency Opportunities*, sponsored by the U.S. Department of Energy. ACEEE 1997 Summer Study on Energy Efficiency in Industry.
- 1995 *Process Evaluation of Three Gas Utility Commercial Industrial Demand Side Programs*. Prepared for the Colonial Gas Company, and presented at ACEEE 1995 Summer Study on Energy Efficiency in Industry.

Selected Publications

- 2017 Smart Electric Power Alliance, 51st State Initiative, *Role of Utilities in the Transforming Energy Economy of the 51st State*, September 2017.
- 2016 *Vermont Solar Market Pathways: From a Developed to an Advanced Solar Economy*. A Phase II Roadmap document prepared for the *Smart Electric Power Alliance 51st State Initiative*.
- 2016 *Vermont Solar Market Pathways*, Vols. 1-4. U.S. Department of Energy, Sun Shot Initiative, Office of Energy Efficiency and Renewable Energy. Award DE-EE-0006911. www.Vermontsolarpathways.org.
- 2016 *Energy Efficiency Program Evaluation and Financing Needs Assessment*. Report prepared for the Alaska Energy Authority, May 2016.
- 2015 *Michigan Renewable Resource Assessment*. Final Report, prepared for the Michigan Public Service Commission Staff under agreement with the Clean Energy States Alliance. April 2015.
- 2012 *Renewable Energy Grant Recommendation Program: Process and Impact Evaluations*. Principal in Charge for comprehensive two-volume study. Alaska Energy Authority.
- 2011 "Solar in Nepal: Small Systems, Big Benefits." *Solar Today*. July / August 2011.
- 2011 "National Clean Energy Standard: Congress Needs to Design It Properly." Perspective with Shaun McGrath and Jeff Lyng. *Solar Today*. July / August 2011.
- 2010 "National RPS Now!" *Solar Today*. July / August 2010.
- 2009 "Carbon Regulation: What's the Most Effective Path?" *Solar Today*. June 2009.

- 2009 “Policy Recommendations for the 111th Congress: Tackling Climate Change and Creating a Green Economy.” Prepared by the American Solar Energy Society Policy Committee.
- 2008 “Pennsylvania Solar Assessment.” Final Report, November 25, 2008. Incorporated into American Council for an Energy-Efficient Economy, *Potential for Energy Efficiency, Demand Response, and Onsite Solar Energy in Pennsylvania*. ACEEE Report No. E093. Washington, DC: ACEEE, April 2009.
- 2008 “Solar Market Transition in New Jersey: Promise and Progress towards Sustained Growth.” *Proceedings of Solar 2008*, American Solar Energy Society.
- 2004 “Cost Effective Contributions to New York’s Greenhouse Gas Reduction Targets from Energy Efficiency and Renewable Energy Resources.” *Proceedings of 2004 ACEEE Summer Study on Energy Efficiency in Buildings*.
- 2002 “The Ten Percent Challenge: A Participatory Community Scale Climate Campaign.” *Proceedings of 2002 ACEEE Summer Study on Energy Efficiency in Buildings*. Volume 9, (with Tom Buckley, Jennifer Green, and Debra Sachs).
- 2000 “Implementing and Monitoring Community-Based Climate Action Plans.” *Proceedings of 2000 ACEEE Summer Study on Energy Efficiency in Buildings*. Volume 9, pp. 149-160 (with Tom Buckley, Mark Eldridge, Debra Sachs, and Abby Young).
- 1998 *Eco-Efficiency Financing Resource Directory*. Electronic web-site, and printed directory prepared for the Environmental Protection Agency, Region I, New England.

Regulatory and Other Governmental / NGO Documents

- 2000 – 2012 *New Jersey’s Clean Energy Programs – Honeywell Team Program Plans*. Led team on designing and implementing of Renewable Energy Program plans and initiatives. Many program plans and strategies for transition to market-based incentives.
- 1998 – 2008 *Long Island Power Authority’s Clean Energy Initiative*. Lead Technical and Senior Advisor on Renewable Energy Plans, including the Solar Pioneer Initiative and Residential Energy Efficiency Programs.
- 2000 *The Climate Action Plan: A Plan to Save Energy and Reduce Greenhouse Gas Emissions*, Lead author for the Burlington (Vermont) Climate Protection Task Force.
- 1998 *Home Weatherization Assistance Program Environmental Impact Analysis*. Prepared for the Ohio Department of Development, Office of Energy Efficiency.
- 1997 *Achieving Public Policy Objectives Under Retail Competition: The Role of Customer Aggregation*. Prepared for the Colorado Governor's Office of Energy Conservation.
- 1997 *IDENTIFY: Improving Industrial Energy Efficiency and Mitigating Global Climate Change*, software and paper. For the United Nations Industrial Development Organization.
- 1997 *Review of the Swaziland Energy Information System and Report on LEAP Training Activities*. Prepared for the Ministry of Natural Resources and Energy, Government Kingdom of Swaziland.

- 1996 *Evaluation of the IDB's Policies and Practices in Support of Renewable Energy and Energy Efficiency: A Report to the Inter-American Development Bank.* Brower and Company and Tellus Institute.
- 1996 *Action Plan for the Massachusetts' Industrial Services Program (ISP)*, prepared for the Sustainable Industries Initiative of the Corporation for Business Work and Learning.
- 1995 *Framework for National Energy Planning: Mission Report*, The Republic of Maldives. United Nations Department for Development Support and Management Services.
- 1994 *The SEI / UNEP Fuel Chain Project: Methods, Issues, and Case Studies in Developing Countries. Venezuela Case Study.*
- 1994 *Future Energy Requirements for Africa's Agriculture (Sudan Case Study).* Report to the African Development Bank by the UN Food and Agriculture Organization.
- 1994 Report to the Idaho Public Utility Commission on Suggested Cost Allowances for the Idaho Power Company's DSM Programs. Prepared for the Idaho Public Utilities Commission, Tellus Report No. 94-177.
- 1994 Review of Pennsylvania Electric Company's 1995 Demand Side Management Filing. Prepared for: Pennsylvania Office of Consumer Advocate. Tellus Study No. 94-071.
- 1994 Review of Union Electric Company's Electric Utility Resource Planning Compliance Filings. Prepared for: The Missouri Office of Public Counsel. Tellus Study No. 93-300.
- 1994 *Incorporating Environmental Externalities in Energy Decisions: A Guide for Energy Planners.* A Report to the Swedish International Development Agency. SEI-B Report No. 91-157.

Leadership

- 2017 – 2019 Energy Coop of Vermont, Board Member and Treasurer.
- 2013 Solar 2013, "Power Forward, Baltimore Maryland." Chair of Conference Advisory Committee responsible for recruiting and coordinating four main conference plenary sessions.
- 2012 – 2013 American Solar Energy Society (ASES), Chair of the Board.
- 2012 Policy Track Chair for the World Renewable Energy Forum, Denver, Colorado, May.
- 2009 – 2012 ASES Policy Committee, Board Member and Chair.
- 2007 Vermont Governor's Climate Change Committee, Member of the Plenary Working Group.
- 2000 – 2010 Renewable Energy Vermont, Founding Board Member, Past Board Chair.

Education

Ph.D., Energy Management and Policy Planning, University of Pennsylvania, Philadelphia, Pennsylvania (PA), 1993.

- Fulbright Scholar: Research on energy decision-making in rural Nepal, 1991 – 1993.

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Master's, Appropriate Technology and International Development, University of Pennsylvania, Philadelphia, PA, 1989.

B.A., Geography and Political Science, Middlebury College, Middlebury, VT, 1986.

Other Qualifications

Nepal, Himalayan Light Foundation. Installed solar lighting systems in 3 remote health clinics and 3 homes, 2010.

Advanced PV Installation certificate. Solar Energy International, 2010.

Peace Corps volunteer. Sierra Leone, 1984 – 1986.

Languages

- Nepali: ILR Level 3, speaking; ILR Level 2, reading
- Krio and Mende (Sierra Leone): ILR Level 2, speaking

Software competency

- LEAP (Low Emissions Analysis Platform), Stockholm Environment Institute. Former trainer and current Principal Investigator of team using scenario modeling on three projects.
- NREL System Advisor Model. Financial and technical modeling tool for renewable energy systems.