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October 4, 2021

Ms. Christine E. Long
Registrar
Ontario Energy Board
2300 Yonge Street, 27th Floor
Toronto, ON M4P 1E4
Registrar@oeb.ca

Dear Ms. Long:

**Re: Small Business Utility Alliance (SBUA) Appointment of Counsel and
Description of Proposed Expert Evidence
Enbridge Gas Inc. – Multi Year Demand Side Management Plan (2022-2027)
EB-2021-0002**

I write in connection with (a) the Small Business Utility Alliance (SBUA)'s appointment of legal counsel to represent it in this matter, and (b) its request to submit expert evidence concerning DSM programming selection and its impact on small businesses.

Appointment of legal counsel

SBUA has appointed as counsel to represent it in this proceeding:

Myriam Seers
Savoie Laporte LLP
2 Grange Place
Toronto, ON M5T 1Z5
416-886-7154
myriam.seers@savoielaporte.com

Daniel Ebady
Ebady Law
3080 Yonge Street, Suite 6060
Toronto, ON M4N 3N1
647-773-2006
daniel@ebadylaw.ca

James Birkelund
Energy and Environmental Law Group
475 Furnace St.
Lake Oswego, OR 97034

415-602-6223

james@birkelundlaw.com

We ask that the email distribution list be updated accordingly.

Request to submit expert evidence

Pursuant to Procedural Orders No. 3 and 4, SBUA proposes to submit expert evidence from Mr. Francis Wyatt, P.Eng. and Mr. Theodore Love of Green Energy Economics Group, Inc. Their CVs are provided together with this letter.

Mr. Wyatt is a civil engineer with over 28 years of experience in the energy efficiency field, during which he has reviewed, critiqued, analyzed and assisted with electric, gas and other fuels demand-side management program planning, design and implementation. He has particular expertise in the commercial and industrial sectors and cost-effectiveness screening and model development. He has developed several technical reference manuals for gas and electric savings. He has played key roles in developing several efficiency and renewable economically achievable potential studies. Mr. Wyatt has collected, analyzed, and compared the DSM spending and savings by sector from many jurisdictions over the last 27 years. Mr. Love is also an expert in energy efficiency who specializes in providing economic-based insights into the design, analysis and implementation of energy efficiency and distributed energy resource programs.

Their experience spans multiple jurisdictions in North America, including Nova Scotia, British Columbia, Ontario, Vermont, New Jersey, Pennsylvania, Wisconsin, Louisiana, Texas, the District of Columbia, Illinois, Oklahoma, Connecticut and Florida. Mr. Wyatt is currently a member of the Nova Scotia Utility and Review Board's DSM Advisory Group.

SBUA proposes to submit evidence from Mr. Wyatt and Mr. Love that is central to SBUA's interests in ensuring that the DSM programming that is selected benefits small businesses. The evidence that they propose to cover is as follows, organized according to the issues list set out in Procedural Order No. 3:

- Issue 2: Address the unique economic circumstances of small businesses and the barriers that exist for these customers' participation in DSM programs.
- Issue 3: Compare Enbridge's planned treatment of small businesses compared to other jurisdictions and industry best practices for serving small businesses in DSM programs.
- Issue 6: Address small businesses unique economic circumstances with appropriate incentive levels. Discuss the impacts of DSM programs on small businesses bills versus rates.
- Issues 8 and 9: Discuss the effect of the shareholder incentive on rates and bills. Discuss how the design of shareholder incentives, performance metrics and targets can affect the treatment of small businesses.
- Issue 10: Discuss the appropriateness of the proposed programs and whether small businesses would be adequately served. Compare the percentage of budget dollars

invested in resource acquisition programs with previous years' programs, and Enbridge's past experience in acquiring small business savings.

- Issue 13: Examine the cost-effectiveness inputs and assumptions for commercial programs. Compare the cost effectiveness to previous years' results and generally higher costs of acquiring gas savings for small businesses.
- Issue 16: Ensure coordination with electric programs. Maintain fuel neutrality and prepare customers for electrification.
- Issue 17: Stakeholder engagement plan as it relates to small businesses.

This proposed expert evidence does not overlap with the expert evidence that OEB staff intends to file, which is not specifically focused on the impact of DSM program choices on small businesses.

If permitted to submit evidence, SBUA, Mr. Wyatt and Mr. Love undertake to work cooperatively with the other intervenors and any other expert witnesses who are permitted to submit evidence to ensure that evidence is not duplicated and that synergies and efficiencies are achieved wherever possible.

SBUA estimates that the cost to produce this evidence will be approximately \$30,000.

We would be pleased to provide additional information about the proposed evidence as appropriate.

Yours truly,



Myriam Seers

Attach.

cc. James Birkelund
Daniel Elman
Intervenors in EB-2021-0002

RESUME

Francis E. Wyatt, P.E.
President, Green Energy Economics Group, Inc.
950 Button Hill Road, Cuttingsville, VT 05738
(802) 492-2239
fwyatt@GreenEnergyEconomics.com

Mr. Wyatt has over 28 years of experience in the energy efficiency field, during which he has reviewed, critiqued, analyzed, and assisted with electric, gas and other fuels demand-side management (DSM) program planning, design and implementation. He has particular expertise in the commercial and industrial sectors and cost-effectiveness screening and model development. Mr. Wyatt has developed several technical reference manuals for gas and electric savings. He has played key roles in developing several efficiency and renewable economically achievable potential studies. Mr. Wyatt has collected, analyzed, and compared the DSM spending and savings by sector from many jurisdictions over the last 27 years.

PROFESSIONAL EXPERIENCE

November 2005 – Present

President, Green Energy Economics Group, Inc., Cuttingsville, VT.

Consultancy specializing in energy-efficiency and renewable resource portfolios investing in electricity and gas savings, co-founded with John Plunkett, a co-worker since 1992. Develop cost-effectiveness screening models for program planning or project-specific analysis. Develop input assumptions for demand-side management programs cost-effectiveness screening. Work on analyses projecting economic and achievable energy-savings potentials. Plan, design and assist with implementation of efficiency programs.

1996 – 2005

Senior Analyst, Optimal Energy, Inc., Bristol, VT.

Developed state- or utility-specific cost-effectiveness screening models for program planning or implementation. Provide follow-up on-site training for using screening models. Develop demand-side management programs, including costs, savings, incentive structure and screening for cost-effectiveness. Focus on commercial and industrial programs and energy-saving measures. Review and critique of utility IRP filings in contested regulatory proceedings. Work on electric and gas analyses projecting technical, economic, and achievable energy-savings potentials. Developed electric energy and peak load profiles for a comprehensive list of residential and non-residential efficiency measures.

1992 – 1996

Analyst, Resource Insight, Inc., Middlebury, VT.

Reviewed, critiqued, and compared utility demand-side management programs. Analyses included program costs, energy impacts, customer participation, program descriptions, implementation, and comparison with other utility programs.

1989 – 1992

*Civil Engineer, **Enman Engineering**, Clarendon, VT.*

Designed sewage disposal systems, water systems, roads, site grading and storm drainage. Drafted plans using AutoCAD. Conducted preliminary site investigations and construction observations. Assisted clients with obtaining state and local permits.

1987 – 1989

*Civil Engineer, **Nowlan Engineering**, Ludlow, VT.*

Designed and drafted sewage disposal systems and water supply. Assisted clients with obtaining town and state permits for subdivisions, sewage disposal and water supply.

1984 – 1985

*Solar Engineer, **Environmental Solar Design**, N. Hollywood, CA.*

Designed solar hot water systems, purchased all parts for installations, obtained city permits, coordinated crews and customers for job installations, and installed solar hot water systems for commercial and residential customers.

EDUCATION

B.S., Agricultural Engineering, University of Missouri, Columbia, Missouri, 1982.

B.S., Agriculture, Agricultural Mechanization, University of Missouri, Columbia, Missouri, 1982.

Member, Tau Beta Pi, an honorary engineering society.

AFFILIATIONS

Professional Engineer in Civil/Sanitary, State of Vermont, Vermont Society of Professional Engineers.

HIGHLIGHTS OF PROJECT EXPERIENCE

ONGOING AND PAST ASSIGNMENTS (GEEG) – 2006-PRESENT

Nova Scotia

- Provided review and comments on proposed DSM portfolio and DSM potential study. Member of the DSM Advisory Group (DSMAG). Work is performed on behalf of the Consumer Advocate of Nova Scotia. 2019 - Present.

Vermont

- Reviewed and analyzed program proposals for the Community Energy & Efficiency Development Fund (CEED Fund), including the development of scoring and rebalancing mechanisms and reviewing and revising cost-effectiveness analyses for consistent

comparisons for innovative concepts not already addressed by conventional DSM programs. August 2012 – 2017.

- Cost-effectiveness screening model and analysis for 5-year investment of \$9 million Energy Efficiency Fund, supplementing Efficiency Vermont investment, on behalf of Green Mountain Power. February 2007 – 2010.
- Worked on development of the efficiency portions of the economic model used for assessing the options for meeting the reliability gap in the St. Albans region of Vermont for Green Mountain Power. 2013.
- Providing technical support for program planning, development and implementation for Efficiency Vermont, the world's first Energy Efficiency Utility, as part of multi-organizational enterprise operating under a contract with the Vermont Public Service Board to deliver statewide energy-efficiency programs for the customers of Vermont's twenty-one electric utilities. Cost-effectiveness screening tool development, maintenance and training. Technical support on program planning, including development of technical reference manual for efficiency measures. Developed energy and peak load profiles for residential and non-residential efficiency measures. Forecasting and bidding tool development for ISO New England forward capacity market. 2000 – 2014.
- Assist Vermont Gas Systems with transition to an energy efficiency utility. Represent VGS at multifamily and commercial benchmarking working group meetings. July 2015 – 2017.

New Jersey

- Participated in developing the analysis for electric and natural gas energy efficiency potential in New Jersey for the New Jersey Board of Public Utilities. 2019.

Pennsylvania

- Program design, implementation planning, regulatory support, technical reference manual development and portfolio and project cost-effectiveness tools for Philadelphia Gas Works. Assisted with testimonies before the Pennsylvania Public Utility Commission in Docket R-2009-2139884, December 2009 and April 2010 and Docket P-2014-2459362, 2015. August 2008 – present.
- Program design, implementation planning, regulatory support, technical reference manual development and portfolio and project cost-effectiveness tools for UGI Gas, including a CHP program. July 2015 – present.
- Energy efficiency program design and implementation assistance, including cost-effectiveness analysis and net-to-gross ratios for UGI Electric. July 2016 – present.
- High-level achievable potential analysis and subsequent portfolio design and cost-effectiveness analysis for Peoples Natural Gas of Pennsylvania. June 2017 – 2019.

- Provided energy-efficiency potential analysis and support on preparation of testimony regarding Peoples Gas of Pennsylvania. On behalf of Citizens for Pennsylvania's Future, July – September 2013.
- Analysis and assistance with direct and surrebuttal testimony for Citizens for Pennsylvania's Future (Pennfuture) on appropriate levels of efficiency portfolio investment in two rate cases before the Pennsylvania Public Utility Commission: Docket Nos. 00061366 and 00061367 re Metropolitan Edison Company and Pennsylvania Electric Company; and Docket No. R-00061346 re Duquesne Light Company. May - August 2006.

Wisconsin

- Portfolio and project cost-effectiveness calculator development. Cost-effectiveness analysis, assistance with contractor selection and regulatory support for 3-year energy-efficiency portfolio for Focus on Energy in Wisconsin. June 2011 – 2013.

Louisiana

- Empirical costs projections and cost-effectiveness analysis of alternative energy-efficiency resource acquisition scenarios for Entergy New Orleans, prepared for the Alliance for Affordable Energy and submitted as comments to the City Council. April-May 2013.

Minnesota

- Subcontractor to Optimal Energy Inc. for the state of Minnesota electric and gas potential studies for the Minnesota Department of Commerce, Division of Energy Resources. Developed agricultural measure characterizations. June 2017 - January 2018.

Texas

- Cost and savings analysis on proposed Public Utility Commission rules for utilities pursuing statutory DSM savings goals, on behalf of the Sierra Club. May-June 2012.
- Analysis of and report on achievable savings and costs for Austin City Council consumer advocate, "Energy Efficiency Resource Acquisition Options for Austin Energy." April 2012.

District of Columbia

- Developed multi-measure cost-effectiveness screening tool for the District of Columbia Sustainable Energy Utility, as a subcontractor to Vermont Energy Investment Corporation. November 2011 – 2014.

Illinois

- Portfolio and project cost-effectiveness calculator development. Cost-effectiveness analysis, assistance with contractor selection and regulatory support for 3-year energy-efficiency portfolio for Peoples Gas in Illinois. September 2008 – June 2012.

Oklahoma

- Energy efficiency potential analysis in support of comments on PUC rulemaking regarding DSM programs on behalf of the Sierra Club, December 2013 – January 2014.
- Analysis, technical assistance and testimony support on potential for energy-efficiency investment to substitute for fossil generation in proceedings before the Oklahoma Commerce Commission on behalf of the Sierra Club, May - December 2011.

Connecticut

- Analysis and testimony support regarding long-range energy-efficiency procurement plan of the Energy Conservation Management Board, on behalf of the Connecticut Office of Consumer Counsel. Fall 2008.

Florida

- Analysis and assistance with direct testimony on the effect of economically achievable energy efficiency on the need for new coal-fired generation, on behalf of the Sierra Club and other environmental intervenors, Florida Public Service Commission Docket No. 070098-EI. March-April 2007. The PSC denied the requested certificate of public good in June 2007.

British Columbia, Canada

- Analysis and testimony support on FortisBC Gas and FortisBC Electric long-term DSM plans, submitted to the British Columbia Utilities Commission, on behalf of the BC Sustainable Energy Association and Sierra Club (BC Chapter). December 2013 – May 2014.
- Analysis and testimony support on adequacy of BC Hydro's 2012-14 DSM Plan, submitted to the British Columbia Utilities Commission, BCUC Project No. 3698592, on behalf of the BC Sustainable Energy Association and Sierra Club (BC Chapter). August 2011 – May 2012.
- Analysis and testimony support on reasonableness of gas DSM Plan by Fortis Energy Utilities before the British Columbia Utilities Commission, BCUC Project No. 3698627, on behalf of the BC Sustainable Energy Association and Sierra Club (BC Chapter), May – November 2011.
- Analysis and testimony support on assessment of FortisBC Electric's long-term DSM plan, before the BCUC, on behalf of BCSEA/SCBC, August 2011 – March 2012.
- Analysis and support for direct testimony on assessment of BC Hydro's long-term DSM plan, before the BCUC, on behalf of the BC Sustainable Energy Association and Sierra Club Canada. November 2008 – March 2009. October 2011 –present.
- Analysis and support for direct testimony on assessment of Terasen Gas conservation plans before the BCUC, on behalf of the BC Sustainable Energy Association and Sierra Club Canada. October 2008.
- Provided analysis for direct testimony on energy-efficiency investment spending and savings, British Columbia Hydro and Power Authority, 2006 Integrated Electricity Plan and Long Term Acquisition Plan, Project No. 3698419; and F2007/F2008 Revenue Requirements Application, Project No. 3698416, on behalf of the Sierra Club of Canada (British Columbia Chapter), British

Columbia Sustainable Energy Association, and Peace Valley Environment Association. September 2006 – January 2007.

People's Republic of China

- Developed portfolio and project economic and financial analysis tools for use in China, and provided remote and in-person training sessions on use. For Natural Resources Defense Council and Institute for Sustainable Communities. August 2008 – September 2010.
- Conducted economic and financial analysis and report for factory efficiency retrofits for Guangdong Economic and Trade Commission, China, on behalf of the Institute for Sustainable Communities October 2007-2008.
- Developed and populated project and portfolio economic and financial models for a pre-feasibility analysis for the Asian Development Bank of a potential loan to support a \$100 million demonstration Efficiency Power Plant (EPP) project in Guangdong province, China, focusing on industrial, commercial and institutional retrofits. June 2006 – December 2007.
- Developed cost-effectiveness screening model and conducted benefit/cost analysis of efficiency program portfolios for Jiangsu province and Shanghai municipality, including assessment of 300-MW Efficiency Power Plants for prospectus by Asian Development Bank. Conducted economic and financial analyses and reports for factory efficiency retrofits Worked on behalf of the Natural Resources Defense Council. (July 2003 – 2008)

PRIOR ASSIGNMENTS (OPTIMAL ENERGY) – 1996-2005

- Developed DSM measure and program cost-effectiveness screening tools to be used by Massachusetts utilities and led training sessions for using the tool. Derived measure and program screening inputs for commercial and industrial programs considered by Boston Edison Company and Commonwealth Electric and Gas Company, for the Massachusetts Collaborative Non-Utility Parties. Developed cost-effectiveness protocols for measures to be installed in a small commercial retrofit program. Developed a custom measure cost-effectiveness and rebate-calculating tool. (1999 –2005)
- Developed DSM custom commercial and industrial measure cost-effectiveness and rebate-calculating screening tool for Cape Light Compact and NSTAR and led training sessions for using the tool. Derived measure screening inputs for commercial and industrial programs. (2003 – 2006)
- Developed cost-effectiveness screening model and assisted with analysis for assessment of economically achievable potential for distributed resources to solve a variety of transmission and distribution contingencies in the "southern loop" of Vermont, on behalf of the Vermont Electric Power Company and Central Vermont Public Service. (2005-2006)
- Part of team estimating the economic and achievable efficiency potentials for natural gas savings in New York State. Developed the portfolio cost-effectiveness screening model used in the analysis. Developed input assumptions for the commercial sector. Integrated the residential, commercial and industrial analyses. (July 2005 – March 2006)

- Developed demand-side management portfolio and project cost-effectiveness screening models for New Brunswick, Canada. Provided training on use of models. (2005-2006)
- Consultant to the Long Island Power Authority in developing and analyzing a portfolio of C&I market transformation and retrofit programs. The project included performance of measure and program level quantitative cost-effectiveness analysis and budgeting, relying on both primary and secondary data sources. Involved with follow-up implementation and evaluation planning tasks, including specific rebate levels, efficiency requirements, savings algorithms, and developing a custom measure cost-effectiveness and rebate-calculating tool. (1998 – 2006)
- Performed analysis of economically achievable potential for energy-efficiency resources to offset loss of output in the event of early retirement of the Indian Point nuclear generation station, on behalf of the National Academy of Sciences. (May-October 2005)
- Developed technical reference manual with savings algorithms and performed analysis for written testimony recommending energy-efficiency portfolio investment levels and savings goals in utility merger application before the Pennsylvania Public Utility Commission, Joint Application of PECO Energy Company and Public Service Electric and Gas Company for Approval of the Merger of Public Service Enterprise Group with and into Exelon Corporation, on behalf of the Pennfuture Parties. (June 2005)
- Consultant to the Northeast Energy Efficiency Partnerships, a regional nonprofit pursuing market transformation in efficiency markets. Developed demand-side management program cost-effectiveness screening model. Economic analysis and report on cost-effectiveness of NEEP initiatives involving C&I motors, C&I lighting, C&I HVAC, C&I New Construction, performance of existing C&I buildings, industrial efficiency, clothes washers, and residential lighting. Cost-effectiveness of codes and standards analyses. Estimated potential electricity savings for New England. (1998 – 2005)
- Provided review and advice on development of demand-side management project, program and portfolio cost-effectiveness software for BC Hydro (Canada). (2004)
- Contributed to commercial and industrial analysis for report on Opportunities for Accelerated Electrical Energy Efficiency in Quebec 2005 – 2012, on behalf of Regroupement National des Conseils Regionaux de L'environnement du Quebec, Regroupement des Organismes Environnementaux en Energie and Regroupement pour la Responsabilite Sociale des Entreprises. (April – May 2004)
- Developed cost-effectiveness screening model and screened agricultural efficiency measures for EnSave Energy Performance, Inc. (2004)
- Provided support for report on performance incentives for administrators of conservation and load management programs in Connecticut, on behalf of Connecticut Office of Consumer Counsel. (November – December 2003)

- Integration of industrial, commercial, residential, and renewable results; cost-effectiveness screening tool creation; and commercial analyses assessing technical, achievable and economic potential for energy-efficiency and renewable resources in New York State and five sub regions over 5, 10 and 20 years, on behalf of New York State Research and Development Authority. (January 2002 – August 2003)
- Integration of industrial, commercial, and residential results; cost-effectiveness screening tool creation; and commercial and industrial analyses projecting potential for demand-side resources to defer the need for major transmission upgrades, on behalf of Vermont Electric Power Company. (November 2001 – April 2003)
- Integration of industrial, commercial, and residential results; cost-effectiveness screening tool creation; and commercial and industrial analyses updating statewide projection of economically achievable efficiency potential for state of Vermont, on behalf of the Vermont Department of Public Service. (October 2001 – February 2003)
- Contributed to commercial and industrial analysis for report on potential for energy efficiency in Michigan, on behalf of the American Council for an Energy-Efficient Economy. (September – December 2002)
- Contributed to commercial and industrial analysis for report on potential for electrical efficiency savings in Maine, on behalf of the Maine Public Advocate. (July – October 2002)
- Consultant to the New Jersey Clean Energy Collaborative – developed the program cost-effectiveness screening model used for planning purposes, developed the commercial custom cost-effectiveness measure screening tool used in program implementation, and conducted program cost-effectiveness screening for the commercial and industrial efficiency programs (2000 – 2001)
- Provided support for the assessment of Centra/Union Gas (Canada) DSM programs, for the Green Energy Coalition. (1996)
- Provided technical support to the United Illuminating Company with its cost-effectiveness screening of proposed DSM programs. Developed cost-effectiveness screening tool and provided training on its use. Reviewed inputs and assured proper use of the screening tool. (1999)
- Characterization of efficiency resources, DSM program design, evaluation of program design and implementation procedures for Citizens Utilities Company. Developed commercial and industrial measure characterizations and savings algorithms. (1998 – 1999)
- Support to the Burlington (VT) Electric Department in development of its 1997 Energy Efficiency Plan. Services included program planning, measure characterization and program design. (1997)
- Contributed to the design, analysis and negotiation of commercial, industrial and residential core DSM programs for the state of Vermont, for the Vermont Department of Public Service. These core programs became the basis for Vermont's Efficiency Utility. Work included

establishing baseline efficiencies; estimates of energy-efficient measure costs, savings and participation; cost-effectiveness screening of measures and programs. (1995 – 1999)

- Developed rebate-calculating and cost-effectiveness spreadsheet for commercial comprehensive early HVAC retirement, for Potomac Electric Power Company. (1997)
- Reviewed measure and program screening of commercial, industrial and residential DSM programs, for the Maryland Office of People's Counsel. Offering suggestions for more accurate screening assumptions and improvements in program designs to increase cost-effectiveness. (1997)

PRIOR ASSIGNMENTS (RESOURCE INSIGHT) – 1992-1996

- Technical assistance on DSM program development in the Potomac Electric Power Company collaborative, for the Maryland Office of People's Counsel. Work included characterizing new energy-efficiency measures and screening for cost-effectiveness, primarily in the commercial sector. Contributed toward the development of baseline and minimum-qualifying efficiencies, and incentive structures. (1992 – 1997)
- Developed costs and savings of commercial and industrial DSM program enhancements for Florida Power Corporation, for the Legal Environmental Assistance Fund and Florida Power Corporation. (1996)
- Reviewed Jersey Central Power and Light's proposed commercial and industrial DSM programs, for the Mid-Atlantic Energy Project. Suggested specific improvements to programs. (1995 – 1996)
- Provided analysis used in negotiations with MidAmerican Energy Company on IRP and DSM program design issues, on behalf of the Iowa Office of Consumer Advocate. Contributed toward the development of innovative Comprehensive Early HVAC Retirement programs for the commercial market. Quantified all program impacts and costs, and performed economic analysis of the program. (1995)
- Contributed to development of commercial and industrial new construction and HVAC retirement programs for Interstate Power, on behalf of the Iowa Office of Consumer Advocate. Quantified measure and program projected impacts and costs. Support for revisions to Interstate Power's IRP filing to include the above programs. (1995)
- Provided analysis for a critical review of Florida Power and Light's integrated resource plan. This project involved assessing the completeness and appropriateness of FPL's IRP process and outcomes, focusing on the development, analysis and screening of its proposed commercial and industrial DSM programs, for the Legal Environmental Assistance Fund. (1995)
- Analysis and testimony regarding fuel-switching and other DSM program options. Before the Vermont Public Service Board Investigation into Least-Cost Investments, Energy Efficiency, Conservation and Management of Demand for Energy In Re: Fuel-Switching Issues Specific

to CVPS Docket 5270-CV-1 In Re: CVPS program designs Docket 5270-CV-3, for the Vermont Department of Public Service, (November 1994 – October 1995)

- Technical assistance analyzing need for power and DSM program changes. Delmarva Power & Light Company Dorchester Power Plant Certificate of Public Convenience and Necessity. Maryland PSC Case No. 8489, for the Maryland Office of People's Counsel. (January 1993)
- Estimated the economically achievable electrical efficiency savings for residential, commercial/industrial, lost-opportunity and retrofit markets in the United Kingdom, for the Conservation Law Foundation. (1993)
- Support for the quantification of costs, savings and cost effectiveness screening of a full portfolio of proposed demand-management programs for Ontario Hydro (Canada), for the Coalition of Environmental Groups. (1992)
- Provided technical assistance for determining DSM potential savings. In the matter of the application of the Detroit Edison Company for authority to amend its rate schedules governing the supply of electric energy and to amend other miscellaneous rates, for the Michigan United Conservation Clubs. Michigan PSC Case No. U-10102. (November 1992)

PRIOR ASSIGNMENTS (ENVIRONMENTAL SOLAR DESIGN) – 1984-1985

- Designed, permitted and installed solar hot water systems for commercial and residential customers. (1984-1985)

THEODORE M.
LOVE

2534 Downingsville Rd. | Lincoln, VT 05443
(919) 949 – 5906
tlove@greenenergyeconomics.com

Professional Experience

Green Energy Economics Group, Inc. – Cuttingsville, VT

<i>Partner</i>	2017 to Present
<i>Senior Associate and Data Scientist</i>	2013 to 2017
<i>Associate</i>	2010 to 2013
<i>Analyst</i>	2007 to 2010

For over 14 years, Theodore “Theo” Love has been providing economic-based insights into the design, analysis, and implementation of energy efficiency and distributed energy resource programs and portfolios in twelve states, three Canadian provinces, and China. He has a particular focus on EE/DER policy analysis, program design and implementation, cost-effectiveness testing, financing, and building scalable tools to analyze everything from individual projects to programs to portfolios.

Alter & Rosen, LLP –New York, NY

<i>Consultant</i>	2007 to 2010
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Managed the development of an online database management system for musical copyrights and brought on board paying beta users. Managed data entry, reporting, termination and reversion issues for transactions involving musical copyright catalogues valued at over \$100 million.

AllianceBernstein LP –White Plains, NY

<i>Client Reporting Analyst</i>	2006 to 2007
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Oversaw the monthly and quarterly report process for clients domiciled outside the United States. Increased by 150% the amount of accounts that met a fifth business day deadline. Transferred firm’s quarterly reporting process to new system.

Education

Clark University – Worcester, MA

B.A. Magna cum Laude, *Mathematics and Computer Science*, 2006.

Kansai Gaidai University: Hirakata City, Osaka Japan.

Study Abroad Program, Spring Semester 2005

General Assembly: New York City, NY

Data Science Intensive Course, 2015

Recent Project Experience

Green Energy Economics Group, Inc.

Economic and Policy Analysis

Small Business Utility Advocate - California

(June 2020 – Present)

- Performing data analysis of underserved small and medium business customers as part of the California Energy Efficiency Coordinating Committee (CAEECC) Underserved Working Group for Small and Medium Business (SMB).
- Prepared report and analysis of arrearages for small businesses due to COVID-19 and assisted with policy recommendations and comments on strategies to address COVID-19 related debt (Do. No. 21-01-014)
- Assisted with analysis and comments for ongoing docket on clean energy financing (Do. No. 20-08-022)
- Provided comments on program design of CleanPowerSF's Food Service Program (Do. No R13-11-05)

Gas Topic Committee Co-chair

Association of Energy Service Professionals (AESP)

(January 2019 – Present)

- Co-chair of the topic committee that oversees gas energy efficiency activity in North America. Leader of regular member calls and active participant in conference planning.

Economic and Policy Analysis

Consumer Advocate – Nova Scotia

(March 2019 – Present)

- Provided analysis and written testimony on Efficiency One's (E1) 2020 – 2022 DSM Plan (Matter No. M09096) as it relates to spending and savings levels, affordability, and allocation of funds in Matter No.
- Provided comments on the 2019 DSM Potential Study's economic analysis and projection assumptions and approach
- Member of DSM Advisory Group (DSMAG) on behalf of the Consumer Advocate of Nova Scotia to provide ongoing support

Development and Implementation of Energy Efficiency and Conservation Plans

UGI Utilities, Inc. – Pennsylvania

(June 2015 – Present)

Assist UGI Utilities, Inc. and PNG with the development and approval of Energy Efficiency and Conservation (EE&C) Plans for their UGI Gas PNG Gas, and UGI Electric divisions, including:

- Ongoing evaluation and portfolio planning activities for both UGI Gas and UGI Electric energy efficiency portfolios.
- Developing an achievable efficiency scenarios for UGI Gas and PNG Gas.
- Designing a five-year, \$27 million energy efficiency and conservation plan for UGI Gas. Submitting direct testimony on behalf of UGI Gas, Inc. on the design and implementation of the proposed plan (Docket No. R-2015-2518438)

- Designing a five-year \$15 million energy efficiency and conservation plan for PNG Gas. Submitting direct testimony on behalf of PNG Gas, Inc. on the design and implementation of the proposed plan (Docket No. R-2016-2580030)
- Assisting with the design and implementation and reporting of the UGI Electric's voluntary EE programs. Designing and assisting with approval for a five-year \$7.2 million electric energy efficiency and conservation plan (Docket No. M-2018-3004144)

Strategic Planning and Implementation of DSM Portfolio

Philadelphia Gas Work's (PGW) - Philadelphia, Pennsylvania (August 2008 – Present)

- Assisting with ongoing program planning and implementation of both the Low-Income Usage Reduction Plan (LIURP) and the market-rate DSM portfolio.
- Provided supporting testimony and analysis for the Phase III market-rate DSM plan under Docket No. P-2014-2459362.
- Designed Phase II plan with PGW and submitted direct testimony supporting the plan on behalf of PGW (Docket No. P-2014-2459362)
- Member of lead consulting team that aided in the design and approval of PGW's five-year, \$54 million portfolio of DSM programs;
- Providing ongoing technical assistance in the development of PGW's \$35 million Phase II five year plan.
- Providing ongoing technical support in program design and implementation, including the roll-out of six programs that, combined since inception, have saved 120,000 MMBtus at a cost of approximately \$17 million;
- Developed specifications for and currently collaborating with internal PGW staff on database system to track weatherization projects, rebate applications, and other information pertaining to PGW's DSM portfolio;
- Developed multiple Excel-based tools used by contractors to perform field audits, provide QA/QC, and track ongoing progress for contractors, programs, and the portfolio as a whole;
- Provided research and analysis support for multiple rounds of expert testimony before the Pennsylvania Public Utility Commission (Docket R-2009—2149884);
- Aided in the issuance of RFPs and selection of candidates for over \$40 million in contracts;
- Major contributor to PGW's ongoing formal reporting and evaluation process, including the issuance of five implementation plans, three annual reports, and two impact evaluations.

DSM Potential Studies in New York, New Jersey, and Pennsylvania

Optimal Energy, Inc. - Vermont (December 2018 – December 2019)

- Assisted Optimal Energy, Inc. with the development of measure assumptions and characterizations for statewide, electric and gas DSM potential studies.

Natural Gas Efficiency Options and EE&C Plan for Peoples Natural Gas

Peoples Natural Gas, Inc. – Pennsylvania (September 2017 – February 2019)

- Prepared report on program, sector, and portfolio-level cost and savings for 29 natural gas administrators in 11 States, and provided recommendations for potential natural gas DSM opportunities for Peoples Natural Gas
- Assist with stakeholder review process
- Developed five year \$42 million Energy Efficiency and Conservation (EE&C) Plan, and provided testimony to support the adoption of the Plan (ongoing).

Research on Leading Energy Efficiency Portfolios

Green Energy Economics Group - Vermont

(November 2007 – Present)

- Maintain research and proprietary analysis on actual and projected results from over a dozen electric and natural gas demand side management (DSM) portfolios throughout North America;

Analytic and Technical Support for DSM Tracking Systems

PECO Energy Company – Pennsylvania

(September 2016 – December 2017)

Commonwealth Edison Company – Illinois

(August 2017 – August 2018)

Companywide

(September 2020 – present)

- Subcontractor to ANB Systems Inc. to provide domain expertise and analytic support to rollout of enhanced tracking system.
- Developed dashboards and internal reports used by PECO's EM&V team, business planning, and various program and portfolio managers.
- Guided automation of PECO's six-month and annual reporting process.
- Provided expert guidance on the development of cost effectiveness calculation modules for clients in Pennsylvania and New Jersey

Technical Assistance for Energy Efficiency Program Planning

Green Mountain Power - Vermont

(August 2012 – July 2017)

- Developed multivariable regression model and framework to estimate the cost per kW to address a reliability gap in the St. Albans region with targeted energy efficiency.
- Reviewed and analyzed program proposals for the \$20 million Community Energy & Efficiency Development Fund (CEED Fund), including the development of scoring and rebalancing mechanisms;
- Analyzed dataset of 5,000 custom business projects to establish models used for future planning exercises.
- Prepared report on uncounted benefits of renewable generation sources for Vermont.

Analysis of Energy Efficiency in British Columbia

BC Sustainable Energy Association & Sierra Club BC, British Columbia (May 2011 – June 2014)

- Provided comments and energy efficiency opportunities report for proceedings on FortisBC Gas and Electric's long-term DSM plans in December of 2013.

- Assisted on research for direct testimony on reasonableness of gas DSM Plan by Fortis Energy Utilities before the British Columbia Utilities Commission, BCUC Project No. 3698627;
- Technical support on assessment of FortisBC Electric's long-term DSM plan and corresponding expert testimony;
- Assistance with direct testimony and technical support on assessment of BC Hydro's long-term DSM plan, before the BCUC.

Energy Efficiency Potential in Oklahoma

Sierra Club, *Oklahoma* (April 2011 – November 2011, December 2013 – January 2014)

- Provided updated report for energy efficiency in Oklahoma and additional comments on PUC rulemaking for electric and gas utility programs.
- Preparation of report on energy efficiency potential for Oklahoma;
- Assistance with research and drafting comments on the US regional haze Federal Implementation Plan for the State of Oklahoma;
- Research and formulation of energy efficiency potential projections provided as part of expert testimony for Oklahoma Gas & Electric's rate case before the Corporation Commission of Oklahoma, Cause No. PUD 201100087.

Technical Assistance for Energy Efficiency Programs

Focus on Energy - *Wisconsin*

(June 2011 – August 2013)

- Developed and customized cost-effectiveness calculators for Wisconsin's Focus on Energy portfolio of energy efficiency programs;
- Trained staff and other consultants on usage of tools and general economic analysis of energy efficiency programs;
- Provided QA/QC on cost-effectiveness analysis of 14 programs spending over \$160 million in two years.

Chicagoland Energy Efficiency Portfolio

People's Gas - *Chicago, Illinois*

(September 2008 – January 2013)

- Providing ongoing regulatory support;
- Provided cost-benefit analysis of various program scenarios and aided in the analysis of contractor bids;
- Customized excel-based portfolio and project cost-effectiveness tools to client's specifications.

Testimony Support for Expanding Gas Energy Efficiency in Pennsylvania

Citizens for Pennsylvania's Future, *Pennsylvania*

(July 2013 – September 2013)

- Provided support on preparation of testimony regarding Peoples Gas of Pennsylvania's DSM plans, including preparation of benchmarking report and alternative scenario projections.

Energy Efficiency Potential in Texas

Sierra Club, *Texas*

(May 2012 – August 2012)

- Research and development of alternative energy efficiency potential scenarios for the ten investor owned utilities (IOUs) in Texas;
- Development of comments for the Public Utility Commission of Texas;
- Development of presentation before the Energy Efficiency Incentive Program Committee.

Austin Energy's Energy Efficiency Potential

Austin City Council Consumer Advocate, *Austin, Texas*

(April 2012)

- Research and development of alternative energy efficiency potential scenarios for Austin Energy.

Nevada Power's Energy Efficiency Potential

Sierra Club, *Nevada*

(November 2011 – June 2012)

- Research on Nevada Power's Integrated Resource Plan (IRP) and development of alternative energy efficiency potential projections.

Comments on EmPower Maryland Programs

Sierra Club, *Maryland*

(September 2011 – October 2011)

- Research for and development of comments on EmPower Maryland's energy efficiency programs, including the development of alternative energy efficiency potential projections.

Ontario Power Authority Field Audit Support Tool

Green Communities Canada - *Ontario, Canada*

(January 2011 – May 2011)

- Collected and implemented specifications for updating the tool used by Ontario Power Authority's low-income program field agents to collect data and determine project net present values;
- Added custom features including customer input forms, saving and closing routines, and database file importing.

Energy Efficiency Potential in Arkansas

Sierra Club/Audubon Society, *Arkansas*

(September 2009 – March 2010)

- Research and drafting assistance for expert testimony on energy efficiency' as an alternative to the White Bluff Steam Electric Station before the Public Service Commission of Arkansas, Docket No. 09-024-U.

Training for NGOs Working on Energy Efficiency Projects in China

ISC and NRDC – *United States and China*

(August 2008 – September 2010)

- Developed training materials and provided remote and in-person training sessions on the economic and financial analysis of industrial retrofit projects for structuring and negotiating financial incentive offers to customers;
 - o Worked with the Institute for Sustainable Communities (ISC) to aid its efforts to promote energy efficiency in the Guangdong and Jiangsu Provinces (February 2009 – September 2010);

- Worked with the National Resource Defense Council (NRDC) to aid in its efforts in China, especially in conjunction with a \$100 million revolving loan fund from the Asia Development Bank (August 2008-January 2009).

Incentive Calculations for the Project Cost-effectiveness Analysis Tool (CAT)

Efficiency Vermont – Burlington, Vermont

(November 2008 – June 2010)

- Aided in the design of a new approach to calculating incentives for custom energy efficiency projects based on financing and reaching a desired rate of return;
- Modified CAT's cash-flow projection engine, an Excel VBA system, to accommodate the new approach to incentives.

Vermont's 20-year Forecast of Electricity Savings from Sustained Investment

Efficiency Vermont – Burlington, Vermont

(December 2008 – October 2009)

- Provided components of final report relating to long-term trends for the environment (climate change, land-use, and water-use), population growth, and governmental regulation;
- Provided additional technical support on electric demand-side savings potential.

Connecticut's Long Term Acquisition Plan

Connecticut Office of the Consumer Council – Connecticut

(August – October 2008)

- Provided research and support for expert testimony regarding long-range energy-efficiency procurement plan of the Energy Conservation Management Board, on behalf of the Connecticut Office of Consumer Counsel.

Energy Efficiency Plans of BC Hydro and Terasen Gas

BC Sustainable Energy Association and

The Sierra Club - British Columbia, Canada

(October 2008 – March 2009)

- Provided research and support for expert testimony and technical support on assessment of BC Hydro's long-term DSM plan, before the BCUC, on behalf of the BC Sustainable Energy Association and Sierra Club Canada (November 2008 – March 2009);
- Provided research and support for expert testimony on assessment of Terasen Gas conservation plans before the BCUC, on behalf of the BC Sustainable Energy Association and Sierra Club Canada (October 2008).

Testimony

1. **Pennsylvania Public Utility Commission (PUC)** P-2014-2459362, Petition of Philadelphia Gas Works for Approval of Demand-Side Management Plan for FY 2016-2020; Philadelphia Gas Works. May 2020.

Review and benchmarking of historical performance and review of planned program changes.

2. **Nova Scotia Utility and Review Board** Matter No. M09096, Efficiency 1 (E1) Application for Approval of 2020 – 2022 Demand Side Management (DSM) Resource Plan; The Consumer Advocate. May 28, 2019.

DSM Investment Levels and Affordability, Usage of Unspent Ratepayer Funding, Rate and Bill Impacts, Target Setting.

3. **Pennsylvania PUC** R-2018-3006814, UGI Gas Utilities Inc. – Gas Division, Rate Case; UGI Utilities Inc. – Gas Division. January 28, 2019.

Energy Efficiency & Conservation Plan and Total Resource Cost Implementation.

4. **Pennsylvania PUC** M-2018-3004144, Petition of UGI Utilities, Inc. – Electric Division for Approval of Phase III of Its Energy Efficiency and Conservation Plan; UGI Utilities, Inc. – Electric Division. August 21, 2018.

Electric energy efficiency and conservation plan development, projections, implementation, and EM&V.

5. **Pennsylvania PUC** M-2017-2640306, Petition of Peoples Natural Gas Company LLC for Approval of its Energy Efficiency and Conservation Plan; Peoples Natural Gas – Peoples Division, Peoples Natural Gas – Equitable Division; January 31, 2018.

Energy efficiency study, energy efficiency & conservation plan, and total resource cost implementation.

6. **Pennsylvania PUC** P-2016-2580030, UGI Penn Natural Gas, Inc. Rate Case; UGI Penn Natural Gas, Inc. January 2017.

Energy efficiency & conservation plan and total resource cost implementation.

7. **Pennsylvania PUC** P-2015-2518438, UGI Utilities, Inc.- Gas Division Rate Case; UGI Utilities, Inc. January 2016.

Energy efficiency & conservation plan and total resource cost implementation.

8. **Pennsylvania Public Utility Commission (PUC)** P-2014-2459362, Philadelphia Gas Works Demand-Side Management Plan for FY 2016-202; Philadelphia Gas Works. May 2015.

Analysis of Phase I DSM Plan and design of Phase II DSM Plan.

Publications

Love, Theodore. J. Nunley. "Using Smart Thermostats to Engage Residential Customers and Drive Comprehensive Retrofit Projects" In *Proceedings of the ACEEE 2020 Summer Study on Energy Efficiency in Buildings*, Washington, D.C.: American Council for an Energy Efficient Economy.

Love, Theodore. "The Future for Residential Gas Efficiency is Combined". *Strategies*. Association of Energy Service Professionals. January 11, 2019.

Love, Theodore. "Using Open Data to Predict Energy Usage: What tax lot data can tell us about energy usage intensity in New York City". *Behavior Energy, and Climate Change Conference 2015*. Sacramento, CA

Plunkett, John, Theodore Love, Francis Wyatt. "An Empirical Model for Predicting Electric Energy Efficiency Acquisition Costs in North America: Analysis and Application". In *Proceedings of the ACEEE 2012 Summer Study on Energy Efficiency in Buildings*, #906, Washington, D.C.: American Council for an Energy Efficient Economy.

Gold, Elliott, Marie-Claire Munnelly, Theodore Love, John Plunkett, Francis Wyatt. "Comprehensive and Cost-Effective: A Natural Gas Utility's Approach to Deep Natural Gas Retrofits for Low Income Customers." In *Proceedings of the ACEEE 2012 Summer Study on Energy Efficiency in Buildings*, #442, Washington, D.C.: American Council for an Energy Efficient Economy.