

## EB-2022-0295 : 1 : Francis Wyatt

COST CLAIM NUMBER 1794	SUBMISSION DEADLINE DATE December 12, 2023	CLAIM STATUS Approved by Finance
EB# EB-2022-0295: Initiatives: Policy Dev, CDM: Ontario Energy Board	OTHER EB#S	PHASE #* 1
INTERVENOR Wyatt, Francis; +1 (802) 492-2239 Fwyatt@GreenEnergyEconomics.com	INTERVENOR COMPANY* Green Energy Economics Group, Inc., Cuttingsville: Corporation	INTERVENOR TYPE Unregistered
HST RATE ONTARIO 0.00	EXCHANGE RATE	COUNTRY US
HST NUMBER	LATE SUBMISSION ALLOWED Yes	EXTENSION DEADLINE DATE December 13, 2023

### PARTICIPANTS

New	Non-Filing Participant First, Last Name	Filing Participant	Total (\$)	Total Hours	Participant Claim Status
No	,	Wyatt, Francis; +1 (802) 492-2239 Fwyatt@GreenEnergyEconomics.com	18,727.50	56.75	Submitted

### ATTACHMENTS

Attachment	Document Type	Import Message
GEEG EB-2022-0295 Cost Claim 121320231158.pdf		
GEEG EB-2022-0295 Cost Claim 121320231211.pdf		
F Wyatt Resume.pdf	CV	

TOTAL LEGAL/CONSULTANT/OTHER FEES 18,727.50	TOTAL DISBURSEMENTS 0.00	TOTAL HST 0.00
--	-----------------------------	-------------------

TOTAL CLAIM 18,727.50	TOTAL AMOUNT AWARDED
--------------------------	----------------------

TOTAL HOURS CLAIMED 56.75	TOTAL HOURS DISALLOWED
------------------------------	------------------------

REASON FOR DISALLOWANCE	REASON FOR DISALLOWANCE - 2	REASON FOR DISALLOWANCE - 3
----------------------------	--------------------------------	--------------------------------

MAKE CHEQUE PAYABLE TO  
Green Energy Economics Group, Inc.

SEND PAYMENT TO ADDRESS	ATTENTION
-------------------------	-----------

Cindy Kimball  
Kimball Office Services, Inc.  
21 Main Street  
Bristol, VT 05443

Cindy Kimball

SUBMIT SECTION

I am a representative of the Party. I have examined all of the documentation in support of this cost claim. The costs incurred and time spent are directly related to the Party's participation in the OEB Process referred to above.

This cost claim does not include any costs for work done, or time spent, by a person that is an employee or officer of the Party as described in section 6.05 and 6.09 of the OEB's Practice Direction on Cost Awards.

The information (fees and disbursements) filed in this cost claim is complete and accurate and in accordance with the OEB's Practice Direction for Cost Awards and Appendix A, the Cost Awards Tariff.

SUBMITTED BY  
Francis Wyatt

DATE SUBMITTED  
December 13, 2023

<b>CASE</b> EB-2022-0295: Initiatives: Policy Dev, CDM: Ontario Energy Board	<b>COST CLAIM</b> EB-2022-0295 : 1 : Francis Wyatt	<b>INTERVENOR NAME</b> Wyatt, Francis; +1 (802) 492-2239 Fwyatt@GreenEnergyEconomics.com	<b>PARTICIPANT CLAIM STATUS</b> Submitted
<b>FILING PARTICIPANT</b> Wyatt, Francis; +1 (802) 492-2239 Fwyatt@GreenEnergyEconomics.com	<b>NEW PARTICIPANT</b> No	<b>NON-FILING PARTICIPANT F. NAME</b>	<b>NON-FILING PARTICIPANT L. NAME</b>
<b>SERVICE PROVIDER TYPE*</b> Consultant	<b>YEAR CALLED TO BAR*</b>	<b>COMPLETED YEARS PRACTICING/YEARS OF RELEVANT EXPERIENCE*</b> 31	<b>HOURLY RATE</b> 330
<b>HST RATE CHARGED*</b> 0.00	<b>CV STATUS (FOR CONSULTANT/ANALYST)</b> CV Attached	<b>LAST CV DATE</b> December 13, 2023	<b>OVERRIDE HOURLY RATE</b> No
<b>HST NUMBER</b>	<b>HEARINGS</b> No	<b>CONSULTATIONS</b> Yes	<b>DISBURSEMENTS</b> No

---

# CONSULTATION

Consultation		Consultations		Consultations		Consultations	
Hours		Subtotal (\$)		Total Tax (\$)		Total (\$)	
56.75		18,727.50		0.00		18,727.50	
Description		Maximum Hours	Hours	Hourly Rate	Sub Total	HST Rate	Total
1	April 11/23 - SAG Meeting #1	5.00	3.75	330	1,237.50	0.00	1,237.50
2	April 26/23 - SAG Meeting #2	5.00	5.00	330	1,650.00	0.00	1,650.00
3	May 12/23 - SAG Meeting #3	3.75	3.50	330	1,155.00	0.00	1,155.00
4	May 19/23 - SAG Sub-Committee Meeting: Industrial Measure Characterization #1	1.50		330		0.00	
5	May 19/23 - SAG Sub-Committee Meeting: Residential Measure Characterization #1	2.25		330		0.00	
6	May 23/23 - Review and Comment: Residential Sub-Committee - Preliminary	1.00		330		0.00	
7	May 24/23 - SAG Meeting #4	4.13	3.50	330	1,155.00	0.00	1,155.00
8	May 26/23 - SAG Sub-Committee Meeting: Commercial Measure Characterization	1.50	1.50	330	495.00	0.00	495.00
9	May 26/23 - Review and Comment: Commercial Sub-Committee - Measure List	1.00	1.00	330	330.00	0.00	330.00
10	May 26/23 - Review and Comment: Industrial Sub-Committee - Measure List and Definitions (1st Round)	1.00		330		0.00	
11	June 2/23 - SAG Sub-Committee Meeting: Residential Measure Characterization #2	1.50		330		0.00	
12	June 2/23 - SAG Sub-Committee Meeting: Industrial Measure Characterization #2	1.50		330		0.00	
13	June 7/23 - Review and Comment: Residential Sub-Committee - Measure List and Definitions (1st Round)	1.00		330		0.00	
14	June 8/23 - SAG Meeting #5	3.75	3.50	330	1,155.00	0.00	1,155.00
15	June 9/23 - SAG Sub-Committee Meeting: Commercial Measure Characterization #2	1.50	1.50	330	495.00	0.00	495.00
16	June 13/23 - Review and Comment: Commercial Sub-Committee - Measure List and Definitions (2nd Round)	0.50	0.50	330	165.00	0.00	165.00
17	June 13/23 - Review and Comment: Industrial Sub-Committee - Measure List and Definitions (2nd Round)	0.50		330		0.00	
18	June 16/23 - SAG Sub-Committee Meeting: Residential Measure Characterization #3	1.50		330		0.00	
19	June 16/23 - SAG Sub-Committee Meeting: Industrial Measure Characterization #3	1.50		330		0.00	
20	June 22/23 - SAG Meeting #6	3.75	3.75	330	1,237.50	0.00	1,237.50
21	June 22/23 - Review and Comment: Commercial Sub-Committee - Measure List and Definitions (3rd Round)	0.50	0.50	330	165.00	0.00	165.00
22	June 23/23 - SAG Sub-Committee Meeting: Commercial Measure Characterization #3	1.50	1.50	330	495.00	0.00	495.00

	<u>Description</u>	<u>Maximum Hours</u>	<u>Hours</u>	<u>Hourly Rate</u>	<u>Sub Total</u>	<u>HST Rate</u>	<u>HST</u>	<u>Total</u>
23	Jul 6/23 - Review and Comment: Residential Sub-Committee - Measure List and Definitions (2nd Round)	1.00		330		0.00		
24	Jul 6/23 - Review and Comment: Commercial Sub-Committee - Measure List and Definitions (4th Round)	0.50	0.50	330	165.00	0.00		165.00
25	Jul 7/23 - Review/Comment: Industrial Sub-Committee - Measure Savings and Costs Batch #1 (1st Round)	1.00		330		0.00		
26	Jul 14/23 - SAG Sub-Committee Meeting: Industrial Savings Example	0.50		330		0.00		
27	Jul 19/23 - Review and Comment: Industrial Sub-Committee - Measure Savings Example	0.50		330		0.00		
28	Jul 24/23 - Review/Comment: Residential Sub-Committee - Measure Savings & Costs Batch #1 (1st Round)	1.00		330		0.00		
29	Jul 26/23 - SAG Meeting #7	3.00	3.00	330	990.00	0.00		990.00
30	Aug 1/23 - Review/Comment: Residential Sub-Committee - Measure Savings & Costs Batch #2 (1st Round)	1.00	0.25	330	82.50	0.00		82.50
31	Aug 2/23 - Review/Comment: Commercial Sub-Committee - Measure List & Definitions (5th Round)	1.00	1.00	330	330.00	0.00		330.00
32	Aug 14/23 - Review/Comment: Commercial Sub-Committee - Measure Savings & Costs Batch #1 (1st Round)	1.00	1.00	330	330.00	0.00		330.00
33	Aug 15/23 - Review and Comment: APS Incentive Approach	1.00	0.75	330	247.50	0.00		247.50
34	Aug 17/23 - SAG Meeting #8	3.75	3.00	330	990.00	0.00		990.00
35	Aug 23/23 - Review and Comment: APS Base Year Disaggregation & Reference Forecast	1.00	1.00	330	330.00	0.00		330.00
36	Aug 23/23: Review/Comment: Industrial Sub-Committee - Measure Savings & Costs Batch #1 (2nd Round)	0.50		330		0.00		
37	Aug 29/23: Review/Comment: Commercial Sub-Committee - Measure Savings and Costs Batch #1 (2nd Round)	1.00	1.00	330	330.00	0.00		330.00
38	Sept 5/23: Review and Comment: Industrial Sub-Committee - Measure Savings & Costs Batch #2	1.00		330		0.00		
39	Sept 9/23: Review and Comment: APS Avoided Costs	1.00	1.00	330	330.00	0.00		330.00
40	Sept 14/23: SAG Meeting #9	3.75	2.75	330	907.50	0.00		907.50
41	Sept 21/23: Review/Comment: Residential Sub-Committee - Measure Savings & Costs Batch #2 (2nd Round)	1.50		330		0.00		
42	Sept 28/23: SAG Meeting #10	3.75	3.75	330	1,237.50	0.00		1,237.50
43	Oct 12/23: SAG Meeting #11	1.50	1.50	330	495.00	0.00		495.00
44	Oct 18/23: Review and Comment: DSM Framework Considerations	1.50	1.50	330	495.00	0.00		495.00
45	Oct 23/23: Review/Comment:SAG Sub-Committee: Industrial:Savings,Applicability,Tech & Econ Potential	2.50		330		0.00		
46	Oct 25/23: SAG Sub-Committee Meeting: Measure Characterization Applicability Tutorial	2.25	2.25	330	742.50	0.00		742.50
47	Oct 26/23: SAG Meeting #12	3.75	2.50	330	825.00	0.00		825.00

	<u>Description</u>	<u>Maximum Hours</u>	<u>Hours</u>	<u>Hourly Rate</u>	<u>Sub Total</u>	<u>HST Rate</u>	<u>HST</u>	<u>Total</u>
48	Oct 27/23: Review and Comment: DSM Framework Considerations	1.50	0.50	330	165.00	0.00		165.00
49	Appendix B: Jul 10/23: EAC Meeting #1	1.50		330		0.00		
50	Appendix B: Jun 12/23: Review and Comment - EGI Industrial Process Evaluation Report	1.50		330		0.00		
51	Appendix B: Jun 20/23: Review and Comment - 2022 Annual Verification Work Plan	1.00		330		0.00		
52	Appendix B: Aug 3/23: EAC Meeting #2	1.50		330		0.00		
53	Appendix B: Aug 4/23: Review and Comment - FR Scope of Work #1	2.00		330		0.00		
54	Appendix B: Aug 25/23: Review and Comment - 2023-2025 EMV Plan	2.00		330		0.00		
55	Appendix B: Sept 13/23: EAC Meeting #3	2.25		330		0.00		
56	Appendix B: Sept 22/23: EAC Meeting #4	3.00		330		0.00		
57	Appendix B: Sept 27/23: Review and Comment - TRM Workplan	1.00		330		0.00		
58	Appendix B: Sept 29/23: Review and Comment - CPSV Scope of Work	1.50		330		0.00		
59	Appendix B: Oct 11/23: Review and Comment - Interview Guides, FR Scope of Work #2	2.00		330		0.00		
60	Appendix B: Oct 13/23: Review and Comment - FR Sample Design, Advance Letter	1.00		330		0.00		
61	Appendix B: Oct 24/23: EAC Meeting #5	2.25		330		0.00		
<b>Total Legal/Consultant Fees</b>			<b>56.75</b>		<b>18,727.50</b>		<b>0.00</b>	<b>18,727.50</b>

## Attachments

<u>Attachment</u>	<u>Document Type</u>	<u>Import Message</u>
GEEG Inv 2061 for OEB SAG EB 2022 0295.pdf	Time Docket and Invoice	
F Wyatt Resume.pdf	CV	

## Hearings, Consultations, Disbursements Attachments

<u>Attachment</u>	<u>Document Type</u>	<u>Claim Type</u>	<u>Import Message</u>
GEEG Inv 2061 for OEB SAG EB 2022 0295.pdf	Time Docket and Invoice	Consultations	
F Wyatt Resume.pdf	CV	Consultations	

Green Energy Economics Group, Inc.

**INVOICE**

TO : Ontario Energy Board

Invoice Number: 2161  
Invoice Date: December 12, 2023  
Job Name: EB-2022-0295

Terms: Net Due

Description of Services

Amount

For Services April 1, 2023 - October 31, 2023

<u>OEB Natural Gas DSM SAG</u>	<u>Hours</u>	<u>Hourly Rate (\$CAD)</u>	<u>Amount</u>
Francis Wyatt	56.75	\$ 330.00	\$18,727.50

**Total Due This Invoice**

**\$18,727.50 CAD**

Please remit payment:

Payable to:  
Green Energy Economics Group, Inc.  
950 Button Hill Road  
Cuttingsville, VT 05738

Federal EIN: 20-4044380

Mail to:  
Cindy Kimball  
Kimball Office Services, Inc.  
21 Main Street  
Bristol, VT 05443

Any questions or additional information needed please contact Francis Wyatt:  
(802) 492-2239, e-mail fwyatt@greenenergyeconomics.com

**INVOICE FOR CONSULTING SERVICES**  
**TO : Ontario Energy Board**

**Francis Wyatt**  
56.75 *Total hours*  
\$ 330.00 *Hourly consulting rate*  
\$ 18,727.50 *Total consulting charges*

No.	Date	Activity	Maximum Hours	Total for Cost Award	Actual Time	Date	Duration (hours)	Description
1	11-Apr-23	SAG Meeting #1	5	3.75	3.75	4/11/23	2.5	DSM SAG meeting 1.
						4/10/23		Review meeting materials. Sign Declaration and 1 Undertaking.
						4/14/23	0.25	TOR review and response.
2	26-Apr-23	SAG Meeting #2	5	5	5.25	4/26/23	2.75	DSM SAG meeting.
						4/25/23	2.5	Review docs for meeting 2.
3	12-May-23	SAG Meeting #3	3.75	3.5	3.5	5/12/23	2.5	SAG meeting.
						5/11/23	1	Review materials for SAG meeting.
7	24-May-23	SAG Meeting #4	4.125	3.5	3.5	5/24/23	2.75	SAG meeting.
						5/24/23	0.5	Review meeting materials and emails prior to SAG meeting.
						5/22/23	0.25	Comment on APS outputs.
8	26-May-23	SAG Sub-Committee Meeting: Commercial Measure Characterization #1	1.5	1.5	1.75	5/26/23	1.75	Commercial SAG meeting.
9	26-May-23	Review and Comment: Commercial Sub-Committee - Measure List and Definitions (First Round)	1	1	1	5/30/23	1	Review Commercial measures and other's comments.
14	8-Jun-23	SAG Meeting #5	3.75	3.5	3.5	6/8/23	2.5	OEB SAG Meeting.
						6/2/23	0.25	Review SAG notes, agenda and email comments.
						6/7/23	0.5	Review meeting agenda, notes from previous meeting and DSM decision references..
						6/20/23	0.25	SAG emails.
15	9-Jun-23	SAG Sub-Committee Meeting: Commercial Measure Characterization #2	1.5	1.5	1.75	6/9/23	1.25	Commercial SAG meeting.
						6/8/23	0.5	Review commercial measure list. Suggest additions.
16	13-Jun-23	Review and Comment: Commercial Sub-Committee - Measure List and Definitions (Second Round)	0.5	0.5	0.5	6/12/23	0.25	Review email re commercial measures. Review commercial measures.
						6/13/23	0.25	Review commercial measure list.
20	22-Jun-23	SAG Meeting #6	3.75	3.75	6	6/22/23	2.75	SAG mtg.
						6/21/23	2.25	Review mtg notes, agenda and emails in prep for tomorrow's mtg. Comments on APS methodology.
						6/26/23	0.75	Review TOR and Enbridge DSM R&D Plan.
						7/17/23	0.25	Provide comments on net-to-gross treatment.
21	22-Jun-23	Review and Comment: Commercial Sub-Committee - Measure List and Definitions (Third Round)	0.5	0.5	0.5	6/28/23	0.5	Review emails re commercial measures.
22	23-Jun-23	SAG Sub-Committee Meeting: Commercial Measure Characterization #3	1.5	1.5	1.5	6/23/23	1.5	Review commercial measures. Meeting canceled.
24	6-Jul-23	Review and Comment: Commercial Sub-Committee - Measure List and Definitions (Fourth Round)	0.5	0.5	0.5	7/7/23	0.25	Commercial measure emails.
						8/21/23	0.25	Commercial measures.
29	26-Jul-23	SAG Meeting #7	3	3	3	7/26/23	2	DSM SAG meeting. Comments on APS methodology.
						7/25/23	0.5	Review meeting agenda.
						7/27/23	0.5	Review residential measure list.
30	1-Aug-23	Review and Comment: Residential Sub-Committee - Measure Savings and Costs Batch #2 (First Round)	1	0.25	0.25	9/6/23	0.25	Review comments on residential measures.
31	2-Aug-23	Review and Comment: Commercial Sub-Committee - Measure List and Definitions (Fifth Round)	1	1	1	8/1/23	1	Review Guidehouse responses to Neme comments and commercial measure characterization matrix.
32	14-Aug-23	Review and Comment: Commercial Sub-Committee - Measure Savings and Costs Batch #1 (First Round)	1	1	1	8/2/23	1	Commercial measure and avoided costs emails.
33	15-Aug-23	Review and Comment: APS Incentive Approach	1	0.75	0.75	8/18/23	0.75	Emails re incentive approach and commercial measures.
34	17-Aug-23	SAG Meeting #8	3.75	3	3	8/17/23	2	DSM SAG mtg. and prep before.
						8/16/23	1	Review agenda, meeting notes, incentives doc, and emails in advance of SAG mtg.
35	23-Aug-23	Review and Comment: APS Base Year Disaggregation & Reference Forecast	1	1	1.25	9/6/23	1.25	Review Disaggregation and Reference forecast methodologies.
37	29-Aug-23	Review and Comment: Commercial Sub-Committee - Measure Savings and Costs Batch #1 (Second Round)	1	1	11.5	8/28/23	1	Commercial measure characterization review.
						9/6/23	3.5	Review commercial measures, batch 1 and comment on.
						9/19/23	2.5	Review commercial measure characterizations Batch 2.
						9/25/23	2	Commercial measure assumptions review.
						9/26/23	2.5	Commercial measure assumptions review.
39	9-Sep-23	Review and Comment: APS Avoided Costs	1	1	1.25	9/19/23	0.5	Review avoided cost emails.
						9/11/23	0.25	Review comments from other SAG members on avoided costs.
						9/27/23	0.5	Review avoided cost emails.
40	14-Sep-23	SAG Meeting #9	3.75	2.75	2.75	9/14/23	2.75	SAG mtg.
42	28-Sep-23	SAG Meeting #10	3.75	3.75	3.75	9/28/23	3.75	OEB SAG mtg. and review of agenda, notes, and schedule before.
43	12-Oct-23	SAG Meeting #11	1.5	1.5	1.5	10/12/23	1.5	Review agenda and Workplan proposal prior to meeting. SAG meeting.
44	18-Oct-23	Review and Comment: DSM Framework Considerations	1.5	1.5	1.5	10/20/23	0.25	Review comments on framework.
						10/23/23	0.25	Review comments on framework.
						10/24/23	1	Review commercial measure matrix. Review comments on framework. Framework comments.
46	25-Oct-23	SAG Sub-Committee Meeting: Measure Characterization Applicability Tutorial	2.25	2.25	2.25	10/25/23	2.25	Applicability intro session. Review materials before and after meeting.
47	26-Oct-23	SAG Meeting #12	3.75	2.5	2.5	10/26/23	2.5	SAG meeting.
48	27-Oct-23	Review and Comment: DSM Framework Considerations	1.5	0.5	0.5	10/25/23	0.5	Submit comments on Framework.
<b>Total Hours</b>			<b>64.125</b>	<b>56.75</b>	<b>70.75</b>		<b>70.75</b>	



# Francis E. Wyatt, P.E.

950 Button Hill Rd. | Cuttingsville, VT 05738  
tel: (802) 492 – 2239  
fwyatt@greenenergyeconomics.com



---

## 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.

---

## 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**

*Consumer Advocate of Nova Scotia*

- Provided review and comments on proposed DSM portfolio and DSM potential study. Member of the DSM Advisory Group (DSMAG). 2019 - Present.

#### **California**

*Small Business Utility Advocate*

- Provided testimony on the Energy Efficiency Business Plans for the 2024-2027 Portfolio and comments on staff proposal for gas energy efficiency incentives and codes and standards sub-programs and budgets (Do. No. 22-02-005)
- Provided 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)

#### **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 cost-effectiveness tool for Columbia Gas of Pennsylvania. Assisted with testimony before the Pennsylvania Public Utility Commission in Docket No. P-2014-2459362. February 2022 – Present.
- 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)

---

## **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.