

DR 41

STATE OF NEW HAMPSHIRE

CONSUMER ADVOCATE
D. Maurice Kreis

TDD Access: Relay NH
1-800-735-2964

ASSISTANT CONSUMER ADVOCATE
Pradip K. Chattopadhyay

Tel. (603) 271-1172



Website:
www.oca.nh.gov

OFFICE OF CONSUMER ADVOCATE

21 S. Fruit St., Suite 18
Concord, NH 03301-2441

September 5, 2017

The Honorable Neal M. Kurk, Chairman
Fiscal Committee of the General Court
State House
Concord, New Hampshire 03301

His Excellency, Governor Christopher T. Sununu
and the Honorable Council
State House
Concord, New Hampshire 03301

REQUESTED ACTION

Pursuant to RSA 363:28, III, authorize the Office of the Consumer Advocate (OCA) to enter into a contract with Optimal Energy, Inc. of 10600 Route 116, Hinesburg, VT 05461 (Vendor #209623) to provide expert services to support the OCA's participation in proceedings related to energy efficiency and grid modernization before the New Hampshire Public Utilities Commission in an amount not to exceed \$150,000 effective upon the date of Fiscal Committee and Governor and Council approvals through June 30, 2019.

Funds will be available in account 02-81-81-812010-50040000-046-500464, OCA Special Assessments:

<u>FY 2018</u>	<u>FY 2019</u>	<u>Total</u>
\$75,000	\$75,000	\$150,000

EXPLANATION

Beginning in the last quarter 2017, the New Hampshire Public Utilities Commission (PUC) will be making a series of decisions that will determine the future of ratepayer-funded energy efficiency programs and the modernization of the state's electricity grid. Specifically, the PUC will be reviewing a comprehensive filing from the state's electric and natural gas utilities setting forth their three-year plan for implementing the Energy Efficiency Resource Standard (EERS) approved by the PUC last year and scheduled to go into effect on January 1, 2018. On a somewhat more relaxed timeline, the PUC will also be acting on the recommendations filed earlier this year by its Grid Modernization Working Group. Among the recommendations are that each electric utility file for PUC approval a specific and detailed grid modernization plan.

These are highly technical issues of critical importance to the residential utility customers the OCA is tasked by statute with representing. The objective of the Energy Efficiency Resource Standard is “all cost-effective energy efficiency,” but determining, monitoring and verifying what is cost-effective requires expertise the staff of the OCA lacks. Similarly, the 21-year process of restructuring of New Hampshire’s electric industry (culminating with the planned divestiture of the remainder of the Public Service Company of New Hampshire generation portfolio) and the ongoing press of technological change (e.g., advanced meters, small-scale and local generation, energy storage devices, on-premises energy management systems) requires new approaches to rates and service so that consumers can take advantage of products and services offered by non-utilities on a competitive basis. Implementing this grid modernization process correctly requires technical insight the OCA does not have on Staff.

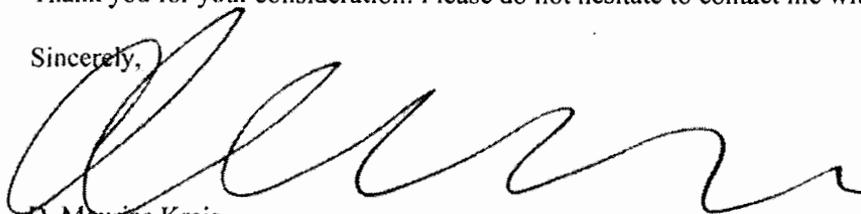
Accordingly, as with the ongoing net metering investigation opened by the PUC at the directive of the General Court, the OCA believes the upcoming energy efficiency and grid modernization proceedings are the sort of extraordinary and nonrecurring regulatory opportunities for which the “special assessment” process in our enabling statute (RSA 363:28) were enacted.

RFP Process and Selection

Accordingly, on July 10, 2017, the OCA issued a Request for Proposals (RFP) to consulting firms that work in the fields of utility regulation, energy efficiency and grid modernization, many of which were recommended by other Consumer Advocate offices around the country. The OCA also posted the RFP on our website. Five firms responded with proposals meeting the requirements of the RFP. Optimal Energy, Inc. proposed competitive hourly rates and access to expert staff under its employ or that of three subcontractors (Wired Group, Resource Insight, Inc. and Energy Futures Group, Inc.). The OCA chose Optimal as the winning bidder based on the combination of expertise, direct experience and competitive price. Information about Optimal Energy and its subcontractors is provided in Exhibit D.

Thank you for your consideration. Please do not hesitate to contact me with any questions or concerns.

Sincerely,

A large, stylized handwritten signature in black ink, appearing to read 'D. Maurice Kreis'.

D. Maurice Kreis
Consumer Advocate

363:28 Office of the Consumer Advocate. –

I. The office of the consumer advocate shall be an independent agency administratively attached to the public utilities commission pursuant to RSA 21-G:10. The office shall consist of the following:

(a) A consumer advocate, appointed by the governor and council, who shall be a qualified attorney admitted to practice in this state. The consumer advocate shall serve a 4-year term and until a successor is appointed and qualified.

(b) An assistant consumer advocate appointed by the consumer advocate, who shall be a full-time classified employee.

(c) A secretary appointed by the consumer advocate.

(d) Two additional staff people appointed by the consumer advocate. When filling these positions, the consumer advocate should consider appointing rate analysts or economists.

II. Except as pertains to any end user of an excepted local exchange carrier or services provided to such end user, the consumer advocate shall have the power and duty to petition for, initiate, appear or intervene in any proceeding concerning rates, charges, tariffs, and consumer services before any board, commission, agency, court, or regulatory body in which the interests of residential utility consumers are involved and to represent the interests of such residential utility consumers.

III. The consumer advocate shall have authority to contract for outside consultants within the limits of funds available to the office. *With the approval of the fiscal committee of the general court and the governor and council, the office of the consumer advocate may employ experts to assist it in proceedings before the public utilities commission, and may pay them reasonable compensation.* The public utilities commission shall charge a special assessment for any such amounts against any utility participating in such proceedings and shall provide for the timely recovery of such amounts for the affected utility.

IV. The consumer advocate shall have authority to promote and further consumer knowledge and education.

V. The consumer advocate shall publicize the Link-Up New Hampshire and Lifeline Telephone Assistance programs in order to increase public awareness and utilization of these programs.

VI. The filing party shall provide the consumer advocate with copies of all confidential information filed with the public utilities commission in adjudicative proceedings in which the consumer advocate is a participating party and the consumer advocate shall maintain the confidentiality of such information.

Criteria for Selection

(DK) D. Maurice Kreis, Consumer Advocate; (PC) Dr. Pradip Chattopadhyay, Assistant Consumer Advocate; (BB) Brian Buckley, Attorney; (JB) James Brennan, Finance Director

VENDOR :Energy Efficiency Institute, Inc.	Max Points	DK	PC	BB	JB	AVG
1. Qualifications, technical expertise, knowledge, and practical experience that the organization possesses, including that of the staff and any subcontractors assigned to the project, providing services directly relevant to grid modernization and energy efficiency.	30	15	20	12	19	16.5
2. Cost of consulting services and expenses, including the competitiveness of the proposed hourly rates and any proposed discounts or other cost-effective benefits. (The OCA reserves the right to negotiate lower fees or a different fee structure than proposed, with any selected firm(s).)	25	20	23	20	20	20.75
3. General experience and qualifications in providing similar services in New Hampshire as well as other states and to other ratepayer advocates or regulatory agencies, including similar current or prior engagements and the positions publicly advocated in connection with such engagements.	25	10	22	20	18	17.5
4. Availability and accessibility of staff assigned to project, including physical proximity to New Hampshire.	10	9	9	7	9	8.5
5. Overall responsiveness to the requirements of the RFP, including completeness, clarity and quality of the proposal.	10	5	5	5	5	5
Criteria Score	100	59	79	64	71	68.25

Criteria for Selection

(DK) D. Maurice Kreis, Consumer Advocate; (PC) Dr. Pradip Chattopadhyay, Assistant Consumer Advocate; (BB) Brian Buckley, Attorney; (JB) James Brennan, Finance Director

VENDOR : Strategen Consulting, LLC	Max Points	DK	PC	BB	JB	AVG
1. Qualifications, technical expertise, knowledge, and practical experience that the organization possesses, including that of the staff and any subcontractors assigned to the project, providing services directly relevant to grid modernization and energy efficiency.	30	25	28	24	26	25.75
2. Cost of consulting services and expenses, including the competitiveness of the proposed hourly rates and any proposed discounts or other cost-effective benefits. (The OCA reserves the right to negotiate lower fees or a different fee structure than proposed, with any selected firm(s).)	25	15	22	18	21	19
3. General experience and qualifications in providing similar services in New Hampshire as well as other states and to other ratepayer advocates or regulatory agencies, including similar current or prior engagements and the positions publicly advocated in connection with such engagements.	25	22	24	22	22	22.5
4. Availability and accessibility of staff assigned to project, including physical proximity to New Hampshire.	10	5	8	4	7	6
5. Overall responsiveness to the requirements of the RFP, including completeness, clarity and quality of the proposal.	10	9	10	9	9	9.25
Criteria Score	100	76	92	77	85	82.5

Criteria for Selection

(DK) D. Maurice Kreis, Consumer Advocate; (PC) Dr. Pradip Chattopadhyay, Assistant Consumer Advocate; (BB) Brian Buckley, Attorney; (JB) James Brennan, Finance Director

VENDOR : Exeter Associates, Inc.	Max Points	DK	PC	BB	JB	AVG
1. Qualifications, technical expertise, knowledge, and practical experience that the organization possesses, including that of the staff and any subcontractors assigned to the project, providing services directly relevant to grid modernization and energy efficiency.	30	20	24	18	21	20.75
2. Cost of consulting services and expenses, including the competitiveness of the proposed hourly rates and any proposed discounts or other cost-effective benefits. (The OCA reserves the right to negotiate lower fees or a different fee structure than proposed, with any selected firm(s).)	25	25	24	22	24	23.75
3. General experience and qualifications in providing similar services in New Hampshire as well as other states and to other ratepayer advocates or regulatory agencies, including similar current or prior engagements and the positions publicly advocated in connection with such engagements.	25	17	23	15	21	19
4. Availability and accessibility of staff assigned to project, including physical proximity to New Hampshire.	10	8	9	7	9	8.25
5. Overall responsiveness to the requirements of the RFP, including completeness, clarity and quality of the proposal.	10	10	8	5	9	8
Criteria Score	100	80	88	67	84	79.75

Criteria for Selection

(DK) D. Maurice Kreis, Consumer Advocate; (PC) Dr. Pradip Chattopadhyay, Assistant Consumer Advocate; (BB) Brian Buckley, Attorney; (JB) James Brennan, Finance Director

VENDOR : Optimal Energy, Inc.	Max Points	DK	PC	BB	JB	AVG
1. Qualifications, technical expertise, knowledge, and practical experience that the organization possesses, including that of the staff and any subcontractors assigned to the project, providing services directly relevant to grid modernization and energy efficiency.	30	30	29	28	29	29
2. Cost of consulting services and expenses, including the competitiveness of the proposed hourly rates and any proposed discounts or other cost-effective benefits. (The OCA reserves the right to negotiate lower fees or a different fee structure than proposed, with any selected firm(s).)	25	20	23	21	23	21.75
3. General experience and qualifications in providing similar services in New Hampshire as well as other states and to other ratepayer advocates or regulatory agencies, including similar current or prior engagements and the positions publicly advocated in connection with such engagements.	25	25	24	24	24	24.25
4. Availability and accessibility of staff assigned to project, including physical proximity to New Hampshire.	10	9	9	8	9	8.75
5. Overall responsiveness to the requirements of the RFP, including completeness, clarity and quality of the proposal.	10	9	10	8	9	9
Criteria Score	100	93	95	89	94	92.75

Criteria for Selection

(DK) D. Maurice Kreis, Consumer Advocate; (PC) Dr. Pradip Chattopadhyay, Assistant Consumer Advocate; (BB) Brian Buckley, Attorney; (JB) James Brennan, Finance Director

VENDOR : Synapse Energy Economics, Inc.	Max Points	DK	PC	BB	JB	AVG
1. Qualifications, technical expertise, knowledge, and practical experience that the organization possesses, including that of the staff and any subcontractors assigned to the project, providing services directly relevant to grid modernization and energy efficiency.	30	28	27	25	25	26.25
2. Cost of consulting services and expenses, including the competitiveness of the proposed hourly rates and any proposed discounts or other cost-effective benefits. (The OCA reserves the right to negotiate lower fees or a different fee structure than proposed, with any selected firm(s).)	25	20	22	21	22	21.25
3. General experience and qualifications in providing similar services in New Hampshire as well as other states and to other ratepayer advocates or regulatory agencies, including similar current or prior engagements and the positions publicly advocated in connection with such engagements.	25	25	23	22	22	23
4. Availability and accessibility of staff assigned to project, including physical proximity to New Hampshire.	10	9	10	8	9	9
5. Overall responsiveness to the requirements of the RFP, including completeness, clarity and quality of the proposal.	10	7	9	8	9	8.25
Criteria Score	100	89	91	84	87	87.75

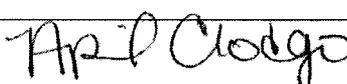
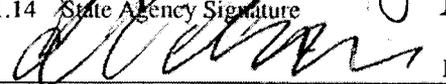
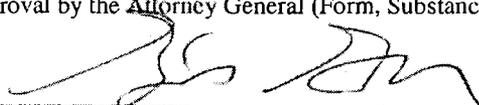
Notice: This agreement and all of its attachments shall become public upon submission to Governor and Executive Council for approval. Any information that is private, confidential or proprietary must be clearly identified to the agency and agreed to in writing prior to signing the contract.

AGREEMENT

The State of New Hampshire and the Contractor hereby mutually agree as follows:

GENERAL PROVISIONS

1. IDENTIFICATION.

1.1 State Agency Name NH Office of the Consumer Advocate		1.2 State Agency Address 21 South Fruit Street, Suite 18, Concord, NH 03301	
1.3 Contractor Name Optimal Energy, Inc.		1.4 Contractor Address 10600 Route 116 Suite 3, Hinesburg, VT 05461	
1.5 Contractor Phone Number 802-482-5610	1.6 Account Number 5004000-500464	1.7 Completion Date June 30, 2019	1.8 Price Limitation \$150,000
1.9 Contracting Officer for State Agency D. Maurice Kreis		1.10 State Agency Telephone Number 603-271-1174	
1.11 Contractor Signature 		1.12 Name and Title of Contractor Signatory Philip Mosenthal, President	
1.13 Acknowledgement: State of <u>VT</u> , County of <u>Addison</u> On <u>8/16/17</u> , before me the undersigned officer, personally appeared the person identified in block 1.12, or satisfactorily proven to be the person whose name is signed in block 1.11, and acknowledged that s/he executed this document in the capacity indicated in block 1.12.			
1.13.1 Signature of Notary Public or Justice of the Peace  [Seal]		April Clodgo	
1.13.2 Name and Title of Notary Public or Justice of the Peace April Clodgo, Notary			
1.14 State Agency Signature  Date: <u>9/5/2017</u>		1.15 Name and Title of State Agency Signatory D. MAURICE KREIS, CONSUMER ADVOCATE	
1.16 Approval by the N.H. Department of Administration, Division of Personnel (if applicable) By: <u>Sara Gullyhan</u> Director, On: <u>9-5-17</u>			
1.17 Approval by the Attorney General (Form, Substance and Execution) (if applicable) By:  On: <u>9-7-17</u>			
1.18 Approval by the Governor and Executive Council (if applicable) By: _____ On: _____			

2. EMPLOYMENT OF CONTRACTOR/SERVICES TO BE PERFORMED. The State of New Hampshire, acting through the agency identified in block 1.1 ("State"), engages contractor identified in block 1.3 ("Contractor") to perform, and the Contractor shall perform, the work or sale of goods, or both, identified and more particularly described in the attached EXHIBIT A which is incorporated herein by reference ("Services").

3. EFFECTIVE DATE/COMPLETION OF SERVICES.
3.1 Notwithstanding any provision of this Agreement to the contrary, and subject to the approval of the Governor and Executive Council of the State of New Hampshire, if applicable, this Agreement, and all obligations of the parties hereunder, shall become effective on the date the Governor and Executive Council approve this Agreement as indicated in block 1.18, unless no such approval is required, in which case the Agreement shall become effective on the date the Agreement is signed by the State Agency as shown in block 1.14 ("Effective Date").

3.2 If the Contractor commences the Services prior to the Effective Date, all Services performed by the Contractor prior to the Effective Date shall be performed at the sole risk of the Contractor, and in the event that this Agreement does not become effective, the State shall have no liability to the Contractor, including without limitation, any obligation to pay the Contractor for any costs incurred or Services performed. Contractor must complete all Services by the Completion Date specified in block 1.7.

4. CONDITIONAL NATURE OF AGREEMENT.
Notwithstanding any provision of this Agreement to the contrary, all obligations of the State hereunder, including, without limitation, the continuance of payments hereunder, are contingent upon the availability and continued appropriation of funds, and in no event shall the State be liable for any payments hereunder in excess of such available appropriated funds. In the event of a reduction or termination of appropriated funds, the State shall have the right to withhold payment until such funds become available, if ever, and shall have the right to terminate this Agreement immediately upon giving the Contractor notice of such termination. The State shall not be required to transfer funds from any other account to the Account identified in block 1.6 in the event funds in that Account are reduced or unavailable.

5. CONTRACT PRICE/PRICE LIMITATION/PAYMENT.

5.1 The contract price, method of payment, and terms of payment are identified and more particularly described in EXHIBIT B which is incorporated herein by reference.
5.2 The payment by the State of the contract price shall be the only and the complete reimbursement to the Contractor for all expenses, of whatever nature incurred by the Contractor in the performance hereof, and shall be the only and the complete compensation to the Contractor for the Services. The State shall have no liability to the Contractor other than the contract price.

5.3 The State reserves the right to offset from any amounts otherwise payable to the Contractor under this Agreement those liquidated amounts required or permitted by N.H. RSA 80:7 through RSA 80:7-c or any other provision of law.

5.4 Notwithstanding any provision in this Agreement to the contrary, and notwithstanding unexpected circumstances, in no event shall the total of all payments authorized, or actually made hereunder, exceed the Price Limitation set forth in block 1.8.

6. COMPLIANCE BY CONTRACTOR WITH LAWS AND REGULATIONS/ EQUAL EMPLOYMENT OPPORTUNITY.

6.1 In connection with the performance of the Services, the Contractor shall comply with all statutes, laws, regulations, and orders of federal, state, county or municipal authorities which impose any obligation or duty upon the Contractor, including, but not limited to, civil rights and equal opportunity laws. This may include the requirement to utilize auxiliary aids and services to ensure that persons with communication disabilities, including vision, hearing and speech, can communicate with, receive information from, and convey information to the Contractor. In addition, the Contractor shall comply with all applicable copyright laws.

6.2 During the term of this Agreement, the Contractor shall not discriminate against employees or applicants for employment because of race, color, religion, creed, age, sex, handicap, sexual orientation, or national origin and will take affirmative action to prevent such discrimination.

6.3 If this Agreement is funded in any part by monies of the United States, the Contractor shall comply with all the provisions of Executive Order No. 11246 ("Equal Employment Opportunity"), as supplemented by the regulations of the United States Department of Labor (41 C.F.R. Part 60), and with any rules, regulations and guidelines as the State of New Hampshire or the United States issue to implement these regulations. The Contractor further agrees to permit the State or United States access to any of the Contractor's books, records and accounts for the purpose of ascertaining compliance with all rules, regulations and orders, and the covenants, terms and conditions of this Agreement.

7. PERSONNEL.

7.1 The Contractor shall at its own expense provide all personnel necessary to perform the Services. The Contractor warrants that all personnel engaged in the Services shall be qualified to perform the Services, and shall be properly licensed and otherwise authorized to do so under all applicable laws.

7.2 Unless otherwise authorized in writing, during the term of this Agreement, and for a period of six (6) months after the Completion Date in block 1.7, the Contractor shall not hire, and shall not permit any subcontractor or other person, firm or corporation with whom it is engaged in a combined effort to perform the Services to hire, any person who is a State employee or official, who is materially involved in the procurement, administration or performance of this

Agreement. This provision shall survive termination of this Agreement.

7.3 The Contracting Officer specified in block 1.9, or his or her successor, shall be the State's representative. In the event of any dispute concerning the interpretation of this Agreement, the Contracting Officer's decision shall be final for the State.

8. EVENT OF DEFAULT/REMEDIES.

8.1 Any one or more of the following acts or omissions of the Contractor shall constitute an event of default hereunder ("Event of Default"):

8.1.1 failure to perform the Services satisfactorily or on schedule;

8.1.2 failure to submit any report required hereunder; and/or

8.1.3 failure to perform any other covenant, term or condition of this Agreement.

8.2 Upon the occurrence of any Event of Default, the State may take any one, or more, or all, of the following actions:

8.2.1 give the Contractor a written notice specifying the Event of Default and requiring it to be remedied within, in the absence of a greater or lesser specification of time, thirty (30) days from the date of the notice; and if the Event of Default is not timely remedied, terminate this Agreement, effective two (2) days after giving the Contractor notice of termination;

8.2.2 give the Contractor a written notice specifying the Event of Default and suspending all payments to be made under this Agreement and ordering that the portion of the contract price which would otherwise accrue to the Contractor during the period from the date of such notice until such time as the State determines that the Contractor has cured the Event of Default shall never be paid to the Contractor;

8.2.3 set off against any other obligations the State may owe to the Contractor any damages the State suffers by reason of any Event of Default; and/or

8.2.4 treat the Agreement as breached and pursue any of its remedies at law or in equity, or both.

9. DATA/ACCESS/CONFIDENTIALITY/PRESERVATION.

9.1 As used in this Agreement, the word "data" shall mean all information and things developed or obtained during the performance of, or acquired or developed by reason of, this Agreement, including, but not limited to, all studies, reports, files, formulae, surveys, maps, charts, sound recordings, video recordings, pictorial reproductions, drawings, analyses, graphic representations, computer programs, computer printouts, notes, letters, memoranda, papers, and documents, all whether finished or unfinished.

9.2 All data and any property which has been received from the State or purchased with funds provided for that purpose under this Agreement, shall be the property of the State, and shall be returned to the State upon demand or upon termination of this Agreement for any reason.

9.3 Confidentiality of data shall be governed by N.H. RSA chapter 91-A or other existing law. Disclosure of data requires prior written approval of the State.

10. TERMINATION. In the event of an early termination of this Agreement for any reason other than the completion of the Services, the Contractor shall deliver to the Contracting Officer, not later than fifteen (15) days after the date of termination, a report ("Termination Report") describing in detail all Services performed, and the contract price earned, to and including the date of termination. The form, subject matter, content, and number of copies of the Termination Report shall be identical to those of any Final Report described in the attached EXHIBIT A.

11. CONTRACTOR'S RELATION TO THE STATE. In the performance of this Agreement the Contractor is in all respects an independent contractor, and is neither an agent nor an employee of the State. Neither the Contractor nor any of its officers, employees, agents or members shall have authority to bind the State or receive any benefits, workers' compensation or other emoluments provided by the State to its employees.

12. ASSIGNMENT/DELEGATION/SUBCONTRACTS. The Contractor shall not assign, or otherwise transfer any interest in this Agreement without the prior written notice and consent of the State. None of the Services shall be subcontracted by the Contractor without the prior written notice and consent of the State.

13. INDEMNIFICATION. The Contractor shall defend, indemnify and hold harmless the State, its officers and employees, from and against any and all losses suffered by the State, its officers and employees, and any and all claims, liabilities or penalties asserted against the State, its officers and employees, by or on behalf of any person, on account of, based or resulting from, arising out of (or which may be claimed to arise out of) the acts or omissions of the Contractor. Notwithstanding the foregoing, nothing herein contained shall be deemed to constitute a waiver of the sovereign immunity of the State, which immunity is hereby reserved to the State. This covenant in paragraph 13 shall survive the termination of this Agreement.

14. INSURANCE.

14.1 The Contractor shall, at its sole expense, obtain and maintain in force, and shall require any subcontractor or assignee to obtain and maintain in force, the following insurance:

14.1.1 comprehensive general liability insurance against all claims of bodily injury, death or property damage, in amounts of not less than \$1,000,000 per occurrence and \$2,000,000 aggregate ; and

14.1.2 special cause of loss coverage form covering all property subject to subparagraph 9.2 herein, in an amount not less than 80% of the whole replacement value of the property.

14.2 The policies described in subparagraph 14.1 herein shall be on policy forms and endorsements approved for use in the State of New Hampshire by the N.H. Department of Insurance, and issued by insurers licensed in the State of New Hampshire.

14.3 The Contractor shall furnish to the Contracting Officer identified in block 1.9, or his or her successor, a certificate(s) of insurance for all insurance required under this Agreement. Contractor shall also furnish to the Contracting Officer identified in block 1.9, or his or her successor, certificate(s) of insurance for all renewal(s) of insurance required under this Agreement no later than thirty (30) days prior to the expiration date of each of the insurance policies. The certificate(s) of insurance and any renewals thereof shall be attached and are incorporated herein by reference. Each certificate(s) of insurance shall contain a clause requiring the insurer to provide the Contracting Officer identified in block 1.9, or his or her successor, no less than thirty (30) days prior written notice of cancellation or modification of the policy.

15. WORKERS' COMPENSATION.

15.1 By signing this agreement, the Contractor agrees, certifies and warrants that the Contractor is in compliance with or exempt from, the requirements of N.H. RSA chapter 281-A ("*Workers' Compensation*").

15.2 To the extent the Contractor is subject to the requirements of N.H. RSA chapter 281-A, Contractor shall maintain, and require any subcontractor or assignee to secure and maintain, payment of Workers' Compensation in connection with activities which the person proposes to undertake pursuant to this Agreement. Contractor shall furnish the Contracting Officer identified in block 1.9, or his or her successor, proof of Workers' Compensation in the manner described in N.H. RSA chapter 281-A and any applicable renewal(s) thereof, which shall be attached and are incorporated herein by reference. The State shall not be responsible for payment of any Workers' Compensation premiums or for any other claim or benefit for Contractor, or any subcontractor or employee of Contractor, which might arise under applicable State of New Hampshire Workers' Compensation laws in connection with the performance of the Services under this Agreement.

16. WAIVER OF BREACH. No failure by the State to enforce any provisions hereof after any Event of Default shall be deemed a waiver of its rights with regard to that Event of Default, or any subsequent Event of Default. No express failure to enforce any Event of Default shall be deemed a waiver of the right of the State to enforce each and all of the provisions hereof upon any further or other Event of Default on the part of the Contractor.

17. NOTICE. Any notice by a party hereto to the other party shall be deemed to have been duly delivered or given at the time of mailing by certified mail, postage prepaid, in a United States Post Office addressed to the parties at the addresses given in blocks 1.2 and 1.4, herein.

18. AMENDMENT. This Agreement may be amended, waived or discharged only by an instrument in writing signed by the parties hereto and only after approval of such amendment, waiver or discharge by the Governor and Executive Council of the State of New Hampshire unless no

such approval is required under the circumstances pursuant to State law, rule or policy.

19. CONSTRUCTION OF AGREEMENT AND TERMS.

This Agreement shall be construed in accordance with the laws of the State of New Hampshire, and is binding upon and inures to the benefit of the parties and their respective successors and assigns. The wording used in this Agreement is the wording chosen by the parties to express their mutual intent, and no rule of construction shall be applied against or in favor of any party.

20. THIRD PARTIES. The parties hereto do not intend to benefit any third parties and this Agreement shall not be construed to confer any such benefit.

21. HEADINGS. The headings throughout the Agreement are for reference purposes only, and the words contained therein shall in no way be held to explain, modify, amplify or aid in the interpretation, construction or meaning of the provisions of this Agreement.

22. SPECIAL PROVISIONS. Additional provisions set forth in the attached EXHIBIT C are incorporated herein by reference.

23. SEVERABILITY. In the event any of the provisions of this Agreement are held by a court of competent jurisdiction to be contrary to any state or federal law, the remaining provisions of this Agreement will remain in full force and effect.

24. ENTIRE AGREEMENT. This Agreement, which may be executed in a number of counterparts, each of which shall be deemed an original, constitutes the entire Agreement and understanding between the parties, and supersedes all prior Agreements and understandings relating hereto.

Contractor Initials

Date

Handwritten signature and date: 8/16/17

Exhibit A – Scope of Services

Optimal Energy, Inc. shall deliver services at the direction of and in a manner prescribed by the OCA in connection with proceedings at the Public Utilities Commission (PUC) related to energy efficiency and grid modernization. Those proceedings may include but shall not be limited to

- the docket to be opened by the PUC on or about September 1, 2017 and concluded by December 31, 2017 to consider the three-year plan from the state's electric and natural gas utilities for implementation of the Energy Efficiency Resource Standard (EERS) approved by the Commission in 2016 in Docket No. DE 15-137,
- subsequent proceedings to be conducted in 2018 and 2019 to adjust the plan and/or to consider issues not resolved by December 31, 2017,
- the docket to be opened by the PUC to consider the recommendations in the March 20, 2017 report of the Grid Modernization Working Group in Docket No. IR 15-296,
- subsequent dockets opened by the PUC to consider grid modernization plans of individual electric utilities, and
- dockets opened by the PUC to consider least-cost-integrated resource plans pursuant to RSA 378, to the extent these proceedings implicate issues related to grid modernization.

Deliverables may include but shall not be limited to

- Review and analysis of filings, focusing on the impacts of such filings and proposals on residential customers;
- Development of alternatives or revisions to utility proposals in the areas of rate design, energy efficiency program design, distribution system planning, grid modernization investments, performance incentives, cost allocation, and cost recovery;
- Assistance in the preparation of discovery requests related to the filings and the relief requested;
- Review and analysis of the companies' responses to discovery requests;
- Preparation of pre-filed written testimony;
- Responses to discovery requests on testimony;
- Review and analysis of rebuttal testimony, if any;
- Assistance with possible settlement discussions;
- Assistance with hearing preparation including drafting questions for cross examination;
- Attendance at technical sessions, settlement conferences and/or hearings;
- Assistance with the preparation of legal pleadings, including motions to compel responses to discovery requests and post-hearing briefs;
- Participation in task forces, working groups and committees when these become appropriate forums for presenting and discussing policy options.
- Other assistance as needed.

Specific tasks to be undertaken shall be approved in advance by the OCA.

Contractor Initials

Date

The signature is a stylized, cursive 'OEA'. The date is handwritten as '8/14/17'.

Exhibit B – Method of Payment

The hourly rates for the professional staff of Optimal Energy, Inc. and its subcontractors (Wired Group, Resource Insight, Inc. and Energy Futures Group, Inc.) are \$240 for principals Philip H. Mosenthal of Optimal, Jeffrey Loiter of Optimal, Paul L. Chernick Resource Insight and Jon Wallach of Resource Insight, \$235 for president Paul Alvarez of the Wired Group and senior consultant Dennis Stephens of the Wired Group, \$220 for associate Stacia Harper of Resource Insight, \$215 for principals Chris Neme of the Energy Futures Group and Glenn Reed of the Energy Futures Group as well as managing consultant Jim Grevatt of the Energy Futures Group, \$190 for senior consultants Gabrielle Stebbins of the Energy Futures Group and Chris Kramer of the Energy Futures Group, \$185 for analyst Simon Metcalf of Resource Insight, and \$152 for analyst Roo Harcourt of Optimal Energy. Optimal may substitute other personnel of comparable qualifications at the appropriate hourly rate only with the approval of the OCA.

Optimal shall be entitled to compensation for travel expenses actually incurred, with no mark-up, if approved in advance by the OCA. Mileage reimbursement shall be at the currently applicable rate adopted by the Internal Revenue Service.

The overall project budget shall be limited to \$150,000.

Contractor Initials 
Date 8/16/17

Exhibit C – Special Provisions

Item No. 12 of the Agreement is modified as follows:

With the approval of the OCA, for the purpose of employing certain expertise that would otherwise be unavailable Optimal Energy is authorized to subcontract portions of its work under this contract to the Wired Group, Resource Insight, Inc. and Energy Futures Group, Inc. It is expressly understood that, as contractor, Optimal Energy, Inc. shall be responsible for all work performed under this contract by its subcontractors. The provisions of Item No. 12 of the Agreement shall otherwise be applicable.

The insurance provisions of Item No. 14 of the Agreement are net with insurance as evidenced by the attached certificate of insurance.

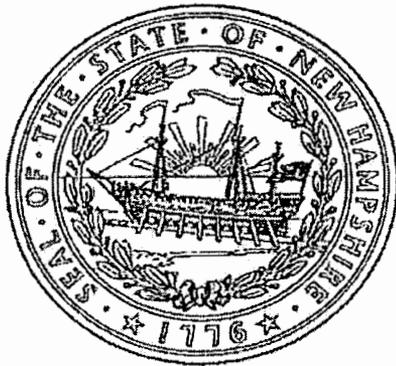
Contractor Initials 
Date 8/10/17

State of New Hampshire
Department of State

CERTIFICATE

I, William M. Gardner, Secretary of State of the State of New Hampshire, do hereby certify that OPTIMAL ENERGY, INC. is a Vermont Profit Corporation registered to transact business in New Hampshire on August 11, 2017. I further certify that all fees and documents required by the Secretary of State's office have been received and is in good standing as far as this office is concerned.

Business ID: 776678



IN TESTIMONY WHEREOF,
I hereto set my hand and cause to be affixed
the Seal of the State of New Hampshire,
this 25th day of August A.D. 2017.

A handwritten signature in cursive script, appearing to read "William M. Gardner".

William M. Gardner
Secretary of State

Corporate Resolution

I, Eric Belliveau, hereby certify that I am duly elected Clerk/Secretary of
(Name)
Optimal Energy, Inc.. I hereby certify the following is a true copy of a vote taken at
(Name of Corporation or LLC)

a meeting of the Board of Directors/shareholders, duly called and held on 8/31, 2017
at which a quorum of the Directors/shareholders were present and voting.

VOTED: That Philip Mosenthal, President is duly authorized to enter a
(Name and Title)

contract on behalf of Optimal Energy, Inc. with the
(Name of Corporation or LLC)

NH Office of the Consumer Advocate State of New Hampshire and further is
(Name of State Agency)

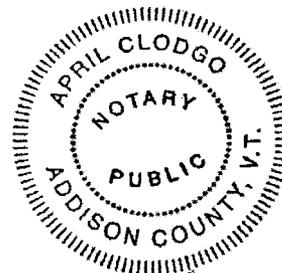
authorized to execute any documents which may in his/her judgment be
desirable or necessary to effect the purpose of this vote.

I hereby certify that said vote has not been amended or repealed and remains in full
force and effect as of the Aug. 28, 2017. I further certify that it is understood that the
State of New Hampshire will rely on this certificate as evidence that the person listed above
currently occupies the position indicated and that they have full authority to bind the
corporation to the specific contract indicated.

DATED: 8/28/17

ATTEST:


(Name & Title)







CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY)
08/30/2017

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER The Richards Group dba Holden Insurance 94 Court Street Middlebury VT 05753		CONTACT NAME: Patricia Keane PHONE (A/C, No, Ext): (802)388-4992 FAX (A/C, No): (802)388-9516 E-MAIL ADDRESS: pkeane@holdenvt.com															
INSURED Optimal Energy Inc 10600 Rte 116 Ste 3 Hinesburg VT 05461		INSURER(S) AFFORDING COVERAGE <table border="1"> <tr> <th>INSURER</th> <th>NAIC #</th> </tr> <tr> <td>INSURER A: Acadia Insurance Co</td> <td>31325</td> </tr> <tr> <td>INSURER B: Continental Western Ins Co</td> <td>10804</td> </tr> <tr> <td>INSURER C: AmGUARD Insurance</td> <td>42390</td> </tr> <tr> <td>INSURER D:</td> <td></td> </tr> <tr> <td>INSURER E:</td> <td></td> </tr> <tr> <td>INSURER F:</td> <td></td> </tr> </table>		INSURER	NAIC #	INSURER A: Acadia Insurance Co	31325	INSURER B: Continental Western Ins Co	10804	INSURER C: AmGUARD Insurance	42390	INSURER D:		INSURER E:		INSURER F:	
INSURER	NAIC #																
INSURER A: Acadia Insurance Co	31325																
INSURER B: Continental Western Ins Co	10804																
INSURER C: AmGUARD Insurance	42390																
INSURER D:																	
INSURER E:																	
INSURER F:																	

COVERAGES

CERTIFICATE NUMBER: CL1783021245

REVISION NUMBER:

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS
A	<input checked="" type="checkbox"/> COMMERCIAL GENERAL LIABILITY <input type="checkbox"/> CLAIMS-MADE <input checked="" type="checkbox"/> OCCUR GEN'L AGGREGATE LIMIT APPLIES PER: <input checked="" type="checkbox"/> POLICY <input type="checkbox"/> PRO-JECT <input type="checkbox"/> LOC OTHER:			CPA0140034-22	12/20/2016	12/20/2017	EACH OCCURRENCE \$ 1,000,000 DAMAGE TO RENTED PREMISES (Ea occurrence) \$ 300,000 MED EXP (Any one person) \$ 5,000 PERSONAL & ADV INJURY \$ 1,000,000 GENERAL AGGREGATE \$ 2,000,000 PRODUCTS - COMP/OP AGG \$ 2,000,000 \$
B	AUTOMOBILE LIABILITY <input type="checkbox"/> ANY AUTO <input type="checkbox"/> OWNED AUTOS ONLY <input checked="" type="checkbox"/> SCHEDULED AUTOS <input checked="" type="checkbox"/> HIRED AUTOS ONLY <input checked="" type="checkbox"/> NON-OWNED AUTOS ONLY			CAA0300469-19	12/20/2016	12/20/2017	COMBINED SINGLE LIMIT (Ea accident) \$ 1,000,000 BODILY INJURY (Per person) \$ BODILY INJURY (Per accident) \$ PROPERTY DAMAGE (Per accident) \$ Medical payments \$ 5,000
A	<input checked="" type="checkbox"/> UMBRELLA LIAB <input checked="" type="checkbox"/> OCCUR <input type="checkbox"/> EXCESS LIAB <input type="checkbox"/> CLAIMS-MADE DED <input checked="" type="checkbox"/> RETENTION \$ 0			CUA0312133-18	12/20/2016	12/20/2017	EACH OCCURRENCE \$ 4,000,000 AGGREGATE \$ 4,000,000 \$
C	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) If yes, describe under DESCRIPTION OF OPERATIONS below	Y/N	N/A	OPWC888573	05/01/2017	05/01/2018	<input checked="" type="checkbox"/> PER STATUTE <input checked="" type="checkbox"/> OTH-ER E.L. EACH ACCIDENT \$ 500,000 E.L. DISEASE - EA EMPLOYEE \$ 500,000 E.L. DISEASE - POLICY LIMIT \$ 500,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

CERTIFICATE HOLDER**CANCELLATION**

New Hampshire Office of the Consumer Advocate 21 South Fruit Street STE 18 Concord NH 03301	SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS. AUTHORIZED REPRESENTATIVE 
---	--

© 1988-2015 ACORD CORPORATION. All rights reserved.



PHILIP H. MOSENTHAL, PARTNER

Optimal Energy | 10600 Route 116, Suite 3 | Hinesburg, VT 05401 | 802-482-5607 | mosenthal@optenergy.com

PROFESSIONAL EXPERIENCE

Optimal Energy, Hinesburg, VT. *Founding Partner, 1996-present.*

Consult with electric and gas utilities, governments and other non-utility parties on energy efficiency, resource planning and regulatory issues. Develop strategies for achieving energy efficiency and least-cost resources, including administrator funding and incentive mechanisms, and program and market design and analysis.

Resource Insight, Inc., Middlebury, VT. *Senior Research Associate, 1995-1996.*

Consulted on DSM planning, program design, monitoring and evaluation, and resource characterization, specializing in the commercial and industrial sectors. Projects performed on behalf of utility and non-utility parties, in both cooperative settings and in contested regulatory proceedings.

Xenergy, Inc. (now DNV-GL), Allendale, NJ. *Chief Consultant, 1990-1995.*

Managed the consulting division for Xenergy's (now DNV-GL's) Research, Planning and Evaluation Group (RP&E) in its Mid-Atlantic Region. Responsibilities included direct utility consulting, as well as marketing, administration and staff management for RP&E. Consulting activities focused on assessment of DSM technology potential, DSM planning, program design and development, and process and impact evaluation for electric and gas utilities.

EDUCATION AND LICENSING

University of Pennsylvania, Philadelphia, PA

Master of Science, Energy Management and Policy, 1990

University of Pennsylvania, Philadelphia, PA

Bachelor of Arts, Design of the Environment, 1982

Pennsylvania State University, Ambler, PA

Certificate in Electrical Engineering, 1984

REPRESENTATIVE PROJECT EXPERIENCE

Massachusetts Energy Efficiency Advisory Council

Team Manager and senior advisor for the commercial and industrial programs and plans for Massachusetts, on behalf of the Massachusetts Energy Efficiency Advisory Council. Responsible for leading a team of consultants representing non-utility parties interests on the planning, design,

development, implementation and evaluation of all Massachusetts's utility programs, and a lead advisor specifically related to C&I sector issues. This project involves supporting the EEAC and utilities in developing and implementing a set of SBC-funded programs with the most aggressive savings goals in the U.S. (2006 – present)

Efficiency Vermont

Advisor on program design, development and planning for Efficiency Vermont, the world's first Energy Efficiency Utility, as part of multi-organizational enterprise operating under a \$30 million contract with the Vermont Public Service Board to deliver statewide energy-efficiency programs for the customers of Vermont's twenty-one electric utilities. Includes design, development and start-up of programs to serve the commercial, industrial, institutional and agricultural sectors in Vermont. (2000 – present)

Illinois Attorney General

Lead advisor for the Illinois Attorney General's Office on efficiency program planning, design, implementation, evaluation and general oversight of utility electric and gas efficiency programs throughout Illinois. Represent the IL AG in a stakeholder process with the utilities and other parties (2007 – present).

State Clean Energy Action Plans, EPA Clean Energy Partnership

Lead energy efficiency analysis, research and product development for EPA's Clean Energy Partnership with State and Local Governments to advance State Clean Energy Action Plans. Projects included development of a Clean Energy Fund Manual to guide state planners in development of Clean Energy Action Plans; development of an energy efficiency potential assessment guide as part of the EPA's National Action Plan on the use, value and performance of efficiency and renewable potential assessments; and development of multi-year plans for efficiency programs for Ohio Office of Energy Efficiency. For EPA (2006 – 2009)

New York State, Assessments and Program Design and Analysis

Manager of NY statewide electric, gas and petroleum efficiency and renewable energy resource assessments and program design and analysis. Responsible for coordinating large multidisciplinary teams to assess residential, commercial and industrial gas efficiency potential, and design and analyze a portfolio of efficiency programs to be delivered statewide. Multiple studies over a decade. For NYSERDA (2003 – present)

TESTIMONY

The following is a summary of Regulatory Testimony before State or Federal Regulatory Bodies for Philip H. Mosenthal.

Jurisdiction	Proceeding Number/Dates	On Behalf of	Nature of Testimony
Connecticut DPUC	Docket No. 03-01-01, October 2003	Connecticut Office of Consumer Counsel	Critical review of Connecticut investor owned utility electric efficiency programs and goals, and recommendation of adoption of more aggressive goals and a performance incentive mechanism to reward utility

			shareholders for exemplary performance.
Florida PSC	Docket Nos. 080407-EG thru 080413-(E.G.,, July 2009	Natural Resources Defense Council and Southern Alliance for Clean Energy	Review and Critique of 8 Florida utility DSM plans, goals, budgets and efficiency potential analyses.
Florida	Dockets 160186-EI, January 2017	Sierra Club	Petition for rate increase by Gulf Power Company
Florida	Docket 16-0170-EI January 2017	Sierra Club	Petition for approval of 2016 depreciation and dismantlement studies, approval of proposed depreciation rates and annual dismantlement accruals and Plan Smith Units 1 and 2 regulatory asset amortization, by Gulf Power Company
Illinois ICC	Docket No. 07-0539, December 2007	Illinois Office of Attorney General	Testimony on 2008 – 2011 DSM Plans of Central Illinois Light Company (dba AmerenCILCO). Testimony addresses recommendations for modification of DSM Plans, as well as issues related to cost recovery and evaluation and verification of savings.
Illinois ICC	Docket No. 07-0540, December 2007	Illinois Office of Attorney General	Testimony on 2008 – 2011 DSM Plans of Commonwealth Edison. Testimony addresses recommendations for modification of DSM Plans, as well as issues related to cost recovery and evaluation and verification of savings.
Illinois ICC	Docket No. 07-0541, December 2007	Illinois Office of Attorney General	Testimony on 2008 – 2011 DSM Plans of Illinois Department of Commerce and Economic Opportunity. Testimony addresses recommendations for modification of DSM Plans, as well as issues related to cost recovery and evaluation and verification of savings.
Illinois ICC	Docket No. 08-0519, October 2007	Illinois Office of Attorney General	Formal comments on the Illinois Power Agency Petition for Power Procurement Plan.
Illinois ICC	Docket No. 10-0568, November 2010	Illinois Office of Attorney General	Testimony on 2011 – 2014 DSM Plans of Central Illinois Light Company (dba AmerenCILCO), Central Illinois Public Service) Company, (dba AmerenCIPS) and Illinois Power Company (dba AmerenIP). Testimony addresses appropriateness of EE goals and budgets, recommendations for modification of DSM Plans, as well as issues related to state statutes, cost recovery and evaluation and verification of savings.

Illinois ICC	Docket No. 10-0570, November 2010	Illinois Office of Attorney General	Testimony on 2011 – 2014 DSM Plans of Commonwealth Edison. Testimony addresses appropriateness of EE savings goals and budgets, interpretation of state statutes, recommendations for modification of DSM Plans, as well as issues related to cost recovery and evaluation and verification of savings.
Illinois ICC	Docket No. 10-0562, November 2010	Illinois Office of Attorney General	Testimony on 2011 – 2014 DSM Plans of Northern Illinois Gas Company (dba Nicor Gas Company). Testimony addresses recommendations for modification of DSM Plans, appropriateness of EE savings goals and budgets and compliance with Illinois Statutes, as well as issues related to opt-out provisions, transportation gas customer treatment, integration of gas and electric programs, cost recovery and evaluation and verification of savings.
Illinois ICC	Docket No. 10-0564, November 2010	Illinois Office of Attorney General	Testimony on 2011 – 2014 DSM Plans of North Shore Gas Company and The Peoples Gas Light & Coke Company. Testimony addresses recommendations for modification of DSM Plans, appropriateness of EE savings goals and budgets and compliance with Illinois Statutes, as well as issues related to opt-out provisions, transportation gas customer treatment, integration of gas and electric programs, cost recovery and evaluation and verification of savings.
Illinois ICC	Docket No. 10-0519, September 2011	Illinois Office of Attorney General	Testimony on Ameren Illinois PY2 (2010-2011) compliance with savings goals pursuant to Section 8-103(f) of the Public Utilities Act.
Illinois ICC	Docket No. 11-0593 August 2011	Illinois Office of Attorney General	Direct testimony on ComEd program year 3 (2011-2012) compliance with savings goals pursuant to Section 8-103(f) of the Public Utilities Act.
Illinois ICC	Docket No. 11-0593 November 2011	Illinois Office of Attorney General	Rebuttal testimony on ComEd program year 3 (2011-2012) compliance with savings goals pursuant to Section 8-103(f) of the Public Utilities Act.
Illinois ICC	Docket No. 11-0689, February 2013	Illinois Office of Attorney General	Testimony comments regarding on-bill-financing legislation, plans and evaluation plans in compliance with Public Act 96-0033 and ICC Initiating Order

			11-0689.
Illinois ICC	Docket No. 11-0592 March 2013	Illinois Office of Attorney General	Rebuttal testimony on Ameren Illinois program year 3 (2011-2012) compliance with savings goals pursuant to Section 8-103(f) of the Public Utilities Act.
Illinois ICC	Docket No. 13-0498 October 2013	Illinois Office of Attorney General	Direct and Rebuttal testimony on Ameren Illinois Plan 3 (2014-2017) approval of the Energy Efficiency and Demand-Response Plan Pursuant to 220ILCS 5/8-103 and 220 ILCS 5/8-104.
Illinois ICC	Docket No. 13-0499 October 2013	Illinois Office of Attorney General	Direct and Rebuttal testimony on DCEO Plan 3 (2014-2017) approval of the Energy Efficiency and Demand-Response Plan Pursuant to 220ILCS 5/8-103 and 220 ILCS 5/8-104.
Illinois ICC	Docket No. 13-0495 November 2013	Illinois Office of Attorney General	Direct and Rebuttal testimony on Commonwealth Edison Plan 3 (2014-2017) approval of the Energy Efficiency and Demand-Response Plan Pursuant to 220ILCS 5/8-103.
Illinois ICC	Docket No. 13-0550 December 2013	Illinois Office of Attorney General	Direct testimony on Integrys Plan 2 (2014-2017) approval of the Energy Efficiency and Demand-Response Plan Pursuant to 220ILCS 5/8-104.
Illinois ICC	Docket No. 13-0549 January 2014	Illinois Office of Attorney General	Direct testimony on Nicor Plan 2 (2014-2017) approval of the Energy Efficiency and Demand-Response Plan Pursuant to 220ILCS 5/8-104.
Illinois ICC	Docket No. 16-0413 October 2016	Illinois Office of Attorney General	AMEREN ILLINOIS COMPANY Approval of the Energy Efficiency and Demand Response Plan Pursuant to 220 ILCS 5/8-103 and 220 ILCS 5/8-104
Illinois ICC	Docket No. 16-0420 October 2016	Illinois Office of Attorney General	COMMONWEALTH EDISON COMPANY Approval of the Energy Efficiency and Demand Response Plan Pursuant to Section 8-103(f) of the Public Utilities Act
Illinois ICC	Docket No. 16-0421 October 2016	Illinois Office of Attorney General	NORTHERN ILLINOIS GAS COMPANY Application Pursuant to Section 8-104 of the Public Utilities Act for Consent to and Approval of an Energy Efficiency Plan
Illinois ICC	Docket No. 16-0422 October 2016	Illinois Office of Attorney General	ILLINOIS DEPARTMENT OF COMMERCE AND ECONOMIC OPPORTUNITY Approval of its Energy Efficiency Portfolio and Plan Pursuant to Sections 8-103(e) and (f) And 8-104(e) and (f) of the Public Utilities Act

Illinois ICC	Docket No. 16-0466 December 2016	Illinois Office of Attorney General	North Shore Gas Company And The Peoples Gas Light and Coke Company Petition Pursuant to Section 8-104 of the Public Utilities Act to Submit an Energy Efficiency Plan
Illinois ICC	Docket No. 17-0311 July 2017	Illinois Office of Attorney General	Ameren Illinois Company Approval of the Energy Efficiency and Demand-Response Plan Pursuant to 220 ILCS 5/8-103B and 220 ILCS 5/8-104
Illinois ICC	Docket No. 17-0312 July 2017	Illinois Office of Attorney General	COMMONWEALTH EDISON COMPANY Approval of its Energy Efficiency and Demand Response Plan Pursuant to Section 8-103B of the Public Utilities Act
Indiana URC	Cause No. 43114 and No. 43114 SI, May 2007	Citizens Action Coalition of Indiana, Save the Valley Coalition, Valley Watch, Sierra Club	Testimony in Duke Energy and Vectren rate cases regarding the need for a new IGCC power plant. Addressed the achievable potential for electric efficiency in Duke Energy and Vectren's territories, the associated costs and benefits, and the reliability impact of efficiency on their electric systems as an alternative to the IGCC plant. Addressed the need for establishment of a utility performance incentive mechanism to provide incentives for pursuit of energy efficiency initiatives.
Mississippi PSC	Docket No. 2010-AD-2	Sierra Club	Order Establishing Docket to Investigate the Development and Implementation of Energy Efficiency Programs and Standards
Missouri PSC	File No. EO-2011- 0271, September 2011	Natural Resources Defense Council, Sierra Club, Renew Missouri, Mid- Missouri Peaceworks, Great Rivers Environmental Law Center	Direct and rebuttal testimony on Ameren's (dba as Union Electric Company) 2011 Utility Resource Filing pursuant to 4 CSR 240-Ch. 22 (IRP). Testimony addressed adequacy of IRP in terms of treatment of demand-side resources and integration of supply- and demand-side resources on an equal footing.
Missouri PSC	Case No. E)-2012-009, March 2012	Natural Resources Defense Council, Sierra Club, Renew Missouri	Testimony on KCP&L's DSM Plan filed pursuant to MEEIA. Testimony addressed regulatory framework for DSM, cost recovery, lost revenue recover, shareholder performance incentives, issues of tracking, counting and truing up savings over time, and program design issues.
Missouri PSC	Case No. EO-2012- 0142, April 2012	Natural Resources Defense Council,	Testimony on Ameren UE's DSM Plan filed pursuant to MEEIA. Testimony addressed

		Sierra Club, Renew Missouri	regulatory framework for DSM, cost recovery, lost revenue recover, shareholder performance incentives, issues of tracking, counting and truing up savings over time, and program design issues.
Missouri PSC	Case No. EO-2015-0084, February 2015	Natural Resources Defense Council	Filed formal comments on Ameren UE's 2014 Integrated Resource Plan, addressing DSM Efficiency potential, and the modeling and integration of efficiency resources with supply-side options.
Missouri PSC	Case No. EO-2015-0055, March 2015	Natural Resources Defense Council	Rebuttal testimony on Ameren UE's DSM Plan filed pursuant to MEEIA. Testimony addressed the efficiency potential and Ameren's program and portfolio plans, the regulatory framework for DSM, cost recovery, lost revenue recovery, shareholder performance incentives, issues of tracking, counting and truing up savings over time, and program design issues.
Missouri PSC	Case No. EO-2015-0055, April 2015	Natural Resources Defense Council	Surrebuttal testimony on Ameren UE's DSM Plan filed pursuant to MEEIA. Testimony addressed the efficiency potential and Ameren's program and portfolio plans, the regulatory framework for DSM, cost recovery, lost revenue recovery, shareholder performance incentives, issues of tracking, counting and truing up savings over time, and program design issues.
Missouri PSC	Case No. EO-2015-0252, August 2015	Natural Resources Defense Council	Filed formal KCP&L Greater Missouri Operations 2015 Integrated Resource Plan, addressing DSM Efficiency potential, and the modeling and integration of efficiency resources with supply-side options.
Missouri PSC	Case No. EO-2015-0254, August 2015	Natural Resources Defense Council	Filed formal comments on KCP&L Missouri 2015 Integrated Resource Plan, addressing DSM Efficiency potential, and the modeling and integration of efficiency resources with supply-side options.
Missouri PSC	Case No. EO-2015-0252 and EO-2015-0254, October- 2015	Natural Resources Defense Council	Filed formal reply comments on KCP&L Missouri and Greater Missouri Operations 2015 Integrated Resource Plan, addressing DSM Efficiency potential, and the modeling and integration of efficiency resources with supply-side options.
New York PSC	Case 06-G-1322, March 2007	Natural Resources Defense Council, PACE Energy Project,	Presented analysis of the natural gas efficiency potential in Con Edison service territory, the associated costs and benefits

		Association for Energy Affordability	to achieve it, and recommended funding levels and strategies to capture gas efficiency. Addressed the need for a revenue decoupling mechanism and performance incentives to overcome Con Edison disincentives to successfully administer efficiency programs.
Ontario Energy Board	EBRO 493/494, August 1996	Green Energy Coalition	Review and critique of Union Gas Company's 1997 DSM Plan
Ontario Energy Board	EBRO 487, 1998	Green Energy Coalition	Review and critique of Consumers Gas Company's 1999 DSM Plan
Texas Legislature	House Committee on Regulated Industries hearing on HB269, Feb. 2007	Public Citizen	Testimony on electric energy efficiency potential in Texas, reliability issues in ERCOT load zone, and benefits and costs of meeting new load growth with efficiency.
U.S. Nuclear Regulatory Commission	Docket Nos. 520912 & 52-013, May 2011	Sustainable Energy and Economic Development (SEED) Coalition, Public Citizen, South Texas Association for Responsible Energy	Direct and rebuttal testimony addressing the need for power to justify construction of South Texas Project Units 3 & 4 nuclear power plants, the accuracy of the electric forecast and analysis of future efficiency savings from codes and standards potential to avoid the need for new power.
Vermont PSB	Docket No. N/A, 1996	Vermont Department of Public Service	Critical review and recommendations on Green Mountain Power's (GMP) performance and plans for C&I New construction programs.
Vermont Legislature	Senate Natural Resources and Finance Committee hearings on S62, 1997	On behalf of the Committee	Testimony electric restructuring bill (S62) addressing the benefits and costs to Vermonters and potential environmental and consumer impacts.
Vermont PSB	Docket No. 5980, August 1997	Vermont Department of Public Service	Development and support of plan to establish a statewide energy efficiency utility (EEU), and present the efficiency programs and plans for the EEU.
Vermont PSB	Docket No. 5983, October 1997	Vermont Department of Public Service	Critique of GMP's analysis and decision to terminate its Small and Large Commercial and Industrial Retrofit Programs in 1994, in the context of Vermont regulatory requirements.
Vermont PSB	Docket No. 6018, February 1998	Vermont Department of Public Service	Testimony addressing cost recovery and lost revenue adjustments for CVPS's Small and Large C&I Retrofit Programs, and violations of agreements made in Dockets 5270 CV-1 & 3 and 5686 and in Dockets 5828 and 5835.

Vermont PSB	Docket No. 6107, September 1998	Vermont Department of Public Service	Critique of GMP's performance in delivery energy efficiency programs and appropriate cost recovery and lost revenue adjustments.
Vermont PSB	Docket No. 6120, October 1998	Vermont Department of Public Service	Review and critique of CVPS's DSM plans.
Vermont PSB	Docket No. 5980, May 1999	Vermont Department of Public Service	Phase 2: Present and defend modifications to the EEU efficiency plans.
Vermont PSB	Docket No. 6860, December 2003	Vermont Electric Power Company	Presentation and defense of Efficiency component of Vermont Electric Company's (VELCO) Transmission Integrated Resource Plan to assess the ability of efficiency to avoid or defer transmission upgrades.
Vermont Legislature	House Commerce Committee hearings on S. 52, April 2005	Efficiency Vermont	Testimony on aspects of s. 52, including the adoption of a VT renewable portfolio standard, inclusion of combined heat and power as eligible for funding under VT statewide electric energy efficiency programs, and mechanisms to allow large electric users to "opt-out" of energy efficiency utility funding surcharges.
Virginia SCC	Case No. PUE-2007-00066, November 2007	Southern Environmental Law Center	Testimony regarding the need for a new coal-fired power plant proposed by Dominion Virginia Power. Addressed the achievable potential for electric efficiency in Dominion's Virginia territory as an alternative to new coal-fired supply, and the associated costs and benefits of efficiency initiatives.



JEFFREY M. LOITER, PARTNER

Optimal Energy | 10600 Route 116, Suite 3 | Hinesburg, VT 05401 | 802-482-5610 | loiter@optenergy.com

PROFESSIONAL EXPERIENCE

Optimal Energy, Hinesburg, VT. *Partner*, 2015-present; *Managing Consultant*, 2006-2014.

As a Partner, Mr. Loiter is responsible for business development, administrative systems, and staff development in addition to project management. In addition, he provides quality control and editing for all of Optimal's client deliverables. His project work includes designing and developing statewide and utility-specific efficiency programs and supporting program implementation for both public and private-sector clients. He works primarily in the commercial sector on programs targeting electric, natural gas, and un-regulated fossil fuel consumption and specializes in developing solutions that fit the needs of specific customer segments and markets. Mr. Loiter is also an experienced analyst and uses these skills in a variety of contexts, such as reviewing and critiquing utility Integrated Resource Plans and efficiency potential studies.

Independent Consultant, Cambridge, MA, 2005-2006.

As an independent consultant for the Massachusetts Renewable Energy Trust SEED Initiative, Mr. Loiter evaluated renewable energy technology companies' applications for early-stage funding. Responsibilities included leading due diligence efforts on three applications and contributing to several others. Awards recommended for approval totaled \$1.4 million. For a separate client, prepared two articles describing the potential impact of proposed federal legislation to increase domestic oil refining capacity, published in *Petroleum Technology Quarterly* (1Q 2006) and *BCC Research/Energy Magazine* (2006).

Industrial Economics, Inc., Cambridge, MA. *Associate*, 1997-2000; *Senior Associate*, 2001-2004.

Managed multi-disciplinary qualitative and quantitative assessments of natural resource damages and environmental policy for clients such as NOAA, USFWS, USEPA, USDOJ, the National Park Service, the State of Indiana, and the United Nations.

URS Consultants, Inc., New Orleans & Boston., 1991-1995.

Prepared water, air, and solid and hazardous waste permit applications for state and federal agencies on behalf of industry clients.

EDUCATION

Massachusetts Institute of Technology, Cambridge, MA

Master of Science in Technology & Policy, 1997

Cornell University, Ithaca, NY

Bachelor of Science with distinction, Civil and Environmental Engineering, 1991

REPRESENTATIVE PROJECT EXPERIENCE

Delaware Department of Natural Resources and Environmental Control, Energy Efficiency Advisory Council Program Development and Support (2015-present)

Optimal Energy provides broad program planning, analysis, and strategic guidance to the Delaware Energy Efficiency Advisory Council as it begins developing a new model for joint utility and public-sector delivery of energy efficiency services, with the objective of dramatically increasing energy savings and demand reductions in that state. In support of the Council, Mr. Loiter drafted Council organizing documents and regulations specifying evaluation, measurement, and verification (EM&V) procedures and standards. He also provided the Council with proposed electric and gas energy savings targets as supported by an earlier potential study.

EPA State and Local Branch, EPA National Action Plan for Energy Efficiency (2008)

Prepared two documents for inclusion with EPA's National Action Plan for Energy Efficiency: a guidebook on conducting efficiency potential studies and a handbook describing the funding and administration of clean energy funds.

Connecticut Municipal Electric Energy Cooperative, Conservation and Load Management Consulting (2006-present)

Optimal has provided energy efficiency consulting services to the Connecticut Municipal Electric Energy Cooperative (CMEEC) since the inception of their conservation and load management programs. Mr. Loiter contributes to the full range of these services, including program planning, program savings analysis and reporting, developing incentive and delivery strategies, and managing CMEEC's participation in the ISO-NE Forward Capacity Market. The latter has included drafting M&V plans specifying procedures for meeting all ISO-specified M&V rules and developing a web-based data tracking and reporting system. Mr. Loiter also helps CMEEC develop strategy for and manage participation in new FCM auctions and arranges for required annual certification reviews.

Orange and Rockland Utilities, Energy Efficiency Program Consulting (2006-present)

Optimal Energy supports program implementation and on-going program design and development for Orange and Rockland Utilities, a subsidiary of Consolidated Edison, Inc. Mr. Loiter managed the preparation of a DSM plan and Commission filings for this client during the initial phases of the New York State Energy Efficiency Resource Standard. Prior to that, he led the commercial sector component of an electric and gas potential study for the utility, which included on-site customer audits and residential surveys.

New York State Department of Public Service, Generic Environmental Impact Statement and Supplement (2014-2016)

As part of proceedings on Reforming the Energy Vision (REV) and the Clean Energy Fund (CEF), Optimal contributed to a Generic Environmental Impact Statement (GEIS) by describing alternative energy supply resources, the potential scale of their use under two future scenarios, and the magnitude of possible negative environmental impacts that would result. Mr. Loiter led a team researching several technologies, including energy efficiency, customer-sited renewables, combined heat and power, alternative rate structures, and energy storage. The research led to estimates of the potential scale and impact of these solutions to New York's future energy challenges.

British Columbia Utility Commission, DSM Filing Technical Support (2012-2013)

In support of staff of the BCUC, Optimal Energy reviewed three utility filings related to DSM programs,

cost-recovery, and performance-based ratemaking. Mr. Loiter led a team that reviewed the filings, drafted interrogatories, and provided information regarding the appropriateness of program designs, measure-level costs and savings estimates, and cost-effectiveness inputs such as discount rates and avoided costs.

Maryland Energy Administration, EmPOWER Maryland Filing Reviews (2008-2009)

As part of efforts to reduce per-capita electric and natural gas under the 2008 EmPOWER Maryland Energy Efficiency Act, the Maryland Energy Administration was responsible for reviewing and commenting on utility-delivered energy efficiency programs and for designing and implementing its own state-wide efficiency portfolio. Mr. Loiter contributed to both of these efforts, appearing before the Public Service Commission on two occasions.

REPRESENTATIVE PUBLICATIONS

“Collaboration that Counts: The Role of State Energy Efficiency Stakeholder Councils,” (with D. Sosland, M. Guerard, and J. Schlegel), *2012 ACEEE Summer Study on Energy Efficiency in Buildings*, Pacific Grove, CA, August 2012.

“Persistence and Cost of Behavioral Programs,” presented at National Association of State Utility Consumer Advocates Mid-Year Meeting, Charleston, SC, June 2012.

“Impending EISA Lighting Standards: Impacts on Consumers and Energy Efficiency Lighting Programs,” presented at National Association of Regulatory Utility Commissioners Annual Meeting (with M. DiMascio), Atlanta, GA, November 2010.

“From Resource Acquisition to Relationships: How Energy Efficiency Initiatives Can Work Effectively with Large Commercial & Industrial Customers,” (with E. Belliveau, J. Kleinman, D. Gaherty, and G. Eaton), *2008 ACEEE Summer Study on Energy Efficiency in Buildings*, Pacific Grove, CA, August 2008.

National Action Plan for Energy Efficiency (2007). *Guide for Conducting Energy Efficiency Potential Studies*. Prepared by Philip Mosenthal and Jeff Loiter, Optimal Energy, Inc. December.

Loiter J.M and V. Norberg-Bohm (1999), “Technology policy and renewable energy: public roles in the development of new technologies,” *Energy Policy* Vol.27 no.85-97

TESTIMONY

The following is a summary of Regulatory Testimony before State or Federal Regulatory Bodies for Jeffrey M. Loiter.

Jurisdiction	Proceeding Number/Dates	On Behalf of	Nature of Testimony
Arkansas PSC	Docket No.06-154-U 27 July 2007	General Staff of the Arkansas Public Service Commission	Presentation of three efficiency scenarios for inclusion in modeling related to the need for a coal-fired power plant proposed by Southwestern Electric Power Company.
Kansas CC	Docket No. 10-KCPE-795-TAR 15 October 2010	Climate and Energy Project	Comment on design and cost of KCP&L proposed efficiency programs; identify additional program strategies
Kentucky PSC	2013-00259 13 January 2014	Sierra Club	Comment on application by East Kentucky Power Cooperative, Inc. for a CPCN related to environmental control retrofits at Cooper Generating Station
Ohio PUC	12-2190-EL-POR, 12-2191-EL-POR, 12-2192-EL-POR 5 October 2012	Sierra Club	Comment on FirstEnergy 2013-2015 Energy Efficiency and Peak Demand Reduction Program Portfolios
Virginia SCC	PUE-2009-00023 31 July 2009	Southern Environmental Law Center	Responses to questions posed by the SCC in evidentiary hearing related to achievable, cost-effective energy efficiency potential, the costs of these savings, and the distribution of savings across the state and by utility.
Virginia SCC	PUE-2011-00092 15 March 2012	Environmental Respondents	Critique and assessment of Dominion Virginia Power IRP
Virginia SCC	PUE-2011-00093 17 January 2012	Environmental Respondents	Comment on application for approval of Dominion Virginia Power DSM programs and associated spending
Virginia SCC	PUE-2012-00128 7 March 2013	Environmental Respondents	Comment on Dominion Virginia Power application for a CPCN for Brunswick natural gas-fired power station
Virginia SCC	PUE-2012-00100	Environmental	Dominion Virginia Power application for

	15 January 2013	Respondents	extension of DSM programs and an administrative approval process for DSM programs
Virginia SCC	PUE-2013-00072 28 January 2014	Environmental Respondents	Comment on application for approval of Dominion Virginia Power DSM programs and associated spending; comment on cost-effectiveness screening criteria
Virginia SCC	PUE-2013-00097 15 August 2014	Environmental Respondents	Comment on Updated Integrated Resource Plan filed by Appalachian Power Company
Virginia SCC	PUE-2014-00071 22 January 2015	Environmental Respondents	Dominion Petition for new demand-side management programs and for approval of two updated rate adjustment clauses
Virginia SCC	PUE-2014-00039 19 March 2015	Environmental Respondents	APCo approval to implement portfolio of EE program and approval of a rate adjustment clause
Virginia SCC	PUE-2015-00035 15 September 2015	Environmental Respondents	Dominion IRP filing
Virginia SCC	PUE-2015-00036 27 October 2015	Environmental Respondents	APCo IRP filing
West Virginia PSC	12-1571-E-PC 26 April 2013	Sierra Club	Comment on petition by FirstEnergy for approval of generation resource transaction
West Virginia PSC	12-1655-E-PC 18 June 2013	Sierra Club	Comment on petition by Appalachian Power for approval of generation resource transaction and related relief
West Virginia PSC	14-0546-E-PC 29 August 2014	Sierra Club	Comment on updated petition by Appalachian Power for approval of generation resource transaction and related relief
West Virginia PSC	15-0303-E-P 19 May 2015	Sierra Club	Comment on APCo/WPCo application for recovery of costs associated with EE/DR programs



GEORGE LAWRENCE, SENIOR CONSULTANT

Optimal Energy | 10600 Route 116, Suite 3 | Hinesburg, VT 05401 | 802-482-5630 | lawrence@optenergy.com

PROFESSIONAL EXPERIENCE

Optimal Energy, Hinesburg VT. Senior Consultant, 2014-present.

As a Senior Consultant, Mr. Lawrence focusses on commercial, institutional and industrial projects. His work primarily consists of providing technical advice on technologies and program implementation to multiple state energy efficiency advisory boards. Mr. Lawrence also provides expertise for the review of technical resource manuals and has managed the savings audit of a gas energy efficiency program.

Vermont Energy Investment Corporation, Burlington, VT. Consultant, 2011-2014.

Mr. Lawrence was the Lead Consultant for all commercial and industrial projects. In addition, Mr. Lawrence designed and helped implement a pilot Strategic Energy Management program for a cohort of industrial, institutional, and commercial customers in Vermont for Efficiency Vermont.

Efficiency Vermont, Burlington, VT. Planning and Development Manager, 2007-2011, Energy Consultant, 2006-2007.

As a Planning Manager, Mr. Lawrence was responsible for designing, implementing, and managing efficiency programs and customized Efficiency Vermont initiatives for the Ski Industry, K-12 Schools, Water and Wastewater, and Agricultural markets as well as for industrial users of compressed air.

As an Energy Consultant, Mr. Lawrence identified and quantified energy efficiency opportunities in commercial and industrial facilities, and then worked with corporate officers to negotiate incentives and to present the process improvement and financial arguments for doing efficiency projects.

The McKernon Group, Brandon, VT. Construction Sales, Green Building Products, 2004-2006.

As a Salesman, Mr. Lawrence managed sales of multiple lines of advanced construction materials such as insulating concrete forms and structural insulated panels.

Northern Power Systems, Waitsfield, VT. Sales Manager, 2000-2004.

As a Sales Manager, Mr. Lawrence managed domestic and international sales of renewable and fossil fuel powered energy systems that were used in extreme environments to provide reliable electricity.

Windstream Power Systems, Burlington, VT. Sales Manager, 1999-2000.

As a Sales Manager, Mr. Lawrence managed the sales of renewable energy power systems.

Self-Employed, Yearsley Construction, Addison, VT and Jackson, WY. General Contractor, Cabinetmaker and Shop Foreman, 1989-1999.

Mr. Lawrence spent a decade working in the construction industry, building homes, furniture, and cabinets in Vermont and Wyoming.

EDUCATION AND LICENSING

Middlebury College, Middlebury, VT

Bachelor of Arts, Physics, 1989

Institute for Energy Management Professionals

Certified Practitioner of Energy Management Systems - Industrial

Association of Energy Engineers

Certified Energy Manager

Association of Energy Engineers

Certified Energy Auditor

US Department of Energy

AIRMaster+ Compressed Air Specialist

REPRESENTATIVE PROJECT EXPERIENCE

Massachusetts Energy Efficiency Advisory Council, Technical Consulting Services (2014-present)

Optimal Energy serves as the lead technical consultant to the Massachusetts Energy Efficiency Advisory Council (MA EEAC) since its inception in 2006. Optimal's role includes representing the EEAC on all aspects of negotiating efficiency programs, plans, goals and budgets with the program administrators, and oversight of all program implementation and evaluation, monitoring and verification activities. Mr. Lawrence is the Commercial and Industrial (C&I) lead consultant. In this role, he led the effort to set appropriately aggressive C&I goals for the Massachusetts 2016-2018 three year energy efficiency plan. Additional tasks include review and analysis of evaluation reports and potential studies to help incorporate lessons learned into the programs. Mr. Lawrence also consults on program planning and design, program savings analysis and reporting; and developing incentive and delivery strategies.

Rhode Island Energy Resource Management Council, Technical Consulting for the Energy Resource Management Council (2011-present)

Optimal Energy has led the Technical Consultant team for the Rhode Island Energy Resource Management Council (ERMC) since its inception in 2006. Optimal Energy co-manages a team of consultants providing support on topics ranging from high-level policy and legislative issues down to the oversight of program implementation and infrastructure development. Optimal's role includes representing the ERMC on all aspects of negotiating efficiency programs, plans, goals and budgets with National Grid, the program administrator. We also provide oversight of all program implementation and evaluation, monitoring and verification activities. Mr. Lawrence is the C&I lead consultant and provides technical support to the Council. These services include consultation on program planning, program savings analysis and reporting, review of annual and three year plans, and developing incentive and delivery strategies. For 2016, Mr. Lawrence is leading the work to set appropriate C&I goals for the 2017-2018 three year plan.

Connecticut Energy Efficiency Board, Technical Consulting Services (2016-present)

Optimal Energy is part of a consortium of consultants who provide a range of technical expertise to the CT EEB on commercial and industrial energy efficiency programs and markets, residential programs and markets, evaluation, measurement and verification, financing, and demand issues. In this role, the consultants work with Eversource and United Illuminating, the Program Administrators, and the CT Department Energy and Environmental Protection (a key Council member) to provide the Council with information and advice. Mr. Lawrence is the C&I lead consultant and provides technical

support to the Council. These services include consultation on program planning, program savings analysis and reporting, review of three year plans, and developing incentive and delivery strategies.

Enbridge Gas Distribution, Evaluation Audit (2013-2015)

Optimal served as the EM&V auditor for all Enbridge Gas Systems evaluations for program years 2013 and 2014, on behalf of Enbridge and the Ontario Energy Board. This involved reviewing the processes and analyses used for the impact evaluation and making recommendations on ways to improve the programs, as well as developing realization rates for each program. Mr. Lawrence managed the completion of this audit process, and was responsible for the review of custom industrial projects.

Illinois Commerce Commission, Illinois Technical Resource Manual (2014)

When the Commerce Commission wanted a common statewide Technical Resource Manual (TRM) for all Illinois utility efficiency programs, they selected VEIC to manage the process to develop it. The process to create it included a dozen or so consultant teams, working for the utilities, to develop draft electric and gas measures. VEIC then reviewed the proposed measure characterizations, suggested changes, and then presented the draft measures along with the proposed changes to the IL Stakeholder Advisory Group. Sometimes the draft measure characterizations and algorithms were incomplete or needed a complete revision, so VEIC completed this work. VEIC also developed new set of full-load hours of use profiles for a range of building types and HVAC equipment for this TRM. While at VEIC, Mr. Lawrence was the C&I lead for development and review of the Illinois Statewide Technical Resource Manual. This involved the supervision of others to develop measure algorithms, development of some algorithms personally, and the management of the process to get stakeholder input and approval.

New York State Energy Research and Development Authority, Project Technical Review (2014-2015)

NYSERDA hired Optimal Energy in partnership with the Vermont Energy Investment Corporation to provide technical review and verification of custom projects enrolled in the Industrial and Process Efficiency and Existing Facilities programs. Optimal reviewed existing pre-project conditions through site visits, and reviewed and either verified or adjusted savings estimates. In some cases there were no savings estimates, so Optimal developed the savings estimates and made the recommendation for an incentive amount. After a project was completed, Optimal performed a second site visit and verified correct installation of equipment and confirmed or adjusted savings which informed a final incentive recommendation. While at VEIC and at Optimal, Mr. Lawrence managed the technical review of projects and the reports necessary to document site conditions pre and post project, detailed savings estimates and recommended incentives amounts. Mr. Lawrence also did some project review and site visits personally.

Commonwealth Edison Illinois, Market Penetration and Saturation Study (2013)

Commonwealth Edison wanted to look beyond a standard potential study to determine the efficient equipment and controls saturation for residential and commercial markets with respect to common end uses such as lighting and air conditioning. In addition, ComEd wanted to better understand how much energy is wasted by the result of human behavior, so ComEd hired a team comprised of Opinion Dynamics and VEIC to conduct the study. While at VEIC, Mr. Lawrence was responsible for leading the team that did the analysis of the C&I data.

Groton School, Comprehensive Recommendations for Greenhouse Gas Reduction (2012)

Groton School, a private prep school in Massachusetts, wanted to reduce carbon emissions from the central heating plant and all school owned faculty housing. In 2006 they chose a group of consultants led by Energy Futures Group to provide recommendations and to develop a spreadsheet tool to track

energy use as well as to quantify carbon emissions and reductions. Based on the recommendations in 2006, Groton took action and reduced carbon emissions by more than 40%. By 2012, Groton had completed almost all of the recommend actions from 2006, and wanted advice on ways to continue to reduce energy costs and carbon emissions. The same team of consultants went back to look for additional energy efficiency opportunities as well as the potential for installing renewable energy. While at VEIC, Mr. Lawrence led the effort to identify and quantify energy efficiency savings from the non-residential buildings on campus. This included a main building with classrooms, a dining hall with a commercial kitchen, dormitories, an athletic complex including a pool and two ice rinks, a wastewater processing facility, and a performance hall. Mr. Lawrence produced a set of recommendations for Groton such that they can continue on the path of carbon and energy usage reduction.

Iowa Environmental Council, Technical Resource Manual Review (2015, 2016)

The Iowa Environmental Council asked Energy Futures Group to review changes to the Iowa Technical Resource Manual (TRM) and provide feedback on the validity and accuracy of the measures and measure characterizations. Energy Futures group in turn asked Optimal Energy to review the commercial and industrial measures. Mr. Lawrence, with experience in the development and review of commercial and industrial measures for a TRM, reviewed and provided feedback on C&I measures in the Iowa TRM.



REBECCA (ROO) HARCOURT, ANALYST

Optimal Energy | 10600 Route 116, Suite 3 | Hinesburg, VT 05401 | 802-482-5640 | harcourt@optenergy.com

PROFESSIONAL EXPERIENCE

Optimal Energy, Hinesburg, VT. *Analyst*, 2016-present.

Ms. Harcourt provides research and analytical support to Optimal Energy’s efforts to promote energy efficiency, renewable energy, and healthy housing. She has experience with research and analysis of energy efficiency technology, energy savings, market conditions, and policies. Her project work includes assisting with research and assembly of grant applications and analytical support in the development and review of energy efficiency programs for Massachusetts Energy Efficiency Advisory Council, and Connecticut Energy Efficiency Board. Ms. Harcourt assists with producing deliverables such as written reports, memos, presentations, and tables.

Westaff, Burlington, VT. *Administrative Assistant*, September 2015-January 2016.

While at Westaff, Ms. Harcourt worked with two different companies to provide support on range of tasks, including creating and distributing program marketing materials for an employee wide wellness event within a hospital. She also organized network files and invoices, and drafted surveys.

Custom Prescription Shoppe, South Burlington, VT. *Lab Technician*, January 2015–July 2015.

Ms. Harcourt was one of two technicians working in a small compounding pharmacy. She made custom medication to meet the needs of people and animals requiring treatment that is not commercially accessible. She also handled administrative tasks such as ordering supplies and customer service.

EDUCATION

University of Vermont, Burlington, VT

Bachelor of Science, Neuroscience, May 2015

PROFESSIONAL ACTIVITIES AND MEMBERSHIPS

Coach, 2015 Orchard Elementary School, Girls on the Run Vermont

Grant Writing, 2008-2009 Transportation Grant, Chittenden Country Metropolitan Planning Organization

REPRESENTATIVE PROJECT EXPERIENCE

Massachusetts Energy Efficiency Advisory Council, Technical Consulting Services (2016-present)

Optimal Energy serves as the lead technical consultant to the Massachusetts Energy Efficiency Advisory Council (MA EEAC) since its inception in 2006. Optimal’s role includes representing the EEAC on all aspects of negotiating efficiency programs, plans, goals and budgets with the program administrators, and oversight of all program implementation and evaluation, monitoring and verification activities. As an Analyst, Ms. Harcourt assists with research for and creation of deliverables for the council.

Connecticut Municipal Electric Energy Cooperative, Conservation and Load Management Consulting (2016-present)

Optimal Energy has provided energy efficiency consulting services to the Connecticut Municipal Electric Energy Cooperative (CMEEC) since the inception of their conservation and load management programs. As an analyst, Ms. Harcourt contributes to this project by reviewing and processing CMEEC energy efficiency program data.

Connecticut Energy Efficiency Board, Technical Consulting Services (2016-present)

Optimal Energy is part of a consortium of consultants who provide a range of technical expertise to the CT EEB on commercial and industrial energy efficiency programs and markets, residential programs and markets, evaluation, measurement and verification, financing, and demand issues. Ms. Harcourt provides research support to gain insight into various programs related to this project.

Delaware Department of Natural Resources and Environmental Control, Energy Efficiency Advisory Council Program Development and Support (2015-present)

Optimal Energy provides broad program planning, analysis, and strategic guidance to the Delaware Energy Efficiency Advisory Council as it begins developing a new model for joint utility and public-sector delivery of energy efficiency services, with the objective of dramatically increasing energy savings and demand reductions in that state. Ms. Harcourt assists with research and deliverables.

Curriculum Vitae -- Paul J. Alvarez MM, NPDP

Wired Group, PO Box 150963, Lakewood, CO 80215 palvarez@wiredgroup.net 720.308.2407

Profile

After 15 years in Fortune 500 product development and product management, including P&L responsibility, Mr. Alvarez entered the utility industry by way of demand-side management rate and program development, marketing, and impact measurement in 2001. He has since designed renewable portfolio standard compliance and distributed generation rates and incentive programs. These experiences led to unique projects involving the measurement of grid modernization costs and benefits (energy, capacity, operating savings, revenue capture, reliability, environmental, and customer experience), which revealed the limitations of current utility regulatory and governance models. Mr. Alvarez currently serves as the President of the Wired Group, a boutique consultancy serving consumer and environmental advocates, regulators, associations, and suppliers.

Research Projects, Thought Leadership, Regulatory Appearances

Evaluation of Southern California Edison's Request to Invest \$2.3 Billion in its Grid to Accommodate Distributed Energy Resources. Testimony before the California Public Utilities Commission on behalf of The Utility Reform Network. A16-09-001. May 2, 2017.

Evaluation of Kentucky Utilities/Louisville Gas & Electric Smart Meter Deployment Plan. Testimony before the Kentucky Public Service Commission on behalf of the Kentucky Attorney General in 2016-00370/2016-00371. March 3, 2017

Evaluation of National Grid's Massachusetts Smart Meter Deployment Plan. Testimony before the Massachusetts Department of Public Utilities on behalf of the Massachusetts Attorney General in 15-120. March 10, 2017.

Evaluation of Pacific Gas & Electric's Request to Invest \$100 Million in Its Grid to Accommodate Distributed Energy Resources. Testimony before the California Public Utilities Commission on behalf of The Utility Reform Network, A15-09-001. April 29, 2016

Evaluations of Westar Energy's Proposal To Mandate a Rate Specific to Distributed Generation-Owning Customers. Testimony before the Kansas Corporation Commission on Behalf of the Environmental Defense Fund, case 15-WSEE-115-RTS. July 9, 2015.

Regulatory Reform Proposal to Base a Significant Portion of Utility Compensation on Performance in the Public Interest. Testimony before the Maryland PSC on behalf of the Coalition for Utility Reform, case 9361. December 8, 2014.

Best Practices in Grid Modernization Capability Optimization: Visioning, Strategic Planning, and New Capability Portfolio Management. Top-5 US utility; client confidential. 2014.

Smart Grid Economic and Environmental Benefits: A Review and Synthesis of Research on Smart Grid Benefits and Costs. Secondary research report prepared for the Smart Grid Consumer Collaborative. October 8, 2013. Companion piece: Smart Grid Technical and Economic Concepts for Consumers.

Duke Energy Ohio Smart Grid Audit and Assessment. Primary research report prepared for the Public Utilities Commission of Ohio case 10-2326-GE. June 30, 2011.

SmartGridCity™ Demonstration Project Evaluation Summary. Primary research report prepared for Xcel Energy. Colorado Public Utilities Commission case 11A-1001E. October 21, 2011.

Books

Smart Grid Hype & Reality: A Systems Approach to Maximizing Customer Return on Utility Investment. First edition. ISBN 978-0-615-88795-1. Wired Group Publishing. 327 pages. 2014.

Noteworthy Publications

Price Cap Electric Ratemaking: Does it Merit Consideration? With Bill Steele. Electricity Journal. Volume 30, Issue 6 (November-December 2017).

Busting Myths: Investor-Owned Utility Performance Can be Credibly Benchmarked. With Joel Leonard. Public Utilities Fortnightly, September, 2017.

Integrated Distribution Planning: An Idea Whose Time has Come. Public Utilities Fortnightly. November, 2014; also International Confederation of Energy Regulators Chronicle, 3rd Ed, March, 2015

Maximizing Customer Benefits: Performance Measurement and Action Steps for Smart Grid Investments. Public Utilities Fortnightly. January, 2012.

Buying Into Solar: Rewards, Challenges, and Options for Rate-Based Investments. Public Utilities Fortnightly. December, 2009.

Smart Grid Regulation: Why Should We Switch to Performance-based Compensation? Smart Grid News. August 15, 2014.

A Better Way to Recover Smart Grid Costs. Smart Grid News. September 3, 2014.

Is This the Future? Simple Methods for Smart Grid Regulation. Smart Grid News. October 2, 2014.

The True Cost of Smart Grid Capabilities. Intelligent Utility. June 30, 2014.

Notable Presentations

NARUC Committee on Energy Resources and the Environment. *How big data can lead to better decisions for utilities, customers, and regulators.* Washington DC. February 15, 2016.

NARUC Subcommittee on Electricity. *Maximizing Smart Grid Customer Benefits: Measurement and Other Implications for Investor-Owned Utilities and Regulators.* St. Louis. November 13, 2011.

NARUC Subcommittee on Energy Resources and the Environment. *The Distributed Generation (R)Evolution.* Orlando. November 17, 2013.

NASUCA 2013 Annual Conference. *A Review and Synthesis of Research on Smart Grid Benefits and Costs.* Orlando. November 18, 2013.

Mid-Atlantic Distributed Resource Initiative. *Smart Grid Deployment Evaluations: Findings and Implications for Regulators and Utilities.* Philadelphia. April 20, 2012

IEEE Power and Energy Society, ISGT 2013. *Distribution Performance Measures that Drive Customer Benefits.* Washington DC. February 26.

National Conference of Regulatory Attorneys 2014 Annual Meeting. *Smart Grid Hype & Reality.* Columbus, Ohio. June 16.

DistribuTECH 2012. *Lessons Learned: Utility and Regulator Perspectives.* Panel Moderator. January 25.

DistribuTECH 2012. *Optimizing the Value of Smart Grid Investments.* Half-day course. January 23.

Canadian Electric Institute 2013 Annual Distribution Conference. *The (Smart Grid) Story So Far: Costs, Benefits, Risks, Best Practices, and Missed Opportunities.* Keynote. Toronto, Canada. January 23.

Great Lakes Smart Grid Symposium. *What Smart Grid Deployment Evaluations are Telling Us.* Chicago. September 26, 2012.

Teaching

Post-graduate Adjunct Professor. University of Colorado, Global Energy Management Program. Course: Renewable Energy Commercialization -- Electric Technologies, Markets, and Policy.

Guest Lecturer. Michigan State University, Institute for Public Utilities. Courses: Performance Measurement of Distribution Utility Businesses; Introduction to Grid Modernization.

Education

Master of Management, 1991, Kellogg School of Management, Northwestern University. Concentrations: Accounting, Finance, Information Systems, and International Business.

Bachelor's Degree in Business Administration, 1984, Kelley School of Business, Indiana University. Concentrations: Marketing and Finance.

Certifications

New Product Development Professional. Product Development and Management Association. 2007.

Curriculum Vitae – Dennis Stephens EE

Wired Group, PO Box 150963, Lakewood, CO 80215 dstephens@wiredgroup.net 303.434.0957

Profile

Mr. Stephens has over 35 years' experience in electric distribution grid planning, design, operations management, asset management, and the innovative use of technology to assist with these functions. He spent his entire career at Xcel Energy subsidiary Public Service Company of Colorado, an electric (and gas) distribution business serving over 1.2 million customers. In a series of electrical engineering and management roles of increasing responsibility, Mr. Stephens served as Director, Electric and Gas Operations for the Denver City and County area; Director, Asset Strategy; and Director, Innovation and Smart Grid Investments (for all of Xcel Energy's 8-state service territory). Mr. Stephens retired from Xcel Energy in 2011, and now works for the Wired Group on a part-time basis.

Noteworthy Projects

Smart Grid Solutions Development, 2010. Worked with several large solution providers to develop and implement technical distribution grid solutions and innovations, including IBM, ABB, and Siemens.

DER Integration Strategy and Roadmap Development, 2009. Established DER integration strategy and road-maps for Xcel Energy, including technology and capability roadmap for high DER penetration geographies in Boulder, Colorado.

SmartGridCity™ Project Development, 2008. Developed the technical foundations for the SmartGridCity project in Boulder, Colorado (46,000 customers).

Distribution Automation Design, 2007. Worked with ABB Corporation to design software to identify and locate failures in underground cable. The ABB Smart Analyzer™ was programmed with three traps to capture detailed information using Oscillography/Digital Fault Records (O/DFR).

Utility Innovations Program Development, 2006. Led the development of Xcel Energy's Utility Innovations program, for which Mr. Stephens' team receive a national Edison Award.

Distribution Asset Optimization Process, 2005. Taking advantage of SPL's Centricity Outage Management Program and Itron's Real Time Performance Management system (RTPM), developed a Distribution Asset Optimization process by mining AMI meter data and asset utilization information in the development of an enhanced asset loading forecasting process. The process took advantage of the systems' abilities to forecast sudden changes in usage patterns to take proactive mediation of equipment overloading.

Distribution Asset Optimization Software Development, 2004. Worked with Itron on the development of a Distribution Asset Optimization software program.

Fixed AMI Communications Network Development, 2003. Worked with Itron to pilot one of the first applications of a fixed wireless radio network to collect data from customer meters.

Electric Asset Management Strategy Development, 2002. Developed Xcel Energy's Electric Distribution Asset Management Strategy

Automated Switching System Deployment, 2001. Worked with S&C Electric Corporation to deploy its Intelliteam™ devices on Xcel Energy's distribution grid to reduce the number of customers impacted by an outage by isolate faults through automated switching routines.

Regulatory Appearances

Southern California Edison 2017 General Rate Case. Testimony in A16.09.001 related to \$2.3 billion in proposed grid modernization investments. Though portrayed by the Company as "required" to accommodate higher levels of distributed energy resources like photovoltaic solar panels, Mr. Stephens' testimony identified appropriate investment proposals (related to grid state monitoring, modeling, and frequent grid reconfiguration) while rejecting proposals which did not return benefits in excess of costs for customers (4kV circuit elimination and centralized, automated grid reconfiguration, as well as the systems and communications associated with centralized, automated grid reconfigurations).

Pacific Gas and Electric 2016 General Rate Case. Testimony in A15.09.001 related to \$100 million in proposed grid modernization investments. Though portrayed by the Company as "required" to accommodate higher levels of distributed energy resources like photovoltaic solar panels, Mr. Stephens' testimony rejected many proposed grid upgrades as either premature (due to insufficient DER on any one circuit or location) or unnecessary (due to safeguards in standard photovoltaic grid interconnection equipment).

General Novelty vs. Public Service Company of Colorado. Testimony in Colorado PUC Case 6609 on behalf of Public Service regarding restitution for customer equipment damage resulting from transformer failure. Public Service Company of Colorado prevailed as a result of Mr. Stephens' testimony.

Notable Presentations

DistribuTECH 2010, Tampa, Florida. "Realizing the Benefits of DER, DG and DR in the Context of Smart Grid"

OSI 2008 User's Conference, Denver, Colorado; DistribuTECH 2007, San Diego, California. "Smart Grid City: A blueprint for a connected, intelligent grid community"

ABB 2007 World Conference, Jacksonville, Florida. "Use of Distribution Automation Systems to identify Underground Cable Failure"

North American T&D Conference 2005, Toronto, Canada; Itron 2005 User Conference, Boca Raton, Florida. "Xcel Energy Utility Innovations and Distribution Asset Optimization"

DistribuTECH 2005, San Diego, California. "How Advanced Metering Technology is Driving Innovation at Xcel Energy"

Education

Bachelor of Science Degree in Electrical Engineering, 1975, University of Missouri at Rolla.

Awards

National Edison Award for Utility Innovations, 2006.



CHRISTOPHER NEME, PRINCIPAL

EDUCATION

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

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

EXPERIENCE

2010-present: Principal (and Co-Founder), 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

PROFESSIONAL SUMMARY

Chris specializes in analysis of markets for energy efficiency, renewable energy and electrification measures and the design and evaluation of programs and policies to promote them. During his 25+ years in the clean energy industry, Mr. Neme has worked for energy regulators, utilities, government agencies and advocacy organizations in nearly 30 states, 5 Canadian provinces and several European countries. He has defended expert witness testimony before regulatory commissions in ten different jurisdictions; he has also testified before several state legislatures.

SELECTED PROJECTS

- ***Green Mountain Power (Vermont).*** Providing technical support on the development and implementation of GMP's plan for compliance with Vermont's RPS "Tier 3" requirement to reduce their customers' direct consumption of fossil fuels, with significant emphasis on strategic electrification strategies. Helped develop new program to introduce ultra-efficient cold-climate heat pumps to Vermont residential and small business markets. (2012 to present)
- ***Green Energy Coalition (Ontario).*** Representing a coalition of environmental groups in various regulatory proceedings. Present recommendations on DSM policies (including integrated resource planning on pipeline expansions), critically review and negotiate with utilities on proposed DSM Plans, and defend expert witness testimony. (1993 to present)
- ***Ontario Energy Board:*** Serve on provincial gas DSM Evaluation Committee, advisory committee on gas efficiency and advisory committee on carbon price forecast and emission abatement costs. Previously served on both overseeing gas DSM evaluation planning and annual audits of Enbridge Gas savings claims. (2000 to present)
- ***New Jersey Board of Public Utilities.*** Serve on multi-firm management team responsible for administration and delivery of statewide New Jersey Clean Energy Programs (annual budget of >\$200 million). Lead strategic planning and program design for the team; also support regulatory filings, cost-effectiveness screening and evaluation work. (2015 to present).
- ***Natural Resources Defense Council (Illinois, Michigan and Ohio).*** Critically review multi-year DSM plans filed by Illinois, Michigan and Ohio utilities. Draft and defend regulatory testimony on critiques. Represent NRDC in regular stakeholder-utility meetings. Played lead role in development of Illinois clean energy bill adopted in late 2016. (2010 to present)



CHRISTOPHER NEME, PRINCIPAL

- **Toronto Atmospheric Fund.** Helped draft an assessment of efficiency potential from retrofitting of heat pumps into electrically heated multi-family buildings (2017).
- **E4TheFuture.** One of five authors of a new National Standard Practice Manual for cost-effectiveness analysis of energy efficiency and other distributed resource measures. Manual was published in May 2017, following several rounds of external review. (2016-2017)
- **Regulatory Assistance Project - U.S.** Provide guidance on efficiency policy and programs. Lead author on strategic reports on what it would take to achieve 30% electricity savings over 10 years, U.S. experience using efficiency to defer T&D system investments, and bidding efficiency resources into capacity markets. Also provide technical assistance to state regulators, technical support to various Energy Foundation grantees across the U.S., and assistance in RAP's work with the U.S. EPA on efficiency's role in carbon emission regulations. (2010 to present)
- **Regulatory Assistance Project - Europe.** Providing on-going technical 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 design considerations for efficiency feed-in-tariffs and roadmap for achieving deep retrofits in half the residential building stock. Reviewed "Roadmap 2050" report that examined how grid de-carbonization, vehicle/building electrification, demand response and efficiency could be combined to achieve 2050 carbon emission goals. (2009 to present)
- **Northeast Energy Efficiency Partnerships.** Helped managed Regional EM&V forum project estimating savings for emerging technologies, including field study of cold climate heat pumps installed in New Hampshire. Also, led project to assess national best practices and develop policy guidance on the use of efficiency to defer T&D investments. (2009 to 2015)
- **Ontario Power Authority.** Managed jurisdictional scans of how efficiency programs leverage building efficiency labeling/disclosure requirements and how non-energy benefits are addressed in cost-effectiveness screening. Also supported staff workshop on the role efficiency can play in deferring T&D investments. Presented assessment of future efficiency policy and program 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)
- **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 first year savings goals to eliminate disincentives to invest in longer-lived (but often more expensive) measures and programs. Work used by Michigan Public Service Commission staff to establish lifetime savings metrics for utility programs. (2013)
- **New York State Energy Research and Development Authority (NYSERDA).** Led analyses of residential efficiency potential (over 20 years) for New York State. (2001 to 2010)

GLENN REED, PRINCIPAL



EDUCATION

M.S., Energy Management and Policy, University of Pennsylvania, 1982
B.A., Biology, Wesleyan University, 1979

EXPERIENCE

2010-present: Principal, Energy Futures Group, Hinesburg, VT
2005-2010: Managing Consultant, Vermont Energy Investment Corporation, Burlington, VT
2001-2005: Dir. of Regional Initiatives, Northeast Energy Efficiency Partnerships, Lexington, MA
1987-2000: Deputy Dir. of East Coast Consulting, XENERGY, Inc. (now DNV GL), Burlington, MA
1983-1987: Principal Planner, Massachusetts Executive Office of Energy Resources, Boston, MA

PROFESSIONAL SUMMARY

Glenn Reed has more than 30 years of experience in demand-side management (DSM) program planning and evaluation; energy-efficiency policy development and implementation; building codes and appliance standards development; and group facilitation and consensus building. Mr. Reed currently is a lead residential advisor to both the Rhode Island Energy Efficiency Resource Management Council (EERMC) and to the Massachusetts Energy Efficiency Advisory Council (EEAC) assisting and overseeing program design and implementation of residential lighting, appliance, HVAC, and consumer electronics programs. As the lead residential Technical Consultant to the Connecticut Energy Efficiency Board (EEB), he plays a similar, though somewhat broader, technical assistance and oversight role in that state, including the development of Connecticut's strategic electrification policy and program efforts. In addition to his on-going work in Massachusetts, Connecticut, and Rhode Island, Mr. Reed is currently supporting stakeholder engagements in Oklahoma and Pennsylvania.

SELECTED PROJECTS

- ***Connecticut Energy Efficiency Board (EEB)***. Leads residential team to provide oversight of the state's electric and gas residential efficiency programs, including emerging strategic electrification efforts. Works closely with the state's utilities to develop, implement, and evaluate cost-effective program designs and goals for the Three-Year C&LM Management Plan.
 - ***Rhode Island Energy Efficiency Resource Management Council***. Senior Advisor providing on-going technical and programmatic advice to, and oversight of, Rhode Island's residential efficient products (lighting, appliances and consumer electronics) and HVAC programs. Works closely with National Grid staff to develop cost-effective program designs and goals for their energy efficiency plans.
 - ***Massachusetts Energy Efficiency Advisory Council***. Provides on-going technical and programmatic advice to, and oversight of, the Massachusetts gas and electric program administrators' residential efficient products (lighting, appliances and consumer electronics) and HVAC programs. This includes review of key screening tool inputs and development of three-year program savings goals. Also assists Council evaluation consultants in review of key residential evaluation and market research studies.
 - ***New York State Energy and Research Development Authority (NYSERDA)***. Part of evaluation oversight team currently assisting NYERDA with planning, coordinating, implementing
- Energy Futures Group • P.O. Box 587, Hinesburg, VT 05461 • 802-482-5001 • greed@energyfuturesgroup.com*



GLENN REED, PRINCIPAL

and reviewing a wide range of program evaluation efforts. Principal engagement has been on evaluation of NYSEERDA's residential lighting program and transportation RD&D activities.

- ***Delaware Potential Study and Preliminary Program Designs, Delaware Department of Natural Resources and Environmental Control (DNREC)***. Led EFG's support of the residential components of this two phase study. Reviewed all measure characterizations and program and sector savings estimates. Developed draft and final program descriptions and assisted in program budget development.
- ***Natural Resources Defense Council***. Managed a nine-state affordable multifamily technical, economic, and achievable potential study for the Energy Efficiency for All advocacy group. This study was subsequently expanded to include California. Results from this study have been used in several regulatory proceedings.
- ***Oklahoma Sustainability Network (OSN)***. Providing ongoing support to this key stakeholder group. Have assisted with re-writing the state's DSM rules and provided critical review of the utilities' 2013 and 2014 annual reports. Provided review and comment on a statewide technical, economic and achievable potential study and on recently filed three year plans.
- ***PennFUTURE and Keystone Energy Efficiency Alliance***. Providing technical support for those two efficiency stakeholder groups in Pennsylvania. Provided review and comments on recently filed draft Five-year Plans.
- ***Regulatory Assistance Project (RAP)***. Co-authored report on the ten most common pitfalls encountered when performing potential studies: *Ten Pitfalls of Potential Studies*. Co-presented webinar on report findings.
- ***Alliance for Affordable Energy***. Provided technical support for this New Orleans-based stakeholder organization. As part of Entergy's IRP proceeding completed detailed review of comprehensive energy efficiency potential study.
- ***Management of Regional Market Transformation Initiatives***. Responsible for NEEP's six residential and C&I regional market transformation Initiatives - ENERGY STAR® Products, Residential HVAC, ENERGY STAR Windows, Premium Efficiency Motors, Unitary HVAC and C&I Information Exchange - and for Initiative-related research and evaluation activities.

SELECTED PUBLICATIONS

- ***Northeast Residential Lighting Strategy***. (With Optimal Energy, D&R International, and Ecova). Northeast Energy Efficiency Partnerships. Lexington, MA. March 2012
- ***The Costs and Benefits of Measuring if States Meet 90% Compliance with Building Codes***. R. Wirtshafter, Glenn Reed, et. al.), Proceedings of the International Energy Program Evaluation Conference (IEPEC), August 2011.
- ***Do CFLs Still Pass the Test***. Chris Granda and Glenn Reed. Home Energy. May/June 2010.
- ***Comparative Performance of Electrical Energy Efficiency Portfolios in Seven Northeast States***. Stuart Slote, Glenn Reed, and John Plunkett. 2006 ACEEE Summer Study on Energy Efficiency in Buildings, Pacific Grove, California, August 2006.

JAMES GREVATT, MANAGING CONSULTANT



EDUCATION

B.F.A., University Honors, University of Illinois, 1982

EXPERIENCE

2013-present: Managing Consultant, Energy Futures Group, Hinesburg, VT
2012-2013: Director, Targeted Implementation, Vermont Energy Investment Corp., Burlington, VT
2011-2012: Director, Residential Energy Services, District of Columbia Sustainable Energy Utility for Vermont Energy Investment Corp., Washington, D.C. and Burlington, VT
2010-2012: Managing Consultant, Vermont Energy Investment Corporation, Burlington, VT
2005-2010: Director, Residential Services, Vermont Energy Investment Corp., Burlington, VT
2001-2005: Manager, Energy Services, Vermont Gas Systems, S. Burlington, VT
1998-2001: Manager, Residential Energy Services, Vermont Gas Systems, S. Burlington, VT
1996-1998: Manager, HomeBase Retrofit Program, Vermont Gas Systems, S. Burlington, VT
1994-1996: Technical Specialist, Vermont Gas Systems, S. Burlington, VT
1991-1994: Associate Director and Technical Specialist, Champlain Valley Weatherization Program, Burlington, VT

PROFESSIONAL SUMMARY

James Grevatt brings 25 years' experience as a leadership professional in energy efficiency program operations to his consulting practice. Mr. Grevatt uses an in-depth knowledge of program implementation and a clear understanding of strategic thinking and planning to assess the effectiveness of program designs and identify improvement areas that will ensure achievement of desired outcomes. Throughout his career, Mr. Grevatt has focused on building strong relationships with staff, peers, trade allies, regulators, and clients as the best way to understand the needs and challenges that each sector faces. Mr. Grevatt has hands-on experience with industry-leading markets-based approaches to managing energy efficiency programs, including multi-family, low income, residential retrofit, new construction, HVAC, and efficient products programs. In his leadership roles, he was responsible for finding successful consensus approaches among diverse groups of partners and stakeholders, and for policy interactions with regulators, assuring that program processes were efficient and effective.

SELECTED PROJECTS

- ***Coalition of Maryland Energy Efficiency Advocates*** Prepared written comments and multiple appearances before the Commission to present evidence regarding Maryland utilities' 2015-2017 EmPOWER Maryland energy efficiency plans, and in subsequent proceedings related to utility goal-setting, cost-effectiveness testing, and energy efficiency financing (2014-2017)
- ***New Jersey Clean Energy Program: Planning Team Lead for F2018-F2022 Strategic Plan*** Facilitated focus groups, worked with Board of Public Utilities Staff, program administrators, utility companies, and other stakeholders to identify opportunities to improve NJCEP strategic direction and increase benefits for ratepayers. Lead author drafting strategic plan (2015-2017)
- ***Energy Efficiency for All: Expert technical support for affordable multifamily energy efficiency advocacy in Pennsylvania and Virginia*** Worked with a coalition of energy



JAMES GREVATT, MANAGING CONSULTANT

efficiency and affordable housing advocates to shape advocacy efforts with utilities and regulators (2015-2017)

- ***Sierra Club of British Columbia and British Columbia Sustainable Energy Association:*** Provided expert witness testimony in DSM proceedings with Fortis BC and BC Hydro. (2017)
- ***Southern Environmental Law Center:*** Provided expert witness testimony in Duke Energy Progress DSM proceeding as well as technical support for SELC staff regarding pre-pay programs and other policy issues as requested (2015-2017)
- ***Regulatory Assistance Project: Researched and co-authored with Chris Neme: The Next Quantum Leap in Efficiency: 30 Percent Electric Savings in Ten Years,*** addressing program and policy questions related to doubling the best efficiency program results (2016)
- ***Vermont Public Service Department: Evaluation of Clean Energy Development Fund*** Conducted interviews of staff and key stakeholders under contract to NMR and prepared memo outlining process findings and recommendations (2014-2015)
- ***Evaluation of Efficiency Maine Low-Income Multi-Family Weatherization Program-*** Responsible for program staff and building owner interviews and process evaluation under contract to NMR and Efficiency Maine (2014-2015)
- ***Northeast Energy Efficiency Partnerships-*** Researched and co-authored meta-study of the use of energy efficiency to defer T&D investments (2014)
- ***Northeast Energy Efficiency Partnerships-*** Researched and co-authored meta-study of ductless heat pump performance and market acceptance (2014)
- ***New Hampshire Electric Co-op-*** Conducted 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)
- ***High Meadows Fund-*** Co-authored a study assessing the market viability of "High Performance Homes" in Vermont (2014)

Selected Presentations

Keys to the House: Unlocking Residential Savings with Program Models for Home Energy Upgrades- ACEEE 2016 Summer Study on Energy Efficiency in Buildings, August, 2016

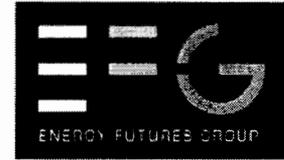
Home Upgrade Program Design & Implementation Models for Acquiring Savings in Multiple Climate Zones- 2016 National Home Performance Conference, April, 2016

EERS Advancements in Maryland: EmPOWER After 2015- Presentation at ACEEE Energy Efficiency as a Resource Conference, September, 2015

Leveling the Playing Field for Distributed Energy Resources- Panelist discussing the use of energy efficiency to defer T&D investments, Acadia Center forum on Envisioning Our Energy Future, February, 2015

Residential Retrofit Programs: What's Working? Perspectives from National Program Leaders- Panelist at AESP National Conference 2012

CHRISTOPHER KRAMER, SENIOR CONSULTANT



EDUCATION

J.D./M.B.A., Stanford University, 2009
B.A., Political Science, University of Michigan, 2003

EXPERIENCE

2011–Present: Senior Consultant, Energy Futures Group, Hinesburg, VT
2009–2011: Senior Program Development Officer, Low Income Investment Fund, Los Angeles, CA

PROFESSIONAL SUMMARY

Chris Kramer provides consulting services to government agencies, utilities, and consumer and environmental advocates on the development of cutting-edge policies and programs to advance investment in energy efficiency. He serves as the lead financing consultant to the Connecticut Energy Efficiency Board, a consultant on financing matters to Lawrence Berkeley National Lab, and a technical advisor on California's energy efficiency financing pilot programs. He has led or contributed to several studies and papers on energy efficiency financing topics, including a national overview of best practices in energy efficiency financing, financing evaluation and related regulatory issues, approaches to accessing secondary market capital for energy efficiency financing programs, and a national comparison of on-bill financing and repayment programs. He has served on the Advisory Committee of the ACEEE Financing Forum for four consecutive years and has presented on energy efficiency financing at numerous national conferences. He has trained NYSERDA staff on the launch of the New York Green Bank, presented to Texas municipalities on the development of Commercial PACE, consulted to stakeholders and drafted comments on the development of energy efficiency financing options in Maryland, advised the Rhode Island Energy Efficiency and Resource Management Council on matters involving the launch of the Rhode Island Infrastructure Bank, and helped the Vermont Public Service Department launch a successful residential energy efficiency financing program.

SELECTED PROJECTS

- **California Alternative Energy and Advance Transportation Financing Authority.** Provide technical assistance on development of commercial energy efficiency financing pilots. 2016 – Present.
- **California Public Utilities Commission.** Technical advisor on California's portfolio of single family, multifamily, and commercial financing pilots. Led review of proposed on-bill financing tariff language and advised on program implementation. 2014 – Present.
- **Connecticut Energy Efficiency Board.** Financing Consultant to the Board overseeing the state's energy efficiency programs. Work closely with utilities, Connecticut Green Bank, and Department of Energy and Environmental Protection to develop, implement, and oversee financing programs to further the state's overall energy efficiency objectives. 2012 – Present
- **Lawrence Berkeley National Lab.** Lead and contribute to national reports on energy efficiency best practices. Provide technical assistance to government jurisdictions developing energy efficiency financing programs. Research topics include: national survey of best practices in EE financing, accessing secondary markets for EE financing programs, financing evaluation



CHRISTOPHER KRAMER, SENIOR CONSULTANT

and regulatory issues, and a national comparison of on-bill financing programs. Technical assistance includes: NY Green Bank launch and developing commercial PACE in Texas. 2013 - Present

- ***New Jersey Board of Public Utilities.*** Lead financing consultant to Board overseeing New Jersey's energy efficiency programs as part of team overseeing design and implementation of those programs. 2015 – Present.
- ***Natural Resources Defense Council.*** Advise and draft comments on the launch of the New York Green Bank and the role of financing in New York's "Reforming the Energy Vision" and "Clean Energy Fund" proceedings. 2014 – Present.
- ***Natural Resources Defense Council.*** Advise and draft comments on the development of single family and multifamily energy efficiency financing options in Maryland. 2015.
- ***Vermont Public Service Department.*** Contribute to program design and implementation of successful residential energy efficiency financing program offering income-based interest-rate reductions to encourage energy efficiency and clean energy improvements. 2014 – Present.
- ***Connecticut Fund for the Environment / Environment Northeast.*** Developed comparison paper of seven prominent residential energy efficiency financing programs across the nation, analyzing ten key elements of residential energy efficiency financing program design. 2012 – 2013
- ***Regulatory Assistance Project (RAP).*** Principal author on *Ten Pitfalls of Potential Studies*, a national review of over 25 energy efficiency potential studies identifying challenges in conducting and interpreting such studies. 2012 – 2013.
- ***Natural Resources Defense Council.*** Compiled a review of building energy policies in 35 cities across the United States. Assisted in drafting analysis of effective building energy efficiency labeling and disclosure policies and strategies. 2012.
- ***DC Department of the Environment.*** Characterized the overall residential efficiency market to assist in program design of the DC Sustainable Energy Utility. Conducted additional in-depth market research on the multifamily building sector. 2011.

SELECTED PUBLICATIONS

- *Current Practices in Energy Efficiency Financing: An Overview for State and Local Governments.* Lawrence Berkeley National Laboratory. November 2016.
- *Green Bank Accounting: Examining the Current Landscape and Tallying Progress on Energy Efficiency.* ACEEE. September 2016.
- *Making It Count: Understanding the Value of Energy Efficiency Financing Programs Funded by Utility Customers.* Regulatory Policies Working Group. December 2015.
- *Residential Energy Efficiency Financing: Key Elements of Program Design.* Environment Northeast and Connecticut Fund for the Environment. January 2013.



GABRIELLE STEBBINS, SENIOR CONSULTANT

EDUCATION

M.A. in Development Studies: Sustainable Development, *Distinction*, Nelson Mandela Metropolitan University, Republic of South Africa, 2002

Coursework in Ethics and Public Policy, *4.0*, Harvard University, Massachusetts (MA), 1999

B.A., Anthropology; B.M Violin Performance, *Cum Laude*, Rice University, Texas, 1998

EXPERIENCE

2016-present: Senior Consultant: Energy Futures Group, Hinesburg, Vermont (VT)

2011-2015: Executive Director: Renewable Energy Vermont, Montpelier, VT

2008-2011: Program Manager: Vermont Energy Investment Corporation, Burlington, VT

2004-2008: Program Coordinator: Massachusetts Department of Fish and Game, Boston, MA

2002-2004: Environmental Educator: Town of Brookline, Waquoit Bay National Estuarine Reserve, MA

PROFESSIONAL SUMMARY

Gabrielle Stebbins is a Senior Consultant at Energy Futures Group (EFG) in Hinesburg, VT. Her interest is in identifying challenges and defining solutions to effectively transition towards an efficient, renewably powered grid. Projects include review, analysis and commentary of Michigan's Integrated Resource Process, Ohio efficiency programs and Maryland efficiency programs; implementation of the VT Zero Energy Now and the New York State Energy and Research Development Authority "Hudson Valley Heat Pump Project" (residential pilot programs that incorporate efficiency – dominated by strategic electrification - with solar and biomass), development of a market baseline for ductless mini-split heat pumps in New York State and Vermont. Prior to joining EFG, Gabrielle served as Executive Director to Renewable Energy Vermont (REV), the state trade association representing hundreds of solar, wind, hydro, geothermal and biomass businesses actively building a clean energy future in Vermont. In this capacity, she led REV's energy policy work in the legislative and regulatory realms while working towards VT's energy goal of 90% of all energy to be obtained through renewables by 2050. Her organizational, business and project management skills are exemplified by a 200% membership and budget increase for the organization during her tenure. Previously, she was a Program Manager at Vermont Energy Investment Corporation where she developed and managed a variety of innovative programs including several community-based efficiency programs, the VT Renewable Energy Incentive Program, and Efficiency Vermont's Biomass Incentive Development. She is Chair of the Burlington Electric Department (BED) Commission, where she is significantly involved in the direction and review of the municipal utilities strategic planning and long-term energy vision including work on BEDs Integrated Resource Plan and maintaining BED's 100% renewably-sourced portfolio.

SELECTED PROJECTS

- ***Natural Resources Defense Council.*** Review, analysis and critique of Michigan's Integrated Resource Planning process and outcome. 2017. Review and analysis of utility efficiency program plan filings in Ohio and Maryland. 2016.
- ***New York State Energy Research and Development Authority.*** Project management of Hudson Valley Heat Pump Program – a comprehensive approach to residential energy savings incorporating heat pumps, weatherization and solar including customer and contractor training and detailed data savings monitoring. 2017-2019.



GABRIELLE STEBBINS, SENIOR CONSULTANT

- ***New York State Energy Research and Development Authority.*** Research and analysis for a Ductless Mini-Split Heat Pump Market Characterization Study. 2016.
- ***Vermont Community Energy Mobilization Project.*** Designed, implemented and evaluated a volunteer-executed, “neighbor-to-neighbor” weatherization and efficiency program. 2008-2010.
- ***Vermont Comprehensive Energy Plan.*** Responsible for leading review and commenting on state energy plan on behalf of renewable industry. 2011-2015.
- ***Vermont Net-Metering Program.*** On behalf of the VT renewable energy industry, convened and oversaw the review, assessment, commenting and provided ongoing testimony on the continual development, legislative process and regulatory structure of VT’s Net-Metering Program before VT Legislature, VT Public Service Department and VT Public Service Board. 2011-2015.
- ***Vermont Renewable Energy Standard.*** Represented the VT renewable energy industry, convened and oversaw the review, assessment, commenting and provided ongoing testimony on the initial and legislative development and regulatory structure of VT’s Renewable Energy Standard before VT Legislature, VT Public Service Department and VT Public Service Board. 2011-2015.
- ***Vermont Small Scale Renewable Energy Incentive Program.*** On behalf of VT Public Service Department, administered the VT Small Scale Renewable Energy Incentive Program including analysis and recommendations regarding program modifications. 2008-2011.
- ***Vermont State Wood Energy Team.*** Represented the VT wood heat industry as a grant partner under the U.S. Forest Service to increase the growth of a robust VT biomass industry, identifying market barriers and developing a five-year Industry Action Plan. 2013-2015.
- ***Zero Energy Now!*** Design and implement comprehensive residential energy retrofits incorporating renewables and efficiency on behalf of Building Performance Professionals Association of VT for Green Mountain Power. 2015-2017.

SELECTED PRESENTATIONS AND PAPERS

- Speaker, **American Council on Energy Efficient Economy (ACEEE)**, (Arlington, Virginia), April 2017. “Next Generation Residential Retrofit Programs”.
- Speaker, **Solar Canada**, (Canada), December 2016. “Group Net-Metering: Challenges and Opportunities”.
- Speaker and Lead Author, **ACEEE**, (California), August 2016. “The Challenges of Comparing PV’s Success to Efficiency”.

PROFESSIONAL AFFILIATIONS

- Board Director, **Burlington Electric Commission**, (VT), 2014 – present. Chair: July 2016 – present.
- Founder, **Renewable Energy Vermont Education Fund**, (VT), 2013. Board Director through May 2016.
- Supply-Side Representative, **Vermont System Planning Committee**, (VT), 2011 – 2014.

PAUL L. CHERNICK

Resource Insight, Inc.
5 Water Street
Arlington, Massachusetts 02476

SUMMARY OF PROFESSIONAL EXPERIENCE

- 1986–Present* **President, Resource Insight, Inc.** Consults and testifies in utility and insurance economics. Reviews utility supply-planning processes and outcomes: assesses prudence of prior power planning investment decisions, identifies excess generating capacity, analyzes effects of power-pool-pricing rules on equity and utility incentives. Reviews electric-utility rate design. Estimates magnitude and cost of future load growth. Designs and evaluates conservation programs for electric, natural-gas, and water utilities, including hook-up charges and conservation cost recovery mechanisms. Determines avoided costs due to cogenerators. Evaluates cogeneration rate risk. Negotiates cogeneration contracts. Reviews management and pricing of district heating systems. Determines fair profit margins for automobile and workers' compensation insurance lines, incorporating reward for risk, return on investments, and tax effects. Determines profitability of transportation services. Advises regulatory commissions in least-cost planning, rate design, and cost allocation.
- 1981–86* **Research Associate, Analysis and Inference, Inc.** (Consultant, 1980–81). Researched, advised, and testified in various aspects of utility and insurance regulation. Designed self-insurance pool for nuclear decommissioning; estimated probability and cost of insurable events, and rate levels; assessed alternative rate designs. Projected nuclear power plant construction, operation, and decommissioning costs. Assessed reasonableness of earlier estimates of nuclear power plant construction schedules and costs. Reviewed prudence of utility construction decisions. Consulted on utility rate-design issues, including small-power-producer rates; retail natural-gas rates; public-agency electric rates, and comprehensive electric-rate design for a regional power agency. Developed electricity cost allocations between customer classes. Reviewed district-heating-system efficiency. Proposed power-plant performance standards. Analyzed auto-insurance profit requirements. Designed utility-financed, decentralized conservation program. Analyzed cost-effectiveness of transmission lines.
- 1977–81* **Utility Rate Analyst, Massachusetts Attorney General.** Analyzed utility filings and prepared alternative proposals. Participated in rate negotiations, discovery, cross-examination, and briefing. Provided extensive expert testimony before various regulatory agencies. Topics included demand forecasting, rate design, marginal costs, time-of-use rates, reliability issues, power-pool operations, nuclear-power cost projections, power-plant cost-benefit analysis, energy conservation, and alternative-energy development.

EDUCATION

SM, Technology and Policy Program, Massachusetts Institute of Technology, February 1978.

SB, Civil Engineering Department, Massachusetts Institute of Technology, June 1974.

SELECTED PUBLICATIONS

“Price Effects as a Benefit of Energy-Efficiency Programs” (with John Plunkett), *2014 ACEEE Summer Study on Energy Efficiency in Buildings* (5) 57–5-69. 2014.

“The Allocation of DSM Costs to Rate Classes,” *Proceedings of the Fifth National Conference on Integrated Resource Planning*. Washington: National Association of Regulatory Utility Commissioners. May 1994.

Optimal Pricing for Peak Loads and Joint Production: Theory and Applications to Diverse Conditions (Report 77-1), Technology and Policy Program, Massachusetts Institute of Technology, September 1977.

SELECTED REPORTS

“Charge Without a Cause? Assessing Electric Utility Demand Charges on Small Consumers” (with John T. Colgan, Rick Gilliam, Douglas Jester and Mark LeBel). Electricity Rate Design Review No. 1, July 2016.

“Avoided Energy Supply Costs in New England: 2013 Report” (with Rick Hornby, David White, John Rosenkranz, Ron Denhardt, Elizabeth Stanton, Jason Gifford, Bob Grace, Max Chang, Patrick Luckow, Thomas Vitolo, Patrick Knight, Ben Griffiths, and Bruce Biewald). 2011. Northborough, Mass.: Avoided-Energy-Supply-Component Study Group, c/o National Grid Company.

“State of Ohio Energy-Efficiency Technical-Reference Manual Including Predetermined Savings Values and Protocols for Determining Energy and Demand Savings” (with others). 2010. Burlington, Vt.: Vermont Energy Investment Corporation.

“Risk Analysis of Procurement Strategies for Residential Standard Offer Service” (with Jonathan Wallach, David White, and Rick Hornby) report to Maryland Office of People’s Counsel. 2008. Baltimore: Maryland Office of People’s Counsel.

“Evaluation and Cost Effectiveness” (principal author), Ch. 14 of “California Evaluation Framework” Prepared for California utilities as required by the California Public Utilities Commission. 2004.

“Energy Plan for the City of New York” (with Jonathan Wallach, Susan Geller, Brian Tracey, Adam Auster, and Peter Lanzalotta). 2003. New York: New York City Economic Development Corporation.

“Updated Avoided Energy Supply Costs for Demand-Side Screening in New England” (with Susan Geller, Bruce Biewald, and David White). 2001. Northborough, Mass.: Avoided-Energy-Supply-Component Study Group, c/o New England Power Supply Company.

SELECTED PRESENTATIONS

“Rate Design and Cost of Service: Issues and Implications for Puerto Rico Energy Commission.” Training presented to the Puerto Rico Energy Commission; San Juan, Puerto Rico, June 16 2017

“Rethinking Utility Rate Design—Retail Demand and Energy Charges,” Solar Power PV Conference, Boston MA, February 24, 2016.

“Residential Demand Charges - Load Effects, Fairness & Rate Design Implications.” Web seminar sponsored by the NixTheFix Forum. September 2015.

“The Value of Demand Reduction Induced Price Effects.” With Chris Neme. Web seminar sponsored by the Regulatory Assistance Project. March 2015.

“Review and Modification of Regulatory and Rate Making Policy,” National Governors’ Association Working Group on Nuclear Power Cost Overruns; Washington, D.C., June 20 1984.

“Review and Modification of Regulatory and Rate Making Policy,” Annual Meeting of the American Association for the Advancement of Science, Session on Monitoring for Risk Management; Detroit, Michigan, May 27 1983.

ADVISORY ASSIGNMENTS TO REGULATORY COMMISSIONS

District of Columbia Public Service Commission, Docket No. 834, Phase II; Least-cost planning procedures and goals. August 1987 to March 1988.

Connecticut Department of Public Utility Control, Docket No. 87-07-01, Phase 2; Rate design and cost allocations. March 1988 to June 1989.

Austin City Council, Austin Energy Rates, March to June 2012.

Puerto Rico Energy Commission, Puerto Rico Electric Power Authority, rate design issues, September 2015 to present.

SELECTED RECENT AND RELEVANT EXPERT TESTIMONY

Penn. PUC I-900005, R-901880; investigation into demand-side management by electric utilities; Pennsylvania Energy Office. January 10 1992.

Appropriate cost recovery mechanism for Pennsylvania utilities. Purpose and scope of direct cost recovery, lost revenue recovery, and incentives.

N.Y. PSC 06-G-1332, Consolidated Edison Rates and Regulations; City of New York. March 2007.

Gas energy efficiency: benefits to customers, scope of cost-effective programs, revenue decoupling, shareholder incentives.

N.Y. PSC 07-E-0524, Consolidated Edison electric rates; City of New York. September 2007.

Energy-efficiency planning. Recovery of DSM costs. Decoupling of rates from sales. Company incentives for DSM. Advanced metering. Resource planning.

Penn. PUC R-2009-2139884, Philadelphia Gas Works energy efficiency and cost recovery; Philadelphia Gas Works. December 2009.

Avoided gas costs. Recovery of efficiency-program costs and lost revenues. Rate impacts of DSM.

Md. PSC 9153 et al., Maryland energy-efficiency programs; Maryland Office of People's Counsel. January 2015.

Costs avoided by demand-side management. Demand-reduction-induced price effects.

Ky. PSC 2014-00371 and 2014-00372, Kentucky Utilities and Louisville G&E rates; Sierra Club. March 2015.

Review basis for higher customer charges, including cost allocation. Design of time-of-day rates.

N.S. UARB Matter No. M06214, NS Power Renewable-to-Retail rate, Nova Scotia Consumer Advocate. November 2015.

Review of proposed design of rate for third-party sales of renewable energy to retail customers. Distribution, transmission and generation charges.

Md. PSC Case No. 9406, 9418, and xx BGE, PEPCo and Delmarva applications for recovery of Smart Meter costs, Maryland Office of People's Counsel. February 2016 to October 2016.

Assessment of benefits of Smart Meter programs for energy revenue, load reductions and price mitigation; capacity load reductions and price mitigation; free riders and load shifting in peak-time rebate (PTR) program; cost of PTR participation; effect of load reductions on PJM capacity obligations, capacity prices and T&D costs.

City of Austin TX, Austin Energy 2016 Rate Review, Sierra Club and Public Citizen. May 2016

Allocation of generation costs. Residential rate design. Geographical rate differentials. Recognition of coal-plant retirement costs.

Manitoba PUB, Manitoba Hydro Cost of Service Methodology Review, Green Action Centre. June 2016, reply August 2016.

Allocation of generation costs. Identifying generation-related transmission assets. Treatment of subtransmission. Classification of distribution lines. Allocation of distribution substations and lines. Customer allocators. Shared service drops.

Puerto Rico Energy Commission CEPR-AP-2015-0001, Puerto Rico Electric Power Authority rate proceeding, PR Energy Commission. Report December 2016.

Comprehensive review of structure of electric utility, cost causation, load data, cost allocation, revenue allocation, marginal costs, retail rate designs, identification and treatment of customer subsidies, structuring rate riders, and rates for distributed generation and net metering.

N.S. UARB Matter No. M07767, NS Power Advanced Metering Infrastructure projects, Nova Scotia Consumer Advocate. February 2017.

Design and goals of the AMI pilot program. Procurement. Coordination with information-technology and software projects.

Québec Régie de L'énergie R-3876-2013 phase 3A; Gaz Métro estimates of marginal O&M costs; Regroupement des organismes environnementaux en énergie. March 2017.

Estimation of one-time, continuing and periodic customer-related operating and maintenance cost. Costs related to loads and revenues. Dealing with lumpy costs.

Mass. DPU 17-05, Eversource Rate Case, Cape Light Compact. Direct April 2017, Rebuttal May 2017.

Critique of proposed performance-based ratemaking mechanism. Proposal for improvements.

PUCO 16-1852, AEP Ohio Electric Security Plan, Natural Resources Defense Council. May 2017.

Residential customer charge. Cost causation. Effect of rate design on consumption.

Iowa Utilities Board RPU-2017-0001, Interstate Power and Light rate case, Natural Resources Defense Council. August 2017.

Critique of proposed demand-charge pilot rates for residential and small commercial customers. Defects of demand rates and shortcomings of IPL experimental proposal design.

Qualifications of
STACIA J. HARPER

Resource Insight, Inc.
5 Water Street
Arlington, Massachusetts 02476

SUMMARY OF PROFESSIONAL EXPERIENCE

- 2016– Present* **Research Associate, Resource Insight, Inc.** Expertise in wholesale-power market operations, design and evaluation of utility energy efficiency and conservation programs, economics of smart grid, AMI investments, and capital expenditure plans, and development of cost allocation and rate design. Responsible for monitoring key energy issues nationally, including Clean Power Plan, FERC Order 1000, RTO developments, integration of intermittent resources, and time-of use program and rate designs.
- 2010–2015* **Director Regulatory Affairs and Energy Markets, Ohio Partners for Affordable Energy.** Testified on electric and natural-gas markets, price forecasts, competitive rate design, dynamic pricing, wholesale transmission markets, consumer programs and smart grid deployments. Represent the interest of residential consumers in smart grid and dynamic pricing programs in state and national forums. Evaluation of procurement practices for natural gas and electric distribution utilities. Development of financing structures for commercial and residential renewable market design positions. Coordinated with transmission policy groups, IMM, environmental groups, utilities and regulators on RTO/ISO operations and state policy. Developed financing structures, including solar PPAs, community solar opportunities, on-bill financing. Technical analysis of advanced metering and smart-grid deployment. Negotiated over \$90 million in utility-sponsored energy efficiency programs for low-income customers.
- 2008–2010* **Senior Energy Policy Advisor, Ohio Consumers' Counsel.** Led engagement with PJM, MISO, FERC, NERC, and utility stakeholder engagement. Provided market analysis and develop market strategy in Ohio regulatory proceedings. Expert analysis of electric power industry restructuring, competitive market design, long-term planning, demand response, transmission planning, SmartGrid, climate change, renewable energy, auction design.

- 2006-2008 **Senior Analyst Pricing and Portfolio Management, Direct Energy.** Responsible for the gross margin management and product development of retail energy products for natural gas commercial and industrial customers. Led the development of consumer segmentation studies and load profile analysis that were then utilized in the pricing and hedging strategies. Responsible for providing senior management energy market update briefings inclusive of commodity pricing trends, gas pipeline flows, RTO markets and emerging market opportunities.
- 2004-2006 **Energy Trader, American Electric Power Company.** Managed supply and demand analytics. Developed commodity price offers for municipal and large industrials. Managed pricing models and market forecasts for gas storage, locational energy pricing, capacity, and ancillary services
- 2001-2004 **Economist, U.S. Department of Energy, National Energy Technology Laboratory/SAIC.** Assisted in the development and analysis of domestic and international energy policies. Econometric modelling for short-term and long-term power pricing, base fuel commodity markets, and estimates of demand and resource supply. Performed cost benefit analysis of competing fuel/power technologies (i.e., IGCC, wind, fuel cells, battery, etc), and evaluation of real-time power pricing programs.

EDUCATION

PhD Studies., Department of Resource and Environmental Economics (2000-2005)

M.S., Department of Resource and Applied Economics, University of Alaska Fairbanks, 2000.

BA, Political Science, West Virginia University, 1995.

BA, Economics, West Virginia University, 1995.

PUBLICATIONS

“Social entrepreneurs and grant professionals: Sustaining environmental and energy resources.” (with Harper-Dorton, K. V.) Strategy Papers, Journal of the Grants Professionals Association, 2(5)1-6. 2015.

“Environmental Justice and the Water/Energy Nexus: A Quest in Progress for Rural People.” (with Harper-Dorton, K. V.) Contemporary Journal of Rural Social Work, 7, 12-25. 2015.

“Smart Grid Hype & Reality: A Systems Approach to Maximizing Customer Return on Utility Investment” Book Review. Wired Group Publishing Lakewood, CO. 2014.

SELECTED PRESENTATIONS

“Introduction to Market Failure,” at National Energy Technology Laboratory. Morgantown, WV. February 28, 2003.

“Demand Response Enabling Behavior Modification: Markets, Customers, Regulators,” at the OPSI 5th Annual Meeting. Carmel, Indiana. October 1, 2008.

“Considering the Consumers’ Perspective,” at the Peak Load Management Alliance Conference on The Changing Face of Electric Utilities. Webcast. November 23, 2010.

“What are the Best Utility Program Design for Weatherization Partnerships?” at 2011 National Community Action Foundation’s Energy and Community Economic Development Conference. St. Petersburg, Florida. October 25, 2011

“Environmental Change and Sustainable Social Development: Integrating Economic, Environmental, and Social Perspectives,” at Social Work Social Development 2012: Action and Impact, Stockholm, Sweden. July 8–12. 2012.

Panelist at Ohio Retail Electric Market Investigation hosted by the Ohio Public Utilities Commission. Columbus Ohio. July 30, 2013.

“The Customer of Today, Tomorrow, and the Future: Low-Income Consumer Perspectives,” at the SmartGrid Consumer Collaborative Annual Meeting. Raleigh, North Carolina. October 2, 2014.

“Moving Community Action and Weatherization Forward; Designs for Weatherization and Health Partnerships,” at the 2014 Energy Partnerships Conference. Washington D.C. August 6, 2014

“Reinventing the Regulatory Compact,” at the SmartGrid Consumer Collaborative Annual Meeting. San Diego, California. February 2, 2015.

“When are Smart Grid and Distributed Energy Resources Good for Low Income Consumers?” Panelist at National Town Meeting on Demand Response and Smart Grid. Washington D.C. May 28, 2015

EXPERT TESTIMONY

1. **PUCO Case No. 09-906-EL-SSO**; FirstEnergy Standard Service offer and Energy Security Plan; Ohio Consumers’ Counsel. December 4, 2009.

Support for market based procurement process.

2. **PUCO Case No. 10-176-EL-ATA**; FirstEnergy Application for Tariff Approval; Ohio Partners for Affordable Energy. January 10, 2011

Proposed pilot solar/wind project as part of a long-term solution to meet the affordable electric needs of legacy all-electric customers.

3. **PUCO Case No. 12-1842-GA-EXM**; Dominion East Ohio Exemption for Natural Gas Sales or Services; Ohio Partners for Affordable Energy. October 4, 2012.

Competition in natural gas markets, role of standard service offers, efficiency of auction processes currently used, support for continuation of program.

4. **PUCO Case No. 12-2637-GA-EXM**; Columbia Gas Exemption for Natural Gas Sales or Services; Ohio Partners for Affordable Energy. November 30, 2012.

Support for continuation of standard offer process as opposed to an exit of the merchant function.

5. **PUCO Case No. 13-753-EL-POR**; Duke Energy Ohio Application for Program Approval; Ohio Partners for Affordable Energy. September 9, 2013.

Support for recovery of program costs, lost distribution revenue and performance incentives related to energy efficiency and demand response programs.

6. **Ohio Senate Bill 58/House Bill 302 131st General Assembly**; Ohio Partners for Affordable Energy. December 11, 2013.

Opposition to removal of Ohio renewable portfolio standards and energy efficiency mandates.

TASK FORCE AND COMMITTEE ENGAGEMENTS

NASUCA Special Committee on RTO Governance (2009)

Ohio Retail Market Investigation Committee, Market Evaluation Subcommittee, Consumer Lead (2013–2014)

PJM Capacity Forum (2010–2013)

SmartGrid Interoperability Panel (2010)

NERC Planning Committee Large End User Representative, Elected (2010–2015)

Ohio Energy Roundtable (2012–2015)

Ohio Special Committee on Energy Efficiency (2012–2013)

Ohio Falls Prevention Coalition (2014–2015)

STAND, Ohio Healthy Homes Network (2013–2015)

American Electric Power Utility Energy Efficiency and Demand Side Management Collaborative, (2010–2015)

First Energy Ohio, Energy Efficiency Collaborative (2010-2015)

Duke Ohio Energy Efficiency and Demand Side Management Collaborative (2010–2015)

Duke Ohio SmartGrid Collaborative (2010–2015)

Columbia Gas Energy Efficiency Collaborative (2010–2015)

SmartGrid Consumer Collaborative, Board Member (2012–2015)

COMMENTS PREPARED

U.S. Federal Energy Regulatory Commission; Proposed Policy Statement and Action Plan, Smart Grid Policy; Docket No. PL09-4-000. Office of the Ohio Consumers' Counsel. Reply Comments June 2, 2009.

U.S. Department of Energy; Request for Information, Implementing the National Broadband Plan by Empowering Consumers and the Smart Grid: Data Access, Third Party Use and Privacy; National Association of State Utility Consumer Advocates. Comments July 12, 2010. Reply Comments August 9, 2010.

Public Utilities Commission of Ohio; First Energy Ohio Companies Ohio Site Deployment of the Smart Grid Modernization Initiative and Timely Recovery of Associated Costs. Cases 09-1820-EL-ATA, 091821-EL-GRD, 09-1822-EL-EEC, 09-1823-EL-AAM. Ohio Consumers Counsel. Initial Comments January 15, 2010.

Public Utilities Commission of Ohio; First Energy Ohio Companies Competitive Bidding Process for Standard Service Offer Electric Generation Supply; Case No. 09-906-EL-SSO. Ohio Consumers Counsel. Brief January, 2010.

U.S. Federal Energy Regulatory Commission; Demand Response Compensation in Organized Wholesale Energy Markets; Docket No. RM 10-17-000; Joint Consumer Advocates. Comments May 13, 2010.

U.S. Federal Energy Regulatory Commission; Technical Conference on RTO/ISO Responsiveness; Docket No. ER09-1063-000, Docket No. ER 09-1142-000. National Association of State Utility Consumer Advocates (NASUCA). Comments March 8, 2010.

Public Utilities Commission of Ohio; Duke SmartGrid Investment; Case No. 10-867-DR-IM. Ohio Partners for Affordable Energy. Comments November 24, 2010.

Public Utilities Commission of Ohio; Consumer Privacy Protection, Customers Data Access, And Cyber Security Issues Associated with Distribution Utility Advanced Metering and Smart Programs; PUCO Case No. 11-277-GE-UNC; Ohio Partners for Affordable Energy. Comments March 7, 2011.

U.S. Federal Energy Regulatory Commission; New Electric Storage Technologies; Docket No. AD10-13-000. Ohio Consumers Counsel. Comments August 22, 2011.

Public Utilities Commission of Ohio; Review of Time-Differentiated and Dynamic Pricing Options for Retail Electric Services; Case No. 12-150-EL-COI. Ohio Partners for Affordable Energy. Comments April 11, 2012.

Qualifications of
SIMON METCALF

Resource Insight, Inc.
5 Water Street
Arlington, Massachusetts 02476

SUMMARY OF PROFESSIONAL EXPERIENCE

- June 2015– Present* **Research Assistant, Resource Insight, Inc.** Supporting investigations into costs of operating and retrofitting energy facilities with quantitative data synthesis and qualitative research. Analysis of power market conditions and operations, capital expenditures, distribution and transmission benefits of demand response, benefits of rooftop solar, generation planning, estimation of market value of full-requirement and unit-contingent power contracts.
- 2014* **Regional Photovoltaics Designer, SolarCity.** Designed residential photovoltaic systems. Compliance with local regulations.
- 2013–2014* **Vehicle Engineer, Terrafugia.** Designed structural & system components of prototype roadable aircraft.
- 2012* **Engineering Intern, GE Aviation.** Supported quality control for irrotational parts in GE's Lynn MA facility, including for the LM6000 turbine.

EDUCATION

BS, Mechanical Engineering, Tufts University, 2013.