

NOVA SCOTIA UTILITY AND REVIEW BOARD

IN THE MATTER OF: THE PUBLIC UTILITIES ACT

-and-

**IN THE MATTER OF: AN APPLICATION by Efficiency Nova Scotia
Corporation (“ENSC”) for approval of 2012 Electricity
Demand Side Management (“DSM”) Plan for 2012**

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Nancy McNeil, Regulatory Affairs Officer/Clerk

Evidence of Glenn Reed
Energy Futures Group
On Behalf of
Ecology Action Center
E-ENSC-R-10
Efficiency Nova Scotia Corporation
Electricity Demand Side Management Plan for 2012

Q. Please state your name and qualifications.

A. My name is Glenn Reed. I am a Partner at Energy Futures Group which is headquartered in Hinesburg, Vermont USA. Previously, I was a Managing Consultant at the Vermont Energy Efficiency Corporation (VEIC), the Director of Regional Initiatives and Residential Program Manager at the Northeast Energy Efficiency Partnerships (NEEP), the Deputy Director of East Coast Consulting at XENERGY (now KEMA), and a Principal Analyst at the Massachusetts Executive Office of Energy Resources.

My current responsibilities include lead residential consultant to the Connecticut Energy Efficiency Board. I am also a consultant to the Massachusetts Energy Efficiency Advisory Council and to the Rhode Island Energy Efficiency Resource Management Council. In Massachusetts and Rhode Island I work with the respective states' efficiency Program Administrators (PAs) on their residential lighting, appliances, consumer electronics, electric and gas HVAC, and behavioural programs.

A full copy of my CV is attached (Exhibit A).

Q. Have you appeared before this or other regulatory boards?

A. I have not appeared before the Nova Scotia Utility and Review Board, though I have previously advised the Ecology Action Centre in its review and comments on the 2006 DSM Potential Study and NSPI's first DSM Plan. I have appeared before, or provided written testimony or evidence to, regulatory boards in Massachusetts and Connecticut.

Q. What is your overall assessment of the Efficiency Nova Scotia Corporation's (ENSC) 2012 DSM Plan?

A. My responses to this and to subsequent questions will be primarily focused on the residential sector, unless the question addresses across sector issues such as the use of the

1 TRC test at the programs vs. measure level.

2 The Plan builds well on Nova Scotia Power's past efforts to include DSM as part of Nova
3 Scotia's energy resource mix. The savings goals, based on the 2009 Integrated Resource
4 Plan Update targets, appear to be fairly ambitious in terms of their ramp up, though by no
5 means unobtainable at the residential sector level. Nonetheless, the 2012 Plan as currently
6 presented contains both a fair amount of uncertainty as to its ability to meet its residential
7 sector goals as well as significant unrealized efficiency potential.

8 Q. Are there any notable strengths and/or weaknesses to the Plan?

9 A. Interestingly, some of the Plan's more atypical program components, which represent
10 strengths if ultimately successful, may also be possible weaknesses. The Plan's Existing
11 Houses Program proposes a very comprehensive set of measures, including traditional air
12 sealing and insulation measures. However, unlike most existing home programs, the
13 Program relies heavily on electric heating system upgrades (six percent of Program Savings)
14 and on hot water and space heating fuel substitution measures (52 percent of total Program
15 savings). The Plan encourages conversions to natural gas and oil as well as to renewable
16 fuels, specifically wood and solar. The Efficient Products Program also has a significant
17 amount of savings (23 percent of Program Savings) coming from cooking range and clothes
18 dryer fuel substitution to gas.

19 The attractiveness of fuel substitution measures is clear. A space heat fuel conversion saves
20 a little over 30,000 kWh per customer and hot water fuel conversions are estimated to save
21 5,965 kWh per household.

22 Fuel substitution measures, however, are very capital intensive, requiring a large upfront
23 investment to replace an electric appliance or heating or hot water system that is typically
24 functioning and not in need of immediate replacement. The space heat fuel conversion
25 measures are estimated to cost between \$3,417 for a wood stove to \$18,312 for a high
26 efficiency gas boiler (Response to NPB IR-3). Even with the promise of large annual savings
27 accruing to the customer, particularly for space heating and hot water conversions, it is often
28 difficult to convince customers to make this financial investment without some type of
29 assistance. Such assistance is typically in the form of an upfront rebate as has been proposed
30 for the fuel substitution pilot, consumer friendly (typically reduced cost) financing, or some
31 combination of the two.

1 Given the large per unit savings from these fuel conversion measures, attaining the 2012
2 Existing Houses Program goals will be very sensitive to fully meeting the implied
3 participation goals for these measures. The Existing Houses Program has 409 projected
4 space heating and hot water fuel conversions for 2012. Falling short of even a few dozen
5 fuel conversion projects will have a noticeable impact on the Existing Houses Program's
6 2012 savings goals. These projected 2012 participation rates may be met. However, the fuel
7 substitution pilot is only now underway. As a result, there are no actual program results to
8 inform the 2012 Existing Houses fuel substitution planning assumptions. As a result, there is
9 likely to be some significant uncertainty as to the ability to meet these fuel conversion goals.

10 Also note that ENSC is using an 80 percent net to gross ratio (Response to EAC IR -43) for
11 the Existing Houses Program. This value does not match those proposed by Dunskey
12 Consulting in their Residential Fuel Substitution Pilot Program description (Appendix D of
13 ENSC's 2012 DSM Plan). Potentially, depending on the final 2012 installed measure mix,
14 ENSC's planned savings from this set of measures may be overstated.

15 Q. What other features stand out among the proposed residential programs?

16 A. The Efficient Products Program has a very small reliance on efficient lighting for its
17 annual savings goals. Only seven percent of the estimated 2012 Efficient Program savings
18 and less than two percent of the entire residential sector savings comes from CFLs and LED
19 holiday lights. In comparison, leading residential programs routinely attain 30 percent or
20 more of their residential sector savings from efficient lighting promoted through retail
21 channels.

22 The low level of lighting savings is due to two factors. First, the program relies primarily on
23 the refrigerator and freezer recycling measures (47 percent of Program savings) and on the
24 aforementioned cooking range and clothes dryer fuel switch measures (23 percent of program
25 savings). Second and most significantly, is the very small numbers of lighting products that
26 the Program will promote in 2012. Using the 2012 first year measure savings and the per
27 unit savings estimates one can calculate the number of each measure that the 2012 programs
28 will promote (Response to NPB IR-3). In 2012, the Efficient Products Program projects to
29 promote 14,037 CFLs. Assuming 440,000 eligible households, this is only 0.03 CFLs per
30 household, much less than the more typical 1.0 to 2.0 CFLs per household that even mature
31 efficient lighting programs are able to support. There would appear to be significant

1 residential lighting savings opportunity that is not being adequately pursued by ENSC in
2 their 2012 Plan.

3 Q. How do the savings from the proposed behavioural program compare to similar
4 programs?

5 A. The assumed 1.5 percent savings estimates (Response to EAC IR-12) is in line with other
6 evaluations of the OPower Program, which appears to be the behavioural program that ENSC
7 plans to promote as most if not all of the supporting documentation for their proposed
8 behavioural program refers to OPower (Response to EAC IR-12). While OPower is likely
9 the best established, longest lived, and most evaluated electric utility behavioural program,
10 there are other behavioural program constructs that may yield larger savings. For example,
11 the evaluation of the Cape Light Compact's Grounded Power (now Tendril) pilot yielded
12 savings of 9.3 percent, though the per customer costs are much higher than those for OPower
13 (Attachment 1). It is not clear whether ENSC has undertaken a comprehensive a review of
14 other behavioural program options.

15 Q. Do you have a recommendation given your responses above?

16 A. Yes, given the uncertainty of achieving both the gross and net savings associated with the
17 fuel substitution measures, which constitute a large percentage of total residential sector
18 savings, and the small investment in efficient lighting made by the 2012 Plan, directing
19 additional program resources into the Products Program should be considered.

20 ENSC should also consider more closely investigating, including possibly piloting,
21 alternative behavioural program approaches. While OPower can be implemented fairly
22 quickly and at a low cost per customer, other behavioural programs may yield greater per
23 customer savings, though possibly at a higher cost per saved kWh.

24 If ENSC were to promote CFL sales equivalent to 1.0 CFL per household, this would result
25 in additional savings of 19.2 GWh, assuming savings of 45 kWh/CFL. This would represent
26 a 38 percent increase in residential sector savings compared to the current 2012 goal of 50.1
27 GWh.

28 Q. Would such a strategy potentially result in exceeding the 2012 targets from the 2009 IRP
29 Update?

1 A. Yes, that might happen, but the benefits, and additional costs, of exceeding the 2012 IRP
2 DSM targets would seem to outweigh what might be a non-trivial risk in not meeting these
3 targets. Additionally, the IRP targets should be viewed as a floor, not as a ceiling. Any cost-
4 effective investment in DSM is by definition less expensive than supply alternatives. Finally,
5 as noted by the ENSC in the 202 Plan, increasingly the focus of DSM efforts will be on
6 cumulative rather than on annual savings, reflecting a more future oriented perspective. If
7 savings exceeding the 2012 IRP targets are attained, at a minimum, they could be viewed as
8 insurance against any future program shortfall, and ideally, the cumulative IRP DSM goals
9 will also be exceeded.

10 Q. So the annual incremental targets in the 2009 IRP Update should not be viewed as
11 prescriptive goals?

12 A. No. If the opportunity arises to exceed the IRP targets at a reasonable cost and without
13 setting unrealistic expectations of the DSM delivery infrastructure then those opportunities
14 should be pursued. To expect that each year's annual incremental targets will be met exactly
15 and sum up to any final, long-term cumulative DSM target puts too much faith into the
16 underlying forecast mechanisms employed in the IRP Update. This is not meant to be a
17 criticism of the Nova Scotia IRP process, but rather a reflection on the reality of any
18 forecasting process.

19 Q. ENSC's 2012 DSM Plan includes "unexpected" savings from improvements made by a
20 small number of extremely large industrial (ELI) customers. ENSC has counted those
21 savings towards the 2012 savings goals, based on the 2009 IRP Update. As a result, the 2012
22 DSM budget has been reduced relative to what it would have been absent the savings from
23 these ELI customers. Do you agree with ENSC's reducing its DSM budget because of these
24 ELI savings?

25 No. The "found" ELI savings again reinforces the uncertainty of the DSM planning and
26 forecasting process. ENSC should maximize the amount of efficiency it can obtain in each
27 year in order to reach or exceed its cumulative savings goals. There will always be
28 uncertainty as to whether ENSC will be able to meet any one particular annual goal. If the
29 opportunity presents itself to exceed an annual IRP target, it should be pursued. There is
30 little if any downside to front loading savings and doing so potentially provides ENSC
31 greater flexibility in out years to pursue more innovative and comprehensive savings

1 strategies under reduced pressure to meet any one specific annual incremental savings target.

2 As noted above, there appear to be a number of additional savings opportunities that could be
3 pursued in 2012 in the residential sector.

4 In short, the IRP targets should inform the DSM savings goals established by ENSC, they
5 should not prescribe it. There has been no compelling case made to minimize the investment
6 in cost-effective energy efficiency as an alternative to more expensive supply side
7 alternatives.

8 Q. What other uncertainties would a more aggressive 2012 efficiency effort help minimize?

9 A. Energy efficiency forecasting is at best an imprecise science. One of the largest sets of
10 uncertainties centers on applying evaluation results retrospectively to actual program results.
11 Evaluation activities focus on both gross and net savings. While there are a number of
12 factors that contribute to the adjustment of gross savings to net savings, the principal ones are
13 free-ridership and spillover. ENSC appears to be applying net to gross (NTG) adjustments at
14 the program rather than at the measure level, except for the New Houses Program (response
15 to EAC IR-43). As noted previously, the 80 percent NTG ratio assumed for the fuel
16 substitution measures in the Existing Houses program are not consistent with the values
17 presented in the Dunskey Consulting report.

18 Similarly, the 85 percent NTG ratio for the Efficient Products Program may understate the
19 likely freeridership rates for measures in this program. Evaluations of refrigerator recycling
20 program activities and residential lighting measures typically report lower NTG ratios than
21 the implied 15 percent freeridership used in generating the 2012 Efficient Products savings
22 estimates. Further, the observed trend among recent evaluations has been for NTG ratios to
23 generally decrease over time, particularly for established measures.

24 Not knowing what the actual NTG ratios are for programs or measures introduces significant
25 uncertainty into the DSM planning process. A strategy to help mitigate this uncertainty
26 would be to raise the 2012 savings goals. If the evaluated savings are less than expected due
27 to lower NTG ratios or other issues, than any savings shortfall will be minimized. If the
28 evaluated savings closely correspond to the planning assumptions used in the 2012 Plan than
29 ENSC is that much closer to meeting its cumulative DSM targets.

30 Q. Do you have any other comments as to free-ridership and spillover?

1 A. Yes. As previously noted, the 2012 Plan incorporates NTG ratios at the program level,
2 with the exception of the New Houses Program. Lacking better data this might be an
3 appropriate approach. However, moving forward ENSC should consider developing NTG
4 ratios at the measure level or at least the measure category level for key measures or measure
5 categories. There are many customer, measure, and market barriers and attributes that
6 contribute to free-ridership and spillover. These include cost, savings, current market
7 saturation, equivalence of features relative to the non-efficient baseline alternative, etc. One
8 would presume that the NTG ratio for a \$3 spiral CFL might be very different than that for a
9 \$16,000 fuel conversion. However, determining NTG ratios can be an intensive undertaking.
10 ENSC and its evaluation contractors should focus measure level evaluation efforts on those
11 measures responsible for significant savings within a program. Research done in other
12 jurisdictions should also be considered to inform which measures or measure categories
13 should be examined.

14 Q. ENSC proposes to move from measure level to program level screening. Do you concur?

15 Generally yes. Measures that fail to pass the TRC test should be noted, examined and a
16 rationale provided for their inclusion within a broader program context. The reasons given
17 by ENSC in their IR responses are appropriate rationales for the inclusion of certain
18 measures that fail the TRC test. Further, while the TRC test is widely accepted in many
19 jurisdictions, the test does have its limitations. Most notably, the test considers all costs, but
20 in most jurisdictions only resource benefits – energy and water - are considered. There are
21 often, particularly in existing and new home programs, a multitude of non-energy benefits
22 that are often not quantified. This results in some potential asymmetry when using the TRC
23 test and may deem a measure not cost-effective due to the inability to quantify these non-
24 energy benefits. This is further reason not to use the TRC test as an absolute determinant of
25 whether a measure should be included in a given program as the TRC test may tend to
26 undervalue measure benefits and yield a lower benefit cost ratio.

27 Q. Does this conclude your evidence?

28 A. Yes it does.



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 KEMA), Burlington, MA

1983-1987: Principal Planner, Massachusetts Executive Office of Energy Resources, Boston, MA

PROFESSIONAL SUMMARY

Glenn Reed has more than 25 years of expertise 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 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 consultant to the Connecticut Energy Efficiency Board (EEB), he plays a similar technical assistance and oversight role in that state. For the Rhode Island Energy Efficiency Resource Management Council (EERMC) he provides oversight support on National Grid's lighting, appliances and gas and electric HVAC programs. In addition to his on-going work in Massachusetts, Connecticut, and Rhode Island, Mr. Reed has performed or directly overseen cost-effectiveness screening and program design for clients in New York, Prince Edward Island, and Vermont. Mr. Reed also developed or co-developed the Cost-effectiveness and Program Planning and Design modules for The Association of Energy Service Professionals' *DSM 101* training and presented this material to utility staff in several locations in the US. Prior to co-founding EFG, Mr. Reed was a Managing Consultant at the Vermont Energy Investment Corporation, Director of Regional Initiatives at the Northeast Energy Efficiency Partnerships (NEEP), and Deputy Director of East Coast Consulting at XENERGY (now KEMA).

SELECTED PROJECTS

- ***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 Leads Council engagement on the development of the residential measure characterizations for Massachusetts' new Technical Resource Manual.
- ***Connecticut Energy Efficiency Board (EEB).*** Leads residential team to provide oversight of the state's electric and gas residential efficiency program. Works closely with the state's utilities to develop cost-effective program designs and goals for the annual Conservation and Load Management Plan. Connecticut's programs are subject to both utility and TRC test review by their regulators. These services are provided through the utilities' engagement with the ECMB.



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- ***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.
- ***Vermont Electric Power Company.*** Managed the residential efficiency cost-effectiveness assessment and program design tasks for the VELCO Southern Loop project. This effort sought to avoid the construction of upgraded transmission lines in southern Vermont. The proposed programs would represent incremental activities above current Efficiency Vermont efforts in the area.
- ***Prince Edward Island Office of Energy Efficiency.*** Managed a potential analysis, measure screening, and program design and cost-effectiveness assessment for the provincial government. This analysis included the residential, C&I, and transportation sectors. Both energy and carbon savings were analyzed and estimated. Subsequent follow-up work included a critical review of Maritime Electric's DSM Plan and screening tool.
- ***Efficiency Vermont.*** Senior Advisor for Retail Market efforts (efficient lighting, appliances and consumer electronics) for Vermont's statewide, award-winning energy efficiency utility.
- ***Long Island Power Authority (LIPA).*** Led the VEIC residential team to provide ongoing technical and programmatic advice to LIPA on the design, implementation, and evaluation of their residential and renewable energy program. Responsible for detailed long-term program planning and cost-effectiveness screening, on-going program design and implementation review and assistance, and support of program evaluation efforts.
- ***Orange and Rockland (O&R).*** Led residential team to assess the cost-effective savings potential and to develop five-year program designs and budgets to attain this potential within prescribed budget caps. Potential analysis was informed by an on-site residential data collection task that was also part of their scope of work for O&R.
- ***Association of Energy Services Professionals (AESP).*** Lead trainer for AESP's DSM 101 workshops in NY, KS, IL, WA, and NC. Developed or co-developed Residential and C&I Technology, Cost-effectiveness, and Program Planning and Design training modules. These workshops, lasting as long as five days, provided efficiency program staff with details on all aspects of energy efficiency program planning, design, implementation, and evaluation.
- ***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.
- ***ENERGY STAR Products and Residential HVAC Initiatives.*** As manager of these NEEP Initiatives, activities include facilitation of multi-state stakeholder Working Group meetings (Sponsors, Sponsors' contractors, collaborative consultants, DOE, EPA, CEE and others), management of multiple RFP processes (coordinated contractor procurement for Sponsors and solicitations to industry to develop and implement joint promotions), development of regional market transformation plans, and coordination with national and other regional market transformation programs. Under Mr. Reed's direction the ENERGY STAR Products Initiative



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and its Sponsors were recognized for five consecutive years at the National ENERGY STAR Awards.

- ***Program for the Evaluation and Analysis of Residential Lighting (PEARL).*** Served on the PEARL Board to address on-going concerns regarding the quality and performance of ENERGY STAR CFLs and fixtures. As a direct result of PEARL's efforts, ENERGY STAR instituted third-party quality assurance testing for ENERGY STAR CFLs and fixtures. Mr. Reed, individually and as a PEARL Board, was recognized for his *Outstanding Contributions Improving the Quality of Efficient Lighting* at the 2005 ENERGY STAR Awards.
- ***New Jersey Statewide Efficiency Assessment.*** Managed a Comprehensive Resource Assessment (CRA) for a working group of New Jersey's electric and gas investor-owned utilities. This study examined an extensive set of efficiency and renewable energy opportunities in New Jersey, and provided a ranking for the technologies to inform future program planning and budget allocation decisions. Testified before the NJ Board of Public Utilities on the study's findings.
- ***Boston Edison Chiller Study.*** Managed a comprehensive analysis of chiller replacement, conversion and retrofit potential for Boston Edison. This project entailed over 600 on-site surveys of installed commercial and industrial chiller. In total, the over 1,000 chillers surveyed provided space cooling for 100 million square feet of floor space. A follow-up assessment targeted smaller customers and involved 150 surveys of commercial and industrial facilities with packaged air conditioners.
- ***New York Gas Group Gas Cooling Study.*** Managed the development of a research agenda to accelerate the commercialization of gas cooling technologies in New York. This analysis addressed both technical and market acceptance issues. Detailed DOE2.1e simulations were completed to develop a life cycle cost comparison between matched pairs of electric and gas cooling technologies. Interviews with manufacturers and research organizations were completed to assess current trends in product development. Focus groups were held in two locations in the state to examine design professional and contractor perceptions regarding gas cooling technologies.
- ***Consolidated Edison Technical Potential Analysis.*** Lead analyst in a research project to determine the DSM technical potential in the residential (retrofit and new construction) and commercial (new construction) sectors. This work, for Consolidated Edison, was done for their first annual comprehensive conservation filing to the New York Public Service Commission.
- ***Massachusetts Electric C&I Rebate Design.*** Managed a project to develop commercial and industrial new construction rebates for a large Massachusetts utility. These rebates were calculated by weighting energy and demand savings across 12 avoided cost periods. Over 30 lighting, envelope and HVAC measures were analyzed.
- ***Massachusetts Residential Code Impact Study.*** Managed a residential code impact study for the Massachusetts Board of Building Regulations and Standards (BBRS). Nearly 200 on-site surveys of recently built homes were completed. Customer selection was done using cluster sampling techniques to limit the number of towns that had to be visited during the survey and to reduce overall project costs. DOE-2 was used to generate estimates of the savings attributable to the revised residential energy code.



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- ***Georgia Power C&I Baseline Study.*** Managed an on-site survey and analysis project to determine new construction baseline practices. For this study for Georgia Power, data were collected on-site at 480 facilities representing over 13 million square feet of new building space. All primary electric and gas equipment was inventoried. With the results from this study, program eligibility criteria for the utility's commercial new construction program were established.
- ***Massachusetts Statewide C&I Baseline Study.*** Managed a joint research project to characterize new construction practices in the commercial and industrial sectors. This project for four Massachusetts utilities analyzed data collected from 100 on-site surveys. In addition, 30 in-person interviews were performed to determine factors affecting specification of high efficiency equipment and controls in new buildings. The results were used for both program design and program evaluation purposes.
- ***New Jersey Residential HVAC Baseline Study.*** Managed a residential HVAC baseline study for the New Jersey HVAC working group consisting of the state's electric and gas investor owned utilities. Nearly 70 on-site surveys characterized HVAC specification and installation practices including system sizing, duct leakage, refrigerant charge and airflow over the indoor coils. XENERGY also completed market actor interviews with manufacturers, distributors, and contractors.
- ***Northern States Power – Wisconsin's C&I New Construction Process Evaluation.*** Managed a process evaluation of NSP – Wisconsin's C&I new construction program. XENERGY completed interviews with program staff, participating and nonparticipating customers, and trade allies. On-site surveys were completed to estimate current new construction practices and to compare these practices to current program guidelines and to the recently revised Wisconsin energy code.
- ***Potomac Electric Residential Impact Evaluation:*** Managed an impact evaluation of Potomac Electric's residential new construction program. This evaluation used both billing analysis and engineering simulation to develop independent estimates of program participation. DOE2.1e was used as the energy simulation tool. The billing analysis and simulation savings estimates were also combined in a statistical engineering model to develop program impacts.
- ***Boston Edison Residential Impact Evaluation:*** Managed an impact and implementation analysis of Boston Edison's Energy Crafted Home residential new construction DSM program. For the impact analysis, both engineering simulations and billing analysis were used. On-site surveys were performed to characterize both participant and nonparticipant homes.
- ***Central Vermont Public Service's C&I Evaluation.*** Managed a process evaluation of CVPS's new construction programs for its commercial and industrial customers. Process tasks included staff interviews, on-site surveys to assess lost opportunities, and telephone interviews of program participants and nonparticipants.
- ***New England Electric System Free-ridership Analysis.*** Managed a free-ridership evaluation of a New England Electric System's Design 2000 New Construction Program. XENERGY engineering and professional staff administered a detailed and comprehensive phone survey to over one hundred participating design professionals and building owners who were responsible for measure specification. In addition, 30 on-site surveys allowed lost opportunities to be assessed. The results of the study showed significant differences in program free-ridership by end use.



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PUBLICATIONS

- *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.
- *Savings Without Rebates: Moving Toward Claiming Savings from Market Transformation.* Glenn Reed, Toben Galven, and Blair Hamilton. 2006 ACEEE Summer Study on Energy Efficiency in Buildings, Pacific Grove, California, August 2006.
- *Pearls of Wisdom: Assuring Efficient Lighting Product Quality and Program Integrity.* Elizabeth Titus, Glenn Reed, Noah Horowitz, and Chris Granda. 2005 International Energy Program Evaluation Conference, New York City, New York, August 2005.
- *Engaging Industry: Better Their Money than Ours.* Glenn Reed, Peter Bardhi, Ed Murphy, Jeff Pratt, and Subid Wagley. 2002 ACEEE Summer Study on Energy Efficiency in Buildings, Pacific Grove, California, August 2002.
- *Reaching the Consumer: Different Approaches to Common Themes.* Marci Sanders, Sue Soweck, Glenn Reed, Wally McGuire, and Maureen McNamara. 2002 ACEEE Summer Study on Energy Efficiency in Buildings, Pacific Grove, California, August 2002.
- *Status of the U.S. Market for Green Power.* Glenn Reed and Ashley Houston. 2000 ACEEE Summer Study on Energy Efficiency in Buildings, Pacific Grove, California, August 2000.
- *Commercial New Construction Practices in Georgia: Findings from 480 On-Site Surveys.* Second National New Construction Programs for Demand-Side Management Conference, San Diego, California, October 1993.
- *Freeridership Estimation in the New Construction DSM Market.* Betty Tolkin and Glenn Reed, Sixth International Energy Program Evaluation Conference, Chicago, Illinois, August 1993.
- *Determination of Baseline Commercial New Construction Practices in Massachusetts.* Building for the Future - New Construction Programs for Demand-Side Management Conference, Lake Tahoe, California, May 1992.
- *Is Fuel Switching a Viable DSM Option: Assessment of Impacts and Potential for Conversion to Gas Cooling in the Rhode Island Commercial Sector.* Glenn Reed and Gary Epstein, Fifth National Demand-Side Management Conference, Boston, Massachusetts, 1991.
- *A Case Study in Comprehensive DSM Measure Analysis and Incentive Setting.* Don Robinson, David Jacobson, Susan Haselhorst, and Glenn Reed, Fifth National Demand-Side Management Conference, Boston, Massachusetts, 1991.
- *No Before, Only After - The Importance of Establishing a Baseline for New Construction.* Fifth International Energy Program Evaluation Conference, Chicago, Illinois, 1991.