

DPS EEU Evaluation Plan for
Three-year EEU funding cycle 2006 – 2008
March 5, 2007

Introduction

Vermont legislation (30. V.S.A § 209) authorizing the creation of an Energy Efficiency Utility (“EEU”) and funded through an Energy Efficiency Charge (“EEC,” or “wires charge”) requires that the Vermont Public Service Board (“PSB”) “[p]rovide for the independent evaluation of programs delivered” under this section. In its Order of 9/30/99 in Docket No. 5980, the Board approved a Memorandum of Understanding between the Vermont Department of Public Service (“DPS” or “The Department”), Vermont’s electric utilities, and a number of other parties. In the MOU, the parties agreed (in ¶ 11) that the Department was to “provide for formal evaluation of the Core Programs and any other System-wide programs approved by the Board for EEU implementation. This evaluation will include but not necessarily be limited to assessment of market transformation accomplishments, with accompanying proposals for program change.”

The Department provided these EEU evaluation services over the first 6 years of the EEU implementation, from 2000 through 2005.¹ This document outlines the Department’s plans for continuing to evaluate the Energy Efficiency Utility (EEU) programs for the three-year, 2006-2008 contract cycle.²

Vermont’s statewide EEU is known as Efficiency Vermont (“EVT”). Efficiency Vermont services and initiatives are provided for most of Vermont under a Public Service Board contract with the Vermont Energy Investment Corporation (“VEIC”), a non-profit organization located in Burlington, Vermont. The City of Burlington Electric Department (“BED”) provides the energy efficiency utility services in their service territory. This evaluation plan is applicable to both EVT and BED programs.

The development of this Plan incorporates input from the EEU implementers, EVT and BED, the EEU Contract Administrator, and other stakeholders. This input was obtained in a September 2006 meeting and in subsequent communications.

1 See DPS website at <http://publicservice.vermont.gov/pub/2003-2005summaryreport.htm>

2 Additional funds may be needed to conduct measurement and verification (“M&V”) evaluations that may be required to support the reliability of EVT and/or BED capacity savings submitted to ISO-NE in the Forward Capacity Market (“FCM”) auction and for subsequent payment submittals in any successful market participation. This plan is intended to be sufficient for the M&V described in the November 17, 2006 Vermont’s EEU M&V Plan for the ISO-NE FCM transition period.

Budgets

When the three-year EEU budget was set in the fall of 2005, the budget total amount was legislatively capped at \$17.5 million annually. At that time, the DPS EEU evaluation budget was set at 3.3% of this total or about \$1.7 million for the three-year period. The 2005-2006 Vermont Legislature removed the \$17.5 million cap and made other changes to provide guidance to the Public Service Board in determining the EEU budget. In an August 2, 2006 Board order, the EEU budgets for each of the years 2006 through 2008 were set at \$19.5 million, \$24 million, and \$30.75 million respectively. The DPS EEU evaluation budget was increased to a total of \$2.0 million for the three years. In a separate document, the Board approved the DPS use of carry-over funds from the previous budget cycle for future evaluation activities.³ This results in a total 3-year budget of about \$2.4 million or approximately 3.2% of the total EEU budget. Table 1 shows the amount of available funds for each of the years upon which this plan is proposed.

Table 1: DPS EEU Evaluation Available Funds

	2006	2007	2008	3-Year Total
Budget	\$677,000	\$692,000	\$708,000	\$2,077,000
Carryover		\$236,676		
Total	\$677,000	\$928,676	\$708,000	\$2,313,676

These funds are used to pay the costs of independent evaluation contractors whose services are procured through a competitive process. The cost of DPS staff time devoted to EEU evaluation activity is currently funded through the Department budget and is in addition to this amount.

Evaluation Goals and Objectives

The goal of this plan is to provide the Board with an independent evaluation of EEU programs, pursuant to its statutory obligations under §209(e)(10). As a result of the implementation of this plan, the Department, Board, and various stakeholders will have a better understanding of Vermont's energy efficiency markets and the impacts of the EEU's activities. Toward that end, this plan has the following overall objectives:

1. Verify the annual energy and coincident peak capacity savings and total resource benefit claims made by the EEU, as provided for in the contract with Efficiency Vermont ("EVT") and the Public Service Board ("PSB"), and at Board direction for Burlington Electric Department ("BED");

3 Board memo dated August 9, 2006

2. Conduct market studies to characterize and assess current conditions in discreet energy efficiency markets identified by stakeholders and in prior evaluation studies and reports;
3. Provide evaluation activities necessary to inform the implementation and success of the Public Service Board’s geographic targeting objectives and directives to the EEU. The Vermont legislature directed the Public Service Board to consider targeting the EEU services to maximize the value of the savings; and
4. Assess the impact of specific measures or initiatives where significant uncertainty exists and/or where the savings contribution is large. This work will be informed, at least in part, by impact evaluation needs as a result of EVT and BED’s participation in ISO-NE forward capacity market (“FCM”).

To meet these objectives, a number of evaluation activities will be conducted through the use of independent contractors. Competitive bids for specific identified objectives will be sought through the request for proposals (“RFP”) process starting in January 2007. A preliminary budget breakdown is presented in Table 2. More detailed budget information can be found in Appendix A.

Table 2: Preliminary Budget

Market characterization & Assessments		\$1,080,000	46.7%
Residential Existing Homes On-Site Assessment	\$ 300,000		
Residential New Construction Baseline Study (SF & MF)	\$ 200,000		
Business New Construction & Remodeling On-Site Study	\$ 280,000		
Business Sector Existing Buildings On-Site Study	\$ 300,000		
Impact Assessments		\$ 925,000	40.0%
Planning & Management		\$ 184,000	8.0%
Other		\$ 124,395	5.4%
Total		\$2,313,395	

Market Characterizations and Assessments

With the increased EEU budgets, directive for geographic targeting, and the potential for the Board to reconsider the 2008 EEU budget set in the Board’s August 2, 2006 order, there is a need to conduct market studies to identify areas of promising efficiency potential and to inform program design decisions. The Department intends to conduct market

assessment and baseline studies initially in pursuit of this goal and has allocated about 46% of the three-year budget amount for that purpose. The detailed budget in Appendix A lists the proposed areas for study. Issues for consideration are listed and briefly described below.

1. “Early retirement” programs. The July 2006 *Vermont Electric Energy Efficiency Potential Study* conducted for the DPS by GDS Associates found that so-called “early retirement” resources were likely to be somewhat more costly (though still cost-effective) than current program lost-opportunity acquisitions. This is not surprising, but efforts in this area may well be necessary to achieve the new, higher energy efficiency objectives. This is an area that requires more research and investigation into potential early retirement opportunities. Leading examples include refrigeration and air conditioning systems, but other areas should be investigated as well. Also, the DPS proposes to conduct market assessment research on industrial process opportunities and develop case studies that document the impact of energy efficiency improvements on particular industries.
2. Residential multi-family new construction baseline study. About half the activity in the residential new construction market is associated with multi-family and single family attached homes. A study that determines current practices in these market, as well as current lighting levels and HVAC equipment in all new homes, would be useful.
3. Residential New Construction lighting baseline study. The DPS annual verification process has identified a need to update the baseline levels and characteristics of lighting in new residential construction. The study might simultaneously update other selected characteristics of the residential new home market and explore possible program design modifications to acquire more efficiency.
4. Update key business sector market effect indicators. Two areas identified for emphasis are building commissioning and the effective use of day lighting.
5. Residential appliances. The evaluation work completed by KEMA in February 2006 estimates much less net impact in recent years, although the study leading to that conclusion seems to inadequately capture the effect on the market of Vermont’s multi-year, ongoing efficiency programs. In response to this situation, this Plan proposes two additional evaluation activities for this cycle. One is to commission a project to review and assess the best current methodologies for estimating net program effects on the market. The other is a new market assessment for residential appliances which would be useful to assist residential program design efforts.
6. Direct some research toward the challenge of increasing first-time participants. One example is some research/evaluation toward EVT’s stated objective of increasing the participation of large grocery stores in stocking and displaying CFLs in the Retail Products initiative.

7. Conduct an evaluation of the Manchester community based project. In its September 25, 2006 order, the PSB directed EVT to use the additional budget amounts to maximize peak capacity reductions statewide and to seek energy and capacity reductions in targeted geographic areas. A study that looked at the Manchester experience would be useful for future geographic targeting initiative designs.

Impact Assessments

Annual Savings Verification Process

Accurate and credible savings estimates are a vital component of the statewide energy efficiency programs operated by EVT and BED. The 2006-2008 Board's contract with VEIC for EEU services specifies that the DPS is responsible for the annual verification of EVT's energy and capacity savings and total resource benefits ("TRB") claims. The contract contains performance indicators for MWh savings, coincident summer KW peak, coincident winter KW peak, and total resource benefits.⁴ EVT's Annual Savings Claim is provided on April 1 following each year of implementation. The DPS conducts a two-month intensive review of the savings and TRB claim and provides its report and recommendation to the EEU Contract Administrator on or about June 7. The process includes the design and implementation of a stratified random sample of business custom projects for review, reviews of measure-level savings in EVT's central database, electronic and paper files for custom projects, savings analysis tools, and pre-installation and post-installation billing history for selected projects. There also is an ongoing technical advisory group process that reviews EVT's technical reference manual additions and revisions, follows up on Department findings in its verification process, and provides a forum for other issues related to EVT's savings estimate procedures.

For this contract period, the Department plans to take steps to further increase the scope of its verification process. The past two years saw a great improvement with the adoption of a stratified random sampling methodology to review savings claimed for EVT's business sector services.⁵ However, the constrained verification process time period has limited the ability to conduct site-specific verification activities that could provide greater savings certainty for large projects or unusual measures. An RFP for these services for this contract cycle will seek proposals that include additional measurement and verification of large or unusual projects, or measures that result in a large savings amounts.

In addition, the DPS will conduct an annual review to verify Burlington Electric Department ("BED") annual savings and TRB claims.

Other Impact Assessments

⁴ Contract negotiations are presently underway to establish indicators for geographic targeting.

⁵ See 2004 and 2005 verification reports on DPS website at:
<http://publicservice.vermont.gov/pub/2003-2005summaryreport.htm>

The verification process is the backbone of the Department's assessment of the impacts of the EEU's savings and activities. The process and its results often point to items and issues where additional evaluation studies are needed. The increasing emphasis on energy efficiency impacts in electric infrastructure planning for both Vermont and New England helps enhance the importance of rigorous impact evaluation.⁶

Vermont's relatively small evaluation budget is a key consideration, however, as impact evaluation can be a very expensive activity.⁷ The goal is to accomplish good, defensible impact evaluation estimates at a reasonable cost. This requires careful strategic targeting of evaluation efforts.

This plan proposes to allocate about 40% of the total three-year budget for impact evaluation studies and activities; \$400,000 of which is estimated for the verification process as described above. The remaining \$525,000 will be allocated for discreet studies in the areas of priority interest. Wherever it is possible and appropriate, the Department will seek to partner with other New England jurisdictions for these studies, to maximize the available funds.

The following list provides several examples of current areas of high priority interest. However, the significantly increased EEU budgets ordered by the PSB in August 2006 and the evolving role of efficiency resources in the ISO-NE forward capacity market requires some flexibility with respect to specific objectives for this Plan. This list, therefore, may be supplemented following future discussions with interested parties in Vermont.

1. Measure persistence and longer-term spillover for residential and business sector lighting. The interest is in both residential and business sector lighting products, especially compact fluorescents bulbs, associated with the EVT Retail Products initiative.
2. Assumptions used to estimate savings from lighting products reported in the Retail Products initiative that are attributed to business customers. In 2005, business customers made twenty-four percent of the CFL bulbs purchased through the Retail Products initiative. These purchases represented 53% of the lighting savings attributed to Retail Products. The in-service rates and hours-of-use documented in EVT's technical reference manual generally reflect standard commercial business characteristics. However, an initial investigation of EVT's tracking system data suggests 70% of these bulbs are linked to hospitality, property management, and religious building accounts.

⁶ Impact evaluation is "used to measure the change in energy and/or demand usage (such as kWh, kW and therms) attributed to energy efficiency and demand response programs." *The Need for and Approaches to Developing Common Protocols to Measure, Verify and Report Energy Efficiency Savings in the Northeast*, Final Report, January 2006, Northeast Energy Efficiency Partnerships, Inc. (NEEP).

⁷ The EEU evaluation budget is about 3.2% of the overall EEU budget for the three years. This is at the low end of typical evaluation allocations in the industry, where a common rule of thumb is 5 to 10% of the total budget.

A study that investigates the disposition of these bulbs and reviews the assumptions used to estimate the savings is needed.

3. Market effects (spillover, free-riders) for the Business New Construction Initiative. Vermont recently passed Commercial Building Energy Standard (“CBES”) legislation, putting standards into effective January 1, 2007. Understanding the impact of EVT activities on standard practice and determining the degree of code compliance are issues central to understanding what savings can be attributed to EVT’s activities in the commercial new construction market.
4. Snow making efficiency measure impacts. Installation of efficient snow making equipment is by the far the largest technology savings in 2005 and EVT indicates additional projects are currently in progress. The DPS verification review identified a number of questions and issues about these measures and their actual impact on energy and demand use at the ski areas.

Planning & Management

The DPS currently has a three-year contract with Dr. Martin Kushler for expert energy program evaluation services, including evaluation design and technical quality control, which extends for the 2006-2008 cycle. In addition, the Department anticipates it will require additional planning and management services in the fall of 2007 through at least mid-2008 to prepare a DPS report and recommendation to Board by March 1, 2008 for the 2009 – 2011 EEU budget. The total budget allocation for Dr. Kushler and the additional assistance is estimated at \$184,000.

Other

The Department’s proposed budget includes \$124,000 for a process evaluation for the EVT Community based pilot in Manchester, and to cover the additional, unanticipated cost of the July 21, 2006 Vermont Electric Energy Efficiency Potential Study totaling \$74,394.⁸ Miscellaneous general expenses are also included under this category.

Implementation Strategy and Scheduling

⁸ The Department received Board approval for this use of unspent EEU evaluation funds (carry over) from the previous contract cycle. This was a one time Department EEC expenditure, as the Docket 5980 MOU that resulted in the creation of the statewide EEU provided for the funding of periodic efficiency potential studies through a utility bill back mechanism.

Implementation of this plan will take place primarily in calendar year 2007 and early 2008. A general strategy is outlined as follows:

1. Issue an RFP for a verification contractor for a two-year contract with option for additional 2-year renewal.
2. Develop and issue RFP's for market assessment and baseline studies in early 2007. This work will help identify opportunities for increased energy efficiency to meet the new EEU budget and savings goals. To the extent practical, studies will be grouped into a minimal number of RFP's.
3. Issue an RFP to develop improved methods to assess net savings impacts, including consideration of attribution, free riders, and spillover.
4. Use the results of the market assessments, baseline work and methodology studies to refine and frame impact evaluations that will be done in 2008.
5. Implement targeted process evaluations as needed for new initiatives and programs with significant uncertainty.

Proposed Market Assessment and Evaluation Activities

The three markets where studies are most needed are residential existing homes, business new construction and remodeling, and business existing buildings. The Department's priority proposals are as follows:

1. Conduct a large scale (100 – 200) on-site assessment of existing single family homes to:
 - a. Document current building and equipment status and potential,
 - b. Assess barriers to higher efficiency on specific priority measures, such as residential customers with no CFLs, and
 - c. Assess potential receptiveness to specific energy efficiency upgrades, including early retirement of targeted appliance and HVAC equipment.

These on-site assessments would not include detailed energy audit type calculations, but rather would be used to gather categorical information on current conditions and physical potential for upgrades, plus customer perceptions and receptiveness with respect to energy efficiency upgrades.

2. Conduct an on-site study of business new construction and remodeling to:
 - a. Document building and equipment status and energy efficiency potential, including targeted baselines for lighting power density ("LPD") and HVAC EER's, and saturation of super T8s and CFL fixtures;
 - b. Determine packaged HVAC distribution of efficiencies by size, and assess the potential for efficiency improvement; and
 - c. Understand the characteristics of equipment change-out in the remodeling market and how energy efficiency might be better incorporated into the market.
3. Conduct a relatively large-scale (50 – 100) on-site assessment of existing business buildings to:

- a. Document building and equipment status and energy efficiency potential, including targeted baselines for lighting power density (“LPD”) and HVAC EER’s, and saturation of super T8s and CFL fixtures;
- b. Determine packaged HVAC distribution of efficiencies by size and assess the potential for efficiency improvement; and
- c. Characterize the remodeling and equipment change-out markets and how energy efficiency might be better incorporated into those markets.

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