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**The Department of Public Service's Energy Efficiency Utility
Evaluation Plan
For
The Contract Period 2003 through 2005**

Executive Summary

This document details the Public Service Department's plans for evaluating the state's Energy Efficiency Utility¹ (EEU) during the current contract cycle (2003-2004).

30 V.S.A. § 209(e)(10) requires independent evaluation of the EEU. The Department of Public Service (DPS or Department) agreement to evaluate the EEU's performance was agreed to in the Memorandum of Understanding (MOU) between the Department, Vermont's electric utilities and other parties and approved by the Public Service Board ("PSB" or "Board") in Docket 5980. The Department views this function as a natural extension of its role as public advocate and its obligation to see that ratepayer dollars are invested effectively, that the total cost of energy service is "least cost" under the definitions of 30 V.S.A. §§ 202a and 218c, and that energy efficiency programs are well-designed, comprehensive, effectively implemented, and continuously improved. The Department's experience with managing the evaluation of the EEU's performance during the first three years (2000-2002) provides a foundation for continuing and strengthening the evaluation of EVT's performance in the second contract cycle.

The objective of this plan is to:

- Provide the Board with the information it needs to fulfill its salutatory obligation regarding evaluation of EVT performance
- Provide information needed to conduct a new competitive solicitation for an entity to serve as the EEU in the next contract cycle, 2006 through 2008
- Provide the information needed to determine how individual programs or groups of programs could be improved
- Verify that claimed energy savings are actually being achieved
- Develop a knowledge base that will help the Board and the Department make decisions on how the overall structure and operations of the EEU could be improved in the next contract cycle

To meet these objectives ten major evaluation activities will take place in 2004 through early 2005. The first seven studies focus on the EEU as it currently operates and will help identify improvements to existing operations and verify savings. The last three studies take a much broader view of the EEU's overall operation, structure and impact on Vermont. They are designed to help the Board and the Department make decisions on how the overall structure and operations of the EEU could be improved in the next

¹Throughout this document the Energy Efficiency Utility ("EEU") is also referred to as Efficiency Vermont ("EVT"), which is the "brand name" used to promote the EEU. Both of these terms will be used interchangeably.

contract cycle. The budget and schedule for each activity can be found in Appendix I of this plan. The following is a brief description of each evaluation.

1. *Impact Evaluations*

The purpose of this evaluation is to verify that the assumptions used to determine whether the efficiency measures installed are saving the energy that is being claimed. In other words, it answers the question: Are we getting what we are paying for? Impact evaluation can be very expensive so this study will need to focus on a limited number of efficiency measures that have contributed significantly to the savings goal. One key measure characteristic that this study will need to focus on is the effective useful life of installed measures.

2. *Update Key Market and Program Indicators*

The purpose of this evaluation is to update benchmarks or “market indicators” that are used to measure the effectiveness of EVT’s programs and services. An example of a program indicator is the total number of Vermont residents purchasing selected energy efficient products within a period of time. By tracking this indicator one can measure the effectiveness of the energy efficiency programs that are trying to increase the distribution and sales of energy efficiency products. This study does not intend to update all market indicators but to focus on the more important ones identified in the evaluation studies conducted in the first contract cycle.

3. *Update Commercial and Industrial and Residential New Construction Baselines*

The EEU is responsible to encourage construction of energy efficient buildings therefore it is important to understand how efficient new facilities are being built absent any influence from EVT. Updating this “baseline” will ensure that EVT will focus its resources on promoting the design and construction of energy efficient buildings that go beyond standard practice and not provide incentives and services for what is already standard practice. This study will update what is considered standard practice in Vermont and use the updated baselines for estimating energy savings and determining incentive payments. The updated baselines when compared to the previous baselines will also help determine how effective EVT has been at influencing the design and construction of energy efficient buildings in Vermont

4. *Develop baseline for the Multifamily New Construction Market*

The last evaluation cycle identified a need to develop a baseline specifically for the multifamily new construction market. This project is already underway.

5. *Research reasons for non-participation in C&I and Residential Programs*

Not all Vermonters have taken advantage of the services offered by EVT. This study will identify the customers or groups of customers that are not using these services and why. The study will then make recommendations on how the EVT could modify its services to increase participation.

6. ***Annual Savings Verification***

Accurate savings estimates are an important element of EVT's efficiency efforts. The Department will continue to conduct its annual verification of EVT's savings. This process includes ongoing input into EVT's savings assumptions, feedback to EVT on savings claimed from custom projects, review of EVT's measure-level savings in its central database, review of other analysis tools, and comparison of savings to billing history. While most of the work is performed during the two months between the submittal of EVT's annual report and the Contract Administrator's verification report, ongoing review and feedback occurs throughout the year.
7. ***Assess Minimum Performance Standards and Performance Awards Indicators***

The EEU will be awarded a monetary incentive if it achieves specific performance targets. The Department and the Board's Contract Administrator are responsible for determining whether EVT has met those performance standards. Tables K-2 and K-4 in Appendix II contain the performance indicators and minimum performance standards that EVT needs to be achieve to qualify for its performance incentives.
8. ***Evaluate the operational efficiency of the EEU***

The goal of this evaluation will be to determine how efficiently EVT and the overall EEU structure is operating and will be used to help shape the Request for Proposals in the next contract cycle. It will also aid in evaluating those proposals and in setting performance standards in the next cycle.
9. ***Evaluate other strategies for acquiring energy efficiency resources***

This study will investigate other strategies for acquiring energy efficiency resources beyond the methods currently used by the EEU. It will also explore how the EEU could spur the development of independent businesses throughout the state that would provide energy efficiency services independent of the EEU. The hope was if that did happen, it would not be necessary to continue with funding an EEU.
10. ***Evaluate the short and long term rate impacts of the EEU's activities***

This study would conduct an analysis to determine rates with and without the energy efficiency charge and the impact of EEU activities. This analysis would consider the energy and dollar savings that would result from EVT activities over the next 5-10 years. The study would examine the impacts under varying assumptions, such as growth rates and key measure characterization assumptions. It would also examine the effects the EEU would have participants and non-participants in the programs.

Other important aspects of this plan include:

- The stipulation between Burlington Electric Department (“BED”) and the Department contains an agreement by the Department to coordinate its evaluation activities with BED. As in the first evaluation cycle, the Department intends to include BED’s service territory in the specific evaluation tasks it undertakes rather than design specific evaluation efforts for BED’s service territory.
- Nationwide there have been numerous evaluation studies conducted that are not unique to a specific region and the results could be applied to Vermont. Whenever possible, those evaluation studies will be used to minimize costs and expedite studies in this plan.
- The Department will not be performing the evaluation studies itself but will contract with firms that specialize in this type of work. In some cases more than one contractor may be assigned to project and in other cases one contractor may be responsible for more than one project.
- The reduced staffing at the Department may make it necessary to use contract employees or consultants for implementation and management of the overall evaluation plan.

I. Introduction

This document details the Department of Public Service's plans for evaluating the state's Energy Efficiency Utility during the current contract cycle (2003-2005).

This plan is designed to meet the five objectives:

1. To provide the Board with the information it needs to fulfill its salutatory obligation regarding evaluation of EVT performance
2. To provide information needed to conduct a new competitive solicitation for an entity to serve as the EEU in the next contract cycle
3. How individual programs or suite of programs could be improved
4. Verify the savings being achieved through services offered by EVT and the efficiency measures being installed.
5. Develop a knowledge base that will help the Board, EVT and the Department understand how the overall structure and operations of the EEU could be improved in the next contract cycle

The evaluation studies discussed in this plan were developed by the Department and based partly in consultation with EVT and the Board's Contract Administrator. The evaluation studies in the previous contract cycle had a broader focus and identified areas that needed to be studied in more detail this cycle. Therefore, the Department will focus this round of evaluation activities on more specific issues identified in the last round. One exception will be an evaluation project that will examine the overall structure and operational efficiency of the EEU.

II. Department of Public Service's Responsibilities

The Department's responsibility to evaluate the Energy Efficiency Utility's ("EEU") performance stems from specific functions delineated in the legislation creating the EEU, in conjunction with the definition of roles laid out in the MOU between the Department, Vermont's electric utilities and other parties and approved by the Public Service Board ("PSB" or "Board") in Docket 5980.² The Department views this function as a natural extension of its role as public advocate and its obligation to see that ratepayer dollars are invested effectively, that the total cost of energy service is "least cost" under the definitions of 30 V.S.A. §§ 202a and 218c, and that energy efficiency programs are well-designed, comprehensive, effectively implemented, and continuously improved. The Department's experience with managing the evaluation of the EEU's performance during the first three years provides a foundation for continuing and strengthening the evaluation of EVT's and BED's performance in the second contract cycle.

² The EEU programs are implemented by Efficiency Vermont in all Vermont electric utility service territories except Burlington Electric Department (BED). BED has Board approval to implement the EEU programs in its service territory "with the same look and feel" as EVT's services and initiatives. The DPS evaluation activities are directed to the EEU programs and activities statewide.

The legislation (30. V.S.A § 209) authorizing the creation of an EEU and the Energy Efficiency Charge (“EEC,” or “wires charge”) requires that the Board “[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 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.”

In addition, the terms of the contract between Efficiency Vermont and the Board specify a number of evaluation-related functions that the Department is either required or expected to perform. Many of these are similar to tasks the Department has undertaken in the past as the public advocate on demand side management (DSM) issues in rate cases and in program design deliberations with utilities. A sample of the functions assigned to the Department are the following:

- Review and verify claims for annual electricity savings and total resource benefits,
- Negotiate, set baselines for, and evaluate compliance with program performance and market indicators,
- Provide input, review and, if necessary, comment to the Board on the methodology and assumptions used to calculate savings for tracking, reporting and planning purposes, including methodologies for total resource benefit (“TRB”) savings,
- Review and comment to the Board on program modifications and budget re-allocations proposed by Efficiency Vermont, and
- Make recommendations to Efficiency Vermont, based on the results of the evaluation studies.

A number of these functions are coordinated with the Board’s Contract Administrator. All of these tasks are part of the Department’s primary evaluation responsibilities.

III. Evaluation Projects

This section describes the specific evaluation activities that are going to be completed in this contract cycle. Prior to issuing a Request for Proposal for each study a more detailed scope of work will be developed and budget estimates and schedules refined. Ten studies have been identified. The first seven studies listed focus on the EEU as it currently operates and will help identify improvements to existing operations and verify savings. The last three studies take a much broader view of the EEU’s overall operation structure and impact on Vermont. They are designed to develop a knowledge base that will help the Board and the Department make decisions on how the overall structure and operations of the EEU could be improved in the next contract cycle.

1. *Impact Evaluation*

The purpose of this evaluation is to verify whether the efficiency measures installed are saving the energy that is being claimed. In other words, it answers the question: Are we getting what we are paying for?

Impact evaluations can be very expensive; therefore, the Department does not intend to conduct formal impact evaluations of entire programs or markets. Rather, the Department's strategy is to identify specific measures with a relatively high degree of uncertainty regarding estimated savings and design the analysis to investigate the underlying factors effecting measure performance, measure life and savings. In general, energy use and the associated savings have two components: the first stems from the amount of energy used when a device is in operation; the second arises from the usage patterns of the business or individual. In many cases, determining the savings when the device is in operation is a fairly straightforward calculation. In contrast, usage patterns can vary widely among participants as well as over time at a single business or residence. To establish reasonable savings estimates, both of these components must be considered. Results from both the market analysis and the baseline of current practices discussed in the following sections will be used to inform these estimates. The types of analyses conducted by this study to establish savings levels may include any or all of the following:

- Reviews of billing history prior, and subsequent, to the installation,
- Surveys of participants to determine how specific devices are being used,
- Review of EVT's central program database to review measure- and project-level savings
- Detailed review of selected projects that may include on-site metering.

The Department will also be taking a close look at a variety of specific projects in the commercial and industrial sector to highlight new technologies or new applications of existing technologies and to investigate measure performance and savings levels for specific applications.

2. *Update Key Market and Program Indicators*

The purpose of this evaluation is to update benchmarks or "market indicators" that are used to measure the effectiveness of EVT's programs and services. An example of a program indicator is the total number of Vermont residents purchasing selected energy efficient product within a period of time. By tracking this indicator one can measure the effectiveness of the energy efficiency programs that are trying to increase the distribution and sales of energy efficiency products. This study does not intend to update all market indicators but to focus on the more important ones identified in the evaluation studies conducted in the first contract cycle.

In the first evaluation cycle, the Department's evaluation contractors, Xenergy and GDS Associates, developed a list of potential program and market indicators for evaluating EVT's progress. The immediate task before the Department is to review the EVT's

program goals and then select the most important market indicators to measure in the current cycle.

Another task that is part of this study will be to explore methods to systematically track key market indicators on an on-going basis. Tracking specific product sales data is one indicator that has been identified as needed and a method for tracking this data needs to be developed.

3. Update C&I and Residential New Construction Baselines

In the new construction markets, construction practices are a critical indicator of program effects and are also used to estimate savings levels. During the first contract cycle, the DPS conducted baseline studies to assess current construction practices for the C&I and the single-family residential new construction markets. The results of these studies provide an initial benchmark for measuring the future impacts EVT's programs would have on new construction projects. From these activities, the Department has identified two immediate priorities:

- Pursuing additional data analysis from the previous baseline conducted for the C&I sector and
- Establishing baseline practices for the multi-family new construction market

In the C&I market, a baseline survey of current construction practices was conducted in the last evaluation cycle. The Department is now working with a contractor to assess this data and perform additional analyses to further the process of recommending modifications to the Vermont Guidelines for Energy Efficient Commercial Construction. In addition, the Department plans to continue on-site inspections for buildings constructed through Act 250.

The Department intends to re-assess market practices in the residential single family detached and C&I new construction markets every three years. In this evaluation cycle, these studies are planned for late 2004.

Establishing baseline practices for the multi-family new construction market is being treated as an independent study and is discussed in the following section.

4. Develop baseline for the Multifamily New Construction Market

EVT has been providing services in the multifamily new construction market through its Residential New Construction ("RNC") and Residential Energy Efficiency ("REEP") programs during the prior contract period and currently through the RNC and Business New Construction ("BNC") initiatives. Over the first three years, about half the activity in EVT's RNC program was related to the multifamily market. However, the residential new construction baseline conducted in the first evaluation cycle covered only single-family detached residences. Given the magnitude of EVT's activities in the multi-family market, understanding current construction practices in this specific market and developing a baseline is key to assessing the impact EVT's activities are having on this market. This study is already underway and should be completed by the end of the year.

5. *Research reasons for non-participation in EVT's Services and Programs*

Not all Vermonters have taken advantage of the services offered by the EVT and there may be specific groups of customers such as low income, senior citizens or small businesses that have not participated to the extent of other groups. This study will identify those customers or groups of customers and attempt to identify significant barriers to participation. The study will then make recommendations on how the EVT could modify its services to increase participation. This study does not intend to address all groups of non-participants and reasons for nonparticipation but to focus on the more significant ones.

One participant study that has been identified involves the residential new construction program. In the first phase of evaluation, the residential evaluation subcontractor Xenergy recommended that the Department further investigate the reasons that nonparticipating builders choose not to take part in the residential new construction program, and participating builders choose to construct some homes outside of the program. In some cases, builders are initially interested and enroll in the program, but later to decide to drop out. To investigate this issue, the Department is currently analyzing EVT's database of builders' activities and plans to conduct a survey of non-participant builders to solicit direct feedback.

6. *Annual Savings Verification*

Accurate savings estimates are an important element of EVT's efficiency efforts. As specified in the 2003-2005 contract amendment between EVT and the Board, the Department will continue to conduct the verification of EVT's energy savings and total resource benefits³ on an annual basis.

It is critical that EVT's savings be reasonably accurate and verifiable because this information serves a number of purposes. These include:

- Determining if EVT qualifies for its performance incentive.
- Providing information for load forecasting
- Assisting with distributed utility planning and transmission planning by the Department, the utilities and VELCO
- Providing information for published reports that are presented to interested parties, the legislature and the public.

An intensive two-month review is performed every year following EVT's submittal of its draft annual report on April 1. After this two-month review, the Department issues a report and recommendations to the EEU Contract Administrator. The Contract Administrator reviews this report and subsequently makes a recommendation to the Board regarding the appropriate savings EVT may claim for the reporting year.

³ Total resource benefits refer to benefits from energy efficiency measure beyond just the electrical energy savings. An example of a resource benefit would be water savings from installing a high efficiency clothes washer.

In addition to this review process the Department participates in an ongoing review of EVT's technical reference manual, which contains the savings assumptions for prescriptive measures. The Department also participates in periodic meetings with EVT to establish savings levels for new measures and review savings assumptions for existing measures.

The Department has also retained the services of an engineering firm to review large and/or complex energy efficiency projects proposed by EVT on an as needed basis.

7. *Assess Minimum Performance Standards and Performance Awards Indicators*

The EVT will be awarded monetary incentives if it achieves specific performance targets and the Department and the Board's Contract Administrator are responsible for determining whether EVT has met those targets. The performance award structure has two components. The first component is a minimum performance standard that EVT needs to meet in order to be considered for the monetary incentives. The second component is a set of eight performance targets (award indicators) that provide EVT with a specific monetary incentives if the targets are reached. Using the information gained for the evaluation studies discussed above it will be the Departments responsibility to determine whether the performance standards have been met. The details for the minimum performance standard can be found in Table K-4 in Appendix II and the performance awards indicators can be found in Table K-2 in the same appendix.

8. *Evaluate the operational efficiency of the EEU*

The goal of this evaluation will be to determine how efficiently EVT and the overall EEU structure is operating and will be used to help shape the Request for Proposals in the next contract cycle. It will also aid in evaluating those proposals and in setting performance standards in the next cycle. This evaluation will need to:

- Define how the operational efficiency of the EEU should be measured
- Make recommendations on how operations and structure could be improved
- Establish benchmarks and goals for continually improving the operational efficiency in the next contract cycle

9. *Evaluate other strategies for acquiring energy efficiency resources*

This study will investigate other strategies for acquiring energy efficiency resources. Currently the EEU uses only one overall strategy to acquire this resource in Vermont and that involves offering services or incentives to customer via programs targeted at specific markets. While this strategy has proven very effective, other strategies have been used in other states to acquire energy efficiency as a resource. An example of another used elsewhere is a "standard offer" to businesses to propose their own projects that increase energy efficiency. Energy efficiency tax credits have also been used. In some states several strategies run concurrently.

Another objective of this study will be to examine ways EEU could spur the development of independent businesses throughout the state that would provide energy efficiency services independent of the EEU. The goal is to find ways to transform the market.

10. Evaluate the short and long term rate impacts of the EEU's activities

This study would conduct an analysis to determine rates with and without the energy efficiency charge and the impact of EEU activities. This analysis would consider the energy and dollar savings that would result from EVT activities over the next 5-10 years. The study would examine the impacts under varying assumptions, such as growth rates and key measure characterization assumptions. It would also examine the effects the EEU would have participants and non-participants in the programs.

IV. Evaluation Budget

The Department's evaluation funding for the three-year cycle (2003 through 2005) totals \$1,574,908, or 3.3% of the EEU budget for the three-year period. These funds flow from the Energy Efficiency Charge and are held by the Fiscal Agent until the Contract Administrator authorizes their release. To ensure that the funding is spent in a manner that provides the best value toward improving the EEU and the customers it serves, the Department has shifted away from formal program evaluation and relies more on targeted studies to address specific issues and areas of greatest concern related to implementing the energy efficacy programs and understanding the characteristics of energy efficiency as a alternative resource to generation. A preliminary budget and schedule, broken out by type of evaluation activity is provided as Appendix I to this plan. The Department expects that some reallocation within the categories may be necessary as needs are explored and new priorities arise between now and 2005.

V. Evaluation Schedule

The Vermont Energy Investment Corporation ("VEIC") is currently operating as the EEU under a 3-year contract that extends through calendar year 2005. The Public Service Board must conduct a new competitive solicitation for an entity to serve as the EEU at the end of 2005. Therefore, many of the results of the Department's evaluation work must be available and reported to the Board by January 2005. This scheduling requires the DPS to act promptly to adopt this plan and begin implementation of the evaluation activities. Appendix I provides the schedule details for each evaluation project. All schedules are extremely aggressive but all the work should be able to be completed in time to support the bid process for an entity to serve as the EEU at the end of 2005.

VI. Burlington Electric Department

The stipulation between Burlington Electric Department ("BED") and the DPS contains an agreement by the DPS to coordinate its evaluation activities with BED. As was done in the first evaluation cycle, the DPS intends to include BED's service territory in the specific evaluation tasks it undertakes rather than design specific evaluation efforts for BED's service territory. The DPS and BED will discuss options to investigate specific issues that may be pertinent to BED programs. The DPS will also provide the Contract

Administrator and the Board with verification of BED savings and program performance indicators, just as it does with EVT.

VII. Summary

This evaluation plan will provide the Board and Department with the information it needs to fulfill its salutatory obligation regarding evaluation of EVT performance. It will also help develop the knowledge base necessary for the Board, EVT and the Department understand how the operations of the EEU and that of the individual programs could be improved.

While the plan identifies specific activities and areas to be addressed, the Department views it as a flexible document to be reviewed at regular intervals to reassess the priorities of the tasks and re-allocate funds and resources as necessary. To be able to respond to the Board's request to receive the evaluation report by the Spring of 2005, the Department must take immediate actions to commence many of the activities outlined in the plan

The Department's experience in implementing the first round of evaluation will be an asset for refining and enhancing the process in the current cycle. The Department is looking forward to the opportunity to continue to work with EVT, the Contractor Administrator and the Board to assess and evaluate EVT's progress toward its goals.

VIII. Appendices

Appendix I	Budgets and Schedules for Evaluation Projects
Appendix II	Tables for Minimum Performance Standards and Performance Awards Indicators