Vermont Public Service Department Energy Efficiency Evaluation Plan 2015-2017

April 16, 2014

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Introduction

Vermont law, 30 V.S.A. §209 requires that the Public Service Board ("PSB" or "Board") "[p]rovide for the independent evaluation of programs delivered" by an Energy Efficiency Utility ("EEU") funded through an Energy Efficiency Charge ("EEC"). The Public Service Department ("Department" or "PSD") has been identified as the entity who would carry out this role since the EEU's inception, first in Docket 5980,[1] and more recently in the "Process and Administration of an Order of Appointment" approved by the Board 12/20/2010.[2] This Evaluation Plan ("Plan"), provided in the context of the Demand Resources Plan ("DRP") Proceeding, outlines the Department's plans to evaluate the EEU's and Vermont's efficiency markets for the 2015-2017 three-year performance cycle.

This evaluation plan is applicable to Vermont's EEU's - Efficiency Vermont ("EVT") and Burlington Electric Department ("BED"). At the time of the writing of this plan Vermont Gas Systems ("VGS") is in the process of also becoming appointed as an EEU. This plan does not address evaluation activities for VGS. VGS's EEU evaluation plan will be developed and integrated into its DRP process. This Plan focuses on measurement, verification and evaluation activities of EEU programs intended to acquire both electric energy efficiency (funded by the Energy Efficiency Charge ("EEC") on electric ratepayer bills) and Thermal Energy and Process Fuel ("TEPF") efficiency (funded by the revenues from the Regional Greenhouse Gas Initiative and participation in the Forward Capacity Market). In addition, this Evaluation Plan describes the Department's proposal to continue to perform the evaluation activities associated with participation in the ISO-New England Forward Capacity Market ("FCM"). The Plan also briefly describes other evaluation activities undertaken by the Department but not specifically funded by the EEC or TEPF funds. These other activities are important in that energy efficiency evaluation work does not happen in isolation, rather the multitude of activities undertaken by the Department in this area leverage and inform one another. Within this Plan, solely as points of reference, PSD has noted EEC and TEPF evaluation activities that may also be applicable to VGS within the specific evaluation activity descriptions. Any VGS cost-share will be identified in VGS future evaluation plan and associated budget.

Evaluation necessitates cooperation from other entities however; primary responsibility for the evaluation described herein remains with the PSD. For the 2015-2017

[1] In its Order of 9/30/99 in Docket 5980, the Board approved a Memorandum of Understanding between parties that identified the Department of Public Service ("PSD" or "Department") as the entity to "provide for formal evaluation of the Core Programs and any other System-wide programs approved by the Board for EEU implementation."

[2] On January 17, 2014, the Department on behalf of itself, Vermont Energy Investment Corporation, operating as Efficiency Vermont (EVT), the appointed statewide Energy Efficiency Utility (EEU); and Burlington Electric Department (BED) in their capacity as the EEU in their service territory, filed proposed modifications to the Process and Administration of an Energy Efficiency Utility Order of Appointment ("P&A") document.

performance cycle, the Department proposes an EEC-funded evaluation budget of $3,958,200, a TEPF-funded evaluation budget of $439,000, and a FCM-funded evaluation budget of $1,882,000. The process and specific program and evaluation budgets are discussed in more detail below, and detailed description of the assumptions used to develop the budgets can be found in the companion evaluation budget filed as *"Attachment B PDS 2015-2017 Evaluation Plan Budget"*.

During the 2012-2014 performance cycle, the Board approved the usage of the EEC to fund the equivalent of two full-time evaluation staff. The Department proposes to continue to retain two-full-time evaluation staff within this plan. The Department expects that resources will continue to result in more timely and effective evaluation as well as the development of more robust in house evaluation systems. Further, we expect that these resources will result in a net savings associated with funds that otherwise would have been spent securing outside evaluation contractors. It is important to note that in addition to these savings, the Department is also able to maintain the amount of activity conducted under this plan, better informing our understanding of efficiency markets and initiatives, leading to sound policy choices based upon the best available information.

Finally, the Department continues to discuss a structural modification to its energy efficiency evaluation framework with stakeholders. This change would leverage the evaluation and verification work conducted in the context of the Forward Capacity Market with the annual savings claim verification. Discussions have highlighted a number of diverging opinions related to the practicality and value of any potential change. The Department is interested in the potential for increased confidence in savings claims, increased administrative efficiency, and reduced total costs that may be realized by this change. However, differences in evaluation purpose, timing, and impact requirements make a merging of the Forward Capacity Market and annual savings verification process complex. It is necessary to proceed with caution to ensure that there are no unintended consequences from such a change in evaluation structure. Throughout the 2015-2017 evaluation cycle, the Department continued discussions with stakeholders and evaluation experts in an effort to identify and further explore the areas where practical synergies present themselves. As a next step, the Department plans to model these structural changes. While this evaluation Plan does not present a merging of savings verification and FCM evaluation for all EEUs, the plan leaves ample room to move towards this end within the 2015-2017 evaluation cycle. This evaluation plan continues to consider the annual savings verification process and the FCM evaluation as independent efforts.

Evaluation Goals and Objectives

The goal of the proposed evaluation under this plan is to provide ratepayers and the Board with an independent evaluation of EEU programs, pursuant to statutory obligations under § 209(f)(10) and under the Board's direction under the Order of Appointment. In addition to the key task of verifying the direct impacts of the EEU's activities[3], the implementation of this plan should enable the Department, the Board, and various stakeholders to improve and update their understanding of Vermont's dynamic energy efficiency markets, and continue to advance Vermont's ability to capture energy efficiency savings. Toward those ends, this plan has the following overall objectives:

1. Verify the annual savings claims made by EEUs relative to performance targets, including but not limited to annual energy and coincident peak capacity savings, and total resource benefit (TRB), MMBtu;
2. Provide evaluation activities necessary to meet the requirements of participation in the FCM;
3. Perform evaluation activities necessary to evaluate "geotargeting" efforts, to the extent that the initiative continues;
4. Perform evaluation of select "Non-Resource Acquisition" activities as needed
5. Conduct market studies to characterize and assess current conditions in discrete energy efficiency markets identified in prior evaluation studies and reports, and in any new markets as may be identified by stakeholders;
6. Benchmark the scope and results of Vermont energy efficiency portfolios and initiatives relative to other programs in the nation;
7. Support the development and understanding of changing baselines and measure characterizations through participation in the Technical Advisory Group, including measures or initiatives where significant uncertainty exists and/or where the potential savings contribution is large, such as behavioral modification and Smart Grid R&D initiatives;
8. Maximize the value of evaluation expenditures by retaining in-house resources and partnering with other New England evaluation efforts where possible and appropriate.

This plan considers PSD energy efficiency evaluation in the context of the EEU's Demand Resources Plan ("DRP")[4], incorporates a variety of funding sources[5] and includes diverse mix of evaluation activities. The plan's goals will be met through a variety of evaluation techniques, including impact assessments, market characterizations and assessments, process evaluations, and research. Some activities will be carried out via independent contractors[6] and others will be performed by in-house staff in order to

[3] It should be noted that evaluation activities to verify EVT and BED savings are independent but often evaluation efforts overlap. The Plan and budget do not separate EVT and BED evaluation activities.
4 Required as part of a longer term EEU Order of Appointment, the Demand Resources Plan (DRP) will be a statewide plan that identifies short- and long-term energy efficiency budgets and savings goals, as well as other compensation matters related to the delivery of energy efficiency services by Vermont's EEU's.
5 Evaluation plan funding sources include but are not limited to the Energy Efficiency Charge (EEC), Forward Capacity Market (FCM) and Regional Greenhouse Gas Initiative (RGGI).
6 Competitive bids for specific identified objectives will be sought through the state approved request for proposals ("RFP") process.

reduce the proportion of contracted efforts relative to past evaluation cycles and continue to build the Departments expertise and in house evaluation management systems.

Budget

For the 2015-2017 cycle the Department has built the evaluation budget from the ground up, effectively enabling the Department to plan both in-house and contracted evaluation activities, as well as categorize evaluation activities by funding source with appropriate cost-shares. This process provides a holistic view of all energy efficiency evaluation activities and the most accurate allocation of costs to date. Finally, this plan reflects activities the Department believes it needs in order to provide comprehensive evaluation of EEU programs. This is a significant accomplishment, given the scope and complexity of the State's energy efficiency programs. The Department views this approach as advantageous and the preferred model for this and future planning efforts.

The Department views the three-year evaluation cycle holistically – costs and staff time for the activities described herein may not be equal in each year within the three-year cycle. For example, certain studies may require a large portion of the allocated evaluation budget but only occur once within a cycle. Consistent with EEC collections in the past, the Department proposes that collections for these evaluation efforts be made gradually, so as to mitigate any volatile rate impacts due to evaluation activities.

For the 2015-2017 performance cycle, the Department proposes an EEC-funded evaluation budget of $3,958,200[7], a TEPF-funded evaluation budget of $439,000, and a FCM-funded evaluation budget of $1,882,000. In-house resources allow the Department to conduct additional evaluation activities in a timely and cost-effective manner. Where reasonable, the Department will utilize in-house resources to conduct certain evaluation activities. The Plan's associated budget detail illustrates each evaluation activity, funding source/ cost-share mix and in-house/ contractor labor mix.

The following sections describe core evaluation activities specifically plus evaluation support activities related to planning, management, professional development, expert services, regional evaluation coordination and other evaluation activities.

Evaluation Activities

Accurate and reliable savings estimates are a vital component of the statewide energy efficiency programs operated within Vermont. Impact evaluation is an industry standard that determines program-specific induced benefits which include reductions in energy

[7] Historically, BED's contribution to the evaluation budget has been a percentage based upon the territory's percent of total kWh sales. The Department proposes that this process to allocate EEC evaluation costs remains in place.

and demand usage such as (such as kWh, kW) and the other Total Resource Benefits[8] that can be directly attributed to energy efficiency.

The narrative below specifies the primary evaluation type; it should be noted that impact evaluation is typically associated with *programs* and measurement and verification with *projects*. In addition, it is not uncommon to mix these and other evaluation types in order to maximize results.

The Department proposes that it should retain the ability to prioritize any of the below assessments, or other as yet unidentified assessments to focus on what is most beneficial to Vermont's energy efficiency initiatives and assessment relative to performance targets. Further, costs associated with any one of the assessments in this plan are the Department's best estimate, and may be subject to change.

Core Energy Efficiency Charge Evaluation Activities

The following activities are central to the Department's effort to assess the impacts of Vermont's energy efficiency programs.

Annual Savings Verification
Pursuant to the statutory requirements identified above and the VEIC and BED Order of Appointments, the PSD is responsible for the annual verification of energy and capacity savings and total resource benefits claims relative to performance targets. To carry out these responsibilities, the Department will conduct an intensive review of the overall EVT savings and TRB claim. A comprehensive review of the database of prescriptive measures will be undertaken to ensure agreed upon values are applied correctly. The high cost of individual project verification usually necessitates the design and implementation of a random sample of business custom projects for review. For selected projects, the Department will complete a comprehensive review, examining all files associated with these custom projects, including billing history, savings analysis tools, and measure level savings claims. Once savings adjustments are finalized for sampled projects, a realization rate is applied to adjust the remainder of custom projects. The above activities will be summarized in a report and recommendations as to energy efficiency savings claims and TRB will be made to the Public Service Board in accordance with the schedule outlined in each EEU's Order of Appointment.

The Department proposes to increase the amount of site visits conducted during the annual savings verification process. Site visits had been limited in the past; however they will allow the Department gain a better understanding of project circumstances and savings.

Evaluation Budget: *$549,100*

[8] Total Resource Benefit includes gross electric benefits, fossil fuel savings, and water savings.

Evaluation Type*: Measurement & Verification*
Source: *Energy Efficiency Charge ($489,100) CEED ($60,000)*

Geotargeting
In August of 2006, pursuant to 30 V.S.A. § 248(b)(2), the Public Service Board modified the 2006-2008 EVT contract to direct a portion of the state's energy efficiency investments to areas where there was a potential for an energy efficiency alternative to a transmission and distribution ("T&D") upgrade.[9] Since then a number of areas have been Geographically Targeted ("GT") with energy efficiency investments.

An evaluation of Geotargeting was completed at the end of 2010. Results concluded that Geotargeting is a technique that appears to work in reducing load in areas with T&D constraints. However, GT evaluation results are complex and multi-faceted. While GT efforts can reduce load, GT's cost effectiveness in deferring T&D upgrades depends on a number of dynamic and conditional factors unique to any particular GT area.

Funding decision making for GT initiatives has effectively been decoupled from the EEU budget and goal setting process in the 2013-2014 Demand Resources Plan Proceeding (DRPP) as defined in the Board's July 16, 2013 Order in EEU-2010-06 regarding the DRPP. It is unknown at the time of this filing whether GT efforts will continue for the 2015-2017 evaluation cycle. However, the Department finds it reasonable to include resources to evaluate future GT initiatives in this evaluation budget. The goal of future GT evaluation is to continue to assess the electric energy savings impact and to attempt verify whether intensive energy efficiency efforts are delivering electric energy efficiency savings a rate fast enough to cost effectively defer a planned T&D upgrade. In addition, the evaluation may continue to examine improvements in the target area selection process and the program delivery mechanisms as appropriate. In addition, the evaluation may attempt to assess quantification of the benefits that have flowed to Vermonters from past investments in GT.

It is important to note that this evaluation will not attempt to forecast or evaluate when T&D investments are needed, ultimately this is the decision of distribution utilities, VELCO and the Public Service Board. Rather, this evaluation will aid parties in determining under what conditions GT remains an effective option for deferring or avoiding T&D projects and/or to what degree GT alleviates system stress.

GT evaluation will primarily be performed by outside contractors. In-house resources will assist with the development of evaluation instruments, some reporting and overall management.

Evaluation Budget: *$173,100*
Evaluation Type*: Impact Evaluation and Process Evaluation*
Source: *Energy Efficiency Charge*

[9] Public Service Board Order Re Geographic Targeting of EEU Funds, p.3. January 8, 2007. See: http://www.state.vt.us/psb/EEU/geographictargeting/OrderreGeographicTargeting.pdf

Technical Advisory Group and Technical Reference Manual Review
An ongoing Technical Advisory Group ("TAG") reviews EVT's Technical Reference Manual ("TRM") additions and revisions, follows up on Department findings in its verification processes, and provides a valuable forum for other issues related to EVT's savings estimate procedures. In the past the Department has relied on outside contractors; in the 2015-2017 evaluation cycle the Department's TAG participation will use contractor support to provide advice and recommendations to the Department throughout the process. However, internal staff resources will lead the effort.

The activities associated with this ex ante evaluation activity increased significantly in the 2012-2014 time period. Stakeholders have implemented steps to systematically update every TRM measure characterization, which will continue to require the Department's review of an increased amount of characterizations. Thus, overall costs associated with this activity have increased relative to previous years.

> Evaluation Budget: *$195,900*
> Evaluation Type*: Supports Impact Evaluation and Measurement & Verification*
> Source: *Energy Efficiency Charge*

Market Characterizations & Assessments
Market studies document saturation of efficient buildings, equipment, lighting, and other appliances and can identify areas with remaining energy efficiency potential. Market studies establish the most current energy efficiency market "baselines" which can illuminate market segments with remaining opportunities and be useful in program design. Further, after more than a decade of program implementation experience in Vermont, these assessments conducted at standard intervals will begin to provide an indication of market transformation in certain areas. As in past performance cycles, the Department intends to conduct market assessment and baseline studies. For this cycle, the Department will place increased emphasis on collecting reliable market share and electric measure saturation data. In addition, the scope will assess adherence to building codes, building shell characteristics, natural gas and heating and cooling fuel type distributions[10].

A series of four studies will be conducted as described below:

- *Residential Existing Facilities.* Conduct a large scale on-site assessment of existing single family homes to:
    - Document lighting and appliance saturation
    - Document home overall efficiency levels
- *Residential New Construction*. Conduct an on-site assessment of newly constructed homes to:
    - Determine saturation of efficient homes and appliances in those homes

[10] Additional funding sources may be available to assist with some or all of these portions of the scope.

    - Document compliance with Residential Building Energy Standards
- *Business Existing Facilities.* Conduct a large scale on-site assessment of existing commercial and industrial facilities to:
    - Document building, lighting and equipment status and efficient equipment saturations
    - Document building overall efficiency levels
- *Business New Construction.* Conduct an on-site assessment of newly constructed buildings to:
    - Document compliance with Commercial Building Energy Standards
    - Determine saturation of above code buildings and efficient equipment

The Department will primarily use contractors to conduct market characterization studies. However, in-house evaluation staff will assist with the modification of existing evaluation instruments and overall management, including increased data collection quality control. The studies will frame market characterization data so it can be analyzed for trends from one three year cycle to the next.

PSD most recently completed a residential market assessment in late 2012 and a commercial market assessment in early 2013. These studies were completed with evaluation funds approved to be carried over from the 2009 – 2011 period to the 2012 – 2014 period. PSD planned and budgeted for residential and commercial market assessments in its 2012-2014 EEU evaluation plan. However, at this time does not anticipate initiating the studies until the early in the 2015-2017 period. The PSD recommends carrying forward the unspent residential and commercial market assessment funds from the 2012-2014 period to the 2015-2017 period. Therefore this activity is essentially cost-neutral for the 2015-2017 period notwithstanding some additional costs due to anticipated scope and contractor cost increases.

Evaluation Budget: *$1,177,300 Electric/ $160,500 Thermal*
Evaluation Type*: Market Characterization and Baseline Creation*
Source: *Energy Efficiency Charge (88%) TEPF (12%) cost-share*[11]

Benchmarking of Vermont Energy Efficiency Efforts
In 2010, the Department conducted a benchmarking study that sought to determine Vermont's standing relative to its peers regarding overall energy efficiency investment portfolio and program results for program year 2008. This was a valuable starting point for data and comparisons across the country. That benchmarking effort itself identified areas of uncertainty and differences between reporting in various jurisdictions. In 2013 and currently on-going into 2014, the Department is conducting a second benchmarking study for programs years 2011 and 2012. This benchmarking effort seeks to compare Vermont's energy efficiency programs with other jurisdictions, maintaining attention to differences in program maturity, state demographics, economic conditions, and energy rates (electric, natural gas and heating & process fuels), as well as the above mentioned

[11] EEC/ TEPF cost-sharing calculations can be referenced in the Budget. This cost-share is based on EEC and TEPF % share of the total combined EEC & TEPF three year budgets.

reporting distinctions. Benchmarking may also consider how other states are supplementing core programs with pilot projects and innovative financing mechanisms. The Department proposes to report benchmarking results at least once in the 2015-2017 performance period, however it plans to collect and update data annually throughout the performance period.

Evaluation Budget: *$88,700*
Evaluation Type*: Regional and National Program Comparison*
Source: *Energy Efficiency Charge*

Supporting Energy Efficiency Charge Evaluation Activities

This section describes activities that are related to the Core Activities outlined above that support and further enhance understanding of Vermont's energy efficiency markets and reliability of savings claims. It includes the evaluation of particular markets or initiatives that have been identified in need of further information or assessment, support of regional initiatives, and the allocation of funds to address unpredictable circumstances where additional information is needed to properly verify savings claims.

Non-Resource Acquisition Initiatives
As part of the Order of Appointment Structure, EEUs have proposed "Non-resource acquisition" ("NRA") initiatives for approval by the Board. These initiatives are those that do not directly contribute to resource acquisition, but are nonetheless important to be undertaken by an EEU, such as supporting the advancement of building codes or energy education programs. Evaluation of NRA activities was minimal in the 2012-2014 period and the Department proposes to carryover remaining funds to the 2015-2017 period in order to assess some select non-resource acquisition initiatives and outcomes. This evaluation is expected to be conducted with primarily independent third party contractors, however some internal resources may be allocated to supplement.

Evaluation Budget: *$51,000 Electric/ $7,000 TEPF*
Evaluation Type*: Process Evaluation*
Source: *Energy Efficiency Charge (88%) TEPF (12%) cost-share*

Administrative Efficiency
The Department is responsible for evaluating performance relative to the EEUs' quantitative administrative efficiency metrics. This evaluation will assess the administrative efficiency of Vermont's Energy Efficiency Utility's (EEU's) key business processes. The evaluation will contribute to recommendations for setting future Administrative Efficiency performance targets. At the time of the writing of this plan, the Department was in the process of conducting an administrative efficiency evaluation for the 2012-2014 performance period. Therefore, it was difficult at the time of the writing of this plan to identify specific evaluation objectives for the 2015-2017 administrative efficiency evaluation, as the results and recommendations for the 2012-2014 evaluation were not yet completed.

Evaluation Budget: *$139,600 Electric/ $19,000 TEPF*
Evaluation Type*: Management Audit/ Deep Process Evaluation*
Source: *Energy Efficiency Charge (88%) TEPF (12%) cost-share*

Home Performance with Energy Star & Building Performance Evaluation
The Home Performance with Energy Star (HPwES) program focuses on providing residential energy efficiency retrofits in single-family homes. The program is also being leveraged to provide energy efficiency retrofit services to small businesses through the Building Performance program. While some of the measures implemented under this program acquire electric efficiency, the bulk of the measures are directed toward acquisition of thermal and process fuel efficiency savings.

The HPwES program has been offered for some time in Vermont, but did not have an in-depth impact evaluation until 2012. This evaluation was for program years 2008, 2009 and 2010.

The Department proposes impact and process evaluations to be initiated in 2015for program years beyond 2010. The primary purpose of the evaluation is to evaluate and verify the impact of the HPwES and Building Performance programs, as well as the electric energy savings attributable to these programs. The goal of the impact evaluation is to develop independent estimates of program savings and to compare those evaluation results with internal program savings projections, as well as to provide suggested mechanisms for adjusting future savings projections as necessary. The goal of the process evaluation is to identify recommendations for increasing participation rates and average savings per participant.

This evaluation will be completed mostly by outside contractors, with internal resources contributing to evaluation instruments.

Evaluation Budget: *$117,600 (Electric only portion)*
Evaluation Type: *Impact and Process Evaluation*
Source: *Energy Efficiency Charge*

Energy Savings Accounts & Customer Credit Program
Some large business customers have expressed a desire to implement electrical energy efficiency measures independently from their EEU. For these customers the Vermont General Assembly passed legislation requiring the Department to develop an Energy Savings Account ("ESA") option that would allow customers that have both the interest and capability to self-administer their own energy efficiency efforts to do so. Customers who choose to self-administer using the ESA option will be subject to the same savings verification oversight as an EEU.

The Customer Credit Program ("CCP"), created as part of the Memorandum of Understanding between parties in Docket 5980, and later approved by the Board, allows commercial and industrial customers who meet eligibility criteria to use a portion of the funds they have paid to the EEC to invest in energy efficiency projects independent of EVT. Currently there is only one customer in the program that enrolled in the CCP program during the 2011-2014 evaluation cycle. The Department's internal evaluation staff will continue to be the primary evaluators of the CCP. Similar to the ESA evaluations, a small role for contractor assistance with metering of larger CCP projects is planned if needed.

> Evaluation Budget: *$31,600*
> Evaluation Type*: Impact Evaluation and Measurement & Verification*
> Source: *Energy Efficiency Charge*

Regional Evaluation Coordination
Vermont's relatively small evaluation budget creates challenges for effectively monitoring and verifying energy efficiency programs. Impact and Market assessments can become expensive activities. The underlying goal of this PSD evaluation plan is to accomplish sound and reliable estimates of energy efficiency impacts at a reasonable cost. To maximize available funds, the PSD plans, where appropriate, to partner with other New England and Northeastern jurisdictions for evaluation studies.

Northeast Energy Efficiency Partnerships has created the Northeast Evaluation, Measurement and Verification Forum to "serve Northeast states and interested stakeholders to develop and use common regional protocols to estimate, evaluate, track and report energy-related savings, costs and emission reductions from demand-side resources."[12] The Public Service Department, along with EVT and the Public Service Board, has participated in the Forum. The Department proposes to continue to fund some of the forum's operational costs, along with jointly funded evaluation studies. Examples of the studies conducted by the forum include research regarding load shapes for particular measures, estimating the potential for claiming savings from codes and standards, and other work that may be cost prohibitive to perform in isolation.[13] As this forum was created, in part, as a response to the ISO-NE Forward Capacity Market (FCM), the Department proposes the costs associated with forum participation be cost-shared from the revenues from FCM participation, as well as through the EEU Evaluation Budget.

The Department has taken a more active role in the NEEP forum over the previous performance period. Thus, a small amount of internal resources are allocated to these efforts.

In addition, the Department is a member of the Consortium for Energy Efficiency, an association of energy efficiency program administrators who work together on common approaches to advancing energy efficiency. A small amount of budget is allocated to membership dues and cost sharing for specific studies that are relevant to Vermont energy efficiency programs.

[12] "Northeast Evaluation, Measurement and Verification Forum for Demand-Side Resources Three Year Plan" April 28, 2008. Northeast Energy Efficiency Partnerships, Inc.
[13] More information on the Forum can be found at http://neep.org/emv-forum

Evaluation Budget: *$238,700*
Source: *Energy Efficiency Charge (75%) & Forward Capacity Market (25%) cost-share*

Behavioral and Smart Grid R&D Evaluation Activities
The Department is uncertain what role behavior-change focused initiatives aimed at reducing energy use will be introduced by the State's EEUs during the 2015-2017 performance cycle. However, it will be a priority understand and verify the impact any EEU Savings estimates associated with behavior type pilot/ R&D programs and measures. The Department has allocated funds to begin evaluation of behavioral pilot programs during the 2015-2017 timeframe. The evaluations will be completed by outside contractors, with in-house resources contributing significantly to evaluation design and management of the studies. Focus of the studies may relate to the reliability, cost-effectiveness, impact and persistence of non-hard-wired measures and investments.

Evaluation Budget: *$784,100*
Evaluation Type*: Impact Evaluation*
Source: *Energy Efficiency Charge*

Contingency Evaluation Funds
Other currently unforeseeable evaluation needs may develop as this performance cycle progresses. For example, new technologies such as Cold Climate Heat Pumps which have recently begun gaining market penetration in Vermont will need to be closely evaluated for both their potential to save energy as well as the potential for load building, as this technology can be used for both heating and cooling, the latter of which has the potential to increase summer peak load.

Further, all evaluation costs are the Department's best estimates, with various cost and resource allocation assumptions that could easily vary depending on any number of circumstances. Thus, the Department finds it appropriate to allocate some contingency funds to directly supplement appropriate evaluations as needed. These funds amount to 5% of the total EEC funded evaluation budget.

Evaluation Budget: *$141,600*
Evaluation Type*: Contingency*
Source: *Energy Efficiency Charge*

Thermal Energy and Process Fuels Initiatives Evaluation Activities

The Department has, in the context of the DRP, submitted proposals for budgets and services to be delivered for Thermal Energy and Process Fuel (”TEPF”) efficiency initiatives jointly with each of the EEUs. These programs leverage the programs already in place to deliver electric efficiency to the greatest extent possible. As a result, programs overlap significantly. As illustrated above EEC/TEPF cost-share has been applied to some specific evaluation activities (conducting TEPF specific evaluations such as market and building type assessments would be duplicative and thus are not necessary). TAG issues, including TRM development, are likely to be minimal in comparison to the electric sector. An annual review of all prescriptive TEPF measures will be conducted in conjunction with the annual review for the electric sector.

The Department will continue to monitor the cost-share practice and propose any changes to this methodology in its annual plans if costs associated with TEPF activities begin to take a larger share of activities.

Other EEU TEPF services, however, do require some dedicated evaluation. Those are described in more detail below.

Home Performance with Energy Star & Building Performance Evaluation
The vast majority of the funding associated with TEPF programs is allocated to funding the Home Performance with Energy Star (HPwES) program for residential energy efficiency retrofits in single-family homes. This program is also being leveraged to provide services to small businesses through the Building Performance program. While the bulk of the measures are directed toward acquisition of thermal energy and process fuel efficiency savings, some of the measures implemented under this program acquire electric efficiency.

The HPwES program, while offered for some time in Vermont, did not have an in-depth impact evaluation until 2012. This evaluation was for program years 2008, 2009 and 2010.

The Department proposes impact and process evaluations of the HPwES program to be completed in 2015 for program years beyond 2010. The primary purpose of the evaluation is to evaluate and verify the impact of the HPwES and Building Performance programs, as well as the electric energy savings attributable to these programs. The goal of the impact evaluation is to develop independent estimates of program savings and to compare those evaluation results with internal program savings projections, as well as to provide suggested mechanisms for adjusting future savings projections as necessary. The goal of the process evaluation is to identify recommendations for increasing participation rates and average savings per participant.

This evaluation will be completed mostly by outside contractors, with internal resources contributing to evaluation instruments.

> Evaluation Budget: *$69,000 (TEPF only portion) ($40,000 from CEED)*
> Evaluation Type*: Impact and Process Evaluation*
> Source: *FCM & RGGI Revenues*[14]

TEPF Contingency

[14] TEPF funding is proposed to be supplemented by funding from the Community Energy and Efficiency Development (CEED) Fund.

Similar to the EEC funded evaluation activities, the Department proposes that some funding be allocated for unforeseen TEPF evaluation needs, and potential variation in actual costs from those estimated here.

> Evaluation Budget: *$35,500*
> Evaluation Type*: Contingency*
> Source: *FCM & RGGI Revenues*

Potential Study
The Department proposes a potential study to assess the full array of technologies that may be deemed technically achievable, including measures that aren't available currently but are expected to be on the market within the study timeline, and measures that may not be cost-effective now but are expected to be within the foreseeable future. This would include measures that aren't available currently but are expected to be on the market within the study timeline, and measures that may not be cost-effective now but are expected to be within the foreseeable future. Estimates of available potential both including and excluding potential/proposed expansions of Vermont's natural gas transmission and distribution system would also be calculated, Additionally identification of the estimated potential related to fuel switching, such as through measures such as air source heat pumps and/or solar hot water would also be included in the scope.

Evaluation Budget: *$99,000*
Evaluation Type: *Potential Study*
Source: *FCM & RGGI Revenues*

Forward Capacity Market Evaluation

Forward Capacity Market Evaluation
The Independent System Operator of the New England electric grid (ISO-NE) created a Forward Capacity Market to ensure that the region has sufficient capacity to meet its peak demand needs. This market-based initiative allows for demand resources, including energy efficiency, to compete directly with generation resources to provide capacity. In order to participate in the market, providers of energy efficiency resources must demonstrate that their efficiency savings are verified in compliance with the ISO-NE standards established for this purpose. Efficiency Vermont (EVT) and Burlington Electric Department (BED) have bid their respective efficiency program portfolios into the FCM, and submitted detailed measurement and verification (M&V) plans that delineated how the evaluation process in Vermont will comply with ISO-NE standards. The original M&V Plans identified the Public Service Department as the entity who would conduct the independent evaluation required. Subsequent plans filed have not explicitly identified the Department as fulfilling this role. This plan proposes that that the Department remains best suited to conduct and manage such evaluation.

The budget below includes the estimated costs associated with both contractor and in-house resources to conduct the Forward Capacity Market evaluation. This includes the development of a sample and sampling plan the development of metering plans for all selected projects, the metering (including purchase or lease of meter equipment) of small and medium sized projects (under the current process, EEUs meters large projects and provides unanalyzed meter data to the PSD for review), the analysis of all sized projects, reporting and costs associated with planning and management.

The Department is working with EVT to try and establish a way to combine the FCM evaluation with Savings Verification. It is anticipated that if this combination can take place there could be significant cost savings as well as increased confidence in the results of Verification. This budget does not reflect the combination of these two evaluations as it is currently unknown if this effort will be successful.

Evaluation Budget: *$1,822,000*
Evaluation Type*: Impact Assessment*
Source: *FCM Revenues*

Planning and Management

This section describes activities related to the planning and management of evaluation activities. Budgeted costs are mostly shared between EEC and TEPF at an 89% - 11% ratio. FCM Planning and Management are included in the FCM budget above. This category includes general evaluation planning, technical assistance, professional development, and other direct costs associated with implementation of this plan. The Department notes that not all costs associated with planning are funded via the energy efficiency fund – other funding sources such as federal grants are leveraged where possible. Those costs are not included here.

Evaluation Planning & Administration
The Department has estimated general costs associated with development of its annual evaluation plan, annual reporting on results, and its three year plan. A small amount of administrative costs are included for tasks that are not particular to any one set of evaluations. Annual plans will be submitted to the Public Service Board
Planning costs associated with the Forward Capacity Market evaluations are included as a part of those total costs as described in the above FCM budget.

Evaluation Budget: *$34,400 Electric/ $4,300 TEPF*
Source: *Energy Efficiency Charge (88%) and TEPF (12%) cost-share*

Expert Technical Assistance
The Department proposes that further evaluation support will continue through the 2015-2017 period through a contract for expert energy program evaluation services, including evaluation design and technical quality control. These services provide a regional and national perspective on Vermont's activities, help the Department reduce costs and obtain the highest possible value from evaluation contractors, and provide a breadth of policy and evaluation design experience to the Department. As this technical assistance is relevant to electrical and TEPF energy efficiency programs, this budget is proposed to be cost-shared.

Evaluation Budget: *$81,600 Electric/ $10,100 TEPF*
Source: *Energy Efficiency Charge (88%) and TEPF (12%) cost-share*

PSD Demand Resources Plan Related Costs
These costs will consist of the time spent by PSD staff on DRP associated activities, including coordination between the PSD and the EEUs.

Evaluation Budget: *$19,700*
Source: *Energy Efficiency Charge*

PSD Staff Evaluation Training
Consistent with past evaluation plans and performance cycles, the PSD has allocated funds to support staff training, including attendance and participation at various industry conferences.

Training costs associated with the Forward Capacity Market are included as a part of those total costs as described in the above FCM budget.

Evaluation Budget: *$59,600 Electric/ $8,100 TEPF*
Source: *Energy Efficiency Charge (88%) and TEPF (12%) cost-share*

Other Direct Costs
Other Direct Costs ("ODCs") consist of travel, equipment, and other expenses incurred by in-house resources that are associated with the above mentioned evaluation activities. Historically, ODCs have occasionally been funded via the energy efficiency charge. This plan proposes to improve tracking of such costs, and allocate them to the appropriate funding source. ODCs do not include travel or expenses associated with the Staff evaluation training described above.

Other direct costs associated with the Forward Capacity Market evaluations are included as a part of those total costs as described in the above FCM budget.

Evaluation Budget: *$6,000 Electric/ $800 TEPF*
Source: *Energy Efficiency Charge (88%) and TEPF (12%) cost-share*

Other Evaluation Activities

This section briefly describes some other known evaluation activities that will be undertaken by the Department during the 2015-2017 timeframe. The Department endeavors to find synergies and leverage all evaluation activities to reduce total costs associated with our activities, while maintaining appropriate levels of oversight across activities. These evaluation categories have their own budget and are not included in the total evaluation budgets provided in this Plan.

Community Energy Efficiency Development (CEED) Fund Evaluation & Verification

Green Mountain Power Corporation (GMP), pursuant to Board Order of June 15, 2012 in Docket 7770, has established the Community Energy & Efficiency Development (CEED) Fund. In that order, the Board approved a mechanism set forth in a Memorandum of Understanding between GMP and the Department under which GMP would utilize the CEED Fund to invest approximately $20.9 million in electric and thermal efficiency programs, renewable and clean energy programs, other demand resources and in innovative technologies in the legacy service territory of the former Central Vermont Public Service Company Inc. (CVPS) over a five year period. The Department's evaluation and verification activities will apply to the $10.9 million portion of CEED funds *not* invested in low-income weatherization. The CEED Fund investment is required to produce net societal benefits of at least 1.2 times this dollar amount.

The Department is obligated to file a CEED Evaluation and Verification Plan for CEED Fund investments as defined in the Board's May 29, 2013 Order in Docket 7988. Because non-weatherization CEED projects are approved on an annual basis the Department does not propose a multi-year evaluation for CEED investments. The Department will propose an annual evaluation plan for each year of the CEED funds. [15] The Department will evaluate and verify the electric and thermal CEED initiatives that are approved by the Board on an annual basis. The evaluation and verification is intended to determine whether CEED investments fulfill GMP's obligation to produce net societal benefits of at least $25 million to legacy CVPS ratepayers.

The Department estimates that the evaluation of CEED investments over its five year period will not exceed 4% of the non-weatherization funds. In order to maximize funding for the delivery of future CEED program investments, the Department has endeavored to balance the need to maintain a lean CEED evaluation budget with the objective of obtaining robust and accurate evaluation results. In addition, the Plan is intended to illustrate the integration of CEED evaluation and verification into the Department's ongoing evaluation and verification efforts of statewide EEU efficiency efforts.

Self Managed Energy Efficiency Program – SMEEP Participants
The Vermont General Assembly, in Act 45 of 2009, mandated that the Department propose a 3-year pilot program called the Self Managed Energy Efficiency Program (SMEEP). The Board's 8/10/2011 Order modified the SMEEP program to bring it into compliance with Section 4 of the Vermont Energy Act of 2011, which established the SMEEP program as permanent program. The program calls for PSD savings verification, which will be funded directly by SMEEP participants. Internal staff will be the primary evaluators that verify the savings from SMEEP and on a three yearly basis a comprehensive review of the program and savings shall take place.

[15] The Department filed its 2014 CEED Evaluation & Verification Plan on February 19, 2014 as defined in a Board Order on January 22, 2014 in Docket 8192. The Department's 2013 CEED Evaluation & Verification Plan was approved in a Board Order on May 29, 2013 in Docket 7988.

Energy Efficiency Potential Study

The Department anticipates it will require additional planning and management services in the fall of 2016-2017 to prepare a PSD report identifying remaining technical, economic, and maximum achievable energy efficiency potential, and costs to achieve such potential. This study will inform a recommendation to the Board concerning the 2018-2020 EEU Budget. Under the MOU associated with Docket 5980, costs for preparation of such potential studies may be allocated directly to the State's distribution utilities. These costs are recoverable in accordance with traditional cost recovery mechanisms.[16] Separate potential studies shall take place for the different EEU territories to better reflect the different markets involved. These studies will be synchronized so that a state wide potential can be created from the individual results.

Overall Performance Assessment

An Overall Performance Assessment ("OPA") will be conducted by the Board to determine whether probable net benefits would result from additional proceedings considering alternate implementation entities other than the incumbent EEU(s). The OPA is a public performance review process that includes consideration of the performance record of the appointed entity or entities for the past two performance cycles.
The Department will carry out this review in concert with evaluation activities already included in this Plan. The following evaluation criteria will be assessed:

Performance with respect to acquisition of energy and demand savings, and achieved Total Resource Benefit; performance with respect to broad policy goals; qualitative performance regarding specific policy initiatives; performance regarding administrative functions necessary to carry out duties will be assessed through; administrative efficiency; customer service with respect to energy efficiency services provided to prospective and participant customers; organizational qualifications of incumbents; financial stewardship of ratepayer dollars; and performance benchmarked in relation to other energy efficiency providers.

The OPA review process will also include consideration of any other market information that may be useful in comparing the performance of the appointed EEU(s) to what might be available from an alternate entity, for example, bids made for comparable resources in the FCM.

Department staff time allotted to the OPA will be billed-back to the EEU(s).

[16] Docket 5980, Paragraph 11 of the Memorandum of Understanding approved by the Board 9/30/99.