

**Exhibit 1.**

**Memorandum in Support of re-issuing BED's Order of Appointment  
pursuant to 30 V.S.A. §209(d)(5)**

## Contents

Executive summary .....	4
Introduction and regulatory context .....	7
Performance with respect to acquisition of energy and demand savings, and achieved Total Resource Benefit .....	9
Performance with respect to broad policy goals .....	13
Market Transformation .....	17
Business Comprehensiveness .....	20
Qualitative performance regarding specific policy initiatives .....	22
Performance regarding administrative functions necessary to carry out duties .....	30
Administrative efficiency .....	31
Customer service with respect to energy efficiency services provided to prospective and participant customers .....	33
Organizational qualifications .....	36
Financial Stewardship of ratepayer dollars .....	40
Performance benchmarked in relation to other energy efficiency providers .....	43
Conclusion .....	44

### List of figures:

Figure 1 – Key performance indicators (2009 - 2014)	5
Figure 2: Impact of energy efficiency on total energy load	18
Figure 3: Avg. Savings per C&I participant	21
Figure 4: Levelized cost of saved energy	23
Figure 5: Energy Engage Web hits	24
Figure 6: Administrative Costs as % of total EEU costs	31
Figure 7: Levelized cost of saved energy	41
Figure 8: Average retail electric rates	41
Figure 9: Participant costs as a % of total program costs	42

### List of tables:

Table 1: Benefit Cost Ratio	5
Table 2 Performance Assessment Map	8

Table 3 Quantified Performance Indicators (2012 – 2014) – Electric only	9
Table 4 - Quantified Performance Indicators (2012 -2014) – Thermal only	10
Table 5 - Quantified Performance Indicators (2009 - 2011) Electric only	11
Table 6: MWh Sales as % of system-wide sales	12
Table 7: MPR 20112 -2014	15
Table 8: MPR 200- 2011	16
Table 9: Energy Star Portfolio Manager Scores for City Schools	28
Table 10: Evergreen Admin costs as a % of total EEU costs	32
Table 11: Customer Survey results	34
Table 12: Benchmarking results	43

## Executive summary

On September 1, 2014, the City of Burlington Electric Department (BED) purchased the Winooski One hydro-electric facility, a 7.4 megawatt generator tied directly to its electric distribution system. Upon taking over the operations of Winooski One, the City of Burlington's (City) 15-year quest to source all of its electricity from renewable power projects was achieved. In another 15 years, Burlingtonians will look back and remember 2014 as a groundbreaking year.

With this acquisition comes a new set of challenges, however.

In order to sustain its claim of 100 percent electric renewability, BED must redouble its efforts in demand side management to minimize load growth and lower peak demand even as Vermont pursues a policy of strategic electrification; an initiative that will likely lead to higher electricity sales.

The challenges ahead are significant but not insurmountable. Among the challenges that BED is especially concerned about are: a.) diminishing levels of achievable energy efficiency savings potential, b.) low-cost natural gas, c.) split incentive barriers, and d.) the reliable performance of new technologies such as battery storage, electric vehicle supply stations and cold climate heat pumps.

To meet these challenges and others, BED must first demonstrate to the Public Service Board (PSB) that it has achieved one overarching goal: that Burlingtonians have received the maximum value possible from their ratepayer funded efficiency programs.<sup>1</sup>

With this filing, BED presents evidence that it has achieved this goal.

As highlighted in the sections below, BED has continued its long, 25 year tradition of providing cost-effective energy efficiency services while simultaneously ensuring customer's rates remain competitive. BED also provides evidence that the City's electricity consumption in 2014 was 5.3 percent lower than in 1989 and 4.7 percent lower than 2011. During the same time period, statewide electricity consumption increased by approximately 9 percent. Very few, if any, distribution utilities in the Nation can claim such an accomplishment.

Energy consumption has declined, in part, due to BED's efficiency programs which have successfully acquired resources at half the cost of traditional power. Meanwhile, every dollar BED invested in energy efficiency produced societal benefits equal to \$4.65.<sup>2</sup>

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<sup>1</sup> See PSB Docket 7466, Order dated August 20, 2010 at pg. 70.

<sup>2</sup> See Evergreen Economics Independent Audit, September 11, 2015.

Table 1: Benefit Cost Ratio

Benefit Cost Ratios - Total EEU portfolio			
	PACT	TRC	SCT
BED	3.60	3.22	4.65
EVT	3.02	2.64	3.45

With respect to the evaluation criteria that the PSB uses to assess the performance of Vermont’s Energy Efficiency Utilities (EEU), BED has performed solidly across all of the metrics.

Figure 1 – Key performance indicators (2009 - 2014)

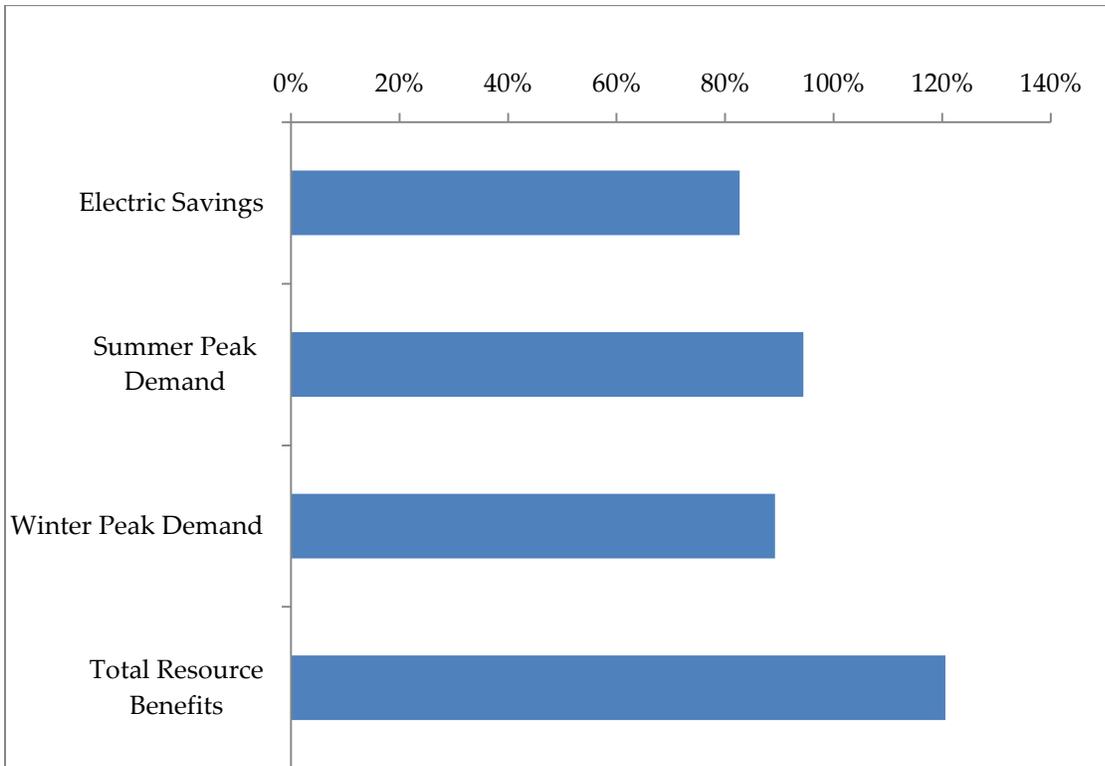


Figure 1, above, highlights the cumulative results over both 3 year performance periods (six years) of the top four quantified performance indicators: electric savings, summer peak demand savings, winter peak demand savings and total resource benefits. Winter peak savings reflect acquisitions only during 2009 – 2011, since this metric was eliminated prior to the commencement of the second performance period. . As for the remaining 5 metrics, BED’s performance met and/or exceeded expectations, as explained in the sections that follow.

Vermont has been widely recognized as a national leader in energy efficiency. Its position is largely due to the efforts of thousands of dedicated people who work in the field every day, including those who work tirelessly for the energy services staff at BED. Based on the evidence submitted with this filing, and knowing that its staff is committed to serving the energy needs of all Burlingtonians, BED asserts that its performance with respect to the PSB's nine evaluation criteria does not indicate that probable net benefits would result from additional proceedings considering alternate implementation entities. Should the PSB find that BED has satisfactorily achieved its goals, BED requests that the PSB re-appoint the City of Burlington Electric Department as an energy efficiency utility for another 11 year term.

## Introduction and regulatory context

Burlington Electric Department (BED) operates as an Energy Efficiency Utility (EEU) in the City of Burlington pursuant to an order of appointment (OOA) issued by the Public Service Board on April 19, 2011. The appointment authorizes BED to serve as the City's EEU through December 31, 2021; provided, however, that BED adheres to the PSB's procedural and administrative guidelines and requirements, as amended from time to time. Such guidelines and requirements, which accompany the OOA, are commonly referred to as the EEU's Process and Administration documents or P&A documents. BED's current P&A document was revised and re-approved by the PSB in September, 2014.

Pursuant to the Section III.1 of the revised P&A document, an Overall Performance Assessment (OPA) shall be conducted, at least every six years, to "*determine whether probable net benefits would result from additional proceedings considering alternate implementation entities other than the incumbent EEU(s)*". Moreover, the OOA, which governs the operations of EEUs in Vermont further states that [another] OPA shall occur in the *latter half of 2015* and that such assessment shall focus on BED's operations as an EEU over the last two 3-year performance periods: 2009 -2011 and the 2012 -2014 periods.

In accordance with Section III. 1. C. of its P&A document, BED submits this memorandum in support of its assertion that it has satisfactorily complied with the PSB's evaluation criteria. Similarly, the memorandum also demonstrates how BED maximized, to the greatest extent possible, the value its customers received from their rate-payer funded efficiency programs.<sup>3</sup>

The PSB's evaluation criteria include the following:

- 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;
- 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 top two performance assessment criteria noted above correlate, more or less, with the quantitative performance indicators (QPI) and minimum performance requirements (MPR) that

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<sup>3</sup> See PSB Docket 7466, Order dated August 20, 2010 at pg. 70.

the Department of Public Service (DPS) monitors on behalf of the PSB. For ease of reference, Table 2, below, maps these top performance assessment criteria to the corresponding QPI or MPR.

**Table 2 Performance Assessment Map**

	Performance Assessment Criteria	Corresponding QPI	Corresponding MPR
i	Performance with respect to acquisition of energy and demand savings, and achieved Total resource benefits	Electric Savings Summer kW Total Resource Benefits Thermal Savings	
ii	Performance with respect to broad policy goals		Long term Market Transformation Business Comprehensiveness Equity for all rate payers Equity for Residential rate payers Equity for Low income customers Min Small Business Participation
iii	Qualitative performance regarding specific policy initiatives		
iv	Performance regarding administrative functions necessary to carry out duties		
v	Administrative efficiency		Key process efficiency
vi	Customer service with respect to energy efficiency services provided to prospective and participant customers		
vii	Organizational qualifications		
viii	Financial stewardship of ratepayer dollars		
ix	Performance benchmarked in relation to other energy efficiency providers		

For the remaining criteria, the PSB applies a qualitative assessment to determine whether an EEU has performed in line with expectations. In the sections that follow, BED provides additional information in support of its request.

## Performance with respect to acquisition of energy and demand savings, and achieved Total Resource Benefit

Similar to the initial 2010 overall performance assessment (OPA),<sup>4</sup> this performance criterion is measured by four quantifiable performance indicators (QPIs): Electric savings, Summer kW peak savings, total resource benefits and thermal savings. These QPIs compare BED's reported and verified resource acquisition results to pre-determined goals established at the beginning of each 3 year performance cycle. Table 3 below highlights, BED's 2012 – 2014 performance relative to those pre-determined goals.

Table 3 Quantified Performance Indicators (2012 – 2014) – Electric only

QPI #	Title	Performance Indicator	Target	Results as of 12/31/2014
1	Electricity Savings	Annual incremental net MWh expected savings	24,518 MWh	BED achieved 85% of the "expected" 22,066 MWh goal & 77% of the "stretch" goal
2	Summer Peak Demand Savings	Cumulative net summer peak demand expected savings	3.2 MW	BED achieved 91% of the "expected" 2.9 MW goal & 83% of the "stretch" goal
3	Total Resource Benefits	Present worth of lifetime electric, fossil, and water expected benefits	\$18,694,000	BED achieved 100% of the "stretch" and "expected" goals

It is important to note that due to an expected delay in the DPS's savings verification process, the table above reflects verified savings through 2013. The reason for the delay is due to the type of evaluation that BED undergoes annually.

During the second performance period, BED and the DPS agreed to combine the Forward Capacity Market (FCM) and Savings Verification (SV) evaluations into a single process. As required by the ISO-NE, the BED's evaluation is more rigorous than the standard SV process. BED's reported savings are subject to onsite metering, onsite verification of measure installs and other post-project verifications, in addition to desk reviews of project files. Such onsite metering

<sup>4</sup> See PSB Docket 7466, Order dated August 20, 2010.

and verifications were conducted on a large enough sample of BED’s projects to achieve a sampling precision of 10 percent and a 90 percent confidence level. Savings verification protocols, which BED followed during the first performance period, required that the DPS’s evaluator only conduct desk reviews of project files to verify reported savings. As a consequence of this more rigorous evaluation, BED’s FCM/SV reports take longer to complete.

For the purposes of this OPA, the DPS recommends applying 92.6 percent realization rate, which is the five year average from the 2009 to 2013. The DPS has observed that BED’s evaluation results have been stable and consistent over the past several years so it is confident that the 2014 results will be similar to the results of previous evaluations. BED is in support of the DPS’s recommendation and understands that this proxy model concept only applies to this specific OPA process

Three year thermal results are included in the table below.

Table 4 - Quantified Performance Indicators (2012 -2014) – Thermal only

<b>TEPF RESOURCE ACQUISITION</b>			
<b>Period Costs for TEPF Savings</b>	<b><u>Residential</u></b>	<b><u>Commercial</u></b>	<b><u>Total</u></b>
Year to Date Costs	\$51,058	\$1,503	\$52,561
Annual Budget	\$97,088	\$52,577	\$149,665
% of Annual Budget	53%	3%	35%
<b>Energy Savings Results</b>			
MMBTU Year to Date	403	0	403
MMBTU Annual Goal	544	132	676
% of MMBTU Annual Goal	74%	0%	60%
<b>Progress Towards MMBTU 3-Year Goals</b>			
MMBTU Cumulative to Date	617	64	681
3-Year MMBTU Goal	1,428	504	1,932
% of 3-Year MMBTU Goal	43%	13%	35%

During the 2009 – 2011 performance period, the savings results are as follows:

**Table 5 - Quantified Performance Indicators (2009 - 2011) Electric only**

Line #	Definition	Minimum Requirement	Target	Policy Goal Advanced	Three Yr results as of 12/31/2014
1	Electric Savings	Annual incremental net MWh expected savings	22,354 MWh's	A predetermined target helps to ensure that all cost effective energy efficiency resources are being aggressively pursued by BED	19,917 mWh, 89% of goal
2	Summer Peak Demand Savings	Cumulative net summer peak demand expected savings	3.0 CP-MW	Designed to encourage BED to achieve high levels of peak summer demand savings in addition to annual energy savings and total resource benefits.	3.2 CP-MW, 104% of the three-year goal
3	Winter Peak Demand Savings	Cumulative net winter peak demand expected savings	3.7 CP-MW	Designed to encourage BED to achieve high levels of peak winter demand savings in addition to annual energy savings and total resource benefits.	3.3 CP-MW, 90% of the three-year goal
4	Total Resource Benefits	TRB total divided by BED total EEU operating costs is equal to or greater than 3.3 over the 3-year period.	3.3 or greater over three year period	Designed to encourage BED to maximize energy-related and other resource benefits in implementing energy-efficiency measures and projects during their economic lifetime	TRB = 4.0

During this performance period, BED did not have Thermal related savings.

It is worth re-iterating that the pre-determined savings goals are negotiated with the DPS during the demand resource planning process. The goals are established based on potential studies that attempt to assess the amount of “achievable” cost-effective savings in the City. However, these studies merely reflect statewide results that have been extrapolated to Burlington even though the City is unlike most other regions in Vermont. Some of the City’s unique characteristics include:

- The top twenty accounts represent nearly 50% of BED’s total energy consumption;
- Commercial, industrial and institutional customers represent 75 % of the total energy consumption;
- 11,000 residential customers use 500 kWh per month or less;
- 60% of residential customers rent their homes;
- There is a high proportion of college-age renters living in the City who move frequently between rented apartments resulting in a 35% annual turnover rate;
- A high percentage of the buildings in Burlington are connected to VGS’s natural gas network (residential: 85%; C& I: 95%); and
- About 70% of commercial customers lease their buildings.

As a consequence of these characteristics, BED contends that the reliance on extrapolated statewide potential study results to set savings goals in its service area is sub-optimal. BED and the DPS have agreed on the need for conducting a separate potential study that is specific to

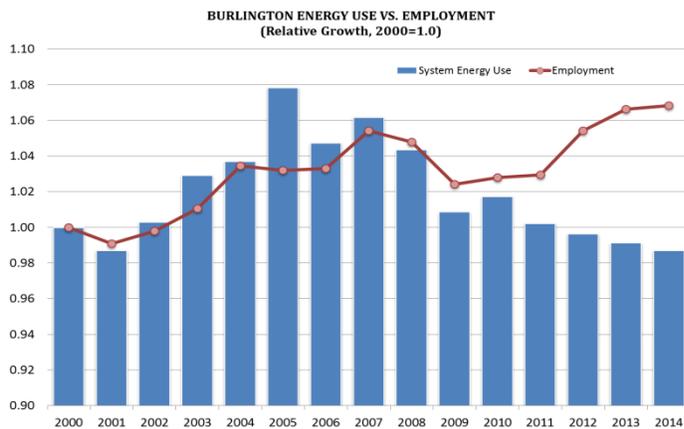
Burlington. BED will continue to work with the DPS on the timing of such a study in the context of BED’s next Integrated Resource Plan (IRP) and its 2018 - 2020 Demand resource planning process; both of which will also incorporate BED’s obligations under Act 56.

Despite the uncertainty around how much achievable efficiency remains in the City, BED has historically acquired savings equal to or greater than 1.0 percent of total sales in every year since the late 1990’s. Such consistent achievement is comparable to the best-run and most aggressive efficiency operations in the Nation.

**Table 6: MWh Sales as % of system-wide sales**

Years	Total Sales (MWh)	Total Gross Savings (MWh)	% of Total Sales
1991-1993	971,283	16,496	1.70%
1994-1996	964,338	12,353	1.28%
1997-1999	993,096	7,167	0.72%
2000-2002	1,000,229	10,662	1.07%
2003-2005	1,059,148	11,794	1.11%
2006-2008	1,069,690	23,013	2.15%
2009-2011	1,038,188	19,362	1.86%
2012-2014	1,020,885	18,834	1.84%

Cumulatively, energy efficiency has resulted in total savings of approximately 84,000 MWh’s since 2000. The rate of savings has flattened the City’s energy load, even as the local economy has grown jobs in recent years and has continued to evolve in dynamic ways as evidenced by the expansion of the UVM Medical Center, University of Vermont, Champlain



College, as well as the addition of new hotels and other commercial buildings throughout the City.<sup>5</sup>

Moreover, total resource benefits amount to approximately \$8 to \$9 million annually due in large part to the long lasting lives of installed efficiency measures and persistence.<sup>6</sup> Because energy efficiency is a highly localized enterprise, the total benefits of

<sup>5</sup> See Vermont Dept of Labor, Labor Market Information reports. <http://www.vtlmi.info/ces.cfm>

<sup>6</sup> 2012 – 2014 TRB amounted to \$18.6 million.

BED's efforts are re-invested in the community rather than exported out of state. These investments create and sustain local, higher paying jobs as the demand for technical, architectural, and engineering, services increases. Efficiency-related dollars also create other local jobs that are not directly tied to energy services and help to sustain a thriving local economy through increased consumer spending.

### **Performance with respect to broad policy goals**

During the initial OPA, the PSB focused its review of criterion *ii* predominately on whether BED and EVT offered efficiency services that had a similar "look and feel". The intent of this broad policy was to minimize customer confusion.<sup>7</sup> A secondary focus centered on the abilities of the two organizations to coordinate activities across several EEU-related duties in order to maximize program benefits. Over the course of the last two performance periods, these two broad policies have remained in effect.

BED and EVT have been and continue to be committed to minimizing customer confusion to the greatest extent possible. The Efficient Products Program and the upstream SMARTLight initiative serve as two primary examples that each organization seeks to deliver programs that maintain the same "look and feel". With regard to the Efficient Products Program, product buy-downs at participating retail stores are the same irrespective of the store location. Thus, Burlington customers receive the same incentive for a qualified product whether they bought it at Home Depot in Williston or at Bibens Hardware on North Avenue in Burlington. In fact, retail customers from Burlington typically do not realize which organization is providing the financial incentive. Similarly, customers buying (mostly through their contractor) qualified lighting products at local "upstream" distributors receive the same rebate from BED as they would from EVT. All the customer or contractor needs to do is report to the distributor (who then reports to EVT) where they are installing the product so that BED or EVT can reimburse the distributor depending on the location of the customer's building. Another example is the upstream HVAC program where both organizations offer similar incentives to contractors and their customers through the appropriate market channels on a wide range of products including but not limited to cold climate heat pumps and high performance circulator pumps.

BED and EVT have also coordinated their respective efforts across a wide spectrum of EEU related duties. Such coordination is most evident during the demand resource planning process, development of the state's technical reference manual, and through other cross-functional working committees that seek to positively influence markets. BED and EVT collaborative working groups include but are not limited to:

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<sup>7</sup> See PSB Docket 7466, Order dated August 20, 2010, at pg. 44.

- Lighting Cross-functional team
- HVAC-R Cross-functional team
- Technical Advisory Group (TAG)
- Thermal Efficiency Task Force
- Vermont Fuel Efficiency Partnership
- Energy Code development
- VGS EEU coordination
- Updates to Avoided cost

Although the initial OPA focused on broad policy matters of importance to the PSB at that time, the evolution of the local energy market warrants a change in focus. For this OPA, criteria *ii* is being measured by BED's ability to comply with the PSB's minimum performance requirements that are monitored by the DPS. These requirements include:

- Long term Market Transformation
- Business Comprehensiveness
- Equity for all rate payers
- Equity for Residential rate payers
- Equity for Low income customers
- Minimum Small Business Participation

For the 2012 – 2014 performance period, BED achieved the following, as shown in the table below:

Table 7: MPR 20112 -2014

MPR#	Title	Performance Indicator	Target	Policy Goal Advanced	Results as of 12/31/2014
5	Comprehensiveness of savings by Existing Business Customers	Increase the average kWh savings per participant premise in the Business Existing Facilities market	26,400 kWh savings per BEF participant on average ( a 10% increase from a 2009-2011 baseline)	Intended to ensure that energy efficiency initiatives are designed and implemented to acquire comprehensive savings	BED did not achieve this goal with 9,242 kWh avg savings per participant. BED believes that this lower result is driven by the high penetration of LED's during the 2009-2011 period and the larger number of smaller lighting projects via the upstream Smart light program during 2012-2014
6	Equity for all Electric Ratepayers	Total electric benefits divided by total costs	Equal or greater than 1.2 cost benefit ratio	Equity for all Vermont electric customers as a group by assuring that the overall electric benefits are greater than the costs incurred to implement and evaluate the <i>EEU</i> and the <i>EEC</i>	BED has achieved this goal with a cost benefit ratio of 4 over the three-year period (avoided cost of electricity / BED program costs + evaluation costs)
7	Equity for Residential Ratepayers	A minimum level of overall efficiency efforts, as reflected in spending, will be dedicated to residential customers	956,000	Equity for residential customers by assuring that a minimum level of overall efficiency efforts, as reflected in spending, will be dedicated to residential customers	BED has achieved this goal with residential spending at \$1.5 million over the three-year period.
8	Equity for Low-income Customers	A minimum level of overall efficiency efforts, as reflected in spending, will be dedicated to Low-income customers	180,000	Equity for low-income customers by assuring that a minimum level of overall efficiency efforts, as reflected in spending, will be dedicated to low-income households	BED has achieved this goal with over \$244,000 in low-income spending over the three-year period
9	Threshold (or minimum acceptable) Level of Participation by Small Business Customers	Number of total non-residential premises with annual electric use of 40,000 kWh/yr or less that acquire kwh savings	158	Equity for small business customers by assuring that a minimum level of overall efficiency efforts, as reflected in participation, will be dedicated to small business accounts	BED has achieved this goal with over 350 participants over the three-year period

For the 2009 - 2011 performance period, BED achieved each of the minimum performance indicators, as shown in the table below.

Table 8: MPR 200- 2011

MPR#	Title	Performance Indicator	Target	Policy Goal Advanced	Results as of 12/31/2014
1	Min electric Benefits	Total electric benefits divided by total costs	Equal or greater than 1.2 cost benefit ratio	This requirement is intended to ensure that BED produces at least enough electricity resource savings to cover contributions by BED's consumer-owners. Also, to ensure that resources are being obtained cost effectively and at or below market power costs.	Total electric benefit ratio of 4.1 was achieved over the three-year period
2	Threshold (or minimum acceptable) level of participation by low-income households	Equity for low-income customers	10% of program spending to be for low-income single and multifamily services	Assuring that a minimum level of BED's overall efficiency efforts, as reflected in spending, will be dedicated to low-income households	4.3% of all program spending was for low-income single and multifamily services (13.8% of total three-year residential spending was for low-income customers)
3	Threshold (or minimum acceptable) level of participation by small non-residential customers	Equitable share of service to smaller non-residential customers.	40% of total non-residential accounts with savings are accounts with annual electric use of 40,000 kWh/yr or less	Offsets potential incentive to concentrate on larger non-residential customers, where BED's cost per kWh is lower	Over the 3 year period, 64% of non-residential accounts with savings are accounts with annual electric use of 40,000 kWh/yr or less

Throughout the year, BED regularly reviews its progress toward achieving the above-noted MPRs as well as other policies not listed herein. During these reviews, BED's energy services staff consider whether program strategies and other market initiatives should be modified to effectively address barriers to energy efficiency. Periodically, the staff also develops new program strategies. Sometimes efforts to implement new strategies are dependent on Efficiency Vermont, other times BED collaborates with Vermont Gas. But mostly, the staff works closely with customers and other market actors to independently effectuate meaningful program strategies and projects. In essence, BED's staff regularly meets with its stakeholders to discuss how it can collaborate with them to further the state's various energy-related goals.

Although each goal listed above is important, the market transformation and business comprehensiveness goals warrant special attention as they are intended to produce long lasting societal impacts. Achieving these goals also consumes a substantial amount of resources and staff time.

## Market Transformation

As noted above, the specific market transformation indicator for BED was to design and initiate an on-bill financing (OBF) mechanism. This was completed in April, 2013. Since that time, twenty-five applications have been received and nine loans completed with several more currently in progress. Today, the total amount of loaned and committed on bill financing amounts to approximately \$470,000. More OBF loans can and will be completed over the next planning period as additional efforts are directed toward actively marketing OBF as a complementary service.

But BED's market transformation efforts and successes have been more extensive. In addition to further developing the OBF initiative, the Energy Services division has also been directly and actively involved in building code issues, account management and upstream programs – to name just a few. Before discussing these initiatives, however, it is important to highlight the City's cumulative achievements with respect to reducing electricity consumption and, in the process, transforming the local market.

ACEEE defines market transformation as

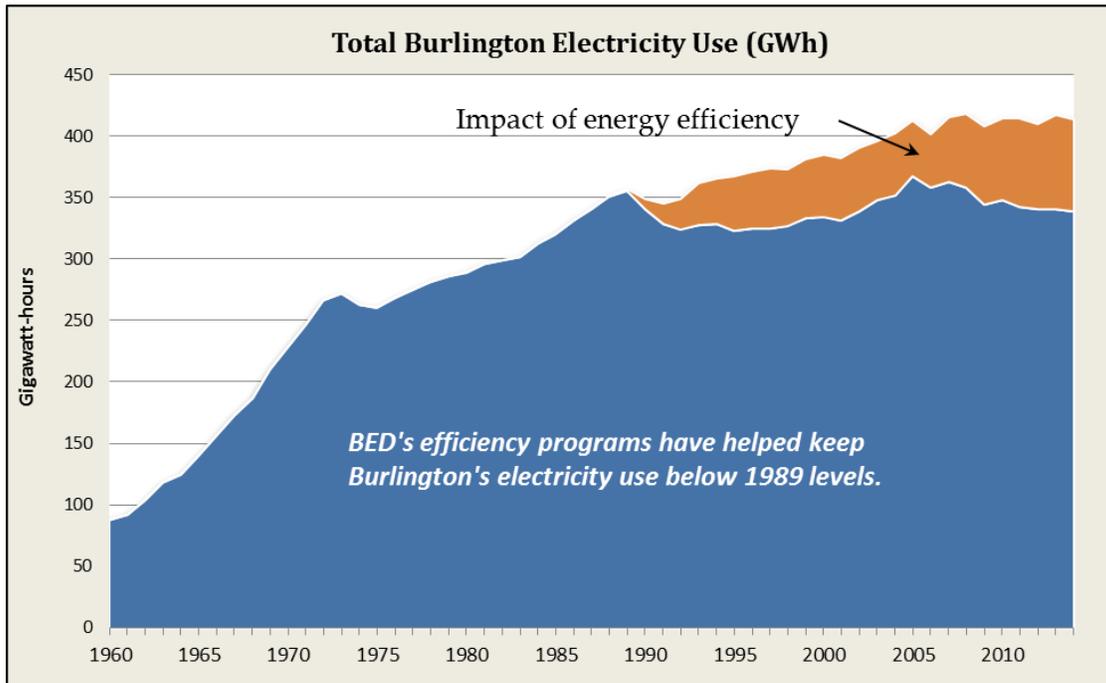
*“Strategic interventions that attempt to cause lasting changes in the structure or function of a market, or the behavior of market participants, resulting in an increase in the adoption of energy efficient products, services, or practices”.*<sup>8</sup>

Since 1990, Burlington residents, businesses and organizations have embraced energy efficiency. And, BED's Energy Services division has been the “go-to” organization in the city to make efficiency happen. Over the past 25 years, BED has provided \$24.6 million in incentives and countless hours of technical advice. Meanwhile, customers invested more than \$27.9 million resulting in a combined investment of \$52.5 million. The community's combined investments have flattened electricity sales over the past two and half decades, as noted above, even as the local economy has grown and evolved.

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<sup>8</sup> See <http://aceee.org/conferences/2015/mt>. Accessed on 9/10/15.

Figure 2: Impact of energy efficiency on total energy load



In BED's view, Figure 2, above, is reflective of BED's long term market intervention efforts to transform how local markets function and modify customers' behaviors relative to energy consumption. Also, the high degree of customer commitment as measured by their willingness to invest so much of their own funds in energy efficiency and their support of BED's Energy Services division is indicative of the community's mindset of placing a high priority on energy efficiency as a cost-effective energy resource.

Other specific market transformation activities include:

[Building codes](#)

BED staff participate in the DPS's development of new building codes as well as help to inform the design build community of changes in buildings codes.

BED staff also attends the City's technical review meetings. The purpose of these meetings is to review with City department heads (city planners, code officials, fire marshal and others) new, proposed large-scale building projects. During these reviews, BED staff work with developers to incorporate above-code building designs and ensure that the building owners are aware of BED's and/or Vermont Gas Systems) financial incentives.

[Account management and continuing energy improvement](#)

BED has a long and established track record of working closely with its larger commercial accounts. It has to. The top 20 C&I accounts consume nearly 50% of BED's total load during a typical year. Thus, actively managing these accounts to ensure system reliability, resiliency and

high levels of customer satisfaction is vital. To this end, a senior account manager is assigned to the University of Vermont (UVM) and another is responsible for the UVM Medical Center relationship (formerly known as Fletcher Allen Health Care). In partnership with VGS and other energy service companies, the two account managers are responsible for helping to identify energy efficiency opportunities, project expediting and management as well as fostering excellent working relationships at multiple levels of the customer's organization. A primary goal of BED's account management practices is to engage the customer's senior managers in long term energy planning. The intent of these activities is to cultivate a culture of continuous energy improvement that is backed by multi-year capital budgets. This ensures that future funds are set aside to make further facility improvements that result in lower energy consumption. The process also helps to transform the way corporate managers think about energy efficiency as a process, not just a project.

#### *Upstream market transformation*

In addition to managing relationships with BED's largest accounts, the energy services staff periodically meets with area lighting and HVAC distributors to promote energy efficiency products. Developing personal relationships with key distributors like Walsh Electric, F.W. Webb and The Granite Group provides our staff the opportunity to serve as a resource to help distributors and contractors upsell products to more efficient models than they would otherwise. On several occasions, BED staff has participated in so-called "Counter Days" which are local sales and training events. During these events, BED staff is available to field questions about the latest technologies, incentives and other questions about the local market. By keeping the lines of communications open and constructive, the sales personnel located at these local distributors help to promote efficiency to their customer base and also maintain higher inventory levels of efficient products.

#### *Tiered incentives for commercial new construction projects*

Beginning in 2012, BED began to advance the "building energy model" option for new construction projects as an alternative to a more prescriptive program approach. In order to better estimate the energy efficiency potential of new commercial projects, and encourage comprehensive treatment, building energy modeling software is used to compare the energy performance of a building that meets commercial building codes to a model of the final building design. The energy savings claimed for a project is a result of comparing the two building energy model runs with actual energy usage a year after occupancy.

A tiered incentive package is a key component of this approach as it pays part of the incentive at project completion, and BED inspection, and then the remaining incentive is paid after one year after comparing actual billing history data to the energy efficient model. It often takes about a year for larger commercial buildings to be fully occupied, equipped and

debugged of any performance issues. This approach helps to more accurately estimate true savings and ensures that the building operators are encouraged to optimize the performance of the building within the first year.

The approach compels the owners and project design teams to stay engaged long after buildings are occupied which historically has not been the case. This retro commissioning process typically finds many issues that have existed from the first year. This approach tries to mitigate those energy performance issues from the start and provide more accurate and persistent savings for the ratepayer investment.

BED has received strong support for this innovative approach from the design community, developers, contractors, customers and measurement and verification professionals. This approach has been used so far with non-profits, for profits, colleges and universities. BED has engaged eleven projects to date which is a large percentage of BED's total commercial new construction market since 2012.

### **Business Comprehensiveness**

The specific measure to assess BED's achievement with respect to business comprehensiveness is *26,400 kWh savings per Business Existing Facilities (BEF) participant, on average (a 10% increase from the 2009 -2011 baseline)*. The purpose of the goal is to ensure energy efficiency initiatives are designed and implemented to acquire comprehensive savings. The average savings across all BEF participants during the 2012 – 2014 performance period amounted to 9,242 kWh. BED was unable to achieve this goal for numerous reasons.

First, BED supports the concept of and desire to provide comprehensive energy efficiency. BED worked closely with the DPS on developing an appropriate metric in this area. In retrospect, however, BED should have defined the terms more clearly in order to account for wide variances in participation rates and savings per participant that can be caused by changes in program designs.

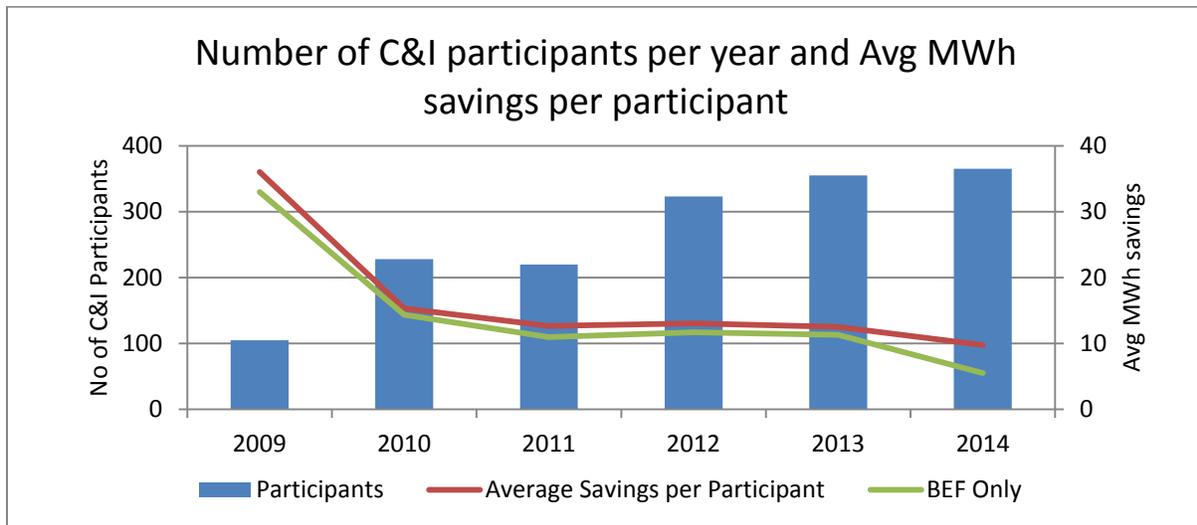
In reaction to the financial meltdown of 2008 and the long recession that followed, BED and EVT launched an "iLED" promotion to commercial customers starting in 2010. This promotion paid for over 75% of the cost of screw-in LED's. The program design achieved its overall goal of motivating customers to upgrade their existing lighting even though many businesses were still recovering financially from the recession. As a consequence of the generous incentives, the promotion was very successful throughout 2010 and 2011 and participation increased substantially.

Second, the successful commercial Smartlight distributor program, launched in mid-2012, has helped to increase participation rates but the savings per lighting purchase are typically small as commercial customers are simply replacing burned out bulbs as part of routine

maintenance. The purpose of this program was, and still is, to transform the supply channel so that supply chain market actors influence the purchase of higher efficiency replacement lighting products.

The downside of these two programs however was a dramatic decline in average savings per commercial customer, as shown in Figure 3.

Figure 3: Avg. Savings per C&I participant



Although the Energy Services division did not achieve the metric during the 2012 – 2014 performance period, as it is currently defined, projects involving larger customers did result in highly comprehensive projects that resulted in deep savings. For example, BED engaged the Hilton Hotel, a seven-story 130,500 square foot building, on a full lighting retrofit project, with controls, that impacted all common areas and guest rooms. The project was completed at the end of 2013 and verified lighting savings amounted to roughly 42% of the prior year’s consumption.

Another project that commenced in 2013 involved an elementary school. BED worked closely with the Burlington School District on a full lighting retrofit, with advanced controls added, to the 52,000 square foot Champlain Elementary School. The project was completed in 2014 and the estimated lighting savings approach 64% of the prior year’s consumption. The school staff and parents are also thrilled with the much improved light quality.

As BED’s relatively small territory can limit savings potential in any given year, BED is highly motivated to fully engage customers as opportunities arise. For example, BED has been working closely with UVM facility staff and a local energy engineering firm, since 2013, on identifying a large number of HVAC and lighting measures. As a part of this engagement, the

UVM project team, with BED's assistance, has installed a number of sub-meters to monitor consumption and to better understand savings potential. Estimates thus far indicate that energy consumption could be curtailed by about 40%. The energy improvement work is still in progress but should be completed by the end of 2015. BED hopes to promote this project to encourage more comprehensive projects with UVM.

### **Qualitative performance regarding specific policy initiatives**

The PSB's focus during the initial OPA was primarily on BED's summer peak demand savings, Forward Capacity Market activities, heating and process fuel services and contributions to the Vermont System Planning Committee. Since that initial OPA, BED has maintained its commitment to these specific policy initiatives and has performed in accordance with the PSB's new expectations. As evidence of its continued commitment to these past specific policy initiatives, BED has attached its annual reports which document BED's involvement in these areas. Further, BED will continue to be committed to these specific policies, and others, moving forward.

Over the more recent performance periods, BED has provided material support to its many stakeholders, including the regulatory community, in several other significant policy areas as well as proactively engaging local market actors as a means to leverage existing resources to promote energy efficiency. These areas include but are not limited to: Integrated resource planning, comprehensive energy planning and serving income-eligible communities.

#### *Integrated least cost resource planning*

As both a distribution utility and an EEU, one of the more important specific policy initiatives that applies to BED is least cost integrated planning. 30 V.S.A. § 218c (a)(1) states:

*A least cost integrated plan for a regulated electric or gas utility is a plan for meeting the public's need for energy services, after safety concerns are addressed, at the lowest present value life cycle cost, including environmental and economic costs, through a strategy combining investments and expenditures on energy supply, transmission, and distribution capacity, transmission and distribution efficiency, and comprehensive energy efficiency programs.*

In 2012, BED's integrated resource plan was updated and submitted for Board approval. As with previous IRP's, energy efficiency was an integral component to meeting the customer's energy needs at the lowest present value life cycle costs. For the first time, however, the 2012 IRP treated the then-projected MWh yield (or electric savings per dollar spent) as a variable and assessed the impacts on BED's 20 year load forecasts. Multiple scenarios were tested; all of which treated energy efficiency on an equal basis with supply-side resources.

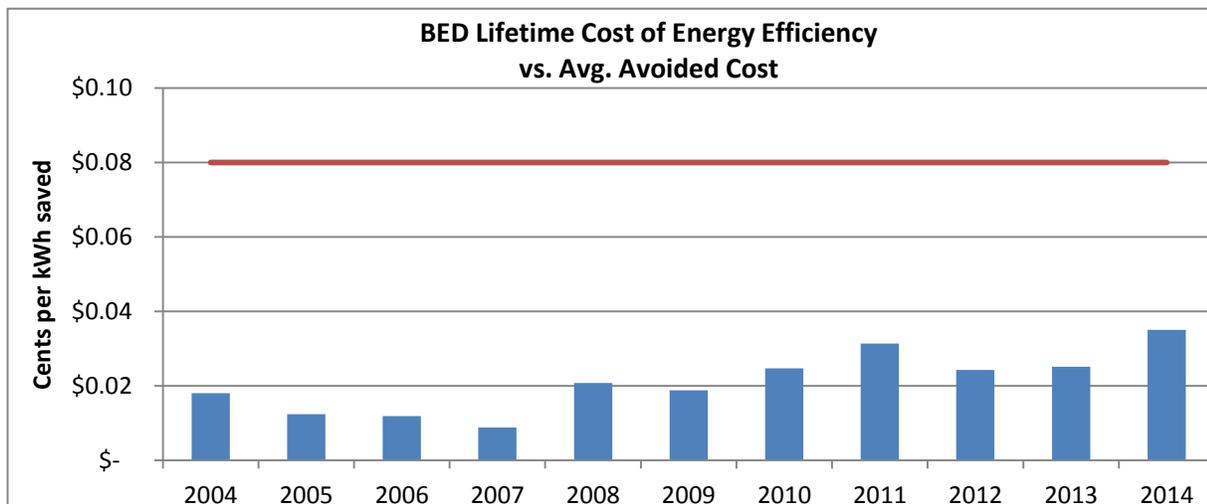
In accordance with prudent utility practices, BED also subjected the projected energy efficiency savings and approved budgets to three main sensitivity analyses.<sup>9</sup>

- Low DSM case – this scenario assumed that actual energy efficiency savings would amount to 80 percent of targeted goals set during the PSB’s demand resource planning process.
- Base DSM case – this scenario assumed that BED achieved 100 percent of the targeted goal.
- High DSM case – this scenario assumed that BED achieved 105 percent of the targeted goal.

It is important to reiterate that changes in the assumed MWh yields did not have a material impact on future annual estimated loads. But the cumulative effects of consistent levels of investment in energy efficiency did. Consequently, BED remains committed to investing in cost effective energy efficiency and other demand side resources, especially since verified results have shown to have lasting impacts on electric loads.

As BED begins the process of updating the next IRP, energy efficiency will once again serve as an important resource. The reasons BED holds energy efficiency in such high esteem are numerous but mostly it is because energy efficiency has clearly proved to be the least expensive future energy resource once all plausible environmental and economic costs and risks are taken into account. As highlight in the Figure 4, below, the levelized cost of saved energy has historically been well below the avoided cost of traditional utility energy.

Figure 4: Levelized cost of saved energy



<sup>9</sup> See; <http://www.burlingtonelectric.com/about-us/what-we-do/our-integrated-resource-plan>

Another reason BED pursues all cost-effective energy efficiency resources is that Burlington’s residents and businesses have been abundantly clear about their preferences: BED should continue to provide cost-effective energy efficiency services as a means to limit the impacts of consumption without sacrificing economic productivity as well as maintaining stable electric bills.<sup>10</sup>

### Comprehensive Energy planning

Over the past several years, staff members from BED’s Resource Planning and Energy Services divisions have provided input into the State’s various energy plans, including the 2011 Comprehensive Energy Plan (CEP) and the more recent Total Energy Plan. BED’s involvement with regard to the DPS’s planning activities has been multi-faceted, consistent, timely and, importantly, constructive. BED’s efforts have mostly concentrated on the CEP’s four cornerstones that are considered to be the main drivers toward a sustainable, renewable energy future: Innovation & Expertise, Financing, Outreach & Education and Regulatory Policy. The sections below highlight BED’s contributions to the state’s CEP’s goals.

### Innovation & Expertise

In 2013, BED launched Energy Engage, a web-based portal where customers can view their energy use and demand.<sup>11</sup> This service has proven to generate a high degree of interest based on customer feedback. Since its launch, interest in Energy Engage continues unabated as evidenced by the number of unique visits per month highlighted in Figure 5.

In its present format, BED’s user-friendly tools present customers with energy use graphics and can even send email alerts when consumption reaches a pre-determined threshold level. BED’s Energy Services Staff use Energy Engage to assist customers who call with high bill complaints. With this innovative and useful technology, BED informs customers of their energy use so they can take action to curb consumption; like participate in an

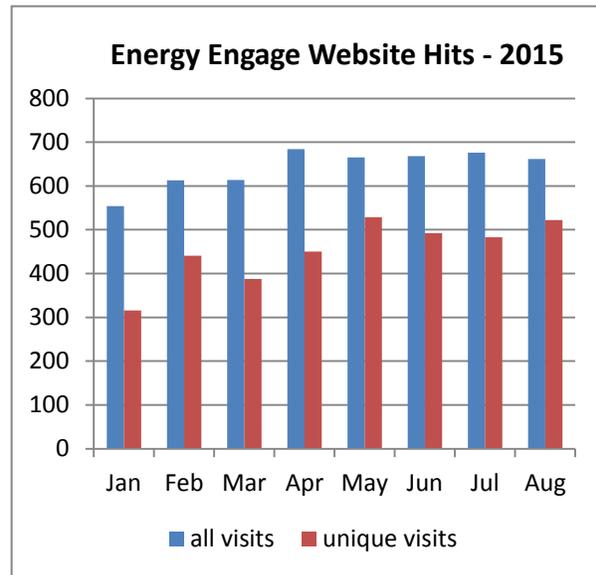


Figure 5: Energy Engage Web hits

<sup>10</sup> See December, 2014 BED Customer Survey results

<sup>11</sup> See <https://bed-ee-web1.burlingtonelectric.com/>

energy efficiency program. This is exactly the type of innovation that the DPS had in mind when it developed its CEP.

During the last two performance cycles, BED also initiated a series of programs that will enhance the organization's data analytics capability. The most prominent program, which was completed during the 2011 – 2013 performance period, was to install a smart grid system that included the conversion of traditional meters to advanced meters with communications capabilities. The total investment in this Smart Grid technology amounted to approximately \$14 million, 50 percent of which was funded by a US Department of Energy grant that BED won in 2010. Today, ninety-five percent of the meters have been converted.

The advanced meters not only enabled BED to launch enhanced services like Energy Engage but they also resulted in several other cost reduction benefits. Among these benefits are: far fewer truck rolls around the city to read meters or to turn power on or off, which of course improves local air quality and reduces the cost of maintenance, gas and staff time. This new system also allows small-scale local renewable energy to be easily incorporated into BED's distribution system by allowing BED to simply re-program customer meters remotely if a generation source is added. Furthermore, the investment allowed BED to begin moving meter readers to new tasks, and to avoid some planned equipment purchases.

While the investment in smart grid technology has already produced tangible results, BED has only just begun to tap into the technology's potential. Moving forward, BED anticipates initiating several additional programs. The goal of these programs is to transition toward the "Utility of the Future": meaning; that BED provides a comprehensive suite of energy services, not just an electric bill.

#### Financing

As noted above, BED instituted on-bill financing in 2013 utilizing a one-million-dollar grant from the United States Department of Commerce Economic Development Administration (EDA). Initially, uptake of OBF was tepid on account of internal, administrative challenges at the EDA. During 2014, these challenges were successfully addressed and OBF participation has slowly begun to expand. Currently BED has closed nine OBF loans and committed funds for close to four-hundred-seventy thousand dollars. With additional marketing, BED anticipates participation will continue to expand in the future.

BED also began to offer PACE (Property Assessed Clean Energy) financing in 2014 for residential customers. PACE allows eligible customers to finance (all-fuels) energy efficiency and renewable energy projects and repay the loans through their property tax bills or other mechanism. The statutory rules governing Vermont's PACE limit the program to owner-occupied residential buildings with a \$30,000 project maximum and very strict underwriting guidelines.

BED offers the repayment of the PACE loans on the BED electric bill, much in the same way as is done for the OBF commercial program. To date, there have been two PACE project completions and there are two projects pending. EVT administers the PACE program outside of Burlington and they report five completions to date.

In addition, BED has been working closely with the University of Vermont (UVM) to take advantage of the University's newly created \$13 million green revolving loan fund (GRLF).

UVM's Board of Trustees set aside up to \$13 million dollars to make energy efficiency improvements to campus buildings in order to reduce energy costs and UVM's carbon output. Projects must have a payback period of no more than seven years and cost \$3 million or less. The Board instructed UVM staff to rely on BED to verify the selection of measures and assumptions about energy savings and payback periods.

HVAC and lighting improvements in the Waterman Building (the main administration building on campus) and the expansion to the central heating and cooling facility (commonly known as the "Cage") are scheduled to utilize the GRLF. BED has already presented UVM with a savings analysis for an extensive package of HVAC and lighting improvements to Waterman and the Cage analysis is in-progress. Vermont Gas Systems (VGS) is also involved in both of these large projects.

#### Outreach & Education

In this area, BED has consistently supported two main initiatives: energy literacy and general public education. Additionally, BED has actively participated in the DPS's committee on benchmarking and building labelling.

Energy Literacy – Under this initiative, BED provides financial and technical support to the Vermont Energy Education Program (VEEP), the program manager of the Energy Literacy project. This successful educational program describes energy and energy efficiency to k-12 students and their teachers, and explains why it is important to reduce our carbon footprint.

General Public Education – Each year, energy service staff participate in workshops throughout the city that seek to raise issues related to the importance of energy efficiency in today's economy. BED's role is to help interested stakeholders better understand how energy use intensity can be reduced through specific technologies and practices such as weatherizing homes, installing LEDs and lighting controls, purchasing energy efficient appliances and/or installing programmable thermostats.

Several times of year, BED staff is also invited into k-12 and college classrooms to talk about energy efficiency policy and program efforts. BED continues to engage 4<sup>th</sup> and 5<sup>th</sup> grade classrooms every year with the Energy Efficiency calendar contest. The contest gives BED the

opportunity to talk about energy efficiency and conservation with several classrooms around the City.

For the past four years, BED has been invited to speak to the incoming class of Aiken Scholars from UVM's Rubenstein School of Natural Resources. This has been a great annual event that has led to several follow-up energy projects from students wanting to work more with BED.

For the past several years, BED and VGS have conducted annual "get ready for winter" workshops with UVM's Office of Off-campus Student Housing. These workshops are a forum for students, and staff, to learn about energy efficiency programs and tips on how to save in rental apartments.

Moving forward, BED is committed to supporting these initiatives. But the organization anticipates that much more will be required. Additional outreach and education efforts will focus on a host of new outreach and education programs that may include:

- Electric Vehicles;
- PassivHaus construction techniques (especially important with the increasing popularity of cold climate heat pumps);
- New building codes;
- Advanced lighting and controls;
- Advanced Rooftop Units and controls.

Benchmarking and Building Labelling – In addition to the above-noted outreach and education efforts, BED was also a key contributor to the State's efforts to promote, in accordance with Act 89, benchmarking and building labelling.

BED actively participated in the development of the DPS's December, 2014 report to the legislature on benchmarking commercial buildings.<sup>12</sup> This report conducted an in-depth literature review of the use of benchmarking tools to assess the energy use intensity of buildings. Benchmarking, if fully supported by utilities and energy services organizations, is widely viewed as an effective tool that can motivate commercial building owners to actively participate in energy efficiency programs and, after completing cost-effective energy efficiency retrofit projects, voluntarily label their buildings. The intent of labelling buildings is to make the energy performance of buildings more transparent and visible to the public. Once building labels are standardized and made public, they can allow tenants and prospective buyers to compare the energy performance of similarly-situated buildings across markets.

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<sup>12</sup> See [http://publicservice.vermont.gov/sites/psd/files/Topics/Energy\\_Efficiency/BEDWG/Comm-MF%20Bldg%20Energy%20Labeling%20Report%20to%20Legislature%2012-15-14%20final.pdf](http://publicservice.vermont.gov/sites/psd/files/Topics/Energy_Efficiency/BEDWG/Comm-MF%20Bldg%20Energy%20Labeling%20Report%20to%20Legislature%2012-15-14%20final.pdf)

The aforementioned report summarized the pros and cons of benchmarking tools and types of building labels. The general objective of the study was to educate policy makers and raise awareness about this potentially powerful tool.

Study contributors also developed a series of recommendations to promote wide-spread adoption of benchmarking and building labelling. Since submission of the report, the Public Service Board has opened Docket No. 8488 – An Investigation of issues related to commercial, multifamily and mixed-use building energy benchmarking and labeling.

Benchmarking is however more than a theoretical exercise to BED. The Energy Services staff have assisted several clients, including many municipal and school buildings, with the use of Energy Star Portfolio Manager; which is the preferred online tool administered by the US EPA. In fact, the following Burlington schools have been noted for their exceptional energy performance. The Energy Star scores of these buildings are shown in the table below.

**Table 9: Energy Star Portfolio Manager Scores for City Schools**

School	ESPM Score	Site kBTU/ft <sup>2</sup>	% diff from National Medium
Barnes School	96	51.2	-50.30%
Champlain School	92	54.7	-41.50%
Flynn	96	47.0	-49.30%
CP Smith	93	49.1	-43.80%

### Regulatory Policy and Structures

Regulatory policy and structures form the foundation on which the private market can flourish. Without a solid foundation, achieving the State’s CEP goals will be impossible. In order to help build this all-important foundation, BED staff collaborated with others at every level of state government. During these collaborations, BED provided constructive leadership in shaping the public discourse over energy policies that provided private markets actors with appropriate levels of guidance and the tools to help Vermonters make the transition to a carbon-free economy. Over the past six years, BED has actively participated in a wide range of major energy-related policy discussions. These discussions ranged from Vermont transmission system planning to the use of EEC funds to support electro-technologies that may increase electric load (Docket 8311). Perhaps one of the more significant, and more recent, discussions however revolved around Act 56, Vermont’s Renewable Energy Standard. This discussion took place during the 2015 legislative session but the creation of this important law has its roots in several previous discussions and events that occurred over the most recent performance period (i.e. 2012 -2014).

As the State seeks to implement its goal of achieving 90 percent renewable by 2050, BED is uniquely positioned as both a distribution utility and an EEU to deliver results that no other EEU could. BED not only delivers best-in-class energy services to its customers at a fraction of the cost of avoided energy but it also controls the grid. No other EEU in the state can make this claim. With such control BED can:

- Ensure that the benefits of advanced meters and smart grid technologies are maximized to the greatest extent possible;
- Enable customers to take advantage of improved data analytics and modify consumption habits;
- Deploy advanced energy efficiency measures that automatically control energy consumption and, thus, maintain a zero growth energy load and help to ensure the City's claim of 100 percent renewability;
- Propose and implement voluntary dynamic retail pricing coupled with energy storage technologies which has the potential to cost effectively address coincident peak demand and avoid expensive capacity costs;
- Leverage the power and enthusiasm of private markets, including private capital, to transform the energy market.

#### *Income-eligible programs*

BED has a long tradition of serving disadvantaged communities and lower income residents. That tradition continues to produce meaningful results for many of BED's income eligible customers. BED's program seeks to reduce energy bills through incentives that cover up to 100 percent of the replacement cost of new energy efficient lighting, appliances and equipment.

The primary objectives of this program were to:

- Reduce the burden of energy costs for income eligible customers
- Increase energy awareness
- Provide the tools, education and resources to income eligible customers so they can take more control over their energy consumption

Working in partnership with Vermont's Weatherization Assistance Program, Champlain Valley Office of Economic Opportunity, Champlain Housing Trust and the Burlington Housing Authority, BED has provided over the past two performance cycles technical assistance to customers with high bills and financial incentives to reduce the cost of qualified measures. Program delivery was coordinated with our partners, including Vermont Gas, to deliver electric efficiency measures at the time thermal improvements were being installed. On a regular basis, BED also engaged with its partners, building owners, public agencies and contractors to determine how program services and incentives could evolve over time to ensure that the

returns on energy efficiency investments are maximized to the greatest extent possible for this important market segment.

This tradition of serving the community will continue indefinitely. Recently, BED and Efficiency Vermont partnered to issue another community grant to help the City's local partners to deliver energy services to income eligible customers in need. Champlain Housing and RESOURCE were provided up to \$30,000 to directly install efficiency measures and coach BED customers about how to reduce energy consumption, including their heating needs.

### **Performance regarding administrative functions necessary to carry out duties**

The PSB does not assess BED's performance regarding its administrative functions in accordance with specific QPI or MRI. Instead the PSB conducts a qualitative assessment. Based on this assessment, the PSB determines whether BED can effectively carry out its duties as an EEU.

During the initial OPA, the PSB's attention focused on BED's data systems and its capabilities to:

- Track and report energy efficiency savings and expenditures
- Respond to data requests
- Manage contracts and
- Manage IT systems

As proof that BED's administrative functions continue to meet and exceed expectations, BED points to the DPS's 2013 Savings Verification report dated September 3, 2015. In this report, the DPS's contractor reviewed BED's electronic project documentation files, analyzed its own metering data, developed alternative energy savings strategies and verified savings. After the DPS's contractor completed its analysis, the DPS compared the contractor's evaluation results to BED's reported savings and expenditures. This comparative analysis led to the DPS's conclusion that BED achieved an overall realization rate of 102.4 percent.<sup>13</sup>

Realization rate: The savings realization rate (RR) is the ratio of evaluated energy savings to the program's reported savings. The RR represents the percentage of program-estimated savings that is actually achieved based on the results of the evaluation, measurement & verification analysis.

*Source: Report by West Hill Energy & Computing, September 3,*

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<sup>13</sup> See Verification of Burlington Electric Department's Energy Efficiency Portfolio for the ISO-NE Forward Capacity Market and Annual Verification report, September 3, 2015, West Hill Energy & Computing.

Although not unprecedented, such a high realization rate is a positive reflection on BED’s administrative capabilities to maintain robust operating systems and databases. Such systems allow BED’s staff to manage myriad project details and project changes, track savings and costs, and follow precise reporting protocols related to individual measure characterizations, i.e. operating hours of use, baseline shifts and coincident peak factors – to name a few.

In addition to managing project level details, BED’s systems are also capable of reporting program and portfolio level results on a regularly scheduled basis, i.e. monthly, quarterly and annually. These scheduled reports are reviewed by the DPS. Intermittently, BED staff responds to the DPS when they have questions about these reports. Overall BED’s reporting capabilities allow for BED to be highly responsive to the DPS when such questions arise.

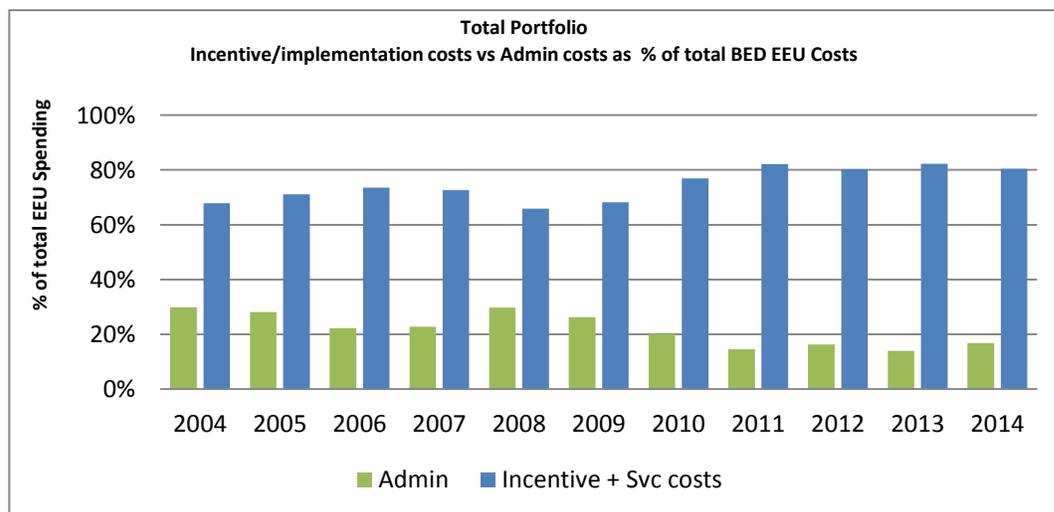
Moving forward, BED anticipates it will continue its commitment to maintain and improve, where necessary, its administrative functions in order to effectively carry out its EEU duties to the satisfaction of the PSB and Burlingtonians.

### Administrative efficiency

In the prior OPA, the focus of the PSB’s inquiry was centered on BED’s EEU related administrative costs as a percent of total EEU costs as well as a comparison of this cost metric to EVT’s.

Based on the record evidence, the PSB concluded that BED’s administrative costs were in line with expectations, i.e. 25 percent of total EEU costs, on average. The PSB also determined that BED’s administrative costs as a percent of total EEU costs were comparable to EVT’s. Over the past six years, BED continued its practice of minimizing administrative costs relative to total costs, as shown in the graph below.

Figure 6: Administrative Costs as % of total EEU costs



Relative to EVT’s proportional share of administrative costs, BED once again demonstrated that it could deliver EEU services in a highly efficient manner. As shown in the table below, BED “admin” costs as a percent of total program costs is, on average, 10 percent lower than EVT’s.

**Table 10: Evergreen Admin costs as a % of total EEU costs**

Year	BED				EVT			
	Incentive Costs	Admin Cost	Program cost	Admin as a % of Program costs	Incentive Costs	Admin Cost	Program cost	Admin as a % of Program costs
2011	\$ 1,372,682	\$ 758,851	\$ 2,131,533	36%	\$ 21,562,122	\$ 18,620,473	\$ 40,182,595	46%
2012	\$ 1,035,050	\$ 785,364	\$ 1,820,414	43%	\$ 18,947,197	\$ 16,796,555	\$ 35,743,752	47%
2013	\$ 1,228,560	\$ 838,888	\$ 2,067,448	41%	\$ 15,408,826	\$ 19,728,819	\$ 35,137,645	56%
3 yr average	\$ 1,212,097	\$ 794,368	\$ 2,006,465	40%	\$ 18,639,382	\$ 18,381,949	\$ 37,021,331	50%

The above results were recently reported by Evergreen Economics, the PSB’s evaluator responsible for conducting an independent audit of the State’s EEUs.<sup>14</sup> It is important to note that Evergreen Economics reported administrative expenses in a different manner than BED has in all previously submitted annual reports. Rather than combine administrative, service and evaluation costs together, as Evergreen did in the table above, BED reports these cost categories separately. BED believes its reporting method is appropriate because service costs reflect the cost of implementing programs. “Service” costs are in reality costs associated with providing technical assistance, energy audits and customer project management. Service costs are defined as implementation costs in the appendix of BED’s annual reports.

Despite this disparity, Evergreen’s finding still sheds light on BED’s ability to ensure customers receive the maximum amount of benefits from their ratepayer funded programs vis-à-vis EVT’s abilities.

Moving forward, BED’s performance in this area will be measured not only by its ability to minimize administrative costs but also by identifying and adopting key process improvements. This new indicator is intended to encourage BED to continually assess its operations to maximize ratepayer value. BED has met its predetermined milestones on schedule, which in the near term only included reporting to the DPS in 2014 that it would review and then implement large scale project management process improvements. The underlying objective of this key process improvement is for BED’s Energy Services staff to begin using data analytics and other tools to quickly assess energy efficiency opportunities as a means to compress the amount of time large scale projects take from initial audits to project completion.

<sup>14</sup> See Independent Audit report of Evergreen Economics, Inc. to the Vermont Public Service Board, September 11, 2015, pg 39.

In 2000, the PSB first authorized BED to provide energy efficiency services within the City on the basis that the anticipated benefits from BED's delivery of service would exceed the cost of potential inefficiencies associated with having two EEU's in Vermont.<sup>15</sup> Since 2000, BED has continually worked to ensure the efficient delivery of energy services in the City and driven down administrative costs relative to total EEU costs. Moreover, BED remains committed to continually seek out key process improvements as a means to drive down overall costs. Based on its 15+ year performance, BED contends that it is more than capable of maximizing ratepayer benefits than any other EEU.

### **Customer service with respect to energy efficiency services provided to prospective and participant customers**

During the 2010 OPA, the PSB conducted a qualitative assessment of BED's customer service. At the time, the PSB made note of BED's customer satisfaction survey results as well as its hands-on approach to providing energy efficiency services and ability to work closely with local design build firms. Based on its assessment, the PSB found that BED's customer service was satisfactory and that no cause existed to consider the merits of awarding BED's appointment to any other implementation provider.

Today, customer service is as good as or even better than in 2010.

BED takes customer service seriously. Throughout the entire organization, BED staff work extremely hard at providing exemplary customer service. To gauge how the organization is performing in this area, independent customer satisfaction surveys are conducted every three years. In December, 2014, two new customer satisfaction surveys were submitted to the Burlington Electric Commission for review: one of residential customers, the other of commercial customers. Both surveys achieved 95% / 5% confidence/interval levels; meaning, that if the surveys were repeated, the survey answers would be the same, more or less, 95 percent of the time.

While BED acknowledges that there is always room for improvement in this area (and others), the hard work and dedication of its employees continues to translate into a high level of customer satisfaction. The 2014 surveys demonstrate that BED's customers continue to recognize and value the services that BED's employees routinely provide and that they are satisfied with the manner in which BED's employees deliver such services. Although the survey

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<sup>15</sup> See Order Re: Approval of City of Burlington Electric Department's proposal to implement core programs within its service area, Order of 9/22/2000, at page 18.

results are attached to this report in their entirety, the tables below provide a snapshot of the results.

**Table 11: Customer Survey results**

Survey Question	C&I	Residential
<b>How satisfied overall would you say you are with BED</b>	85%	86%
<b>How satisfied are you with BED in offering energy efficiency programs</b>	73%	72%
<b>Have you ever used BED's energy efficiency programs</b>	39.3% responded yes	23.5% responded yes
<b>Were you satisfied with BED's energy efficiency programs</b>	90.8% responded yes	93.8% responded yes

The results above reflect the percent of customers that ranked BED’s service as an 8, 9 or 10, with 10 signifying that customers were extremely satisfied with BED.

Energy Services staff also continue to engage prospective and participant customers one-on-one. Such a hands-on approach is a must in a close-knit city such as Burlington and is absolutely necessary to gain the customer’s trust. BED’s project managers are typically on a first name basis with their customers and have in-depth knowledge of their buildings after having literally crawled around their basements and attics over the past several years. The testimonials below are indicative of BED’s approach to energy efficiency and underscore the survey results noted above.

"We've been fortunate to have Jake Yanulavich as our point of years we've been involved in two large "efficiency" programs that have involved BED. We installed a 136 panel, 30 kilowatt solar array on our roof at City Market. Jake helped steer us through the process providing information necessary to assess critical points of consideration as we decided to move forward. From rebates, to payback to energy savings calculations Jake was there for us when we needed.

We are now moving forward on an upgrade of our lighting at the store. We will be replacing our old lights with new LED technology (200+ bulbs) that will reduce our usage, improve lighting in the store and will reduce supply costs because of their extended "bulb life". Once again Jake provided the necessary information to make this a realistic investment for us.

City Market is committed to being a good environmental partner in the City of Burlington, and it is great to have BED working with us as we seek to minimize our impact.

~ Pat Burns, City Market

Paul Frank + Collins and its landlord, One Church Street Partnership, joined together to retrofit all existing fluorescent light fixtures in the historic Masonic Temple building with new energy-efficient ballasts and bulbs. The majority of the retrofit replaced older T-12 fluorescent lamps and magnetic ballasts with the more efficient T-8 lamps and electronic ballasts. Approximately 531 fixtures were modified in all, with the majority of the retrofit occurring on the three floors of the law firm's office space. The retrofit work was performed by FJG Electric, Inc., of Ferrisburgh, VT. It is estimated that PF+C's electricity consumption for lighting may be reduced by up to 27 percent annually.

"We are continually looking for new ways to be 'green' and this project was a significant step that will have immediate results. We will be able to give our employees and visitors higher quality lighting while also saving money and helping the environment." Incentives provided by Burlington Electric Department covered over half of the cost of the project. In addition to the financial incentives, BED provided valuable technical assistance and was a very effective partner in this project. I would encourage any BED commercial customer to look into this incentive program.

~ Cindy Goodrich, Facilities Manager –  
Paul, Frank & Collins

From time to time, BED also develops case studies of customer projects to promote energy efficiency. These studies are a testament of the services BED provides and indicate how customers feel about the services they receive.<sup>16</sup> BED is appreciative whenever customers take the time to let us know how we are serving them.

As a part of its comprehensive customer service offering, BED's energy services staff also regularly engage with local tradespeople, the design build community and others who are instrumental to BED's efforts to transform markets. Over the past several years, BED has hosted educational and outreach events either in conjunction with Efficiency Vermont or by itself. Energy related events have included the Burlington Business Association, PassivHaus design professionals and architects as well as lighting peer exchange members (i.e. manufacturers, distributors, lighting designers and specifiers and other energy efficiency providers). More recently, BED has also visited with local distributors and manufacturer's representatives such as Walsh Electric, FW Webb, Hulbert Supply, the Granite Group and others. These upstream market actors serve an important role in promoting energy efficiency to their contractor and customer base. Finally, BED sponsors, with Efficiency Vermont, the annual BBbD conference and presents on pertinent subjects of interest to this community.

## Organizational qualifications

The PSB performs a qualitative assessment to determine whether an EEU has the organizational qualifications to carry out the functions of an EEU. For the purposes of making this determination, the PSB focused, in 2010, primarily on the experience, qualifications and education of BED's staff across several energy related disciplines; including but not limited to: years of education, professional designations, knowledge and experience with advanced technologies, knowledge and experience with local building codes and local building characteristics, load forecasting, and project management including working with local engineering firms. Based on its qualitative assessment, the PSB determined that BED at the time had the requisite qualifications to serve as an EEU.<sup>17</sup>

Today, the staff of BED's energy services is equally qualified as the staff was in 2010; perhaps even more so, on account of the fact that technologies are more advanced and the needs of our customers more complicated.

The tables below include a brief synopsis of each Energy Staff member's qualifications, grouped in accordance to their roles and sectors they serve.

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<sup>16</sup> Customer case studies have been included in the supporting documents folder and can be viewed by clicking [here](#)

<sup>17</sup> See Dkt7466, Order of 8/20/2010, pg. 58.

### Small to Med Commercial Sector

<b>Name:</b>	Ravi Parikh	J.C. McCann
<b>Title</b>	Energy Services Specialist	Energy Services Specialist
<b>Yrs of EE Experience</b>	10	15
<b>Short Job Description</b>	Responsible for working closely with Burlington's commercial customers and professional community in presenting and delivering customer services and demand-side management (DSM) programs.	Commercial energy consultant specializing in small to medium business customers. Responsible for client service, rebate/incentive calculations, increasing program participation and emerging technologies.
<b>Degree</b>	BS in Business Administration, Champlain College	B.A. English, SUNY Potsdam
<b>Certificates</b>	Certified Energy Auditor	Natural/Propane Gas Certified Installer (VT)
<b>EE related conference presentations</b>	Lighting Programs 101, Better Buildings by Design Conference ASHRAE, Illuminating	Type S- Specialty Electric License (VT) <i>Positive Pressure Ceramat Burner Technology- ISH Las Vegas 2003</i>
<b>Working relationships/</b>	Engineering Society, Burlington Business Association, DesignLights Consortium, NEEP	IES/ILAD,ASHRAE, PHCC, DLC

### Large C,I & Institutional Sector

<b>Name:</b>	Jake Yanulavich	Michelle B. Keller
<b>Title</b>	C & I Energy Services Engineer	C & I Energy Services Engineer
<b>Yrs of EE Experience</b>	10	12
<b>Short Job Description</b>	UVM Medical (FAHC) Account Manager, providing technical support, incentive and energy analysis services to BED C & I Customers.	UVM account management, providing technical support , incentive and energy analysis services.
<b>Degree</b>	BS, Electrical Engineering	BS, Chemical Engineering (MIT)
<b>Certificates</b>	CEM	LEED AP
<b>EE related conference presentations</b>	"Re-Commissioning - Success Stories" "Profiting From Thermal Storage" "BED's Demand Response Program"	

<b>Working relationships/member ships</b>	UVM Medical Center, ASHREA, Cx Associates, Temp Controls of VT, Zero by Degrees	University of Vermont (UVM), Other utilities and respective efficiency programs: Efficiency Vermont (EVT), Eversource (NH, MA, CT), Efficiency Maine, NYSERDA, Duke Energy, Tampa Electric Co
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### Residential Sector

<b>Name:</b>	Brian Reilly
<b>Title</b>	Residential Energy Services Engineer
<b>Yrs of EE Experience</b>	2
<b>Short Job Description</b>	Support EE needs of Burlington's residential customers.
<b>Degree</b>	BSME
<b>Certificates</b>	
<b>EE related Articles</b>	
<b>EE related conference presentations</b>	
<b>Working relationships/member ships</b>	IEEE, Drive Electric VT, Northern VT Building Science Group

### Planning, Implementation and regulatory

<b>Name:</b>	Chris Burns	Tom Lyle
<b>Title</b>	Director of Energy Services	EE program & planning
<b>Yrs of Experience</b>	10 years in current position. 27 years in total in the energy efficiency and electric utility industry.	20 years of regulatory experience, 8 specific to energy efficiency.
<b>Short Job Description</b>	Responsible for supervising the delivery of BED's customer and energy service offerings to all of BED's residential and commercial customers. The position is also responsible for the recommendation, development and implementation of city-wide energy-efficiency programs.	Responsible for strategic planning, designing and implementing energy efficiency programs. Works closely with Vermont Gas, VEIC, and BED's regulatory stakeholders. Focused on providing the EE team with detailed operational roadmaps for scaling-up BED's energy efficiency programs, introducing emerging technologies,

		managing costs and risks and evaluating program results.
<b>Degree Certificates</b>	B.A, Political Science & Environmental Studies	MBA, Finance
<b>EE related Articles</b>		"The Emerging Importance of Regional Planning to the Clean Energy Industry under FERC Order 1000" "Commercial Building Benchmarking: Will They Manage It" "FERC Order 1000, Regional System planning and Renewable Energy Development "Once They've Measured It."
<b>EE related conference presentations</b>	Low income Weatherization Assistance Program regional and national conference presentations, APPA Energy Connection Conferences, Affordable Comfort and Better Building by Design	ACEEE, Renewable Vermont
<b>Working relationships</b>	DPS, VGS, WAP, CEE, NEEP, ISO-NE, ACEEE, APPA, ASHRAE, VGBN,	DPS, Renewable Vermont, ACEEE, NEEP

BED has also been recognized as an industry leader by the American Public Power Association (APPA). This past spring, BED was presented with the Award of Continued Excellence for its decade's long commitment to energy efficiency, use of renewable energy, support for public power and support of research and innovative demonstration projects. BED has received from APPA four "Demonstration of Energy & Efficiency Development" or DEED grants for projects related to energy efficiency. The most recent DEED grant was in 2014. The objective of that grant is to test the impact of in-home energy information devices empowered by the smart grid. This project is now underway in collaboration with UVM.



When it comes to BED's qualifications in the context of the state's push toward 90 percent renewable by 2050, the PSB needs to look no further than the national attention BED's staff has attracted regarding its power generation fleet. This feat did not happen overnight. In fact, it took years of planning, analysis, careful forecasting, dedication and a highly qualified staff.

### **Financial Stewardship of ratepayer dollars**

Like the criteria above, the PSB conducts a qualitative review of an EEU's financial stewardship. In the prior OPA, the PSB focused on BED's ability to:

- Follow proper accounting procedures in order to prevent misallocation of energy efficiency funds,
- Leverage program participant funds, and
- Ensure that customers can access private capital to finance energy efficiency projects.

Based on its review in 2010, the PSB found that BED's financial stewardship was satisfactory and that appointing BED as the EEU in Burlington was appropriate.

Over the last six years, BED has continued its tradition of exemplary financial stewardship and is dedicated to do so into the foreseeable future. As a municipal utility of 110 years, safeguarding ratepayer money is paramount and earning the customer's trust every day is critical.

Although not the focus of the PSB's assessment in 2010, BED asserts that two fundamental measures of financial stewardship warrant further attention: the levelized cost of saved energy

and rate impacts. These two measures, in BEDs view, are highly indicative of an EEU’s ability to not only safeguard ratepayer funds but to also ensure that such monies are appropriately invested. For each of these performance measures, BED has excelled. Over the past 6 years, BED has invested rate payer funds in resources at roughly half the cost of traditional energy costs while also keeping rates competitive with other distribution utilities in the state, as the next two figures show.

Figure 7: Levelized cost of saved energy

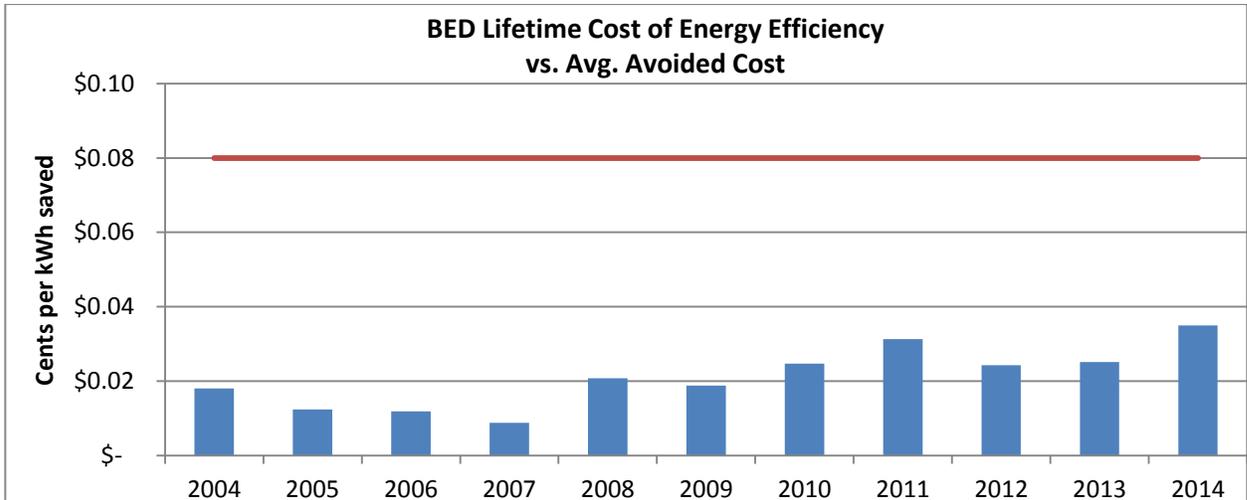
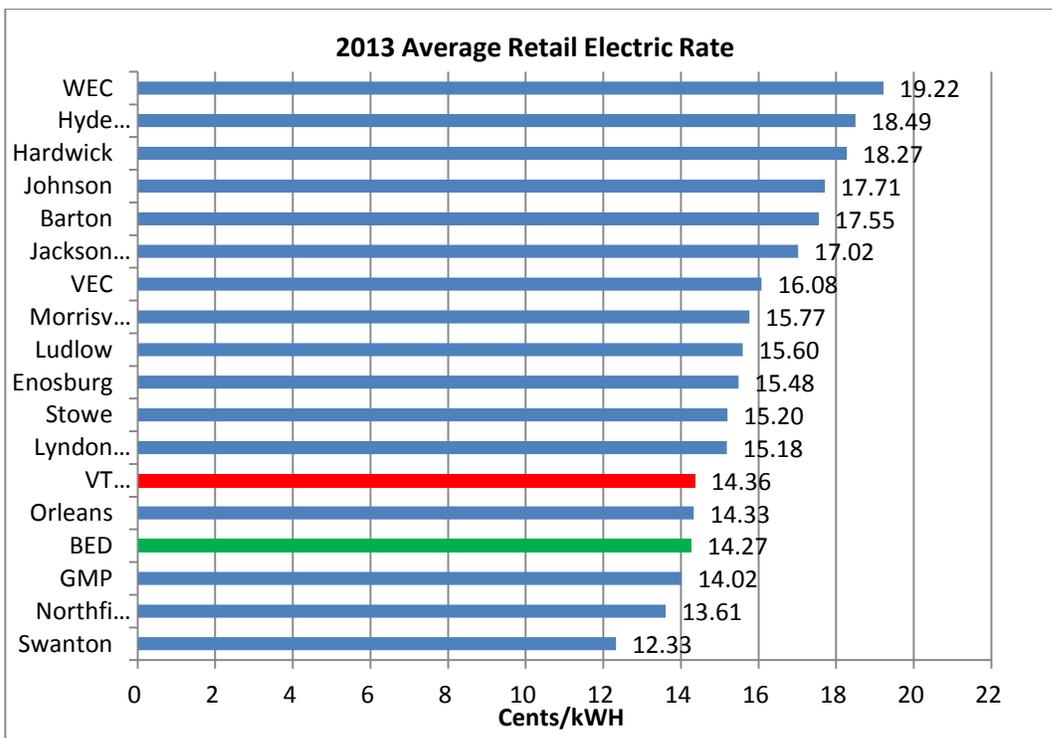


Figure 8: Average retail electric rates

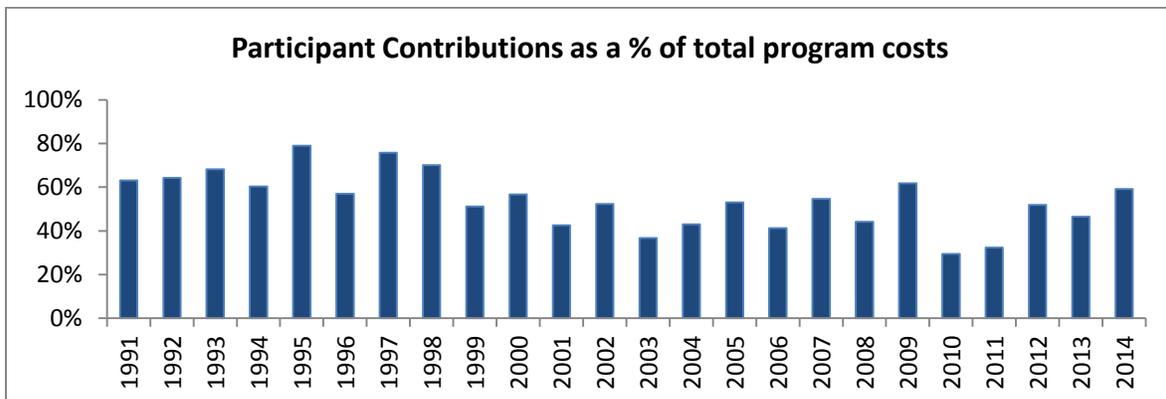


In BED’s view, financial stewardship imposes a responsibility on the EEU to safeguard ratepayer funds and ensure that such funds are delivering meaningful results that ratepayers could not have otherwise attained on their own. The above graphs show BED has been able to effectively deliver such results. BED will continue to do so in the future.

With respect to the other, afore-mentioned areas of past interest to the PSB, BED continues to ensure that the organization follows strict accounting procedures that allocate ratepayer funds in accordance with PSB rules and generally accepted accounting protocols. Each year, BED submits audited financial statements to the PSB for review. In all the years covered by the last two performance periods, there has not been a material audit finding suggesting that funds have been misallocated or that any EEU related function has been subsidized by another BED department or division.

BED also maintains a policy of ensuring that program participants contribute their own funds in energy efficiency projects. The intent of this PSB policy is to minimize, to the greatest extent possible, free ridership and to motivate customers to take ownership in energy efficient projects that result in persistent savings. As the figure below highlights, BED has demonstrated a tradition of encouraging participating customers to contribute to their own projects. The graph below shows the percent of participating customer contributions to the total program costs. Such costs include BED’s administrative, technical assistance and evaluation costs as well as the incentives paid to customers. Thus, customers provided as much as 60 – 70% of their own funds in efficiency. It is important to note that the differences in contributions from year to year are highly sensitive to the mix of projects in that year. For example, if savings are derived predominately from prescriptive measures then contributions from participants will typically range from 25 to 33 percent of total program costs. On the other hand, if savings are derived predominantly from custom or new construction projects, then contributions tend to be higher as percent of total costs.

Figure 9: Participant costs as a % of total program costs



Lastly, BED continues to provide customers with financing options. As noted above, BED continues have an on-bill financing option available to qualifying customers to consider as well as arrangements with local lenders.

## Performance benchmarked in relation to other energy efficiency providers

Because it is difficult to compare the performance of multiple energy efficiency providers located in various jurisdictions, the PSB primarily conducts a qualitative assessment of this criterion to determine whether a Vermont EEU is meeting expectations.<sup>18</sup> The difficulties vary considerably from state to state but they are generally associated with differences in evaluation practices, reporting standards, market maturity, market characterizations and budgets.

Despite these widely acknowledged difficulties, the PSB, in 2010, focused its assessment of BED's performance on a benchmarking report submitted by the DPS. That report indicated BED's performance was satisfactory and that BED achieved savings at a cost that was comparable – on average – with some of the leading energy efficiency providers in the Nation.

Today, the same conclusions apply.

Based on a 2014 benchmarking report covering 2011 and 2012, BED continued its practice of delivering above average savings as a percent of total MWh sales at a cost that was slightly above the median. The table below highlights BED's performance relative to EVT and the median results of other providers.<sup>19</sup>

**Table 12: Benchmarking results**

	Spending as % of Revenue	Energy Savings as % of Sales	Summer Peak Demand Savings as % of Peak Demand	Retail Cost of Energy \$/kWh	Cost of First Year Savings		Levelized Cost of Energy Savings *	Cost of Lifetime Savings **
					\$/kWh	\$/kW		
All Benchmarked Median	2.70%	1.70%	0.90%	\$0.12	\$0.25	\$1,825	\$0.03	\$0.02
EVT	4.00%	2.40%	1.30%	\$0.15	\$0.24	\$1,705	\$0.03	\$0.02
BED	3.60%	1.90%	1.20%	\$0.14	\$0.26	\$2,254	\$0.03	\$0.02

\* Levelized cost of energy includes a capital recovery factor.

\*\* Cost of lifetime savings is annual spending divided by lifetime savings.

<sup>18</sup> See Docket 7466, Order of 8/20/2010, at pg. 63.

<sup>19</sup> See Direct Testimony of Brian Cotterill, Docket No. 8455, June 26, 2015, at pg. 17.

Although making comparisons between and among energy efficiency providers is difficult for the reasons noted above, this comparative analysis can nevertheless help regulators identify programs that merit further scrutiny if the results of the target entity are considerably different than its peers. But the results captioned in the table above clearly indicate that BED's results are comparable with some of the Nation's best performing efficiency providers located in Connecticut, Massachusetts and Maine. Accordingly, there is no cause to suggest that additional benchmarking analysis is warranted at this time.

In addition to the DPS's 2014 benchmarking study, the PSB might also want to consider an October, 2015 ACEEE report highlighting municipal utilities with strong performance in energy efficiency. That report was based on a comprehensive analysis of annual reports, program plans and surveys. ACEEE surveyed 23 municipal utilities considered by their peers to be national leaders in the energy efficiency field and then profiled nine utilities that demonstrated exemplary performance based on regulatory filings. The nine municipal utilities included:

- Burlington Electric Department
- Fort Collins Utilities
- Glendale Water & Power
- Los Angeles Department of Water and Power
- Lansing Board of Water and Light
- Seattle City Light
- Sacramento Municipal Utility District
- Snohomish County Public Utility
- Tacoma Power

The purpose of ACEEE's report was to document examples of municipal utilities with established records of success in energy efficiency and to discuss factors that motivate and enable municipals to achieve high savings rates in a cost effective manner. According to ACEEE, the nine profiled utilities turned in results that were as competitive as many of the best-performing investor – owned utilities in the nation. Among the selected group, the average savings was 1.4% of total energy sales and energy efficiency spending was about 3.1 percent.

## Conclusion

BED's administration of the City's energy efficiency programs indicates that Burlingtonian's are receiving the maximum amount of benefits from their ratepayer funded programs. As noted above, every dollar invested in energy efficiency has produced societal benefits in excess of \$4.50. Further, BEDs resource acquisitions have consistently exceeded 1.0% of total MWh sales in every year since the late 1990's. These resource acquisitions cost less than half the avoided cost of traditional energy supply. At the same time that BED has flattened its load growth over

the past two decades, it was also able to maintain competitive retail rates vis-à-vis the other Vermont distribution utilities as well as source all of its power from renewable energy projects. Moreover, BED is considered by ACEEE to be a national leader in energy efficiency. Very few, if any, organizations have accomplished so much.

Irrespective of these past accomplishments, BED is committed to moving the organization along a positive trajectory and to help the State move toward a post-carbon economy. It is making strides to becoming the utility of the future by incorporating innovative tools and services that will enhance the customer's experience. Such efforts will also enable BED to ensure reliable, low cost power for the foreseeable future.

Based on the evidence presented herein, BED asserts that it has complied with the PSB's nine evaluation criteria and that its performance does not indicate that probable net benefits would result from additional proceedings considering alternate implementation entities.