BURLINGTON ELECTRIC DEPARTMENT

2018 Energy Efficiency Annual Report

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1 Introduction & Summary

The Burlington Electric Department (BED) is pleased to submit the following report to the Burlington Electric Commission, the Vermont Public Utility Commission and the Vermont Department of Public Service, summarizing the implementation of energy efficiency programs in the City of Burlington for the year 2018. BED remains committed to offering its customers high quality and affordable energy services and a secure, environmentally sound supply of electricity into the future. Energy efficiency continues to play a major role in achieving this goal, and is the cornerstone of the BED resource acquisition strategy.

Energy efficiency has been clearly shown to be Vermont's least expensive future energy supply resource over time, and is every day a greater environmental imperative. The Burlington Electric Department is owned by all the citizens of Burlington, who have been unequivocally clear that the option for future supply that they prefer above all others is the pursuit of additional cost-effective energy efficiency.

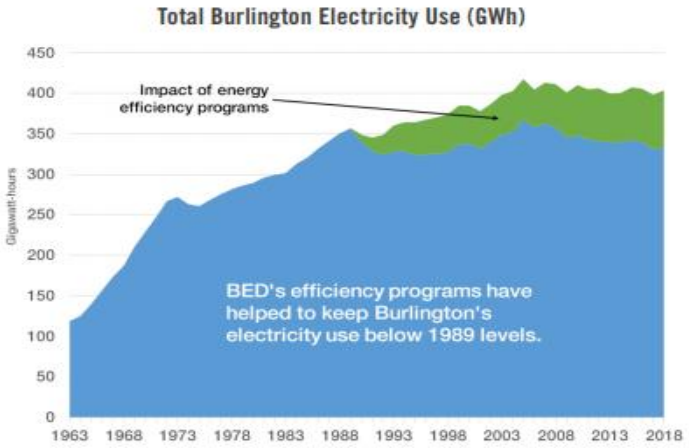
Burlington voters in 1990 approved an 11.3 million dollar bond to fund energy efficiency programs that supported successful program activities through 2002. Since 2003, BED customers (like all other Vermont electric customers) pay a small monthly charge that supports these "Energy Efficiency Utility" programs. When these funding sources are considered along with customers' direct investment, $70.4 million has been invested in energy efficiency efforts sponsored by BED over the last 29 years. This is comprised of about $34.2 million spent by BED on all of its energy efficiency efforts during that period, combined with another $36.2 million in matching expenditures by its customers. The willingness to invest their private funds in these investments is a testament to the value that BED customers place on these services.

As Figure 1 indicates, the overall effect has been dramatic. Energy Efficiency has essentially flattened BED's energy load requirement since the 1990's. Overall electricity use in 2018 was about 6.1% lower than in 1989. In other words, we are meeting the

needs of a growing local economy with less electricity than we used over a quarter century ago. The consistent delivery of affordable energy efficiency services has helped to meet the needs of a growing local economy over the last 29 years with less electricity than was used then!

Energy efficiency expenditures are made almost entirely locally, typically in the form of professional services, skilled trades employment, and equipment purchases. Not only is the value of the City's building and energy-using equipment improved, but locally-retained dollars are "multiplied" many times over by subsequent consumer spending. Absent these energy efficiency expenditures, these funds would have gone toward the purchase of electricity and enhanced infrastructure to satisfy increased demands on the City's electrical system. Most of these dollars would have been exported out of state, and many out of the country. Energy efficiency is a win-win situation for the city of Burlington through increased local economic activity, and through the avoidance of increasingly costly electricity purchases, their associated infrastructure growth and capital expenses, and their environmental impacts.

Figure 1: Impact of DSM on Total City Electricity Sales



During 2018 alone, BED saved 5,381 Megawatt hours (MWh) of energy from efficiency measures installed, which will result in 70,209 MWh of savings over the useful life of the installed measures (2018 measures have a weighted average lifetime of about 13 years).

This is equivalent to providing energy to about 1,153 average Burlington residential customers for 13 years.

BED met 84% of 2018 MWh savings projections. BED projected 6,413 MWh savings and achieved 5,381 MWh. BED's projected budget for 2018 was $2,862,962 and $2,502,769 was expended, about 13% less than budgeted. It is important to note that BED carried over $320,300 of committed EEU funds from 2018 to 2019. There are several new construction projects that will be completed in 2019 where BED has committed incentives to customers based on the agreed upon project designs.

Burlington continues to experience a relatively large increase in new construction activity. There has close to 1.6 million square feet of new construction planned for completion between 2017 and 2022 which includes about 1,068 new apartments.

Annual fluctuations in any energy efficiency program's performance depend on a variety of human and business cycle dimensions that are hard to quantify and even harder to predict with precision. The decision to move forward with an energy efficiency project is ultimately the individual customer's. Customers consider a wide variety of factors in their decision-making process, including their perceptions of local and national economic conditions and trends, their availability of funds and competing interests for the use of those funds, fluctuations in their business functions and volumes, and the opinion of off-site consultants and decision makers. The decision to move forward with an energy efficiency project is ultimately the individual customer's. Given the relatively small size of BED's system, the loss of only a few commercial new construction projects, for example, can have a dramatic impact on its annual budgets and savings estimates.

The redevelopment of the Burlington Towne Center shopping mall is a prime example of this. As of today, the new Burlington City Place project is scheduled to begin construction shortly and includes a mix of apartments, retail and office space spread over seven stories. The project has had numerous delays over the past three years which makes EEU budgeting and savings projections difficult.

Year-to-year fluctuations in program results reflect the relative unpredictability of energy efficiency program timing, and support the notion that *annual* projections are no more than carefully-crafted estimates. In the long run, the performance of BED's energy efficiency programs continues to meet the expectations laid out in BED's Integrated Resource Plans and prior planning documents dating back more than 29 years. Energy efficiency has essentially flattened BED's energy load requirement since the 1990's and BED's consistent investment in energy efficiency will continue to have lasting benefits in the City by helping to reduce non-strategic load growth for the foreseeable future.

This report includes coverage of BED's program activities related to the nineteenth year of operation of the State's — and the nation's — first Energy Efficiency Utility (EEU). Statewide energy efficiency programs are today operated by the non-profit service provider "Efficiency Vermont" (EVT). Thanks to a long history of successful program implementation, BED serves as the City's own EEU and delivers these programs within the City of Burlington, continuing to build on its past success in helping Burlington's consumer-owners achieve energy efficient electric use.

BED recognizes that much of its success comes from effective working relationships not only with EVT, but also with its partners Vermont Gas Systems (VGS) and the Champlain Valley Weatherization Service (CVWS). A cooperative relationship with the VGS has helped both organizations promote efficiency services. About 95% of Burlington's buildings use natural gas for space heating and about 85% use it for domestic hot water. VGS reports that about fifty-percent of all their total weatherization program completions have happened in Burlington. VGS's willingness to work with BED to promote electrical energy efficiency programs to its natural gas customers has been a noteworthy strength of its joint energy efficiency program offerings.

BED also continues to perform substantial analysis of energy efficiency and demand response impacts on its system as part of the BED Integrated Resource planning and reporting process. BED updates all of its energy efficiency and demand response planning assumptions on a 3-year basis. BED is responsible for reacting with

appropriate program design modifications to the changing market conditions that impact customers' decisions about undertaking energy efficiency upgrades.

There are a number of factors that continue to inform BED's planning projections that "traditional" electric energy efficiency savings will become more expensive to obtain. The largest factor is due to increasing efficiency baselines. Baselines are increasing due to more stringent state energy codes and federal appliance and lighting standards. This results in declining increments of potential savings to pursue through advanced technology upgrades driven by program activities. BED estimates that higher incentives may be necessary to encourage higher levels of overall participation and deeper savings per project.

Other major forces continue to shape BED's approach to energy program design and delivery as well. The on-going transformation of the utility industry (utility 2.0 as called by some), Vermont's ACT 56 (Renewable Energy Standard) strategic electrification (aka Tier 3) provision and BED's net-zero energy city strategic direction. All of these forces now require BED to play nimbly and strategically in two worlds: the historic distribution utility/EEU world and the new energy transformation world. As both a distribution utility, and an energy efficiency utility, BED is in a unique and strong position to offer our customers a full suite of efficiency and beneficial electrification solutions. BED continues to explore and adopt new strategies for electric efficiency as well as a much deeper expansion into the renewable, thermal and transportation arenas while keeping a keen focus on optimizing the use of the electric grid.

2019 Outlook

As BED describes in its **2019 Annual Energy Efficiency Utility Plan** (filed with the VT-PUC November 1, 2018) BED will continue to test all program design assumptions and pursue all strategies to make programs as cost-effective, and as easy to participate in, as possible.

BED's role in helping to establish Burlington as a *2030 District* member is a prime of example of this planning. BED's commercial class uses 75% of total annual electric sales.

As with the residential class, BED strives to develop program strategies to help customers take a complete look at their electric, thermal and transportation opportunities. Working with private sector partners, staring in 2016, BED has helped to establish Burlington as a 2030 District member. 2030 Districts are unique private/public partnerships in designated urban areas across North America committed to reducing energy use, water and transport emissions. More information is available at: http://www.2030districts.org/burlington

BED's energy efficiency programs will also continue to play a major role in BED's strategic vision to make Burlington a Net Zero Energy City. BED continues to encourage building owners to reduce energy loads through weatherization, deep energy retrofits, and Net Zero Energy building practices.

Achieving the Net Zero Energy goal will mean not only continuing BED's progress in the electric sector, but also transforming our heating and transportation sectors. To help analyze the best options to reach Net Zero Energy, BED conducted a Request for Proposals in 2018 to identify a partner to create a Net Zero Energy Roadmap. BED selected Synapse Energy Economics (along with its transportation partner RSG) to work with BED on creating a Roadmap that will provide a baseline of energy use and greenhouse gas emissions across the electric, thermal, and ground transportation sectors. From this baseline, the Roadmap will offer analysis of various pathways to achieve the City's Net Zero Energy goal, with an eye on solutions that provide the best economic and environmental outcomes for Burlingtonians.

The remaining pages on this report provide details on BED's delivery of the following EEU services in 2018:

- **Business New Construction**
- **Business Existing Facilities**
- **Residential New Construction**
- **Existing Homes**
- **Efficient Products**
- **Thermal Energy and Process Fuels (Residential and Commercial)**

Table 1: All Business & Residential DSM History*

	-------- Participants --------	---------- Costs ----------						---------- Savings ----------			
		Admin	Services	Incentive	Evaluation	Participant	Program Total	Mwh	Lifetime Mwh	Winter Kw	Summer Kw
1991	391	$356,563	$0	$273,437	$6,015	$1,091,19	$1,727,205	3,703	52,103	1,224	0
1992	330	$334,066	$0	$264,615	$14,711	$1,104,05	$1,717,442	3,595	72,723	1,385	0
1993	1,343	$344,326	$0	$501,991	$107,646	$2,052,04	$3,006,008	9,198	133,079	2,634	0
1994	734	$367,600	$0	$197,054	$46,172	$927,802	$1,538,628	3,304	32,558	991	0
1995	827	$255,770	$0	$149,865	$16,666	$1,584,81	$2,007,112	6,764	31,402	1,650	0
1996	774	$215,329	$0	$118,006	$44,318	$500,363	$878,016	2,285	38,654	0	358
1997	735	$143,184	$0	$122,189	$6,011	$848,380	$1,119,764	2,665	39,091	0	714
1998	692	$204,588	$0	$107,140	$353	$731,707	$1,043,788	3,202	43,971	0	822
1999	675	$214,782	$0	$101,224	$1,529	$331,985	$649,520	1,300	14,174	0	358
2000	1,364	$334,762	$97,067	$148,162	$0	$761,673	$1,341,664	3,130	37,211	443	387
2001	1,410	$425,123	$129,955	$208,178	$59,637	$609,115	$1,432,008	3,094	41,258	398	341
2002	1,824	$469,263	$192,143	$407,057	$2,352	$1,178,69	$2,249,510	4,438	63,159	444	520
2003	1,897	$305,283	$365,691	$236,762	$19,006	$538,589	$1,465,331	3,346	56,332	346	361
2004	1,484	$253,037	$302,017	$271,856	$19,067	$638,819	$1,484,796	3,500	46,856	625	557
2005	1,977	$242,385	$351,009	$260,806	$5,904	$970,437	$1,830,541	4,948	69,570	630	630
2006	2,188	$221,862	$352,886	$381,706	$42,057	$702,575	$1,701,086	6,254	83,951	813	891
2007	2,045	$255,856	$375,480	$441,352	$52,025	$1,353,65	$2,478,364	9,679	128,022	1,206	1,158
2008	6,392	$447,867	$412,037	$578,245	$65,159	$1,187,67	$2,690,979	7,299	72,402	1,178	889
2009	1,181	$317,257	$371,233	$452,901	$67,667	$1,959,97	$3,169,035	5,679	64,416	765	811
2010	1,638	$378,153	$339,569	$1,102,59	$54,283	$781,528	$2,656,130	6,492	75,954	1,223	1,148
2011	1,027	$310,536	$381,043	$1,372,68	$69,742	$1,020,84	$3,154,845	7,191	68,153	1,333	1,000
2012	1,244	$296,104	$425,616	$1,035,05	$63,671	$1,968,11	$3,788,555	6,428	75,050	1,118	957
2013	1,229	$289,056	$472,270	$1,228,56	$77,562	$1,793,53	$3,860,982	7,007	82,273	1,267	910
2014	988	$380,161	$577,196	$1,246,48	$63,671	$3,277,60	$5,545,111	5,399	64,811	959	785
2015	1,021	$329,612	$570,899	$1,291,41	$67,289	$2,025,39	$4,284,606	6,025	80,842	849	628
2016	1,427	$383,409	$511,696	$1,367,95	$69,644	$2,292,04	$4,624,747	6,102	72,043	745	529
2017	1,559	$529,382	$561,806	$1,307,06	$69,646	$2,477,24	$4,945,143	7,022	88,436	899	709
2018	1,555	$566,467	$562,927	$1,373,37	$42,397	$1,527,52	$4,072,691	5,381	70,209	942	651
Total	39,951	$9,171,782	$7,352,539	$16,547,722	$1,154,200	$36,237,365	$70,463,608	144,430	1,798,703	24,067	16,115

*** All tables in this report reflect a reduction in MWh savings claims as a result of the final VT-DPS annual savings verification process.**

Table 2: All Business DSM History

	-------- Participants --------	---------- Costs ----------						---------- Savings ----------			
		Admin	Services	Incentive	Evaluation	Participant	Program Total	Mwh	Lifetime Mwh	Winter Kw	Summer Kw
1991	3	$130,784	$0	$1,849	$0	$2,157	$134,790	31	93	30	0
1992	16	$149,138	$0	$119,535	$4,063	$454,104	$726,840	246	24,388	227	0
1993	164	$162,366	$0	$305,473	$35,559	$1,308,52	$1,811,922	5,587	72,218	1,421	0
1994	104	$238,153	$0	$163,733	$21,690	$630,639	$1,054,215	2,242	14,970	626	0
1995	163	$199,835	$0	$142,342	$9,480	$1,368,95	$1,720,611	6,137	21,386	1,615	0
1996	151	$151,409	$0	$50,423	$28,498	$355,217	$585,547	1,233	16,150	0	334
1997	160	$78,321	$0	$96,959	$5,612	$757,774	$938,666	2,300	33,565	0	669
1998	164	$141,258	$0	$65,048	$50	$615,144	$821,500	2,767	37,930	0	734
1999	162	$150,772	$0	$71,501	$0	$270,056	$492,329	1,051	10,895	0	338
2000	145	$176,552	$56,070	$80,108	$0	$613,597	$926,327	2,438	28,712	309	334
2001	127	$255,082	$99,310	$84,729	$43,248	$384,763	$867,132	2,064	26,581	240	240
2002	113	$284,826	$112,447	$238,866	$252	$912,280	$1,548,671	2,888	43,183	224	392
2003	144	$154,937	$243,386	$148,306	$9,503	$254,905	$811,037	2,193	32,975	122	162
2004	142	$115,796	$192,327	$140,234	$3,928	$507,253	$959,538	2,505	35,419	335	394
2005	133	$133,542	$208,860	$202,143	$0	$814,001	$1,358,546	3,751	57,787	342	397
2006	150	$112,917	$240,425	$261,310	$24,533	$575,467	$1,214,652	5,094	73,084	503	652
2007	151	$125,761	$244,030	$280,213	$33,320	$977,132	$1,660,456	6,530	104,174	482	763
2008	115	$113,641	$250,666	$304,252	$43,576	$904,640	$1,616,775	3,264	48,407	386	386
2009	105	$173,789	$224,900	$305,352	$44,608	$1,743,18	$2,491,831	3,781	51,336	336	555
2010	228	$168,765	$249,094	$849,801	$35,630	$458,549	$1,761,839	3,489	52,358	511	673
2011	220	$162,357	$277,034	$972,032	$47,704	$335,095	$1,794,222	2,787	37,950	421	521
2012	323	$153,822	$307,898	$721,047	$49,516	$1,667,50	$2,899,786	4,215	54,786	494	680
2013	355	$166,097	$384,773	$952,314	$64,371	$1,320,52	$2,888,076	4,440	55,668	533	537
2014	365	$193,375	$434,315	$846,835	$47,753	$3,006,37	$4,528,650	3,559	43,676	526	524
2015	382	$159,179	$430,188	$746,424	$50,467	$1,709,72	$3,095,979	3,691	50,912	332	382
2016	512	$166,511	$406,350	$893,142	$51,990	$1,659,63	$3,177,627	4,074	39,361	361	397
2017	508	$232,740	$463,676	$907,098	$50,198	$2,183,38	$3,837,092	4,645	53,336	420	544
2018	436	$263,751	$478,835	$951,062	$31,671	$1,021,74	$2,747,066	2,985	33,472	461	497
Total	5,741	$4,715,476	$5,304,584	$10,902,130	$737,220	$26,812,312	$48,471,722	89,987	1,154,772	11,257	11,105

Table 3: All Residential DSM History

	-------- Participants --------	---------- Costs ----------						---------- Savings ----------			
		Admin	Services	Incentive	Evaluation	Participant	Program Total	Mwh	Lifetime Mwh	Winter Kw	Summer Kw
1991	388	$225,779	$0	$271,588	$6,015	$1,089,03	$1,592,415	3,672	52,010	1,194	0
1992	314	$184,928	$0	$145,080	$10,648	$649,946	$990,602	3,349	48,335	1,158	0
1993	1,179	$181,960	$0	$196,518	$72,087	$743,521	$1,194,086	3,611	60,861	1,213	0
1994	630	$129,447	$0	$33,321	$24,482	$297,163	$484,413	1,062	17,588	365	0
1995	664	$55,935	$0	$7,523	$7,186	$215,857	$286,501	627	10,016	35	0
1996	623	$63,920	$0	$67,583	$15,820	$145,146	$292,469	1,052	22,504	0	24
1997	575	$64,863	$0	$25,230	$399	$90,606	$181,098	365	5,526	0	45
1998	528	$63,330	$0	$42,092	$303	$116,563	$222,288	435	6,041	0	88
1999	513	$64,010	$0	$29,723	$1,529	$61,929	$157,191	249	3,279	0	20
2000	1,219	$158,210	$40,997	$68,054	$0	$148,076	$415,337	692	8,499	134	53
2001	1,283	$170,041	$30,645	$123,449	$16,389	$224,352	$564,876	1,030	14,677	158	101
2002	1,711	$184,437	$79,696	$168,191	$2,100	$266,415	$700,839	1,550	19,976	220	128
2003	1,753	$150,346	$122,305	$88,456	$9,503	$283,684	$654,294	1,153	23,357	224	199
2004	1,342	$137,241	$109,690	$131,622	$15,139	$131,566	$525,258	995	11,437	290	163
2005	1,844	$108,843	$142,149	$58,663	$5,904	$156,436	$471,995	1,197	11,783	288	233
2006	2,038	$108,945	$112,461	$120,396	$17,524	$127,108	$486,434	1,160	10,867	310	239
2007	1,894	$130,095	$131,450	$161,139	$18,705	$376,519	$817,908	3,149	23,848	724	395
2008	6,277	$334,226	$161,371	$273,993	$21,583	$283,031	$1,074,204	4,035	23,995	792	503
2009	1,076	$143,468	$146,333	$147,549	$23,059	$216,795	$677,204	1,898	13,080	429	256
2010	1,410	$209,388	$90,475	$252,796	$18,653	$322,979	$894,291	3,003	23,596	712	475
2011	807	$148,179	$104,009	$400,650	$22,038	$685,747	$1,360,623	4,404	30,203	912	479
2012	921	$142,282	$117,718	$314,004	$14,155	$300,610	$888,769	2,213	20,264	624	277
2013	874	$122,959	$87,496	$276,247	$13,191	$473,013	$972,906	2,567	26,605	734	373
2014	623	$186,786	$142,880	$399,649	$15,918	$271,228	$1,016,461	1,840	21,135	433	261
2015	639	$170,433	$140,711	$544,989	$16,822	$315,672	$1,188,627	2,334	29,930	517	246
2016	915	$216,898	$105,346	$474,809	$17,654	$632,413	$1,447,121	2,028	32,682	384	132
2017	1,051	$296,642	$98,130	$399,964	$19,448	$293,867	$1,108,051	2,377	35,100	479	165
2018	1,119	$302,715	$84,092	$422,314	$10,726	$505,778	$1,325,625	2,396	36,737	481	154
Total	34,210	$4,456,306	$2,047,955	$5,645,592	$416,980	$9,425,054	$21,991,887	54,443	643,931	12,810	5,010

2 Overview of EEU Services Results

2018 proved to be a challenge for achieving savings goals in all programs but overall BED achieved 84% of the total annual MWh goal, 88% of the summer coincident–peak KW goal and 92% of the winter coincident–peak KW goal.

BED projected 6,413 annualized MWh savings and achieved 5,381 annualized MWh which will result in 70,209 MWh of savings over the useful life of the installed measures (2018 measures have a weighted average lifetime of about 13 years). BED projected 735 coincident-peak summer KW savings and achieved 650 KW. BED projected 1,021 coincident-peak winter KW savings and achieved 942 KW. Residential Existing Buildings and Retail Products had strong years and exceeded savings projections.

BED's projected budget for 2018 was $2,862,982 and $2,502,769 was expended, about 13% less than budgeted. BED's cost for, first year, saved energy was higher than projections. BED estimated it would spend about $446 per annualized MWh saved, and instead spent $465 per annualized MWh.

BED's general administrative costs as a percentage of total program costs remained consistent with historical performance; about 22.5% of the budget was used to defray program operating costs in 2018. 77% of the 2018 budget was spent on direct technical assistance (energy audits and engineering services) and cash incentives to customers; 22% of this on direct technical assistance and 55% on customer incentives.

In the first nineteen years of Vermont's Energy Efficiency Utility structure both BED and EVT have exceeded savings estimates in most years and have done so at a lower cost per MWh than anticipated. Energy efficiency is now being delivered at a total utility cost of about $.038 per kilowatt-hour statewide. When compared with other energy sources, energy efficiency remains the state's best bargain for future supply and the expenditures stay largely in the Vermont

economy. Avoiding electric generation also avoids the associated air emissions and other environmental impacts that effect Vermont and the region.

Table 4: EEU Business & Residential - Total Resource Benefits

Avoided costs of Electricity	$7,864,753.78
Fossil Fuel Savings	$654,787.13
Water Savings	$64,820.66
TRB Total	$8,584,361.24

	Annualized	**Lifetime**
Meter MWh	4,913	64,394
Generation MWh	5,381	70,209
Meter Demand Kw	2,337	32,111
Generation Peak Summer Kw	650	7,885
Generation Peak Winter	942	12,807
Water Savings	549	7,600
Fuel Increase	3,077	52,881
O+M Savings	$141,429	$1,207,685

Table 5: EEU Business & Residential - Summary

	Prior Year 2017	Current 2018	Program to date
Participants	1,560	1,555	31,616
--- Program Costs ---			
BED Administration Costs			
General	$488,432	$539,693	$5,886,355
Implemntation	$3,003	$22,597	$2,043,340
Planning	$0	$0	$106,711
Marketing	$37,947	$4,177	$905,660
IT Development	$0	$0	$224,662
	$529,382	**$566,467**	**$9,166,728**
BED Service Costs			
Participants	$561,806	$562,927	$7,338,122
Trade Allies	$0	$0	$11,761
	$561,806	**$562,927**	**$7,349,883**
BED Incentive Costs			
Participants	$1,305,900	$1,373,375	$16,469,096
Trade Allies	$1,162	$0	$73,615
	$1,307,062	**$1,373,375**	**$16,542,711**
BED Total Costs	**$2,398,250**	**$2,502,769**	**$33,059,323**
Evaluation Costs	**$69,646**	**$42,397**	**$1,154,109**
Participant Costs	**$2,477,597**	**$1,527,526**	**$37,003,729**
Total Program Costs	**$4,945,493**	**$4,072,691**	**$71,217,160**
--- Benefits ---			
Annualized mWh	7,024	5,381	145,317
Lifetime mWh	88,457	70,209	1,827,261
Winter peak Kw	899	942	24,368
Summer Peak Kw	709	651	16,626
mWh / Participant	5	3	5
Weighted Lifetime	13	13	13

Table 6: EEU Business & Residential - End Use Summary

Description	Participants	Gross Mwh	Net Mwh	Lifetim Net	Winter Net Kw	Summer Net Kw	MMBTU	CCF
Air Conditioning	132	517.99	534.07	6,735.11	156.97	139.13	3,577.10	0.00
Clothes Washing	184	48.49	49.30	629.87	5.06	6.21	21.88	504.50
Consumer Electronics	171	35.81	40.68	354.15	1.34	19.22	0.00	0.00
Dishwashing	1	0.93	1.05	13.69	0.13	0.07	3.60	34.50
Hot Water	29	38.63	44.24	572.75	6.83	3.48	-26.16	9.84
HVAC	131	440.67	450.37	8,751.21	95.98	0.00	103.50	0.00
Lighting	2776	3,641.19	4,056.96	49,690.01	655.50	475.79	-602.48	0.00
Refrigeration	138	54.91	53.92	883.17	4.96	6.26	0.00	0.00
Space Heating	59	58.79	65.36	1,292.77	7.73	0.03	0.00	0.00
Ventilation	30	75.78	85.20	1,286.48	7.94	0.24	0.00	0.00
Total		4,913.18	5,381.16	70,209.21	942.43	650.43	3,077.44	548.84

2.1 Development and Support Service

The following section highlights BED's Development and Support Services (DSS) activities for 2018 (renamed from Non Resource Acquisition in 2017). DSS activities are those that do not directly achieve immediate energy savings but are essential to the operation and administration of BED's EEU services and to the long-term success of future efficiency savings and innovation. The DSS categories were developed collaboratively with the DPS as part of the EEU Demand Resource Plan Process and approved by the PUC.

BED's DSS activities include: education, applied research and development, planning and reporting, evaluation, policy and public affairs, information technology and general administration.

Education & Training- This category captures BED's work throughout the year on general energy efficiency education that is geared toward building awareness that leads customers to take action to reduce energy use through efficiency or conservation. BED provides education to – builders and contractors, real estate professionals, K-12 students and teachers, college and universities and the general public.

Applied Research and Development- This work includes BED's collaboration with EVT and other entities on applied research and development activities designed to optimize the creation of cost-effective solutions to meeting BED's long-term resource acquisition goals.

Planning and Reporting- To help keep the Vermont Public Utility Commission, the Department of Public Service, and other stakeholders, informed about BED's EEU activities, BED submits monthly, quarterly, annual reports and an annual plan to the Board and DPS.

Evaluation- Determining the accuracy of BED's savings claims, evaluation is a critical aspect of BED's responsibilities as an EEU to Burlington rate payers. There are several evaluation activities that BED participates in to help BED continually improve savings quantification methods.

Policy and Public Affairs- This DSS activity captures BED's participation in discussions about energy efficiency and EEU related issues that typically occur throughout the year with regulators and other stakeholders.

Information Technology (IT) - BED's on-going IT initiative mainly consists of continuing the support of and improvement to the DSM EEU database system for the collection and processing of project data and program information critical to tracking, reporting and planning functions. There is a fairly regular need to alter measure savings characterization, existing tools or add new tools and functionality to the system which helps us to better understand and respond to changes in the Burlington marketplace.

General Administration- This NRA category captures BED's annual activities and costs for the overall management of EEU programs not specific to the individual programs and includes: general staff meetings, coordination of program implementation across all program functions and managing and monitoring overall performance and spending.

Table 7: Electric Development and Support Services

DSS Activity	Annual Budget	Year End Costs
Education and Training	$35,690	$31,253
Applied R & D	$11,620	$9,014
Planning and Reporting	$57,270	$37,026
Evaluation	$19,090	$15,359
Policy and Public Affairs	$10,873	$2,406
Information Technology	$12,108	$9,770
General Administration	$45,027	$125,976
Total	**$191,678**	**$230,804**

2.2 Business Services Overview

This section of the report contains information on BED's Business EEU Services: Business New Construction and Business Existing Facilities (Market Opportunities & Retrofit).

Overall, 2018 results in business services did not meet savings projections. BED projected 4,810 megawatt-hour (MWh) savings while achieving actual annual energy savings of 2,985 MWh, 62% of the projection. BED's cost to deliver EEU business services in 2018 was $1,693,648 below the budgeted amount of $2,113,987 by 20%.

As mentioned in the Introduction, it is often difficult to forecast savings and expenses in the Business sector in Burlington. This is due to the potential for completion of a few large unexpected projects by one or two customers, dramatically exceeding projections and budgets. On the other hand, savings goals may just as unpredictably be missed due to delays or cancellations of planned significant projects.

BED also continues to explore how to move beyond lighting as the dominant savings measure in the commercial market. Long-lasting LED technology continues to be widely adopted so HVAC, and other measures, are beginning to play more prominent roles. However, with about 70% of BED's commercial customer leasing their spaces, HVAC improvements present strong challenges that BED will need to overcome. BED's work with Vermont Gas and Burlington's 2030 District are examples of how BED is trying to leverage relationships in this important market.

Table 8: EEU Business - Total Resource Benefits

Avoided costs of Electricity	$4,471,492.59
Fossil Fuel Savings	$565,295.25
Water Savings	$0.00
TRB Total	$5,036,787.51

	Annualized	**Lifetime**
Meter MWh	2,730	30,908
Generation MWh	2,985	33,472
Meter Demand Kw	873	10,075
Generation Peak Summer Kw	497	5,672
Generation Peak Winter	461	5,249
Water Savings	0	0
Fuel Increase	2,674	45,344
O+M Savings	$102,860	$669,256

Table 9: EEU Business - Summary

	Prior Year 2017	Current 2018	Program to date
Participants	509	436	4,082
--- Program Costs ---			
BED Administration Costs			
General	$223,613	$239,605	$2,916,532
Implemntation	$2,243	$21,719	$1,295,695
Planning	$0	$0	$62,003
Marketing	$6,884	$2,427	$316,979
IT Development	$0	$0	$120,291
	$232,740	**$263,751**	**$4,711,501**
BED Service Costs			
Participants	$463,676	$478,835	$5,295,628
Trade Allies	$0	$0	$6,780
	$463,676	**$478,835**	**$5,302,408**
BED Incentive Costs			
Participants	$906,577	$951,062	$11,031,297
Trade Allies	$521	$0	$38,669
	$907,098	**$951,062**	**$11,069,967**
BED Total Costs	**$1,603,514**	**$1,693,648**	**$21,083,875**
Evaluation Costs	**$50,198**	**$31,671**	**$735,846**
Participant Costs	**$2,183,430**	**$1,021,748**	**$26,674,350**
Total Program Costs	**$3,837,142**	**$2,747,066**	**$48,494,071**
--- Benefits ---			
Annualized mWh	4,646	2,985	90,944
Lifetime mWh	53,338	33,472	1,183,086
Winter peak Kw	420	461	11,572
Summer Peak Kw	544	497	11,525
mWh / Participant	9	7	22
Weighted Lifetime	11	11	13

Table 10: EEU Business - End-Use Summary

Description	Participants	Gross Mwh	Net Mwh	Lifetim Net	Winter Net Kw	Summer Net Kw	MMBTU	CCF
Air Conditioning	23	500.54	516.74	6,489.53	156.97	125.38	3,577.10	0.00
HVAC	27	64.13	63.31	1,139.56	13.15	0.00	-17.03	0.00
Lighting	1133	2,048.35	2,273.51	23,636.73	276.84	371.09	-885.69	0.00
Refrigeration	1	0.26	0.28	2.76	0.04	0.04	0.00	0.00
Space Heating	27	43.11	48.57	956.98	6.14	0.03	0.00	0.00
Ventilation	8	73.85	83.08	1,246.20	7.70	0.00	0.00	0.00
Total		2,730.24	2,985.48	33,471.77	460.84	496.54	2,674.38	0.00

2.2.1 Business New Construction

Program Description

This service helps commercial and industrial builders and developers incorporate the most energy efficient products and systems possible when building or renovating. It is designed to help customers exceed Vermont's Commercial Energy Code (CBES). By working directly and early in the process with designers and owners, BED assists in the choice of energy efficient systems and construction practices that meet business and energy needs.

The program offers financial incentives for the installation of cost effective efficiency measures. Eligible participants gain technical assistance, verification services and financial incentives to help with efficient equipment costs. BED's Business New Construction service (BNC) addresses all energy (especially electricity) consuming equipment, components or practices, including thermal envelope, motors, lighting, heating, ventilation, air-conditioning (HVAC) and control packages.

Natural gas is almost universally available in Burlington. To insure comprehensiveness in building and system designs, BED coordinates with Vermont Gas Systems (VGS) on projects when appropriate. The two utilities notify each other when projects are identified or when major changes are considered by the developers or the design teams. This partnership is mutually beneficial to both organizations and the ratepayers.

BED maximizes the adoption of energy efficient systems and techniques through proactive outreach and recruitment. As both an electric distribution utility and a municipal department with a role in the City's design review process, BED is in a unique position to identify new construction and major renovation before significant design efforts begin. BED coordinates this effort with other city agencies including the city's Planning & Zoning Department and its Department of Public Works.

After several years of offering a fairly prescriptive based program, BED, starting in 2014, began to offer an "energy model/tiered incentive" based option for larger projects. The primary motivation was to gain deeper savings per project across more end uses. Historically, BED had been successful with lighting but not as much with thermal envelope, integrated design approaches and HVAC controls. With baselines increasing due to energy code revisions, and with electric heat pump heating and cooling technology options increasing (coupled with BED's net–zero city strategic direction), BED embarked on a new approach.

BED's tiered incentive approach pays 50% of the incentive at project completion and then the remaining incentive after about one year of comparing actual energy usage data to the building energy model. In order to best estimate the energy efficiency potential of larger buildings, energy modeling software is used to compare the energy performance of an energy code compliant design to a model of the final "more efficient" building design. The original energy model assumptions are fine-tuned, as needed, with actual operating hours, set-points and plug loads.

It often takes about a year for larger commercial buildings to be fully occupied, equipped and debugged of any performance issues. This approach allows for deeper BED involvement, more accurate savings claims and ensures that building operators are encouraged to optimize the performance of buildings. This approach has been well received by customers and the design community. BED starts to monitor the energy usage data shortly after occupancy and provides feedback to the project team.

Project Highlights

The annualized megawatt-hour (MWh) savings for 2018 were 823, about 57% lower than the projection of 1,924 MWh. Total BED program costs were $690,782, 39% lower than the budgeted amount of $1,125,644.

Variance Discussion

Customers make business decisions independent of BED's program budgeting efforts, and we fully anticipate that year to year efforts will be "lumpy", and show dramatic swings in performance. For example, BED achieved 80% higher saving is 2017 BNC. Long-term average results are a better indicator of what can be expected on an annual basis than any given year's data.

For 2018, BED will continue to explore the potential benefits of commercial building envelope commissioning. BED continues to see a growing number of heat pump heated and cooled buildings (ductless mini splits, variable refrigerant flow (VRF) and ground source heat pump systems) coming on line so high performance building shells, and HVAC controls, are an increased focus. With the help of Vermont based thermal envelope specialists, BED continues working with Architects, owners and contractors to encourage building envelops that are being designed and constructed utilizing higher performance thermal envelope techniques.

BED is also continuing to focus on how best to coordinate EEU and Tier 3 programs to optimize the goals of both efforts. BED's Tier 3 could be used to encourage non-fossil based heating systems and BED's EEU can then work to optimize the thermal envelope, lighting controls package, etc.

Table 11: EEU Business New Construction - Total Resource Benefits

Avoided costs of Electricity	$1,729,738.65
Fossil Fuel Savings	$654,493.34
Water Savings	$0.00
TRB Total	$2,384,231.99

	Annualized	**Lifetime**
Meter MWh	795	10,177
Generation MWh	823	10,386
Meter Demand Kw	274	3,916
Generation Peak Summer Kw	182	2,509
Generation Peak Winter	129	1,719
Water Savings	0	0
Fuel Increase	3,475	52,122
O+M Savings	$0	$0

Table 12: EEU Business New Construction - Summary

	Prior Year 2017	Current 2018	Program to date
Participants	22	23	296
--- Program Costs ---			
BED Administration Costs			
General	$45,609	$61,760	$592,664
Implemntation	$0	$3,439	$129,924
Planning	$0	$0	$15,847
Marketing	$2,146	$1,328	$182,073
IT Development	$0	$0	$43,673
	$47,755	**$66,528**	**$964,181**
BED Service Costs			
Participants	$144,289	$175,325	$1,437,587
Trade Allies	$0	$0	$0
	$144,289	**$175,325**	**$1,437,587**
BED Incentive Costs			
Participants	$265,866	$448,929	$2,799,918
Trade Allies	$0	$0	$3,313
	$265,866	**$448,929**	**$2,803,231**
BED Total Costs	**$457,910**	**$690,782**	**$5,204,999**
Evaluation Costs	**$10,086**	**$17,517**	**$88,690**
Participant Costs	**$789,243**	**$701,908**	**$8,866,528**
Total Program Costs	**$1,257,239**	**$1,410,207**	**$14,160,217**
--- Benefits ---			
Annualized mWh	1,513	823	20,434
Lifetime mWh	12,092	10,386	301,742
Winter peak Kw	117	129	2,023
Summer Peak Kw	163	182	2,869
mWh / Participant	69	36	69
Weighted Lifetime	8	13	15

Table 13: EEU Business New Construction - End Use Summary

Description	Participants	Gross Mwh	Net Mwh	Lifetim Net	Winter Net Kw	Summer Net Kw	MMBTU	CCF
Air Conditioning	17	370.15	378.64	5,679.66	75.58	122.47	3,577.10	0.00
Lighting	17	421.85	441.56	4,663.18	52.89	59.45	-102.28	0.00
Space Heating	1	2.56	2.88	43.24	0.71	0.00	0.00	0.00
Total		794.56	823.09	10,386.09	129.18	181.92	3,474.82	0.00

2.2.2 Business Existing Facilities
(Market Opportunities & Retrofit Services)

Program Description

Business Existing Facilities, Market Opportunity Service (MOP) targets naturally-occurring equipment changeovers to secure energy savings in the equipment replacement market. Targeted equipment includes lighting, heating, ventilation, cooling, water heating, refrigeration, motors and drives, controls and industrial process applications. This program offers prescriptive and custom tracks, with technical assistance, financial incentives and on-bill financing that encourage the adoption of cost effective, high efficiency alternatives to standard efficiency equipment.

BED and EVT offer prescriptive incentives (fixed incentives for specific eligible measures) for building lighting, refrigeration economizers, controls, motors and unitary HVAC equipment.

Non-prescriptive cost-effective measures or combinations of measures are eligible for custom incentives. Custom incentives are designed to capture as many potential lost opportunity resources as possible, while maximizing program delivery resources. BED staff and trade allies serving Burlington (including: equipment vendors, manufacturers, suppliers, contractors, architects and engineers) market the program to potential participants.

As natural gas is the predominant heating fuel in Burlington, BED works closely with Vermont Gas Systems (VGS) to encourage a comprehensive approach to energy savings. BED and VGS staff are committed to bringing appropriate projects to each other's attention. As described in the residential section below, BED and VGS continue to explore ways to better coordinate services by building upon the ***energyChamp*** platform.

Business Existing Facilities, Retrofit Service offers energy efficiency services that have been provided by BED staff for over two decades. Building retrofit entails BED staff and/or trade allies examining customer buildings and systems to identify energy efficiency opportunities for the customer. When promising projects are identified, BED staff prepares analyses for the customer showing the costs and benefits of potential energy efficiency measures. This service is offered to all business customers – from the smallest retail store to the largest commercial and industrial facility.

Program Highlights

The annualized megawatt-hour (MWh) savings for 2018 were 2,162, about 25% lower than the projection of 2,886 MWh. Total BED program costs were $1,022,866, 1% over the budgeted amount of $988,343.

As BED's largest program in most years (this market consumes about 75% of total annual kWh sales), BEF program managers are responsible for delivering services across a very diverse population of institutions and businesses; from extremely large hospitals and colleges to tiny book stores, restaurants and clothing boutiques. BED's largest customers consume between 1,000 and 57,000 MWh per year and typically exceed peak demand of 100 kWs. Many smaller customers, on the other hand, have the energy profile of large residential homes, consuming about 8,000 to 20,000 kWh annually. Such diversity requires a multi-prong implementation strategy.

Variance Discussion

As mentioned in other sections of this report, BED has explored how to move beyond lighting as the dominant measure in this market. HVAC, and other measures, need to play a more prominent role but with about 70% of BED's commercial customer leasing their spaces, HVAC improvements present strong challenges. As a response, BED issued, in mid-2015, an RFP seeking Energy Engineering companies to work with BED staff to help identify cost-effective HVAC related improvements.

BED requested quotes from energy engineering professionals, with proven project histories, to conduct, in partnership and coordination with BED, initial high level energy surveys on commercial buildings. The primary purpose of the high level audit is to quickly identify energy waste and prioritize potential energy efficiency opportunities and provide summary estimates of project costs and savings – both electric and thermal. BED's goal is to provide customers with initial high-level energy efficiency audit reports and recommendations as soon as practical from the date of the customer's request.

BED is using this initial information to present customers with estimated energy savings, potential maintenance and/or building comfort benefits, estimated BED incentives and on-bill financing details. With this information, customers may be persuaded to pursue additional (deeper-level) energy analysis, beyond the initial high-level survey, to finalize savings estimates and overall project cost.

When combined with BED's on-bill-financing service (OBF), the energy engineering approach has leverage close to $850,000 of energy efficiency projects in this market over the past few years.

As close to 75% of all kWh sales are to the commercial class, this is an important market to work effectively with. Strategies that encourage these customers to pursue energy efficiency improvements are crucial to helping BED meet savings goals in the years to come. BED is hopeful that the excitement caused by the Burlington 2030 District program, and BED's net zero energy city goal, will drive more customers to program participation.

Table 14: EEU Business Existing Facilities - Total Resource Benefits

Avoided costs of Electricity	$2,741,753.95
Fossil Fuel Savings	($89,198.10)
Water Savings	$0.00
TRB Total	$2,652,555.52

	Annualized	**Lifetime**
Meter MWh	1,936	20,732
Generation MWh	2,162	23,086
Meter Demand Kw	598	6,159
Generation Peak Summer Kw	315	3,163
Generation Peak Winter	332	3,530
Water Savings	0	0
Fuel Increase	-800	-6,779
O+M Savings	$102,860	$669,256

Table 15: EEU Business Existing Facilities - Summary

	Prior Year 2017	Current 2018	Program to date
Participants	487	413	3,786
--- Program Costs ---			
BED Administration Costs			
General	$178,004	$177,845	$2,323,868
Implemntation	$2,243	$18,280	$1,165,771
Planning	$0	$0	$46,156
Marketing	$4,738	$1,098	$134,906
IT Development	$0	$0	$76,619
	$184,985	**$197,224**	**$3,747,319**
BED Service Costs			
Participants	$319,387	$303,509	$3,858,041
Trade Allies	$0	$0	$6,780
	$319,387	**$303,509**	**$3,864,821**
BED Incentive Costs			
Participants	$640,711	$502,132	$8,231,379
Trade Allies	$521	$0	$35,356
	$641,232	**$502,132**	**$8,266,735**
BED Total Costs	**$1,145,604**	**$1,002,866**	**$15,878,876**
Evaluation Costs	**$40,112**	**$14,154**	**$647,156**
Participant Costs	**$1,394,187**	**$319,840**	**$17,807,822**
Total Program Costs	**$2,579,903**	**$1,336,860**	**$34,333,853**
--- Benefits ---			
Annualized mWh	3,133	2,162	70,510
Lifetime mWh	41,246	23,086	881,344
Winter peak Kw	303	332	9,549
Summer Peak Kw	381	315	8,656
mWh / Participant	6	5	19
Weighted Lifetime	13	11	12

Table 16: EEU Business Existing Facilities - End Use Summary

Description	Participants	Gross Mwh	Net Mwh	Lifetim Net	Winter Net Kw	Summer Net Kw	MMBTU	CCF
Air Conditioning	6	130.39	138.10	809.86	81.39	2.91	0.00	0.00
HVAC	27	64.13	63.31	1,139.56	13.15	0.00	-17.03	0.00
Lighting	1116	1,626.50	1,831.95	18,973.55	223.95	311.64	-783.41	0.00
Refrigeration	1	0.26	0.28	2.76	0.04	0.04	0.00	0.00
Space Heating	26	40.55	45.69	913.74	5.43	0.03	0.00	0.00
Ventilation	8	73.85	83.08	1,246.20	7.70	0.00	0.00	0.00
Total		1,935.68	2,162.39	23,085.68	331.66	314.62	-800.44	0.00

2.3 Residential Service Overview

This section of the report contains information on BED's Residential EEU Services: Residential New Construction, Existing Homes, Efficient Retail Products and Thermal Energy and Process Fuels services.

In 2018, BED projected 1,603 annualized MWh residential savings while achieving annual energy savings of 2,396 MWh or 49% above the projected goal. BED's cost to deliver residential services in 2018 was $809,121 which was 8% over the projected spending of $748,995.

As BED explains in each program below, there are a number of factors that influence year to year budgets and savings projections in Burlington's residential markets.

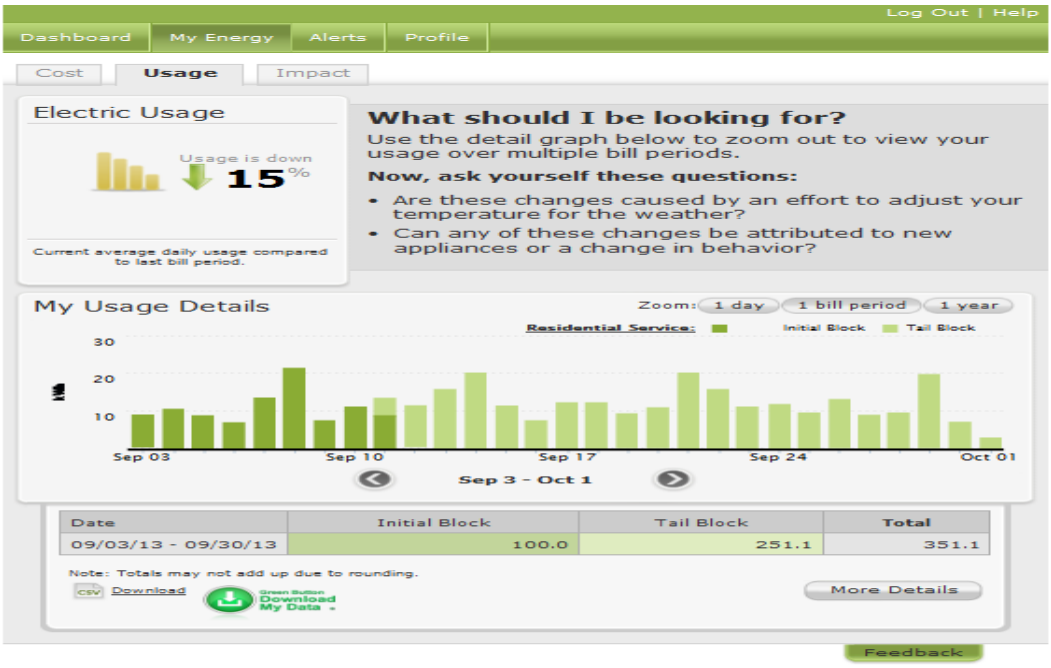
The residential class presents particular challenges as about 60% of BED's residential customers are renters and about 85% of these customers pay their electric and natural gas heating bills directly. Rental apartments are typically smaller with fewer appliances and lighting opportunities. BED's best information indicates that about 95% of residential buildings use natural gas for space heating and about 85% use natural gas for domestic hot water.

BED also turns over about 35% of residential accounts each year due to the high percentage of students. Also, BED's average annual usage per residential customer (2018 monthly average was 390 kWh) continues to remain flat. BED's residential consumption is about **24**% less than the average Vermont residential customer, about **34**% less than the average New England residential customer and about **55**% less than the national average.

BED will continue to test all program design assumptions and pursue all strategies to make programs as cost-effective as possible. BED will also continue to focus on energy education efforts. The energy consumption information, and guidance, that is available through BED's smart grid web presentment tool (Energy Engage) is designed to

encourage customers to take steps to reduce usage. The tool continues to be invaluable in helping BED staff more effectively assist customers with high bill concerns.

This software includes "dashboards" that presents energy usage details and energy efficiency- related technical advice, and efficiency program opportunities, to customers. EEU funds were not used for Energy Engage but BED believes that it provides a platform to launch other energy efficiency offerings from. Pictured below are examples of the types of information that our customers have access to:


Log Out | Help
Dashboard
My Energy
Alerts
Profile
Cost
Usage
Impact
Electric Usage
Usage is down
15%
Current average daily usage compared to last bill period.
What should I be looking for?
Use the detail graph below to zoom out to view your usage over multiple bill periods.
Now, ask yourself these questions:
• Are these changes caused by an effort to adjust your temperature for the weather?
• Can any of these changes be attributed to new appliances or a change in behavior?
My Usage Details
Zoom: 1 day 1 bill period 1 year
Residential Service: Initial Block Tail Block
30
20
10
Sep 03
Sep 10
Sep 17
Sep 24
Oct 01
Sep 3 - Oct 1
Date | Initial Block | Tail Block | Total
09/03/13 - 09/30/13 | 100.0 | 251.1 | 351.1
Note: Totals may not add up due to rounding.
Download
Download My Data
More Details
Feedback
Cut Costs
Tune up your heating and cooling system
Hire a qualified professional to inspect and maintain your heating and cooling system.
More Ways to Cut Costs
Be Efficient
Manage your energy usage
Install a programmable thermostat to maintain a comfortable temperature in your home and to manage usage during the winter and summer months.
More Ways to Use Less
Reduce Your Impact
Plant some deciduous trees
Reduce your heating and cooling costs with an energy-efficient landscape design
.
More Ways to Go Green

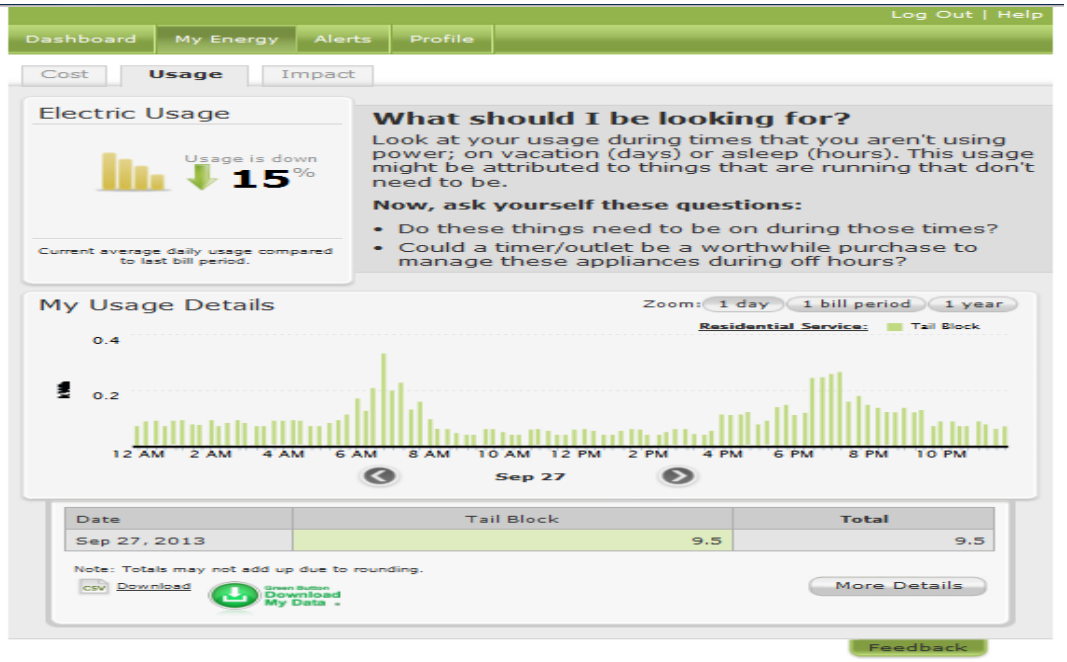

Log Out | Help
Dashboard
My Energy
Alerts
Profile
Cost
Usage
Impact
Electric Usage
Usage is down
15%
Current average daily usage compared to last bill period.
What should I be looking for?
Look at your usage during times that you aren't using power; on vacation (days) or asleep (hours). This usage might be attributed to things that are running that don't need to be.
Now, ask yourself these questions:
• Do these things need to be on during those times?
• Could a timer/outlet be a worthwhile purchase to manage these appliances during off hours?
My Usage Details
Zoom: 1 day 1 bill period 1 year
Residential Service: Tail Block
0.4
0.2
12 AM
2 AM
4 AM
6 AM
8 AM
10 AM
12 PM
2 PM
4 PM
6 PM
8 PM
10 PM
Sep 27
Date | Tail Block | Total
Sep 27, 2013 | 9.5 | 9.5
Note: Totals may not add up due to rounding.
Download
Download My Data
More Details
Feedback
Cut Costs
Hang dry your clothes
Run your dryer less and save energy by installing and using a clothes line for drying clothes.
More Ways to Cut Costs
Be Efficient
Practice daylighting
Use windows and skylights to bring natural light into your home and help reduce the need for artificial light.
More Ways to Use Less
Reduce Your Impact
Plant some deciduous trees
Reduce your heating and cooling costs with an energy-efficient landscape design
.
More Ways to Go Green

Table 17: EEU Residential - Total Resource Benefits

Avoided costs of Electricity	$3,393,261.18
Fossil Fuel Savings	$89,491.88
Water Savings	$64,820.66
TRB Total	$3,547,573.73

	Annualized	**Lifetime**
Meter MWh	2,183	33,485
Generation MWh	2,396	36,737
Meter Demand Kw	1,464	22,036
Generation Peak Summer Kw	154	2,213
Generation Peak Winter	482	7,559
Water Savings	549	7,600
Fuel Increase	403	7,538
O+M Savings	$38,569	$538,429

Table 18: EEU Residential - Summary

	Prior Year 2017	Current 2018	Program to date
Participants	1,051	1,119	27,534
--- Program Costs ---			
BED Administration Costs			
General	$264,819	$300,087	$2,969,823
Implemntation	$760	$878	$747,644
Planning	$0	$0	$44,709
Marketing	$31,064	$1,751	$588,681
IT Development	$0	$0	$104,371
	$296,642	**$302,715**	**$4,455,228**
BED Service Costs			
Participants	$98,130	$84,092	$2,042,495
Trade Allies	$0	$0	$4,981
	$98,130	**$84,092**	**$2,047,476**
BED Incentive Costs			
Participants	$399,323	$422,314	$5,437,799
Trade Allies	$641	$0	$34,946
	$399,964	**$422,314**	**$5,472,744**
BED Total Costs	**$794,736**	**$809,121**	**$11,975,448**
Evaluation Costs	**$19,448**	**$10,726**	**$418,263**
Participant Costs	**$294,167**	**$505,778**	**$10,329,379**
Total Program Costs	**$1,108,351**	**$1,325,625**	**$22,723,089**
--- Benefits ---			
Annualized mWh	2,378	2,396	54,373
Lifetime mWh	35,119	36,737	644,175
Winter peak Kw	479	481	12,796
Summer Peak Kw	165	154	5,101
mWh / Participant	2	2	2
Weighted Lifetime	15	15	12

Table 19: EEU Residential - End Use Summary

Description	Participants	Gross Mwh	Net Mwh	Lifetim Net	Winter Net Kw	Summer Net Kw	MMBTU	CCF
Air Conditioning	109	17.45	17.33	245.58	0.01	13.75	0.00	0.00
Clothes Washing	184	48.49	49.30	629.87	5.06	6.21	21.88	504.50
Consumer Electronics	171	35.81	40.68	354.15	1.34	19.22	0.00	0.00
Dishwashing	1	0.93	1.05	13.69	0.13	0.07	3.60	34.50
Hot Water	29	38.63	44.24	572.75	6.83	3.48	-26.16	9.84
HVAC	104	376.54	387.06	7,611.65	82.82	0.00	120.53	0.00
Lighting	1643	1,592.84	1,783.46	26,053.28	378.66	104.71	283.21	0.00
Refrigeration	137	54.65	53.64	880.41	4.92	6.21	0.00	0.00
Space Heating	32	15.68	16.79	335.79	1.59	0.00	0.00	0.00
Ventilation	22	1.93	2.12	40.28	0.24	0.24	0.00	0.00
Total		2,182.94	2,395.67	36,737.44	481.59	153.89	403.06	548.84

2.3.1 Residential New Construction

Program Description

This service aims to improve the efficiency of all new homes, and buildings undergoing substantial renovation. This includes single-family homes, multi-family homes and low-income multi-family projects. It addresses all major end uses: space heating, water heating, central cooling (if applicable), ventilation, major appliances and lighting for high use areas. Residential New Construction (RNC) encourages builders and consumers to build to the Vermont Energy Star Home standard. This standard specifies that homes meet the Energy Star performance standard (representing over 25% savings in heating, cooling and hot water consumption relative to the Vermont Residential Building Energy Standard (RBES).

The Vermont Energy Star Homes (VESH) standard is promoted to developers, architects, builders, building supply centers, equipment suppliers and consumers through a combination of marketing, technical assistance to builders, provision of energy ratings, and a package of incentives for efficient lighting fixtures, major appliances and ventilation equipment.

EVT and Vermont Gas Systems continue to do great work promoting VESH which has had direct benefits to BED. As most of the trade allies mentioned above build inside and outside of Burlington it has been helpful to have a joint program with identical participation requirements.

BED uses several additional methods to encourage participation in this sometimes difficult to influence market. These include:

- BED staff attends monthly Technical Review meetings where all new construction projects are introduced to the Burlington Planning and Zoning Department staff as part of the City's local project approval process. At these

meetings BED explains the RNC program to the permit applicant and gives them program literature.

- New and revised electric service and line extension applications help us track smaller renovation projects that may have bypassed the City's permit approval process. All "ability to serve" letters from BED include information about energy efficiency services.
- BED receives a weekly electronic report from the Department of Public Works-Building Inspection Division (DPW) listing all trades permits issued.
- The Burlington DPW refers projects to BED to help them ensure compliance with RBES (and CBES) and to assess opportunities for exceeding requirements.

Program Highlights

In 2018, the majority of the savings came from a new, 32-unit, market rate, multi-family building that is heated and cooled using air source, ductless, mini-split heat pumps. BED was able to persuade the owner to design and build to the VESH "High Performance" tier. This is the fifth of six similar heat-pump buildings for this one owner.

Variance Discussion

In 2018, the RNC service achieved 103 MWh in annualized electricity savings for the year which was 20% of the projected 521 MWh goal. At $184,327, spending was 40% lower than the projected spending of $309,648.

The timing of a number of on-going new construction projects played a major role in the 2018 variance. For example, in 2016, the RNC service achieved 244 MWh in annualized electricity savings for the year which was 225% greater than the projected 75 MWh goal.

As BED has reported in previous Annual Reports, RNC is a difficult market to predict year to year as it only takes a few projects in Burlington to adjust savings projections and budgets dramatically.

Program Changes

In 2018, BED, EVT and VGS will continue to assist the residential market with exceeding RBES and will also promote low-load and net-zero building practices. BED's residential new construction market is dominated by multi-family structures and most of the single-family work is with gut-rehabilitation projects so BED will continue to develop strategies to work effectively with both of these markets. BED is engaging with the City's Building permitting department to explore ways to belter enforce RBES and CBES compliance especially as it pertains to smaller project or component projects i.e. just the heating system is being replaced.

As mentioned above, cold climate heat pumps (CcHP's) are becoming a popular technology for market-rate multi-family new construction projects as they provide heating and cooling at a low first installation cost, especially when the owner desires to have each apartment individually metered.

CcHP's are becoming a program market opportunity when coupled with highly efficient thermal envelopes. However, BED continues to maintain that the technology still requires careful attention and on-going analysis. BED will continue to study the energy usage of the CcHP buildings to evaluate the pros and cons of installing CcHP systems in new construction, including whether these systems are cost effective and if peak load requirements begin to rise, especially when electric resistance baseboard heat is used as a back-up heating source

Table 20: EEU Residential New Construction - Total Resource Benefits

Avoided costs of Electricity	$234,911.11
Fossil Fuel Savings	$55,281.33
Water Savings	$3,871.96
TRB Total	$294,064.40

	Annualized	**Lifetime**
Meter MWh	87	2,135
Generation MWh	103	2,515
Meter Demand Kw	57	1,400
Generation Peak Summer Kw	9	202
Generation Peak Winter	25	629
Water Savings	35	449
Fuel Increase	204	4,879
O+M Savings	$0	$0

Table 21: EEU Residential New Construction - Summary

	Prior Year 2017	Current 2018	Program to date
Participants	12	10	464
--- Program Costs ---			
BED Administration Costs			
General	$64,825	$77,029	$474,658
Implemntation	$0	$0	$96,638
Planning	$0	$0	$11,195
Marketing	$1,099	$302	$93,566
IT Development	$0	$0	$34,345
	$65,924	**$77,332**	**$710,402**
BED Service Costs			
Participants	$24,539	$17,396	$661,321
Trade Allies	$0	$0	$2,700
	$24,539	**$17,396**	**$664,021**
BED Incentive Costs			
Participants	$5,505	$89,600	$700,558
Trade Allies	$0	$0	$2
	$5,505	**$89,600**	**$700,560**
BED Total Costs	**$95,968**	**$184,327**	**$2,074,983**
Evaluation Costs	**$4,925**	**$4,434**	**$66,530**
Participant Costs	**$10,529**	**$53,162**	**$402,804**
Total Program Costs	**$111,421**	**$241,923**	**$2,544,317**
--- Benefits ---			
Annualized mWh	17	103	1,761
Lifetime mWh	302	2,515	31,100
Winter peak Kw	4	25	365
Summer Peak Kw	15	9	309
mWh / Participant	1	10	4
Weighted Lifetime	18	24	18

Table 22: EEU Residential New Construction - End Use Summary

Description	Participants	Gross Mwh	Net Mwh	Lifetim Net	Winter Net Kw	Summer Net Kw	MMBTU	CCF
Air Conditioning	7	3.47	4.10	98.46	0.00	8.10	0.00	0.00
Dishwashing	1	0.93	1.05	13.69	0.13	0.07	3.60	34.50
HVAC	9	79.21	93.45	2,332.44	24.87	0.00	200.00	0.00
Refrigeration	1	3.60	4.05	68.93	0.37	0.47	0.00	0.00
Ventilation	1	0.09	0.10	1.87	0.01	0.01	0.00	0.00
Total		87.30	102.75	2,515.40	25.38	8.64	203.60	34.50

2.3.2 Residential Existing Buildings

Program Description

This service aims to improve the efficiency of all residential existing buildings (REB) including low-income single family, market-rate single-family and all multi-family projects (market-rate and low-income). BED offers the same existing homes service as Efficiency Vermont (EVT) and also works closely with Vermont Gas Systems (VGS) and the Champlain Valley Weatherization Service (CVWS) on many of its projects.

The REB program targets both market driven and discretionary, early replacement/retrofit opportunities. Additionally, the program serves as a point of contact for customers seeking advice about electric vehicles; electric vehicle charging equipment and other transportation related measures, as well as heat pump technology.

Low-income buildings are addressed by a partnership with the state's Low-income Weatherization Assistance Program (WAP). This partnership provides electric efficiency measures to Burlington's low-income electricity consumers. Electrical efficiency measures are delivered to income-eligible electric customers at the time they receive thermal shell, space heating and water heating improvements from CVWS.

This service also works closely with high usage households for energy efficiency improvements that can significantly reduce their energy bills. On-site energy audits, customer energy education, appliance meter loans, technical assistance, project management and cash incentives are all part of this service.

BED and VGS continued collaboration working with the private (market-rate) rental housing market (customers not eligible for low-income energy services) to increase both participation and the depth of savings per participant. Traditionally, renters (60% of Burlington's residential customers are renters) have not been strong participants and the same holds true for property-owners where the tenants pay the energy bills directly which is the case in about 85% of Burlington's dwellings.

The "Rental Properties Owners" service offers free tank wraps (electric tanks only), pipe insulation, water saving devices, enhanced rebates for the early retirement of eligible refrigerators, incentives for improving mechanical ventilation along with up to six free screw-in LED's per apartment.

This service provides savings directly to the tenant but also water savings, and potential maintenance savings via controlled ventilation fans to the property owner. This service allows us the opportunity to develop relationships with property-owners to help identify further savings from refrigeration replacements, common area lighting and laundry equipment improvements, weatherization and ventilation.

Program Highlights

In 2018, 200 LED lighting products were installed, 55 high efficiency circulator pumps for boilers were installed, 45 refrigerators were retired early and replaced with ENERGY STAR models and 68 heat pumps were installed.

Variance Discussion

REB achieved 341 MWh in annualized electricity savings for the year, 70% greater than the projected goal of 200 MWh. At $203,826 spending was 36% higher than BED's projected spending of $149,749.

About 95% of BED's residential customers use natural gas for space heating and about 85% use it for domestic hot water. At current electric and natural gas rates, switching to electric heat pump technology would increase most customers' annual energy costs. BED will continue to leverage common area energy savings, building water savings, and ice dam and moisture damage solutions for property-owners as part of the service to help develop long-term relationships with building owners.

Because 60% of BED's customers are renters, expanding and refining the existing homes program to actively target multifamily (MF) buildings will continue to be a priority. However, because MF electric bills are relatively small (321 kWh per month on average)

compared to the cost of space and water heating with natural gas, the program will focus on a whole building, all-fuels marketing approach to motivate customers to take action. Identifying electrical opportunities alone simply won't produce the savings necessary to make the customer's effort worthwhile. Accordingly, BED and VGS will continue with the ***energyChamp*** collaboration.

energyChamp (EC) was designed to encourage more residential customers to participate in available efficiency programs. The joint effort with VGS was born from the idea that the two utilities are stronger working together than separately. EC offers customers a one-stop option to help them take a more complete look at their total energy picture including the thermal shell, HVAC, lighting, appliances along with solutions for comfort or moisture related issues. More information about the ECC is available at: https://energychamp.org/

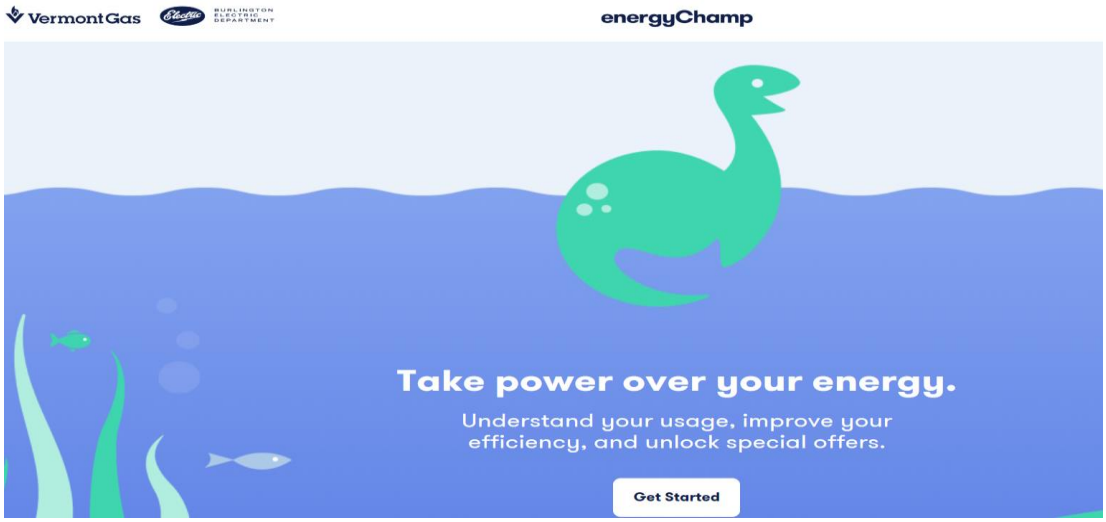


Table 23: EEU Residential Existing Homes - Total Resource Benefits

Avoided costs of Electricity	$464,858.13
Fossil Fuel Savings	($21,948.57)
Water Savings	$539.01
TRB Total	$443,448.57

	Annualized	**Lifetime**
Meter MWh	343	6,105
Generation MWh	341	6,066
Meter Demand Kw	76	1,330
Generation Peak Summer Kw	3	47
Generation Peak Winter	64	1,136
Water Savings	7	59
Fuel Increase	-107	-1,786
O+M Savings	$92	$1,407

Table 24: EEU Residential Existing Homes - Summary

	Prior Year 2017	Current 2018	Program to date
Participants	236	178	9,310
--- Program Costs ---			
BED Administration Costs			
General	$36,397	$37,530	$1,399,567
Implemntation	$477	$878	$560,467
Planning	$0	$0	$19,067
Marketing	$1,300	$780	$316,105
IT Development	$0	$0	$47,283
	$38,174	**$39,188**	**$2,342,489**
BED Service Costs			
Participants	$73,445	$66,344	$1,051,454
Trade Allies	$0	$0	$0
	$73,445	**$66,344**	**$1,051,454**
BED Incentive Costs			
Participants	$96,461	$98,295	$1,936,504
Trade Allies	$0	$0	$34,277
	$96,461	**$98,295**	**$1,970,780**
BED Total Costs	**$208,080**	**$203,826**	**$5,364,723**
Evaluation Costs	**$6,149**	**$2,145**	**$226,729**
Participant Costs	**$19,048**	**$48,328**	**$5,192,038**
Total Program Costs	**$233,276**	**$254,300**	**$10,783,491**
--- Benefits ---			
Annualized mWh	259	341	21,805
Lifetime mWh	4,372	6,066	337,277
Winter peak Kw	43	64	5,975
Summer Peak Kw	6	3	1,006
mWh / Participant	1	2	2
Weighted Lifetime	17	18	15

Table 25: EEU Residential Existing Homes - End Use Summary

Description	Participants	Gross Mwh	Net Mwh	Lifetim Net	Winter Net Kw	Summer Net Kw	MMBTU	CCF
Consumer Electronics	11	0.81	0.90	6.59	0.05	0.10	0.00	0.00
Hot Water	6	5.97	3.69	45.60	0.54	0.28	-27.36	6.56
HVAC	86	296.69	292.88	5,271.91	57.44	0.00	-79.47	0.00
Lighting	45	7.37	8.29	125.05	2.44	0.67	0.00	0.00
Refrigeration	32	14.97	16.14	242.87	1.48	1.87	0.00	0.00
Space Heating	32	15.68	16.79	335.79	1.59	0.00	0.00	0.00
Ventilation	21	1.84	2.02	38.40	0.23	0.23	0.00	0.00
Total		343.32	340.72	6,066.21	63.77	3.15	-106.83	6.56

2.3.3 Retail Products

Program Description

The Efficient Products (EP) service aims to increase sales of ENERGY STAR® qualified lighting products, and appliances such as clothes washers, refrigerators, freezers, room air conditioners, dehumidifiers and a number of consumer electronics. This is accomplished primarily through sales at retail stores with on-site and mail-in consumer rebates, but also by arranging retailer buy-downs and manufacturer mark-downs.

EP also promotes advanced power strips for home entertainment centers and controls for computers' internal power supplies. These incentives are intended to entice consumers by lowering the cost of efficient products. EP uses a variety of marketing and promotion efforts in addition to its prominently displayed in-store rebate coupons including a catalog, and an on-line purchase web site in order to build consumer awareness and participation in the program.

Program Highlights

In 2018 alone, BED customers purchased 31,244 LED bulbs, 102 ENERGY STAR® clothes washers, 49 ENERGY STAR® clothes dryers, 90 ENERGY STAR® refrigerators and freezers, 56 ENERGY STAR® dehumidifiers and 419 efficient consumer electronic devices such as ultra-efficient LCD computers monitors, efficient televisions and controlled power strips.

Variance Discussion

Savings of 1,952 annualized MWh exceeded the projection of 882 annualized MWh for 2018 considerably. Annual expenditures were $420,967 which is about 45% higher than the projected budget of $289,598. EP's promotion of higher quality LED's drove the higher program spending. LED products accounted for about 82% of total program savings.

Program Changes

2018 will see a continued focus on promoting specialty LED bulbs and appliances that are the most efficient within the ENERGY STAR rating. These products include: refrigerators, clothes washers, dehumidifiers, pool pumps and consumer electronics. 2019 will also see the continued promotion of high efficiency circulator pumps and air source heat pump water heaters (a limited market in Burlington due to the high saturation of natural gas).

Table 26: EEU Efficient Products - Total Resource Benefits

Avoided costs of Electricity	$2,693,491.94
Fossil Fuel Savings	$56,159.13
Water Savings	$60,409.69
TRB Total	$2,810,060.77

	Annualized	**Lifetime**
Meter MWh	1,752	25,245
Generation MWh	1,952	28,156
Meter Demand Kw	1,332	19,306
Generation Peak Summer Kw	142	1,964
Generation Peak Winter	392	5,793
Water Savings	508	7,093
Fuel Increase	306	4,445
O+M Savings	$38,477	$537,021

Table 27: EEU Efficient Products - Summary

	Prior Year 2017	Current 2018	Program to date
Participants	803	931	17,760
--- Program Costs ---			
BED Administration Costs			
General	$163,596	$185,528	$1,095,598
Implemntation	$283	$0	$90,539
Planning	$0	$0	$14,447
Marketing	$28,665	$668	$179,010
IT Development	$0	$0	$22,742
	$192,544	**$186,196**	**$1,402,337**
BED Service Costs			
Participants	$146	$353	$329,719
Trade Allies	$0	$0	$2,281
	$146	**$353**	**$332,000**
BED Incentive Costs			
Participants	$297,357	$234,418	$2,800,737
Trade Allies	$641	$0	$667
	$297,998	**$234,418**	**$2,801,404**
BED Total Costs	**$490,689**	**$420,967**	**$4,535,742**
Evaluation Costs	**$8,374**	**$4,147**	**$125,004**
Participant Costs	**$264,591**	**$404,288**	**$4,734,536**
Total Program Costs	**$763,654**	**$829,403**	**$9,395,281**
--- Benefits ---			
Annualized mWh	2,102	1,952	30,807
Lifetime mWh	30,445	28,156	275,798
Winter peak Kw	432	392	6,456
Summer Peak Kw	144	142	3,786
mWh / Participant	3	2	2
Weighted Lifetime	14	14	9

Table 28: EEU Efficient Products - End Use Summary

Description	Participants	Gross Mwh	Net Mwh	Lifetim Net	Winter Net Kw	Summer Net Kw	MMBTU	CCF
Air Conditioning	102	13.98	13.24	147.11	0.01	5.66	0.00	0.00
Clothes Washing	184	48.49	49.30	629.87	5.06	6.21	21.88	504.50
Consumer Electronics	160	35.00	39.78	347.55	1.29	19.12	0.00	0.00
Hot Water	23	32.65	40.55	527.15	6.29	3.20	1.20	3.28
HVAC	9	0.65	0.73	7.31	0.51	0.00	0.00	0.00
Lighting	1598	1,585.47	1,775.17	25,928.23	376.22	104.03	283.21	0.00
Refrigeration	104	36.08	33.45	568.60	3.07	3.87	0.00	0.00
Total		1,752.32	1,952.21	28,155.83	392.44	142.10	306.29	507.78

3 Thermal Energy and Process Fuels Activity (TEPF) (Residential and Commercial)

Program Description

This BED service provides thermal shell (aka weatherization upgrades) heat pump and wood heating system energy efficiency services specifically to customers who use unregulated fossil fuel (oil, LP gas and wood) for their heating energy needs. This service is funded by revenues from the ISO-NE Forward Capacity Market (FCM) and Regional Greenhouse Gas Initiative (RGGI) auction proceeds. Currently, these funds cannot be used for natural gas customers.

BED and EVT established a working partnership in early 2009 that serves BED's TEPF customers. BED customers have access to the same services and incentives as those customers in the rest of the state including:

- **Home Performance with ENERGY STAR-** The EEU's collaborate to deliver TEPF savings to residential customers through a network of Building Performance Institute (BPI) certified contractors installing comprehensive home energy thermal improvements.
- **Commercial Building Performance-** Technical assistance and incentives to assist small businesses property owners in improving the insulation and comfort of their buildings. Energy audits and improvements are performed by a participating Building Performance Institute (BPI) certified contractor.

Program Highlights

There were seven residential completions (19 housing units) in 2018 with total savings of 286 MMBTU's. The projects consisted of five single-family, owner-occupied, homes and two condominium buildings within the Red Rocks neighborhood. BED achieved 100% of the residential annual savings goal. BED spent $31,666 in 2018, 31% of the $103,300 annual budget.

Variance Discussion

The limited unregulated fossil fuel market, as well as the housing characteristics of the potential unregulated fuels market, has presented challenges in attracting participants. The unregulated fossil fuel residential market is small in Burlington due to the high saturation of natural gas. BED's best information shows that about 95% of residential buildings use natural gas for space heating and about 85% for domestic hot water.

BED's current best estimate is that there are about 400 homes in the TEPF market. This includes 110 mobile homes at the North Avenue Cooperative. The remaining market is made up of homes that are predominately located in the more affluent Burlington neighborhoods where the properties have been relatively well maintained and updated over the years.

Program Changes

As BED described in its 2019 Annual Energy Efficiency Utility Plan (filed with the VT-PUC November 1, 2018), starting in 2019, BED's TEPF programs will be comprised of three main components designed to continue existing services and take advantage of new opportunities. The components include:

- Traditional programs as described above;
- District Energy Services (DES); and,
- Advanced Manufactured Homes (a/k/a Zero Energy Modular or ZEM)

Regarding DES, BED has been actively working with community leaders, businesses, residents and an internationally recognized district energy firm (Corix Utilities) to construct a District Energy System (DES) in the City. As described in BED's 2018-2020 EEU Triennial Plan, BED sought PUC approval to reserve TEPF funds to help support a DES system from the McNeil bio-mass plant. As BED explained in the Plan, the decision to move forward with the DES project is dependent upon the participation of several key customers including the University of Vermont Medical Center (UVMMC). BED

and Corix continue to work with UVMMC, and other key customers, on project details and hope to have a final decision on the building of the project in 2019.

Regarding ZEM, the objective of this pilot program is to utilize TEPF funds to provide financial and technical support to income qualified customers seeking to purchase hyper-efficient modular homes. The program focuses on the residents/owners of the North Avenue Cooperative (NAC). NAC is Burlington's only trailer home park and consists of about 110 homes heated by LP or kerosene. Many of the homes are very old and ready to be replaced.

BED, and partners (CEDO, CVOEO, VEIC and CHT) have developed a home loan program that offers high performance modular homes to the residents. Throughout 2018, BED and partners finalized the pilot program design including a Memorandum of Understanding with the Champlain Housing Trust (CHT) which allows NAC residents to now participate in CHT's "Manufactured Housing Down Payment Loan Program (MHDP)" which includes access to CHT's "Home Education & Counseling" training program: http://www.getahome.org/education.

These homes can be net-zero energy which would eliminate fossil fuel usage and have a significant financial impact for customers when compared to existing energy costs or the energy costs of a new or used home. To date, there are two potential participants who have started the application process.

Table 29: Thermal Energy and Process Fuels Activity

Period Costs for TEPF Savings	**Residential**	**Commercial**	**Total**
Year to Date Costs	$31,070	$598	$31,668
Annual Budget	$98,135	$5,165	$103,300
% of Annual Budget	32%	12%	31%
Energy Savings Results			
MMBTU Year to Date	286	0	286
MMBTU Annual Goal	285	35	320
% of MMBTU Annual Goal	100%	0%	89%
Progress Towards MMBTU 3-Year Goals			
MMBTU Cumulative to Date	286	0	286
3-Year MMBTU Goal	855	100	955
% of 3-Year MMBTU Goal	33%	0%	30%

TEPF Development and Support Services

	Year to Date Costs	**Annual Budget**
Education and Training	$1,297	$3,400
Applied Research and Development	$0	$750
Planning and Reporting	$2,332	$1,105
Evaluation	$610	$750
Policy and Public Affairs	$291	$1,000
Information Technology	$305	$750
General Administration	$6,806	$2,600
	$11,641	**$10,355**

4 Appendix

4.1 Definition and End Notes

Tables 30 and 31 are templates to help explain the appropriate footnotes for each program and summary table throughout this report.

Table 30: Summary Report Table Template

	Prior Year	Current Year 2015	Projected Year 2015	Projected Year 2015	Program To Date
		(1)	(2)		(3)
Participants	(4)				
Program Costs					
BED Administration Costs	(9)				
General	(10)				
Implementation	(11)				
Planning	(12)				
Marketing	(13)				
IT Development	(14)				
BED Service Costs	(15)				
Service to Participants	(16)				
Service to Trade Allies	(17)				
BED Incentive Costs	(18)				
Participants	(19)				
Trade Allies	(20)				
BED Total Costs	(8)				
Evaluation Costs	(23)				
Participant Costs	(21)				
Total Program Costs	(26)				
Benefits					
Annualized MWh	(27)				
Lifetime MWh	(28)				
Winter Peak KW	(29)				
Summer Peak KW	(30)				
MWh/Participant	(31)				
Weighted Lifetime	(32)				

Table 31: End Use Report Table Template

Description	Participants	Gross MWh	Net MWh	Lifetime MWh	Winter Net KW	Summer Net KW	MMBTU	CCF
	(33)	(35)	(36)	(34)	(37)	(38)	(39)	(40)

Footnotes for the report table templates:

(1) Verified activity for the current reporting year. For savings this figure will be the estimated savings for measures actually implemented and verified for the current report period. Savings should be reported in MWH, at generation and net of all approved adjustment factors, except as otherwise noted.

(2) Estimated portion of the three-year savings and costs projected for the current report year. This footnote should identify the source of the projections. Projections for categories footnoted (4) to (7), (21) to (26) and (28) to (32) will be provided if available.

(3) Program to date activity. For participation [(4) to (7)], the program to date column should count each customer (premise) only once, regardless of participation in previous years. The executive summary should count each customer (premise) only once, even if a customer was served by more than one program.

(4) Number of customers with verified installations during the current report period. Customer is defined as a unique premise as defined by the utility, with one exception. For master-metered, multifamily buildings, customer is defined as a dwelling unit.

(8) Total costs incurred by Burlington Electric Department during the current report period. All costs in nominal dollars, (9) + (15) + (18).

(9) Subtotal of all administrative costs detailed in the categories below, (10) + (11) + (12) + (13) + (14).

(10) Costs include general management, budgeting, financial management and legal costs directly associated with program implementation (such as contract review).

(11) Implementation management and administrative costs include costs related to business development and customer service, data management, and other program administrative costs directly related to implementation.

(12) Costs related to program design and planning, program screening and other similar functions.

(13) Costs related to marketing and outreach.

(14) IT development and maintenance costs do not need to be broken out by program, i.e., this category may be filled in only on the executive summary page.

(15) Subtotal reflecting total implementation costs, (16) + (17).

(16) Costs related to conducting audits or analyses, preparing the package of efficiency measures, contract management and post project follow up.

(17) Costs related to educational or other support services provided to entities other than individual program participants, such as trade allies, manufacturers, wholesalers, builders, and architects.

(18) Subtotal reflecting total incentive costs, (19) + (20).

(19) Direct payments made to participants to defray the costs of specific efficiency measures. If a program employs a shared savings mechanism or loan system, this category should include the utility share of the measure and carrying costs projected over the payment period, net of all projected participant payments.

(20) Incentives paid to manufacturers, wholesalers, builders, or other stakeholders.

(21) Total costs incurred by participants related to BED activities during the current report period. This category includes the participant contribution to the capital costs of installed measures and to specific DSM-related services, such as technical assistance or energy ratings.

(23) Evaluation costs, excluding tracking and reporting expenditures.

(24) Total program costs, (8) + (21) + (22) + (23).

(26) Total expenditures associated with the delivery of direct services to participants and trade allies, including all BED, participant and third party costs.

(27) Annualized MWH savings at generation and net of all approved adjustment factors (e.g., free riders, spill over) for measures installed and verified during the current report period.

(28) The lifetime estimated MWH savings for measures installed and verified during the current reporting year, at generation and net of all approved factors. (Estimated annualized savings times the life of the measure).

(29) Estimated impact of measures at time of winter system peak, at generation, net of adjustment factors.

(30) Estimated impact of measures at time of summer system peak, at generation, net of adjustment factors.

(31) Annualized MWH savings per participant, net at generation, i.e., (27) / (4).

(32) Average lifetime, in years, of measures in the program weighted by savings, i.e., (28)/(27).

(33) Number of customers with verified installations of measures within the end use, utility grouping.

(34) The total annualized MWH saved, at generation, net of adjustment factors, should add up to the savings reported in the line item footnoted as (27).

(35) The total lifetime MWH saved, at generation, net of adjustment factors, should add up to the savings reported in the line item footnoted as (28).

(36) The total annualized MWH saved, gross at the customer meter.

(37) The total winter coincident KW, at generation, net of adjustment factors, should add up to the savings reported in the line item footnoted as (29).

(38) The total summer coincident KW, at generation, net of adjustment factors, should add up to the savings reported in the line item footnoted as (30).

(39) Total MMus estimated to be saved (positive) or used (negative) for alternative fuels as a result of measures installed in the end use.

(40) Total water saved (CCF) (positive) or used (negative) due to measures installed in the end use.