

# Annual Report

## State Energy Management Program

Sec. E.112 (d) of ACT 58 of 2015 On or before October 1 of each year commencing in 2016 and ending in 2019, the Department and EVT shall provide a joint report on the implementation of this section.

July 1, 2017 – June 30, 2018

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## Executive Summary

In accordance with ACT 58 Sec. E.112 of 2015, the Vermont Department of Buildings and General Services (BGS) and Efficiency Vermont collaboratively developed and launched the State Energy Management Program (the Program) to accelerate, for State buildings and facilities, energy management measures, implementation of energy efficiency and conservation, and the use of renewable energy resources.

In FY2016, the first year of the Program, BGS and Efficiency Vermont executed a Memorandum of Understanding, defining the relationship, roles, and responsibilities of each organization as it pertains to the Program. BGS, with support from Efficiency Vermont, recruited, hired, and trained its Program team effectively creating the BGS Energy Office.

In FY2017, the second year of the program, BGS and Efficiency Vermont identified, developed, and implemented energy saving projects resulting in over \$150,000 of initial year savings for the State of Vermont, and over \$1.2 million in savings over the life of these measures.

In the third year of the program, BGS and Efficiency Vermont identified, developed, and implemented energy saving projects resulting in over \$397,000 of initial year savings for the State of Vermont, and over \$3.6 million in savings over the life of these measures.

FY2019 is the final year of the preliminary period in which project identification, development, and completion will accelerate as targeted efforts to prioritize the worst performing buildings continue to be successful. The Program team is systematically executing energy evaluations on prioritized state-owned buildings in accordance with Section 24 Title 29: 157 VSA (a) (3). Completed evaluations have developed into successful energy savings projects while new evaluations are identifying opportunities for future energy savings projects. The Energy Office's project development process has become an integral part of BGS' standard operating procedures when evaluating overall building portfolio management needs resulting in a cohesive roadmap for continued Program success.

ACT 58 Sec. E.112 (d)(5), asked BGS and Efficiency Vermont to submit an evaluation of the Program authorized under this section and any resulting recommendations, including recommendations related to Program continuation in the FY2019 report. For the program to continue seamlessly without energy savings interruption, the legislature will need to approve funding in the 2019 legislative session. Based on the overwhelming success of the Program in FY2018, it is the recommendation of the Department of Buildings and General Services and Efficiency Vermont to institutionalize the State Energy Management Program.

# FY2018: Targets, Actions, Results

## Targets:

In accordance with ACT 58 Sec. E.112 (b) (1) (B), BGS and Efficiency Vermont aimed to reduce the State's total energy usage and related costs by an amount not less than \$150,000 through measures implemented as part of the Program.

## Actions:

- BGS and Efficiency Vermont are implementing the Program Process, including:
  - Project identification, development, management and completion procedures
  - Hand-off points during the execution of projects
  - Documentation, tracking and reporting schedule and protocols
- Program representatives from each organization continue to meet bi-weekly for collaborative project identification, development, and management. A whole team meeting occurs quarterly to communicate specific program and project needs and to evaluate program success.
- Energy Star Portfolio Manager® ("ESPM") is serving as a functioning building energy accounting system that includes baseline and annual energy data. The Program Team utilizes ESPM to analyze building energy consumption data and develop prioritized building lists based on building performance metrics. Through coordinated efforts with the Agency of Administration Office of Finance, ESPM is now being updated on a monthly basis, allowing the Program Team access to the most current building energy data available.
- BGS, with support from Efficiency Vermont, secured the services of two consistent and professional energy auditing firms to perform ASHRAE Level 2 energy audits for state owned and operated buildings. BGS is mandated to audit 10% of its building square footage annually. In FY2018 the Program Team successfully audited over 475,000 square feet of building space, equal to 13% of the BGS's total space. The prioritized lists of buildings that have received energy audits and those buildings that are scheduled to receive energy audits are included in the Appendices.
- BGS and Efficiency Vermont, with support from Burlington Electric Department, identified, developed, and completed energy saving projects; as shown in the tables below.

FY2018 Results:

Site	Project Focus	KWH	MMBTU	First-year \$ Savings	Lifetime \$ Savings
Numerous locations	Efficiency VT Prescriptive Projects			\$136,590	
Numerous locations	Solar Net Metering			\$72,629	
Hebard SOB	Parking Lot Lighting Retrofit	8,936		\$1,600	\$32,000
Sharon Information Center Vietnam Memorial	Lighting Upgrade	38,888		\$8,912	\$57,123
ANR Essex Forest Parks & Recreation	Solar PV	45,356		\$8,000	\$240,000
AOT Park & Rides	LED Upgrades	20,794		\$6,719	\$134,382
Kengar Building Hyde Park	LED Lamp Retrofit	7,508		\$1,576	\$37,521
Woodside Gym	High Bay LEDs	17,979		\$2,157	\$32,362
108 Cherry St	Lighting & Controls Upgrade	372,845		\$69,355	\$1,387,103
Waterford Welcome Center	Site Lighting Upgrade	2,103		\$783	\$11,745
32 Cherry	Luminaires	2,165		\$708	\$14,160
Chimney Point and Mt. Independence	Lighting Retrofit	20,288		\$7,530	\$150,594
Guilford Welcome Center Atrium	Lighting Retrofit	5,110		\$1,695	\$25,425
WSOC	FCU Reprogramming	15,550		\$2,365	\$47,295
Springfield State Office Building	HVAC/Lighting	285,021		\$56,048	\$1,120,955
50 Cherry St	Energy Project	81,622	1,601	\$16,638	\$249,570
Williston Info Center SB	Airsealing/Controls/Insulation	15,699	1,129	\$4,643	\$92,857
		<b>557,522</b>	<b>2,730</b>	<b>\$397,947</b>	<b>\$3,633,091</b>

# FY2019: Projected Savings, Strategies

## Targets:

In accordance with ACT 58 Sec. E.112 (b) (1) (B), BGS and Efficiency Vermont aim to reduce the State's total energy usage and related costs in FY2019 by an amount not less than \$150,000 through measures implemented as part of the Program.

With the Program now in the beginning of its fourth year, BGS and Efficiency Vermont anticipate a continued trend of accelerated performance resulting in energy savings that exceed targets through the project implementation process.

## Projected Savings:

Energy type	KWH	MMBTU	\$ savings
Electricity	698,653		\$229,206
Thermal Fuels		13,228	
Solar Photovoltaic Net-Metering	5,651,039		\$56,876
	<b>6,349,692</b>	<b>13,228</b>	<b>\$286,082</b>

A detailed list of planned FY2019 activities can be found in the Appendices.

## Strategies:

Collaborative and systematic project identification, development, and management is vital to the success of the Program. To ensure this process continues to be efficient and effective, BGS and Efficiency Vermont will evaluate the success of the following strategies and modify as necessary.

### *Consistent, Collaborative Communication*

- The Program team shall adhere to the project identification, development, and management procedures defined in the MOU.
- The Program team, with representatives from each organization, shall continue to participate in bi-weekly meetings for ongoing collaborative project identification, development, and management and coordinate full Program Team meetings on a quarterly basis.

### *Adequate Staffing*

- Efficiency Vermont shall dedicate staff resources totaling a minimum of one (1) Full Time Employee (FTE) to support collaboration and project completion with the BGS for the duration of the Program.
- BGS shall maintain a staff team, supported by Efficiency Vermont, dedicated to Program implementation for Project Management and Program Support. These positions shall be in addition to BGS' State Energy Program Manager.

*Collaborative Project Identification, Development, Management, and Completion:*

- The Program team shall continue conducting energy audits on state-owned buildings in accordance with Section 24 Title 29: 157 VSA (a) (3), following the procedures developed by BGS with the support of Efficiency Vermont.
- With Technical Assistance from Efficiency Vermont as needed, BGS' Energy Project Managers finalize each project's scope of work and procure resources for implementation.
- Upon request, Efficiency Vermont assists BGS in assessing the need for commissioning or tuning of newly installed equipment.

*Energy Tracking:*

In accordance with ACT 58 Sec. E.112 (d) (3) BGS will continue to make improvements toward systems of measurement to achieve the goals of 2011 Acts and Resolves No. 40.

- Using Energy Star Portfolio Manager®, BGS will maintain an energy accounting system that includes baseline and annual data on energy consumption at properties owned or managed by BGS. BGS has requested that all state agencies who own and operate buildings utilize ESPM for these purposes.
- With respect to transportation, Administrative Bulletin 2.3 Appendix B: Fuel Card Use – State Owned Vehicles, effective February 2, 2016, established the requirements of the statewide universal fuel card program to provide State agencies and departments with a vehicle and/or equipment fuel card that allows State employees to purchase fuel and other vehicle related supplies and services for State vehicles and/or State-owned fuel-powered equipment in order to conduct governmental business. BGS is now able to capture state employee fuel purchases through the WEX Fleet Purchase Card reporting system.
- Additionally, BGS recommends that the State of Vermont move toward a centralized energy data tracking and reporting system that encompasses all state government energy consumption data. This system should be provided by a third-party entity and administered with support from the service provider. The tracking system should provide a utility billing audit function. Currently, utility bills are paid by several different state entities. Inconsistencies in billing are not tracked and reported as regularly as they occur. Utility bill auditing can help find and fix issues relating to unusual billing period lengths, cost duplication, gaps in billing dates, frequently estimated bills, use or cost that exceeds the norm, significant variance from historical patterns for use, cost, or demand, meter reading issues, rate schedule issues, and actual vs. budget differences.

# FY2020: Projected Savings, Strategies

## Targets:

In accordance with ACT 58 Sec. E.112 (b) (1) (B), BGS and Efficiency Vermont will continue to reduce the State's total energy usage and related costs of the Program by an amount not less than \$150,000 annually.

Projected Savings from projects currently in the project pipeline.

Energy type	KWH	MMBTU	\$ savings
Additional Projects resulting from Energy Audits	1,652,071	2,606	\$507,384
Solar Photovoltaic Net-Metering	5,500,000		\$55,356
	<b>7,152,071</b>	<b>2,606</b>	<b>\$562,740</b>

## Strategies:

Ongoing, collaborative, and systematic project identification, development, and management will remain critical to the long-term success of the Program. BGS and Efficiency Vermont will continue to execute the strategies as noted in the Memorandum of Understanding, making modifications and improvements as needed.

In accordance with ACT 58 Sec. E.112 (d) (3) BGS will continue to make improvements toward systems of measurement to achieve the goals of 2011 Acts and Resolves No. 40.

## Observations & Recommendations

BGS and Efficiency Vermont, through the development, launch, and implementation of the State Energy Management Program, have successfully achieved \$397,947 of annual energy savings and \$3,633,091 of lifetime savings for projects implemented in FY2018. With a full staff onboard, our organizations are confident that the Program will continue to produce more than the required annual savings, and significant lifetime savings, for the State of Vermont.

In FY2018 the State of Vermont received \$327,793 from Efficiency Vermont to support the building project manager position and two four-year limited service or consulting positions established in the 2015 ACT 58 Sec. E.100(a)(2), and related supervision and overhead, as BGS and Efficiency Vermont consider necessary to meet the Program goals.

BGS and Efficiency Vermont are recommending making this program permanent within BGS in FY2020 and beyond. This pilot program has exceeded the minimum performance criteria established by the Legislature and should be continued as it has the potential to further reduce State government energy use and funding. Continued funding support for the program should be a topic of discussion during the upcoming Legislative session.

Efficiency Vermont

By:   
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# Appendices

## FY2019 Detailed Project List:

Site	Project Focus	kWh	MMBTU	Dollars savings
Derby Public Safety Building	Energy Retrofit	83,262	2,699	\$18,208
Williston Info Center Northbound	Lighting/Air-sealing/Controls	33,783	650	\$6,505
Middlebury Mahady Courthouse	Lighting/Insulation/Air-sealing	193,399	1,333	\$33,395
St. Johnsbury Caledonia Courthouse	Lighting/Air-sealing/Controls	137,542	7,877	\$38,021
Rutland Courthouse and Office	Lighting/HVAC/Controls	187,920	400	\$34,501
Brattleboro Courthouse	Lighting/Insulation	14,430	268	\$25,979
AOT Central Garage	Lighting & Lighting Controls	46,977		\$7,046
133 State St.	Window Replacement		1	\$7,575
2 & 4 Aiken	Window Replacement	1,340	0.2	\$1,100
		<b>698,653</b>	<b>13,227</b>	<b>\$229,206</b>

## Future Projects Under Development from Completed Energy Audits:

Site	kWh	MMBTU	Dollars savings	Payback
Bennington Bennco (6082)	20,482	41.4	\$3,651	2.6
Bennington Welcome Center (9912)	30,008	4.2	\$4,557	8.4
Burlington Zampieri Office Bldg (6174)	530,678	256.1	\$74,227	10.7
Montpelier 2 Governor Aiken Ave	7,761	0.2	\$1,507	44.3
Montpelier 4 Governor Aiken Ave (6002)	5,844	0.1	\$743	54.7
New Haven Public Safety - CAMPUS	22,250	60.6	\$4,349	11.6
Newport State Office Bldg (6266)	497,325	706.8	\$66,422	7.8
Pittsford Admin Building (6288)	6,441	1.1	\$1,290	17.8
Pittsford Firehouse (6272)	5,565	270.7	\$4,906	5.6
Pittsford Warehouse (Behind Firehouse) (6284)	396	47.7	\$859	14.8
Rutland Asa Bloomer Building (6303)	262,276	609.4	\$45,463	6.3
Rutland McKinley Ave - COMPLEX	14,213	17.1	\$2,452	7.2
Rutland Motor Vehicles (6307)	6,374	36.2	\$1,380	16.0
St. Albans District Courthouse (6321)	22,690	366.5	\$7,471	13.7
VEC Community Solar	88,764	0.0	\$241,405	7.2
Brattleboro State Office Bldg (6160)	29,218	0.0	\$5,751	14.6
Fair Haven Welcome Center (9250)	9,977	33.4	\$1,985	9.4
Guilford Southeast Welcome Center (9734)	12,980	30.2	\$2,346	13.4
St. Johnsbury State Office Bldg (6340)	12,925	58.4	\$2,727	9.8
Barre District Court/Office (6070)	21,177	0.7	\$28,410	22.7
Bennington District Court/Office (6080)	60,122	0.0	\$3,802	16.3
Royalton Troop HQ - CAMPUS	5,087	65.3	\$1,681	20.5
	<b>1,652,071</b>	<b>2,606.2</b>	<b>\$507,384</b>	<b>15.2</b>

**Future Projects in Development with Scheduled Energy Audits:**

<b>Property Name</b>	<b>Property GFA - Self-Reported (ft<sup>2</sup>)</b>
Montpelier 1 Baldwin St (6003)	7,952
Montpelier 10 Taylor St Shop and Storage (6013)	2,450
Montpelier 109 State St and Connector (6014)	124,188
Montpelier 110 State St (6015)	14,910
Montpelier 112 State St (6011)	22,349
Montpelier 115 State St and Annex (6018)	68,988
Montpelier 116 State St (6019)	22,788
Montpelier 118 State St (6030)	5,327
Montpelier 120 State St (6020)	75,672
Montpelier 122 State St Boiler Plant (6021)	5,276
Montpelier 126 State St (6022)	7,375
Montpelier 128 State St (6023)	9,250
Montpelier 132 State St and Shop (6024+6034)	4,746
Montpelier 133 State St (6025)	103,160
Montpelier 134 State St (6026)	3,048
Montpelier 136 State St (6027)	5,133
Montpelier 6 Baldwin St (6004)	24,186
Montpelier 111 State St (6016)	46,672
Montpelier 2 Governor Aiken Ave	11,541
Montpelier 4 Governor Aiken Ave (6002)	5,732
Bradford Rest Area (9707)	6,861
	<b>577,604</b>

BGS, with support from Efficiency Vermont, developed this prioritized-buildings list using two primary criteria; Energy Cost Intensity (ECI, measured in \$/ft<sup>2</sup>) and Site Energy Use Intensity (EUI, measured in kBtu/ft<sup>2</sup>). ECI shows how much BGS spends in electricity and fuel per building per ft<sup>2</sup>. Site EUI measures how much electricity and fuel a building consumes per ft<sup>2</sup>.

The Program team ranks buildings by each primary criterion independently, from best to worst performing building. The team then averages the two criteria-based lists for each year. The final step in creating the prioritized list above is to average the years together to determine the best and worst performing buildings over the past four years.