2017 Annual Report

OCTOBER 2018

Efficiency Vermont

This report is submitted to the Vermont Public Utility Commission and to the Vermont Public Service Department, in fulfillment of the regulatory requirement for submitting Efficiency Vermont's Annual Report 2017.

Making Vermont Stronger, Together

A message from Karen Glitman, Director, Efficiency Vermont[1]

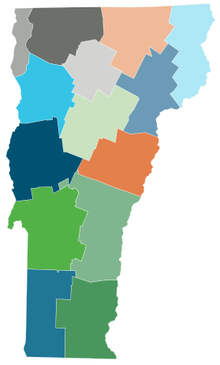
In 2017, we were privileged to help more than 121,950 Vermonters with objective guidance to improve their homes, businesses, institutions, and communities with energy efficiency. Together, these Vermonters will save more than $182.8 million over the lifetime of their 2017 investments in efficient equipment and buildings.

Efficiency Vermont Director Karen Glitman discusses efficiency upgrades to the Orleans County Sheriff's Department with Marc Nadeau of Nadeau's Plumbing & Heating (see page 9).

That's a big number, but the positive impact of those savings is even bigger. Because energy efficiency results in homes that cost less to live in; employers with lower overhead; more viable downtowns and farms; and schools and municipal buildings operating at less cost to taxpayers. It all adds up to a more affordable, economically strong Vermont.

These benefits are the result of a statewide effort. While we worked with Vermonters in every county, we also supported a statewide network of businesses that our customers turn to for efficient goods and high-performance buildings (see pages 11-12). With these partners—who provide a growing number of green jobs—we worked hard to ensure that all Vermonters have local access to affordable, top-quality efficient goods and services.

Efficiency Vermont's customers and partners can feel proud of the powerful effect that efficiency has on the quality of lives and livelihoods throughout the state. I am pleased to present this overview of our work together in 2017.



Numbers of Vermonters who Lowered their Energy Use via Efficiency Vermont's 2017 Services

Addison	5,542	Lamoille	5,106
Bennington	10,333	Orange	3,543
Caledonia	5,321	Orleans	5,323
Chittenden	36,018	Rutland	13,294
Essex	519	Washington	13,014
Franklin	6,980	Windham	7,124
Grand Isle	1,179	Windsor	8,660

Efficiency Vermont's 2017 Value

139,376 MWh saved
The electricity it takes to power 14,538 homes for a year

201,836 MMBtu saved
The fuel it takes to heat 2,191 homes for a year

$182.8 million saved by Vermonters
The amount Vermonters will save in energy and water costs over the lifetime of their 2017 investments in efficient equipment and building improvements

Avoided pollutants

820,000 US tons
Carbon dioxide

374.9 US tons
Nitrogen oxides

306.3 US tons
Sulfur oxides

Every **$1** invested in efficiency = **$2.00** saved[2]

[1] Karen Glitman was Director of Efficiency Vermont during the period covered by this report.

[2] Investments are Efficiency Vermont's and participants' 2017 costs. Savings are participants' lifetime savings from 2017 investments.

15,500

Businesses served

$103,195,055

Saved by businesses over the lifetime of their 2017 investments in efficient equipment and buildings

Strengthening Vermont Employers

In 2017, Bradford manufacturer Copeland Furniture cut its annual energy costs by more than $12,600 by taking an extra step when an air compressor failed. Instead of simply replacing the failed unit with an efficient model, the company took Efficiency Vermont's advice to also upgrade a second aging compressor. To afford this investment, Copeland Furniture worked with Efficiency Vermont to get a low-interest loan from a local lender. Copeland's monthly energy savings are bigger than the loan payments.

This cost-saving improvement is just the latest that Copeland Furniture has made over the years with the help of Efficiency Vermont. A dedicated Efficiency Vermont account manager stays aware of Copeland Furniture's priorities over time, giving objective advice on the best approaches for its needs. Efficiency Vermont provides these customized solutions for the largest energy users in the state as well as services to meet the particular needs of Vermont's small and medium-sized businesses. Efficiency Vermont also lends its expertise to help cut energy use in specialized processes, such as farming, maple sugaring, snowmaking, commercial food preparation, and others.

Copeland Furniture, maker of fine furniture in Bradford since 1976, employs a staff of 100.

"It's tough to get excited about air, even though we really rely on it. But the study Efficiency Vermont did for us pointed to the strong case for upgrading our process, and **we're really pleased with the outcome**."

Tim Copeland, Owner
Copeland Furniture, Bradford

Photo credit: Carolyn Bates

Elm Place was developed by owner Cathedral Square Corporation. Partners included Duncan Wisniewski Architecture, Hardy Structural Engineering, Engineering Services of Vermont, ReArch Company, Eco Houses of Vermont, and Efficiency Vermont.

"Energy efficiency is integrally important to affordable housing—from a standpoint of both lower operating costs and quality-of-life issues like healthy indoor air. **Efficiency Vermont was a tremendous resource in this project**, working closely with the architect, translating technical elements for us, and identifying critical funding so we could make this exceptional housing a reality for the low-income seniors we serve."

Cindy Reid, Director of Development, Cathedral Square

Cutting Costs for Low-Income Vermonters

2017 marked the completion of Vermont's first affordable housing facility certified as a "passive" structure—meaning it meets specific standards for exceptionally low energy use. Elm Place, a 30-unit apartment building for seniors in Milton, features high insulation values for its exterior walls, foundation, and roof; high-efficiency windows; and a cold-climate heat pump system for heating and cooling. Elm Place was recognized as the year's Best Overall Project and Best Senior Housing by the Passive House Institute US.

Efficiency Vermont works with affordable housing and service providers throughout the state to help build energy-saving new housing and to improve the efficiency of existing homes for low-income Vermonters.

$6,528,554

Saved by low-income Vermonters over the lifetime of 2017 investments in their efficient equipment and buildings

Photo credit: Sally McCay

Residents of Elm Place, Milton

Bringing Quality Housing in Reach for All Vermonters

Anna Kehler's Greensboro farmhouse was so cold and damp that she couldn't live in it during the winter. In 2017, Anna took action. She tackled a comprehensive efficiency upgrade with a local contractor in Efficiency Vermont's statewide Home Performance with ENERGY STAR® network. To lower project costs, Anna and the contractor worked as a team to find and fix the causes of drafty rooms and moisture problems. Thanks to extensive air sealing, insulation, and a heat-recovery ventilation system, Anna now has a year-round cozy home requiring little fuel to keep warm.

Home improvement was just one of the ways that Vermonters saved energy through Efficiency Vermont's residential services in 2017. Energy-saving appliances and lighting products were easy to find in stores because of Efficiency Vermont's partnerships with retailers. Homeowners built high-performance houses thanks to Efficiency Vermont's technical support for architects and builders. And renters had lower energy bills and more comfortable housing thanks to Efficiency Vermont's services to rental property owners.

"One January morning it was 23 degrees in the bedroom and the furnace was going full tilt. Now, I'm heating the house with just a woodstove. **I am amazed at how quickly the place heats up.**"

Anna Kehler, Homeowner, Greensboro

106,400

Households served

$79,674,544

Saved by households over the lifetime of their 2017 investments in efficient equipment and buildings

Efficiency upgrades turned this once-uninhabitable Greensboro farmhouse into a cozy home in 2017.

Vermonters learned how to cut energy use in their homes, businesses, and community buildings at Efficiency Vermont's workshops and events in 2017.

Partnering for Community-Wide Benefit

2017 brought good news for Orleans County taxpayers. The county's yearly energy bills were being cut by more than $6,000 thanks to efficiency improvements begun in the county courthouse and sheriff's department. With energy-saving lighting, insulation, and heating systems, the buildings now stay warm all winter and provide safer, well-lit spaces, inside and out. And, for courthouse staff, a trip to the basement records room no longer means an eerie walk through a dark, damp space.

The Orleans County Courthouse upgrade marked the launch of Efficiency Vermont's 2017-2018 community-wide initiative in the greater Newport area. Designed to benefit towns and surrounding farms engaged in economic revitalization, 2017 community initiatives brought Efficiency Vermont to three areas of the state, delivering on-site energy consultations, workshops, and objective guidance on optimal energy-saving approaches for businesses, households, and municipal buildings.

Orleans County Courthouse, Newport

Project partners: Fred's Energy of Vermont, Derby*
Gates Electric, Newport*
New England Foam & Coating, St. Johnsbury

Orleans County Sheriff's Department, Derby

Project partners: Gates Electric, Newport*
Nadeau's Plumbing & Heating, Newport*
Northeast Employment Training, Newport

"I am still in shock how much was improved in these two buildings and the diligent work Efficiency Vermont and our local contractors did to make our projects a success. **This saves taxpayers money and improves important community buildings, benefiting Orleans County for years to come."**

Mary Ann Fletcher, Orleans County Treasurer

*Member, Efficiency Vermont's Efficiency Excellence Network

Supporting Vermont's Green Economy

Since 1890, people in South Hero have come to the Robinson family's hardware store to supply their farms and homes. In 2017, the current generation of owners—Kathy and Jim Robinson—and their staff of four family members made Robinson Hardware an Efficiency Vermont efficient-lighting retail partner. Robinson Hardware is no stranger to helping customers save energy; the 128-year-old store has been stocking insulation and do-it-yourself weatherization products, according to Kathy Robinson, "since they were invented". Efficiency Vermont is proud to welcome Robinson Hardware to a statewide network of sellers of the best in efficient products and services.

Robinson Hardware co-owner Kathy Robinson and staff. From left: Kathy's son Sam, sister Cindy, daughter Kait, Kathy, and cousin Susan. Not pictured: Kathy's husband, co-owner Jim Robinson.

"Efficiency Vermont makes things run smoothly so we can stock good products at good prices. Our lighting sales have never been so high. Our customers are happy because they save money when they buy efficient lighting and when they use it. And it gets the customer in the store, so it's a win-win."

Kathy Robinson, Co-owner
Robinson Hardware, South Hero

801
Equipment suppliers

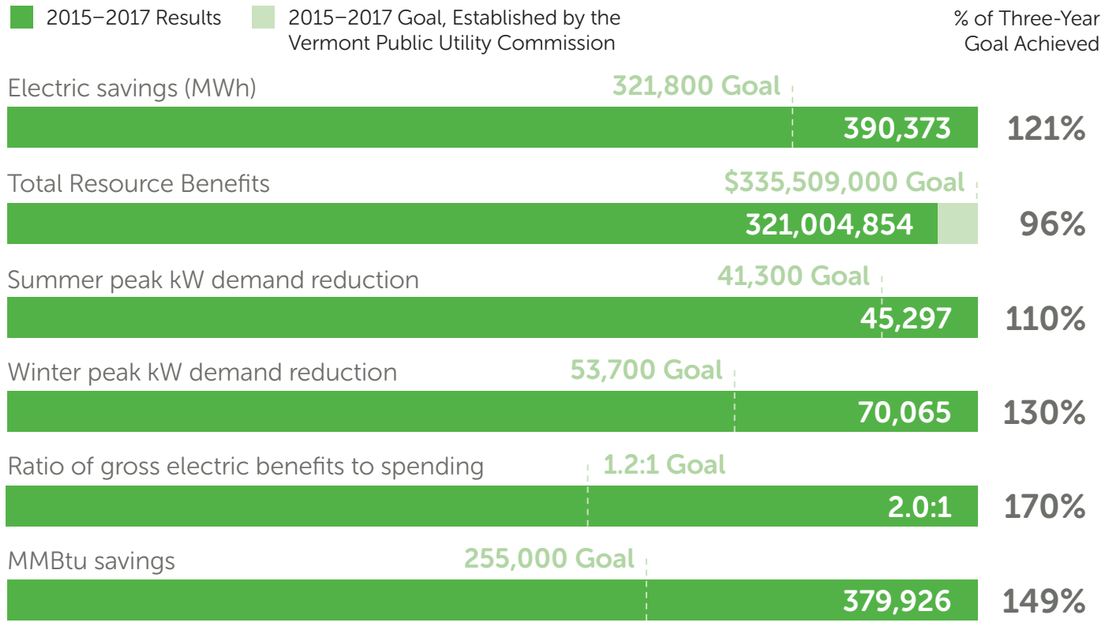
313
Retailers

918
Contractor companies

148
Building design firms

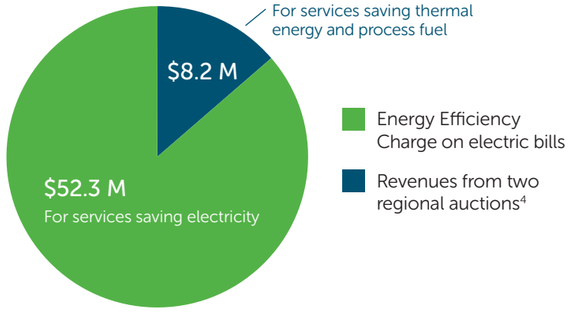
Throughout Vermont, efficiency purchases give a competitive edge to retailers, wholesalers, and service providers. Efficiency Vermont supports these businesses with workforce-development technical training, consumer price reductions, and promotions. As a result, Vermonters can easily find the efficiency resources they need while benefiting trusted local businesses.

2015–2017 Results[3]

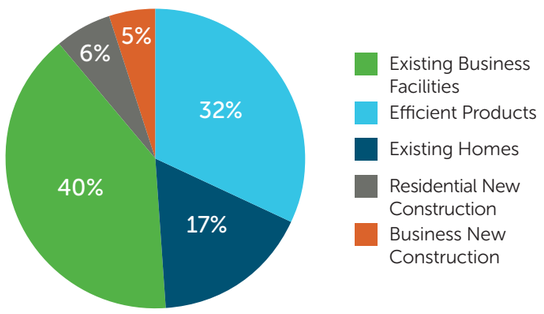


2017 Budget Breakdown

By Funding Source



By Major Market



[3]Unless otherwise noted, data on pages 13 and 14 do not include results from the Customer Credit program.

[4]The Regional Greenhouse Gas Initiative (RGGI): Efficiency Vermont is one of the entities in nine states receiving funds acquired through RGGI's sale of carbon allowances to polluting electricity generating facilities. 2) The Forward Capacity Market: Efficiency Vermont sells its expected electricity savings to New England's electric-grid operator (ISO-NE) as a resource in meeting regional electricity demand.

The Saving Power of Efficiency

3.6¢/kWh[5]

Cost of saving electricity with efficiency

VS

8.4¢/kWh

Cost of supplying electricity

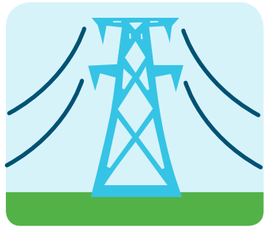
$16.56/MMBtu[6]

Cost of saving fossil fuel with efficiency

VS

$18.08/MMBtu

Cost of supplying fossil fuel



Percentage of Vermont's 2017 electric needs met by efficiency[7]

16.6%

[5]This is the levelized net resource cost of electric efficiency, taking into account participating customers' costs and savings as well as Efficiency Vermont's cost of delivery, which was 4.4 cents/kWh.

[6]This is the levelized net resource cost of thermal energy and process fuel efficiency, taking into account participating customers' costs and savings as well as Efficiency Vermont's cost of delivery, which was $3.39/MMBtu.

[7]This shows the lasting impact of efficiency savings from Efficiency Vermont's 2000 launch through 2017. This figure includes results from Efficiency Vermont, Burlington Electric Department, and the Customer Credit program, as well as from projects undertaken in partnership between Efficiency Vermont and both the Green Mountain Power Energy Efficiency Fund and the Green Mountain Power Community Energy & Efficiency Development Fund.

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2. 2017 SERVICES

2 2017 SERVICES

Efficiency Vermont designed and delivered objective, customer-focused technical, financial, and educational services to help Vermonters overcome barriers to improving the energy efficiency of their homes, businesses, institutions, and municipal facilities.

In 2017, the U.S. Environmental Protection Agency honored Efficiency Vermont with the ENERGY STAR® Partner of the Year—Sustained Excellence award in recognition of three Efficiency Vermont services: Residential New Construction (Section 2.4.1), Retail Efficient Products (Section 2.4.2), and Home Performance with ENERGY STAR (Section 2.4.3 "The Efficiency Excellence Network" discussion).

2.1 THERMAL ENERGY AND PROCESS FUEL EFFICIENCY SERVICES

In addition to electric efficiency services, Efficiency Vermont provided thermal energy and process fuel (TEPF) efficiency services. TEPF services were provided through the following:

- Training and promotional support for certified Building Performance Institute contractors, to deliver Home Performance with ENERGY STAR residential weatherization services and/or Building Performance weatherization services in qualifying commercial buildings
- Coordination with affordable housing providers, 3E Thermal, and Vermont's Weatherization Program in service to low-income households
- Technical information and financial incentives, for commercial and industrial customers, for projects that reduce thermal energy and industrial process fuel use
- Technical information and financial incentives for high-efficiency residential and commercial heating equipment—including biomass systems and certain efficient oil and propane systems—and to support the installation of smart thermostats in homes
- Efficiency Vermont's statewide Efficiency Excellence Network, providing training to contractors for these areas of focus: heating / ventilation / air conditioning (HVAC), refrigeration, commercial and residential thermal shell improvements, heat pumps, refrigeration, electrical systems, and home construction
- Guidance and advice to customers regarding heat pump technologies
- Services promoting the installation of recommended efficient non-electric commercial kitchen equipment
- Thermal project partnerships with Burlington Electric Department (BED) and Vermont Gas Systems (VGS)
- Support of distribution utility (DU) efforts to meet specifications of Vermont legislative Act 56, as discussed in Section 2.4.7.

2.2 SERVICES TO EXISTING BUSINESS FACILITIES

Existing Vermont businesses, institutions, and municipalities working with Efficiency Vermont in 2017 saved an approximate total of 61,700 megawatt-hours (MWh) and 26,600million British thermal units (MMBtu), delivering Total Resource Benefits of $53 million to approximately 15,300 customers. The average anticipated return on investment for efficiency improvements in existing commercial facilities in 2017 was 55% per year. Highlights of efforts in existing buildings follow.

2.2.1 VERMONT'S LARGEST ENERGY USERS

To serve the state's largest energy users—defined by their use of more than 500 MWh of electricity per year—Efficiency Vermont continued to take a customized approach. Efforts to reduce energy use and costs in this sector are detailed below.

Account Management

Designated Efficiency Vermont staff maintained long-term proactive professional relationships with individual businesses. To design and deliver effective, customized services, account managers maintained a deep understanding of each company's priorities and challenges. Efficiency Vermont served approximately 300 businesses through Account Management, garnering a combined expected annual savings of $4.5 million from measures completed in 2017. Efficiency Vermont:

- Provided technical and financial analysis to enable businesses to:
    - Create comprehensive portfolios of savings opportunities
    - Develop energy savings plans
    - Assess and utilize their energy usage data
    - Manage peak electricity use
    - Optimize systems
    - Engage in continuous energy improvement (CEI),[8] which helps customers look comprehensively at their facilities and at how equipment is operated and maintained.
- Offered financial incentives and supply chain price negotiations for recommended approaches and delivered assistance in identifying third-party financing options
- Organized Best Practices Exchange events delivering industry-specific energy savings information and providing customers with opportunities to learn from their peers in Vermont
- Facilitated energy Kaizen events, applying continuous quality improvement practices to energy management, and "sleeping plant" tours to find unneeded energy use during plant shutdown.

[8] CEI efforts in 2017 were delivered as a pilot service, described in Section 2.4.9 Resource Acquisition Research & Development.

2.2.2 Small and Medium-Sized Businesses

Efficiency Vermont designed and implemented services addressing the particular needs of Vermont businesses that typically use up to 1,000 MWh per year and that are not served under Efficiency Vermont's targeted market initiatives (discussed in Section 2.2.3). Efficiency Vermont provided:

- Direct customer engagement and Account Management to help businesses identify and prioritize savings opportunities, to provide guidance through the course of energy-saving projects, and to help businesses manage energy use over time.
- Thermal efficiency services through Building Performance. This service, modeled after Home Performance with ENERGY STAR, provides incentives to qualifying small businesses and rental property owners completing efficiency improvements with certified Building Performance contractors.
- Engagement through the Efficiency Vermont Efficiency Excellence Network of efficiency service and product providers (discussed in Section 2.4.3).
- Services and outreach conducted through community-wide efforts, discussed in Section 2.4.5.
- Education through strategic outreach via numerous avenues, including social media, direct mail, traditional media placements, Efficiency Vermont's e-newsletter, chambers of commerce, business associations, trade associations, planning commissions, economic development groups, business-focused events, and utility partners.
- Coordination with the Vermont Green Business Program, to identify efficiency opportunities for businesses undertaking the program's application process.

2.2.3 Targeted Markets

Efficiency Vermont continued to implement targeted initiatives—each with its particular approaches, energy-saving measures, and incentives—to address the priorities, challenges, and motivations of specific markets. These markets were agriculture, colleges and universities, hospitals, primary and secondary (K–12) schools, leased commercial real estate, lodging facilities, municipalities, restaurants, ski areas, and state buildings. A sampling of 2017 activities in selected targeted markets follows:

- Agriculture: Provided phone consultations to more than 30 farmers participating in Ben & Jerry's Caring Dairy Program, which requires participants to work with Efficiency Vermont to identify energy-saving opportunities in their operations and buildings. Efficiency Vermont expanded support for process equipment specific to the maple and dairy industries, as well as for ventilation equipment with broad use in the market. Efficiency Vermont stopped support for equipment that had reached market saturation or that had been superseded by improved technologies.
- Colleges and Universities: Saw participation in several newer services, including steam trap assessment, compressed air leak remediation, ventilation upgrades, and retrocommissioning.

- Hospitals: Efficiency Vermont saw strong participation in its service in support of lighting design and growing involvement of hospitals in its chilled-water optimization peer cohort.
- K–12 Schools: Although there was considerable interest from schools in undertaking efficient lighting design, retrocommissioning, pumps, motors, and heating-systems projects, school consolidation and the potential for closures had an impact on project time lines and efficiency investment decisions.
- Ski Areas: Supported three resorts in bringing snowmaking dashboards online and leveraged operational data analysis to uncover cost-effective efficiency opportunities.
- State Buildings: Efficiency Vermont continued to coordinate with the Vermont Department of Buildings and General Services and state agencies on the State Energy Management Program.

2.2.4 Key Commercial Technologies

Efficiency Vermont continued to maintain awareness of efficient technologies that hold the potential to provide significant benefits in commercial applications and engaged in efforts to bring these benefits to Vermont's commercial sector. Efficiency Vermont's 2017 activities included the below.

Commercial Lighting
Efficiency Vermont:

- Provided technical guidance and promotions to encourage the adoption of high-quality, efficient indoor and outdoor lighting equipment and approaches, including: 1) light-emitting diode (LED) technologies; 2) integrated and non-integrated lighting controls; and 3) efficient lighting design
- Through engagement in the equipment supply chain, reduced purchase prices via supply chain incentives and worked to maintain product availability; decreased midstream incentives to remain consistent with market prices for screw-based LEDs
- Partnered with lighting distributors, designers, and representatives to leverage their interactions with customers
- Provided efficient lighting technology training to lighting designers and to contractors through the Efficiency Excellence Network
- Monitored and evaluated emerging lighting technologies for possible inclusion in services
- Promoted quality lighting products and initiatives in collaboration with the Consortium for Energy Efficiency (CEE), Design Lights Consortium, ENERGY STAR, Northeast Energy Efficiency Partnerships (NEEP), and U.S. Department of Energy.

Heating, Ventilation, Air Conditioning, and Refrigeration
Efficiency Vermont's 2017 efforts included both direct customer and supply chain partnering activities designed to increase the installation of high-efficiency equipment and the optimization of entire systems. In 2017, Efficiency Vermont:

- Worked in collaboration with a circulator-pump manufacturer to replace all low-tier stock in Vermont with high-tier circulator pumps designed specifically to meet the criteria of Efficiency Vermont's program
- Launched a structured, custom offering for high-efficiency refrigeration condenser units and began development of a 2018 supply chain offering for this equipment
- Began alignment with the Northwest Energy Efficiency Alliance's advanced water heating specification, which is the standard that most heat pump water heater manufacturers use in product development
- Engaged with distribution utilities regarding coordination of heat pump technology efforts.

Industrial Process Equipment
Efficiency Vermont continued to work with Vermont manufacturers and other businesses to identify savings opportunities through upgrades for pumps, motor controls, variable frequency drives, compressed air systems, and process heating and cooling systems. Efforts included Account Management of large customers; engagement with small and medium-sized industrial businesses; supply chain partnerships designed to increase adoption of efficient technologies; coordination with qualified auditors to take a system-wide or facility-wide approach to equipment auditing; and research and service development intended to deepen market knowledge, to further develop internal processes, and to increase customer engagement and savings.

Combined Heat and Power (CHP)
Efficiency Vermont, in concert with private design professionals and supply chain contacts, invested in the development of a multiphase assessment and comprehensive design of a CHP system at a large commercial facility. The assessment phase was completed in 2017, and the design phase initiated. The system was expected to be operational in 2018.

2.3 SERVICES TO HOMES

2.3.5 EXISTING MARKET-RATE HOMES

Single-Family Homes
Following the efforts of the Efficiency Vermont–led Building Energy Labeling Working Group, Vermont Realtors adopted the inclusion of a home energy information form for all homes sold after July 1, 2017.

Efficiency Vermont supported a network of 63 Home Performance with ENERGY STAR contractors—working within 49 Vermont companies—who are trained and certified to perform energy efficiency home improvements. In 2017, Efficiency Vermont provided:

- Tiered financial incentives, and financing through lending institutions, for homeowners who completed projects with certified contractors
- Financial incentives to contractors for completed projects

- Coordination with VGS and BED regarding Home Performance with ENERGY STAR projects in their respective service territories
- Support by phone to help customers complete projects and to develop long-term plans for achieving comprehensive energy efficiency improvements
- Marketing and outreach campaigns promoting the benefits of working with certified contractors and informing homeowners about available incentives and financing options
- Online customer information
- Contractor services, discussed in Section 2.4.3.

Efficiency Vermont also delivered community-based initiatives, such as the 2017 statewide "Button Up Vermont" campaign, designed to motivate home weatherization and adoption of energy-efficient products. Further discussion of community-based activities can be found in Section 2.4.5.

Multifamily Homes
In service to Vermonters living in rental housing, Efficiency Vermont engaged in efforts designed to motivate rental property owners to take energy-saving action. Efficiency Vermont provided owners with technical and financial support for the installation of efficient equipment and for thermal improvements completed by certified Building Performance Institute contractors. In 2017, to optimize the effectiveness of its services to owners of non-subsidized multifamily housing, Efficiency Vermont conducted a market evaluation, which identified opportunities in: 1) addressing owners' needs across their portfolio of buildings, including non-multifamily properties; and 2) aligning customer incentives across building types, when possible, to improve the customer experience.

2.3.6 Existing and New Low-Income Housing

Efficiency Vermont undertook its efforts in service to low-income households in collaboration with long-standing partners: 1) low-income housing and service providers, including the Vermont Foodbank and agencies of Vermont's Weatherization Program; 2) affordable housing funders, including the Vermont Housing and Conservation Board (VHCB) and the Vermont Housing Finance Agency; and 3) multifamily housing developers, including Housing Vermont.

In 2017, Efficiency Vermont engaged in the following:
- Installation, as applicable, of lighting, appliances, heat pump technologies, and cost-effective custom measures in designated high-use, low-income households
- Distribution of efficient lighting and energy savings kits through the Vermont Foodbank
- Improvement of the energy efficiency of multifamily and single-family buildings housing low-income Vermonters in coordination with low-income housing providers

and 3E Thermal, and via targeted electrical and thermal measures implemented through agencies of Vermont's Weatherization Program

- Application of design and construction approaches that result in housing exceeding Vermont's Residential Building Energy Standards attained by partnering with Vermont's network of nonprofit affordable housing providers
- Technical and financial support for new construction and major renovations of multifamily properties developed by Vermont's affordable housing delivery network, which uses state and federal subsidies
    - Notable in 2017 was the completion of the first affordable housing in Vermont to receive Passive House certification—a 30-unit senior housing facility in Milton that was recognized as the country's best new passive building and best senior housing by the Passive House Institute US.
- Identification and implementation of innovative measures in targeted high-performance multifamily buildings to support the achievement of net-zero goals
- The awarding of Community Energy Partnership grants to six nonprofit, low-income service providers to help them support their clients in identifying and making energy efficiency improvements
- Provision of a zero energy modular (ZEM) home option for low- and moderate-income home buyers in partnership with VHCB and Vermod (a Vermont modular-home builder). Notable 2017 ZEM activities included the following:
    - Efficiency Vermont engaged in successful efforts—in collaboration with BED—to include a new "cottage" model ZEM in a Burlington housing cooperative.
    - Efficiency Vermont, in collaboration with Lamoille Housing Partnership, completed an 11-unit, affordable rental ZEM mobile home replacement project in Caledonia County.
    - Efficiency Vermont worked with the Vermont Manufacturing Extension Center, the High Meadows Fund, and Vermod to identify best practices in ZEM home construction and customer service. This work will be open-source for the benefit of future ZEM builders around the country.
    - Efficiency Vermont secured an agreement with the Lamoille Housing Partnership to complete the first Leadership in Energy and Environmental Design (LEED)-certified ZEM home; installation was planned for a Caledonia County neighborhood of ZEM homes.
    - Launched an effort with the Randolph Area Community Development Corporation to create a portable ZEM model unit to better enable Vermonters to view a ZEM home; completion of the unit was expected to take place in 2018.

2.4 Activities In Service To Multiple Customer Sectors

While serving specific markets, as described above, Efficiency Vermont also provided services that had an impact on multiple sectors. A key element of this cross-sector approach was Efficiency Vermont's ongoing partnering with the businesses that Vermonters turn to for

efficient products and services. These partnerships, although not always evident to the general public, have a profound impact on all Vermonters' ability to lower energy use in their homes and places of business. Efforts made with these providers included workforce development training, coordinated planning, information exchange, quality assurance, financial incentives, and promotional activities. These partnerships enabled Vermont homes and businesses to have access to a valuable network of knowledgeable providers while strengthening these providers' bottom line.

2.4.1 New Construction Services

Efficiency Vermont's support for the creation of efficient new buildings continued to focus primarily on the professionals engaged in architectural design and construction. These individuals included architects, engineers, specialty design service providers, construction tradespeople, equipment suppliers, installation contractors, commissioning agents, appraisers, lenders, developers, and real estate agents. Efficiency Vermont also worked with homeowners who preferred to engage directly rather than through their builders, and with building owners who were key members of teams undertaking construction projects by institutions, government agencies, and large businesses with multiple buildings. Efficiency Vermont recognized and publicized exceptional achievement in new construction through its annual *Best of the Best* awards.

Business New Construction

Efficiency Vermont delivered services to encourage a comprehensive approach to efficient design, integrating energy efficiency decisions and including energy goals as part of the overall construction strategy from the earliest stages of a project. Services included:

- Technical assistance throughout the design, construction, and post-construction phases
- Tiered services for specific building performance levels, including net zero
- Designated energy consultants as single points of contact for the most active design professionals in the state.

Residential New Construction

To support Vermonters' varied efficiency aims for their new single-family and multifamily residential buildings, Efficiency Vermont offered training for builders through the Efficiency Excellence Network (Section 2.4.3), technical guidance, financial assistance, and energy rating services in alignment with ENERGY STAR, LEED, the National Green Building Standard, and net-zero-ready standards. To assist builders in meeting and exceeding Vermont Residential Building Energy Standards, while promoting low-load and net-zero building practices, Efficiency Vermont provided services in support of the construction of homes meeting specific levels of energy performance:

- Efficiency Vermont Certified: Homes exceeding Vermont code requirements and meeting Efficiency Vermont prescriptive requirements for energy efficiency. ENERGY STAR certification and home energy ratings were offered as options.

- Efficiency Vermont Certified Net-Zero-Ready High-Performance: Homes meeting elevated criteria for comprehensive energy efficiency and suitability to achieve net-zero energy use with the incorporation of renewables.
- High-Performance Modular Homes: Vermont-built modular homes meeting high-performance criteria for low energy use, durability, health, and safety.

New Construction Information and Education

Efficiency Vermont provided energy efficiency training and information to professionals and tradespeople involved in construction and renovation projects through the Efficiency Excellence Network (discussed in Section 2.4.3), and through the Energy Code Assistance Center and annual Better Buildings by Design Conference (discussed in Section 2.5.1).

2.4.2 Retail Efficient Product Services

Efficiency Vermont's services were designed to increase availability and knowledge of quality efficient products and to reduce purchase costs in order to motivate Vermonters to select efficient models of products for their homes and businesses. A notable example of public education efforts in 2017 was an extensive campaign—in stores and through traditional and online media—to help consumers distinguish quality LEDs from low-quality products entering the marketplace.

Efficiency Vermont provided support for a range of consumer products that met or exceeded efficiency standards set by the U.S. Environmental Protection Agency's ENERGY STAR program, including lighting, appliances, heating and cooling equipment, dehumidifiers, pool pumps, electronics, and smart thermostats.

Support included rebates, buy-downs and markdowns at the manufacturer and retail level, point-of-purchase information, advertising, and promotional and public information activities, including events at retail locations. An essential element of Efficiency Vermont's efforts continued to be services to retailers and to partners in the product supply chain to ensure the availability of high-quality efficient products in Vermont stores. Efficiency Vermont continued to play a role in regional and national efforts regarding efficient product specification and emerging products of benefit to Vermont through its engagement with NEEP, CEE, Attachments Energy Rating Council, and ENERGY STAR, and as a participant or lead on teams of the U.S. Environmental Protection Agency's Retail Products Platform.

2.4.3 Services to Contractors and Equipment Suppliers

In 2017, Efficiency Vermont continued:

- Engagement with manufacturers, distributors, and suppliers to reduce equipment purchase costs, ensure Vermont product availability to contractors and consumers, and reduce lead times for product ordering
- Collaboration with manufacturers regarding emerging and rapidly advancing efficiency technologies

- Account Management of Vermont stores in retail chains, targeting store owners, managers, and staff to ensure implementation of promotional agreements established at the corporate level
- Assistance to independent and chain retailers, including merchandising support, guidance on efficient product differentiation on the sales floor, and product knowledge training
- Training and support for installers, to help them increase the use of new, efficient technologies and approaches
- Promotions focusing on targeted products
- Creation of opportunities to earn education credits for HVAC system designers, equipment installers, and service technicians through Efficiency Vermont's Better Buildings by Design Conference (see Section 2.5.1)
- A designated website, providing information about available services, training, and business opportunities, at www.contractors.efficiencyvermont.com
- Listings of contractors and homebuilders at www.efficiencyvermont.com.

The Efficiency Excellence Network

In addition to the above, Efficiency Vermont coordinated the growing Efficiency Excellence Network, providing homebuilders and contractors (electrical, heating, ventilation, air conditioning, refrigeration, heat pump, and building improvement) with the following benefits to support members in identifying and promoting efficient approaches for their customers:

- Specialized training sessions
- Professional certifications, in affiliation with the Building Performance Institute, to deliver retrofit efficiency services to Vermont homes (Home Performance with ENERGY STAR contractors) and small businesses and rental properties (Building Performance contractors)
- Consumer financial incentives and third-party financing options for projects completed by Efficiency Excellence Network contractors
- A point person to provide support and information
- Specific member cooperative advertising opportunities
- Network affiliation in consumer listings on www.efficiencyvermont.com.

2.4.4 Trade Association Partnerships

In addition to engaging in direct customer interaction, Efficiency Vermont worked with professional and trade member organizations representing a wide range of constituents. Efficiency Vermont was able to inform business customers about best practices via these trusted channels and targeted messaging resonating with each market's particular priorities.

2.4.5 COMMUNITY-BASED ACTIVITIES

Throughout the state, Efficiency Vermont engaged with Vermonters in their communities in efforts to reduce energy use in their businesses, homes, institutions, and municipal facilities. Efforts included:

- Targeted Communities, a community-wide, cross-market pilot initiative in three towns—Morrisville, Newport, and Vergennes—in coordination with the Vermont Department of Housing and Community Development, community development corporations, local municipalities, schools, and businesses.
- The Efficiency Vermont Speakers Bureau, launched in the first quarter, presenting 25 educational workshops in 2017 for the general public and for employees in work settings.
- Participation in the Vermont Council on Rural Development (VCRD) Vermont Climate Economy Model Communities Program—in partnership with the VCRD and GMP—launched to help communities identify and implement priority actions that increase economic vitality and affordability. Middlebury and Pownal were selected to participate.
- The 2017 Button Up Vermont campaign, which engaged residents in 31 communities to take at least one action to reduce heating and cooling costs. Efficiency Vermont launched the campaign in partnership with BED, Green Mountain Power Corporation (GMP), Capstone Community Action, the Energy Action Network's Brighter Vermont initiative, NeighborWorks of Western Vermont, Vermont Energy and Climate Action Network, VGS, Vermont Public Power Supply Authority, Washington Electric Cooperative (WEC), and local retailers.
- Vermont Community Energy Partnership grants, supporting six Vermont nonprofit organizations to help their low-income clients reduce energy use.
- eVolve Panton, in collaboration with GMP, focusing on helping homeowners and the municipality move toward energy transformation through total energy solutions.

2.4.6 FINANCIAL SERVICES

In its ongoing commitment to help Vermonters overcome financial barriers to investing in cost-effective efficiency for their buildings and equipment, Efficiency Vermont engaged in the following efforts in 2017.

Product and Service Price Reductions

To motivate Vermonters to make energy-efficient choices in the marketplace, Efficiency Vermont targeted specific products and services for purchase price reductions. Primary mechanisms were: 1) negotiated cooperative promotions that provided incentives to manufacturers, distributors, and retailers—both independent and chain stores—to lower the purchase price of products; and 2) rebates and financial incentives for:

- Efficient products and equipment purchased at the retail level and through commercial suppliers and installation contractors

- Process equipment for such businesses as farms, manufacturers, and industrial facilities
- The incorporation of advanced, cost-effective techniques and approaches that enable the design and construction of high-performance residential and commercial buildings
- Thermal building upgrades made by Building Performance contractors in small commercial and multifamily properties
- Comprehensive home improvement projects conducted by Home Performance with ENERGY STAR contractors.

Financing for Energy Efficiency Projects

Efficiency Vermont continued to work with lending institutions to ensure the availability of cost-effective financing that includes energy savings in the repayment formula. Efficiency Vermont provided technical and financial analysis, promotions, and informational support for customers. Efficiency Vermont engaged with a range of financing vehicles, including the following, which customers acquired through lending institutions:

- Business Energy Loan: Increasing businesses' opportunities to finance efficiency projects. In the third quarter of 2017, Efficiency Vermont and Vermont State Employees Credit Union agreed to double the maximum loan size to $50,000 and the maximum loan term to 10 years.
- Municipal Tax-Exempt Leasing: Opportunities for municipalities to make energy-saving upgrades, in facilities such as K–12 schools, without raising budgets or establishing bonds.
- Heat Saver Loan / Efficiency Excellence Network Partnership: Financing for heating system replacements and comprehensive thermal efficiency projects through Efficiency Vermont's Efficiency Excellence Network and in partnership with the Vermont Department of Public Service (Department). In 2017, Efficiency Vermont, the Department, and credit union partners engaged in discussions that resulted in a decision to transition administration of the Heat Saver Loan program from the Department to Efficiency Vermont in 2018.
- Property Assessed Clean Energy (PACE): Home loans secured by a property lien. Efficiency Vermont conducted an evaluation of the offering and concluded that uptake was slow owing to growth in the diversity of financing products. Because of this market evolution, Efficiency Vermont determined that as of 2018, it will no longer administer, or seek to obtain funding from investors for, new PACE financings. Efficiency Vermont determined that it will continue to administer existing PACE financings.
- Agricultural Energy Efficiency Loan: Providing agricultural facilities with low-interest financing.

Financing Education and Analysis

To enable Vermonters to be aware of, understand, and make decisions regarding financing options, Efficiency Vermont provided financing information to targeted sectors—such as

rental property owners—and offered information through community workshops, by phone, on its website, and in media placements. Efficiency Vermont also continued to provide financial analysis for custom projects, to offer tools helping retrofit contractors present financing options to their customers, and to make discussion of cost-effective financing a standard part of service to customers lacking capital for beneficial upgrades.

Financial and Leveraged Product Development
Efficiency Vermont continued its efforts to: 1) increase financing opportunities for Vermonters engaged in energy efficiency projects; and 2) leverage public and private resources to draw new funding for energy efficiency efforts without additional ratepayer investment. These efforts are discussed in Section 2.5.5.

2.4.7 Coordination with Distribution Utilities

Efficiency Vermont:

- Worked with VGS and BED to ensure coordination in the implementation of efficiency services as well as in specific initiatives, such as those connected to the advanced metering infrastructure and home energy controls.
- Maintained its coordination with GMP in the implementation of services through the GMP Community Energy & Efficiency Development (CEED) Fund. These efforts offer GMP customers unique services as well as shared services, through which GMP invests in existing Efficiency Vermont programs.
- In support of DU efforts to meet the specifications of Vermont legislative Act 56 (creating the Renewable Energy Standard [RES] authorizing DUs to implement programs to achieve fossil fuel reduction targets), coordinated with DUs to ensure alignment of new DU-specific efficiency services with Efficiency Vermont's statewide offerings, in order to maximize the value delivered to ratepayers. In support of joint RES Tier III (Tier III) programs, Efficiency Vermont:
    - Engaged with distribution utilities to develop strategies for meeting 2017 Tier III energy transformation goals
    - Implemented data sharing for joint Tier III services with Vermont Electric Cooperative (VEC), WEC, and GMP to measure and monitor shared savings results
    - Launched co-branded marketing campaigns with VEC, WEC, and GMP promoting efficient HVAC equipment and the Home Performance with ENERGY STAR service
    - Submitted the annual report summarizing 2016 Tier III Technical Advisory Group activities
    - Facilitated the 2017 Tier III Technical Advisory Group process
    - In the spirit of improved coordination and collaboration, engaged in ongoing communications with DUs from across the state, including BED, GMP, VEC, WEC, Stowe Electric Department, and Vermont Public Power Supply Authority to identify:
        - Gaps or redundancies in services
        - Impacts of Efficiency Vermont and DU efforts
        - Future value propositions

- Opportunities for partnerships
- Data sharing means and methods.

2.4.8 State, Regional, and National Partnerships

In service to Vermonters and in support of the State's energy goals, Efficiency Vermont continued to leverage the expertise and resources of entities engaged in a range of energy and efficiency endeavors, both in Vermont and outside the state. Efficiency Vermont shared its own expertise at regional and national gatherings, enabling Vermont to be both recognized for its innovations and informed by best practices in other states. In Vermont, partners included the High Meadows Fund, the VHCB, the Regulatory Assistance Project, and many others. On a regional and national level, Efficiency Vermont maintained ongoing partnerships with such organizations as NEEP, the New Buildings Institute, CEE, the Construction Specifications Institute, ENERGY STAR, the Compressed Air Challenge, and the American Council for an Energy-Efficient Economy, working to share information on best practices and to establish uniform product eligibility criteria and program designs.

2.4.9 Resource Acquisition Research & Development

Efficiency Vermont continued 2015–2017 performance period efforts to determine the potential for achieving verifiable, cost-effective energy savings from behavior-based energy efficiency services. These services were designed to motivate customers to reduce their energy use by empowering them with knowledge about: 1) their energy use and the benefits of energy use reduction; 2) the connection between their actions and their energy use; and 3) ongoing energy use management approaches and benefits. Efforts were also designed to demonstrate rigorous measurement and verification approaches for quantifying savings and determining cost-effectiveness for behavior-based energy efficiency, and to test data collection and analysis processes. Efficiency Vermont's 2017 activities follow.

Home Energy Reports

This pilot initiative provided individualized, comparative electric usage information and energy-saving tips to 100,000 GMP residential customers through mailed and e-mailed reports. The pilot also provided each participant with a private, secure web portal. Efficiency Vermont paused the initiative for market testing in order to improve the customer experience. Efficiency Vermont then redesigned the reports to eliminate a neighbor-usage comparison component, which was a key driver for electricity savings but which customers disliked. After delivery of the reports was renewed, customer satisfaction increased, but the initiative no longer acquired sufficient savings to be cost-effective. As a result, Efficiency Vermont made the decision not to renew the effort in 2018.

Continuous Energy Improvement Pilot

CEI was undertaken as an approach to reducing energy intensity over time for large commercial and industrial customers through behavioral and operational changes. The pilot engaged two cohorts: 1) large commercial and industrial facilities, hospitals, and ski areas;

and 2) a cohort focused on industrial ammonia refrigeration. Efficiency Vermont provided participants with training, software tools, and metering equipment for real-time energy use feedback and management, and assessments of energy-saving opportunities. Efficiency Vermont submitted usage data changes and causes to the Department's evaluator and recruited a third cohort to focus on chilled water systems in 2018.

Research into Behavior Savings in New Markets

To identify and test methods of capturing behavior savings, Efficiency Vermont focused on three research initiatives:

- CEI Lite: Researching the cost-effectiveness, for small and medium-sized businesses, of lower-cost versions of approaches proven successful with the state's largest energy users. Implementation was launched, with an identified treatment group of 5,000 customers, through inquiries regarding interest. Despite a strong response, actual participation was low. Efficiency Vermont identified two barriers to participation and to acquiring complete and detailed data: 1) separate metering of multiple utility accounts in a single building; and 2) complexity of rates.
- Realizing Behavior Changes in Multifamily Buildings: Partnering with five housing authorities around the state and BED to deliver electricity savings to renters with limited resources. In 2017, Efficiency Vermont launched this effort in the form of an energy savings competition—with a sweepstakes prize of free rent—providing residents of a building with savings tips and the ability to gauge their progress in comparison to the anonymous results of neighbors. Efficiency Vermont measured consumption-based savings through energy models and surveyed residents to tie savings to actions taken. Initial results showed positive customer satisfaction and indicators of savings. Plans for implementation in 2018 were pending Department evaluation of savings and internal evaluation of customer satisfaction.
- Digital Engagement: Measuring the efficacy of engagement platforms and fitting them into overall Efficiency Vermont data strategies. Efficiency Vermont installed monitors in just over 200 homes throughout Vermont, using the data to determine their ability to identify electricity savings. Efficiency Vermont also began development of a program that uses the real-time energy use data of individual pieces of equipment, in an effort to identify specific energy-saving actions participating households could take.

Data Analytics

Using Efficiency Vermont's integrated data storage and analytics platform, this research aimed to develop and implement streamlined processes in order to deliver recommendations and savings estimates, and to verify results with customers. Efficiency Vermont also investigated the power of this information—and the power of the tools developed to understand it—to enhance customer engagement, motivate customer action, and capture energy savings. Efficiency Vermont engaged in significant efforts designed to increase DU data transfer and to make the platform scalable so it could accommodate more data, and to identify and implement approaches that would optimize service to customers.

2.5 DEVELOPMENT AND SUPPORT SERVICES

Efficiency Vermont engaged in efforts that built customer awareness and knowledge, helped shape energy and efficiency policies, and identified approaches for optimal service development, delivery, and improvement. These efforts continued to be essential to Efficiency Vermont's efforts to deepen energy savings and to have a lasting, positive impact on Vermont households, businesses, institutions, and communities.

2.5.1 EDUCATION AND TRAINING

Codes and Standards Support—Residential and Commercial / Industrial
Efficiency Vermont provided technical support and information about Vermont's commercial and residential energy codes to Vermont construction tradespeople, building design professionals, property owners, municipal officials, realtors, building supply firms, and equipment suppliers. Information was provided through training sessions held throughout the state, delivery of code handbooks and materials, and conversations with callers to the Energy Code Assistance Center.

Energy Literacy Project
Efficiency Vermont worked to inspire lifelong commitment to energy efficiency, conservation, and environmental stewardship in Vermont's next generation by creating greater awareness and understanding of energy and the impact of energy consumption. Efficiency Vermont conducted education activities in all 14 Vermont counties, with a particular focus on outreach to communities with a higher-than-average energy burden. The Vermont Energy Education Program, under contract with Efficiency Vermont to implement this project, supported educators in enhancing school curricula and increasing student awareness of and advocacy for energy-related issues in their schools and communities. The primary goals of the Energy Literacy Project continued to be to:

- Promote energy education and literacy in Vermont's K–12 schools
- Affect energy-related behaviors of students and staff at school
- Encourage students and staff to apply their learning at home and to participate in Efficiency Vermont, VGS, and BED efficiency services.

General Public Education
To motivate and empower the general public to take energy-saving actions, Efficiency Vermont engaged in activities designed to increase public awareness of: 1) energy efficiency and its benefits; 2) actions that lower energy use; and 3) Efficiency Vermont as a resource for comprehensive energy efficiency solutions. Methods included:

- Provision of information and promotions via print, broadcast, web-based, and social media
- Engagement of customers through access, at www.efficiencyvermont.com, to recommendations on efficiency actions, online rebate applications, information about efficient technologies and approaches, identification of qualified local service

providers, locations of retailers selling efficient products, and information on a range of other efficiency and energy topics
- Dissemination of information at a variety of events, including home shows, community events, fairs, and trade shows.

Better Buildings by Design Conference
Efficiency Vermont presented its annual Better Buildings by Design Conference in February. This two-day design and construction conference is a key resource to more than 1,000 construction and design professionals, and equipment installation and service contractors. The conference focused on the latest energy-efficient techniques and technologies for new and renovated high-performance residential and commercial buildings, mechanical systems, and lighting. In addition to 40 workshops and hands-on demonstrations given by industry leaders, the conference hosted a trade show of 50 exhibitors of efficient technologies and services for the design / build industry. The 2017 keynote speaker, architect Ann V. Edminster, is a nationally recognized expert on net-zero and green home design and construction and a principal author of the LEED residential rating system.

Customer Support
Vermonters continued to have easy access to expert guidance and information through Efficiency Vermont's multichannel contact center, which utilized phone, e-mail, and live chat communications to provide:
- Help for commercial and residential customers in understanding their energy use and engaging in energy management
- Information related to efficient buildings and equipment and to Efficiency Vermont's services
- Assistance in finding knowledgeable Vermont contractors, builders, and designers, and sellers of qualified efficient products and equipment in support of customers' efficiency projects
- Referrals to resources such as Vermont's Weatherization Program, the Renewable Energy Resource Center, the Energy Code Assistance Center, VGS, and electric distribution utilities.

2.5.2 Applied Research and Development

Efficiency Vermont engaged in a range of research and development projects to gather information on areas with potential for inclusion in future programming.

Emerging Data Services
To strategically plan for the optimal use of data in service to customers, planners, and policy makers, Efficiency Vermont explored new strategies, techniques, and / or technologies that showed promise for increasing energy savings, facilitating targeted segmentation, decreasing delivery costs, or increasing customer engagement and satisfaction. In 2017, Efficiency Vermont:

- Integrated a submeter deployment planning and tracking system with a submetering data analysis application to decrease the delivery costs of energy analysis
- Developed a prototype batch computer process to calculate and aggregate metrics about energy use across the customer portfolio
- Developed a prototype application to create targeted customer lists by portfolio segmentation using batch-produced metrics
- Conducted research into methods for automatically inferring operating schedule and hours from energy data to use for energy modeling, targeting, anomaly detection, and corroboration of customer data
- Developed a prototype computer library and calculator for estimating energy cost from rate information to more accurately assess savings predictions and provide customer engagement and satisfaction
- Developed a computer framework for storing, calculating, and recalculating metrics derived from energy data for use in reporting and scenario planning
- Expanded capabilities to perform weather modeling, normalization, and savings estimations based on advanced Uniform Methods Protocol definitions and industry standard methods
- Engaged in the development, refinement, and exploration of multiple applications, methods, and tools.

Technology Demonstrations

Efficiency Vermont engaged in activities intended to advance the goals of sound product and service design over time through field testing, technology demonstrations, and research on emerging technologies and implementation strategies. Efficiency Vermont maintained a webpage at www.efficiencyvermont.com/news-blog/whitepapers, providing the public with access to information about technology demonstration efforts. An overview of 2017 activities follows.

Exploring the Water–Energy Nexus in Vermont: Electricity used for water pumping can be wasted either at the utility level, resulting in lost revenues, or at the customer level, resulting in the overuse of pumps for well and septic systems. Efficiency Vermont worked with the Vermont Department of Environmental Conservation (DEC) to understand its existing municipal leak detection program and examined existing data to identify costs and savings. Efficiency Vermont determined that there was a viable opportunity to achieve statewide savings by addressing leaks at the municipal level and engaged in discussion with the DEC regarding partnering to enhance existing DEC services.

Zero Energy Homes Data Study—Phase II: This study was undertaken to determine the extent of building envelope improvements necessary to enable renewable sources to supply all energy needs in a home while maintaining comfort needs and healthy indoor air. The study monitored 10 homes that had undergone substantial energy improvements. Results showed that: 1) indoor temperatures vary among different spaces in zero energy homes; 2) a rooftop photovoltaic system is generally inadequate to completely balance a home's energy needs,

and Vermont's current net metering regulations provide no incentive to balance this equation; 3) although it's possible to undertake a zero energy retrofit by simply adding heat pumps and solar to a typical Home Performance with ENERGY STAR project, such a simplified approach misses an opportunity to leverage energy work for home renewal, and leaves the home far short of industry standards for evenly distributed conditioned air in a home; 4) air-to-water and mini-ducted heat pumps need cold-weather and efficiency improvements before they are good candidates for a zero energy home; 5) embedding energy improvements as part of a home improvement project would likely result in greater cost-effectiveness of deep energy retrofits and zero energy retrofits.

Testing the Value of Energy Efficiency in the Renewable Ramp Challenge: As the electricity grid increasingly accommodates solar electricity, a problem is emerging: At sunset, non-solar sources of electricity must quickly ramp up. This limits choices for power plants providing the post-sunset electricity and is difficult for traditional power grids to accommodate. In this study, Efficiency Vermont analyzed the effectiveness of specific energy-efficient equipment upgrades in flattening the loads of Vermont businesses and residences. These measures and results were: 1) clothes washers and dryers—minimal effect; 2) refrigerators—slight positive effect; 3) freezers—an excellent vehicle for alleviating the curve; 4) LED lighting—consistent alleviation of the system coincident peak, especially during the coldest weather; 5) cold climate heat pumps—while calculated to improve curve scores on the whole, this measure added to the morning ramp in warm weather (because water heaters have a nearly flat load shape) and improved scores by increasing usage in the early morning hours.

Existing Homes Non-Energy Benefit Study: Anecdotal evidence suggested that many participants in energy efficiency programs value the non-energy benefits more than the energy savings associated with their efficiency retrofits. These benefits can include greater comfort, safety, noise reduction, and healthcare savings. Currently, Efficiency Vermont's program cost-effectiveness calculation does not count some non-energy benefits because these benefits are difficult to quantify and monetize. To identify, and measure the value of, non-energy benefits resulting from efficiency improvements, Efficiency Vermont surveyed 319 customers who had completed Home Performance with ENERGY STAR projects. The survey revealed that participants valued combined non-energy benefits at 150 percent of the value of energy cost savings; that is, cost savings accounted for 40 percent of the total perceived value of participants' home improvements and combined non-energy benefits accounted for 60 percent.

Demonstrating Electric Transit Vehicles in Vermont: Efficiency Vermont analyzed the costs and fuel use resulting from the deployment of an electric public-transit vehicle to determine the impact of this technology in Vermont. Efficiency Vermont worked with a transit-vehicle manufacturer to deploy an electric model through a local transit authority for seven weeks. Data was collected on operating costs, electricity use, fossil fuel displacement, energy efficiency gains (expressed in Btu) and cost savings. Qualitative data was also collected from drivers and mechanics so Efficiency Vermont could evaluate their perceptions and experience. The primary learning objectives were met during this research project. Highlights

included identifying variables that impact vehicle efficiency that can inform a strategy for incorporating electric transit buses into an energy efficiency framework. In addition, transit operators' positive experience with this new technology was documented, and concerns about cold weather performance were addressed. An understanding of the barriers to electric transit bus adoption, as well as the partnerships needed to advance the technology, were also observed and documented. Key outcomes of the project included the relative importance of the operating environment on the efficiency of the vehicle, validation that the technology can operate well in Vermont weather conditions, and the importance of combining resources and technical assistance from both the transportation and energy sectors that are required to make such a collaboration possible.

Leveraging Modeling Software to Implement Efficient HVAC and Refrigeration Systems: This project was undertaken to evaluate variable refrigerant flow (VRF) and refrigeration technologies through the use of building energy modeling software tools. VRF is an energy-saving technology that enables heating and cooling equipment motors to move refrigerant at varying speeds by responding to need rather than being run constantly. The software used was OpenStudio, a free, flexible energy modeling interface developed and supported by the U.S. Department of Energy and the National Renewable Energy Laboratory. This project aimed to achieve more accurate and customizable analysis while providing consistent, repeatable processes for Efficiency Vermont. The measure writing component of the project was contracted to Performance Systems Development (PSD), an expert at writing OpenStudio measures and creating work flows based on those measures. PSD delivered a fully packaged set of measures to carry out the VRF calculation that can be accessed via a DOS prompt or run natively in OpenStudio. Efficiency Vermont developed a specification for the VRF tool, and tested the measures and work flow that were developed. Two example projects were run in the tool, one for a medium-sized office building and one for a mid-rise apartment building. The effort provided a foundation for research into VRF for other purposes such as Technical Reference Manual measure development, developed the capability to interface directly with an internal calculation engine, and identified opportunities for further research into refinements and improvements.

Testing Electric Bikes as an Energy Efficiency Measure: In partnership with local bicycle organizations and retailers, Efficiency Vermont set out to gain increased knowledge on new owners' selection decisions and their satisfaction with their purchase after using their electric bicycle (e-bike) for a series of months. E-bike options range from small battery / light assistance to larger batteries / significant pedal assistance enabling constant 20 to 30 mile-per-hour speeds. This effort was designed to help Efficiency Vermont: 1) better understand the status of e-bike use in Vermont; 2) identify the energy efficiency of various models; and 3) develop a framework to characterize and evaluate the various e-bike equipment available in Vermont. In 2017, Efficiency Vermont conducted a survey of e-bike owners; more than 90 owners completed the survey. Results showed that ownership is increasing in Vermont, especially around urban areas. E-bikes were shown to displace meaningful amounts of driving miles, and to be much more efficient than electric or conventional cars. However, e-bikes were also found to consume very little electricity relative to their up-front costs, indicating

that incentives to promote more efficient e-bike models would be impractical. However, research indicated that the large battery chargers that are paired with e-bikes may waste more energy than the bicycles themselves use. These battery chargers for e-bikes—and for other large equipment—showed sufficient efficiency opportunity to warrant further research.

Paying Energy Arrearage through Savings: This study focused on the concept of using energy savings to pay overdue energy bills, to prevent utility shut-offs, and to lower the energy burden for low-income households. To determine the feasibility of including this approach in future program offerings, Efficiency Vermont researched existing arrearage and savings programs and identified two industry best practices that helped frame the remainder of the research: 1) offering discount rates (authority rests with individual distribution utilities in Vermont); and 2) running an arrearage management program for low-income customers (regulatory authority is not required in Vermont). With the November 2017 order issued by the Vermont Public Utility Commission (Commission) to explore and discuss cooperative approaches among utilities, regulators, social service agencies, and providers of energy efficiency services, Efficiency Vermont looks forward to opportunities for greater collaboration with utility partners to deliver clean energy services that help financially vulnerable neighbors gain more financial stability by minimizing their energy burden.

Predictive Control Strategies for Building Management Systems: The exploration of this topic evolved over two years. Efficiency Vermont initially launched research to validate the energy-saving potential of predictive control strategies in building management systems, using forecasted outdoor temperatures to determine when a heating system would come on. This effort expanded to became a study utilizing HVAC systems to identify benefits both to the customer and to electric grid use optimization. In 2017, Efficiency Vermont began a pilot initiative to test the cost-effectiveness of a predictive weather approach with a customer's ice storage HVAC system. This is a system designed to make ice during periods of lower-cost electricity for use in space cooling—instead of air conditioning—during periods of higher-cost electricity. Efficiency Vermont discovered that owing to the customer's time-of-use electricity rate structure, the ice storage system was not resulting in significant energy cost savings for the customer. The ice storage system would, therefore, not provide meaningful data for the pilot initiative, which was stopped. Efficiency Vermont began discussions with the customer and its DU to identify rate structures of benefit both to the customer and to electric grid use optimization.

2.5.3 Planning and Reporting

Annual Plans and External Reporting

Efficiency Vermont prepared and submitted required documents to the Commission, the Department, and other stakeholders. The below documents were presented in fulfillment of requirements specified under agreements with state agencies, to maintain accountability and to provide accurate tracking of progress for service delivery optimization, for public benefit, and for the benefit of entities outside Vermont seeking replication.

- Triennial plan 2018–2020
- Annual savings claim summary and annual report
- Annual highlights and budget overview documents
- Monthly and quarterly reports
- Quarterly and annual budget variance reports
- Service quality reports
- Quarterly customer complaint and feedback reports
- Department monthly invoice reviews
- Ad hoc reporting requests

Efficiency Vermont also engaged in activities, as noted below, with the following entities:

- Regional Greenhouse Gas Initiative (RGGI): Providing fund use information for the RGGI annual report
- American Council for an Energy-Efficient Economy: Providing information and reviewing reports and documents on request
- Energy Action Network (EAN): Maintaining and populating the EAN's online Community Energy Dashboard
- Vermont Agency of Commerce and Community Development: Providing savings data for towns in the Designated Downtowns effort

Demand Resources Plan (DRP)

Vermont Energy Investment Corporation (VEIC), as administrator of Efficiency Vermont, engaged with the Department, the Commission, and other Vermont Energy Efficiency Utilities (EEUs) to collaboratively establish resource acquisition and Development and Support Services budgets, Quantifiable Performance Indicators (QPIs) and goals, and compensation levels related to the delivery of energy efficiency services by EEUs. 2017 marked the completion of the first collaborative modeling process between Efficiency Vermont and the Department in the DRP proceeding, focusing on maximizing ratepayer value in the next performance period.

Participation in State and Regional Integrated Planning

Efficiency Vermont continued its active participation in the Vermont System Planning Committee (VSPC), a collaborative body bringing together Vermont's utilities, Vermont Electric Power Company, the Department, and individuals representing the interests of ratepayers to address approaches to electric transmission system planning and management. In 2017, Efficiency Vermont participated in three VSPC subcommittees: Coordinating, Forecasting, and Geographic Targeting.

Independent System Operator–New England (ISO-NE) Forward Capacity Market (FCM) Administration

VEIC, as the implementer of Efficiency Vermont, continued to represent the interests of Vermont ratepayers by participating in the ISO-NE FCM, in which energy efficiency savings are bid as a resource for the regional grid. VEIC delivered 102.8 MW of peak capacity savings

from Efficiency Vermont activity in the FCM in 2017. This led to approximately $5.8 million in revenues that provided funds for investment in thermal efficiency services. Efficiency Vermont's 2017 FCM commitments represented Vermont's single largest peak capacity provider, increasing grid capacity by lowering demand.

2.5.4 EVALUATION

As an essential part of its reporting efforts, Efficiency Vermont engaged in activities designed to maintain the accuracy of reported savings claims. These activities included the following.

- ISO-NE FCM Metering, Monitoring, and Evaluation: Performing metering, measurement, and evaluation activities related to ISO-NE FCM participation. This process entailed the identification and metering of completed projects, followed by the acquisition of data to confirm projected savings. In 2017, Efficiency Vermont assessed data for 2016 projects spread over 14 sites. Efficiency Vermont filed a verification report to ISO-NE as part of its FCM bid obligations.
- Annual Savings Verification: Coordinating with the Department and its evaluation contractor, Cadmus, to conduct the annual savings verification process. This included portfolio and project data submittal, review of individual project findings, and weekly status meetings.
- Technical Advisory Group: Working with the Department, BED, and other stakeholders to resolve any issues arising from the annual savings verification process, to track the implementation of any recommendations or continuous improvement activities identified via those evaluation activities, and to provide a proactive mechanism for developing energy characterization and savings calculations. In 2017, the Technical Advisory Group reviewed multiple program implementation procedures, including Home Energy Reports and a do-it-yourself pilot approach for Home Performance with ENERGY STAR. Ongoing evaluation activities managed by the Department, including the market baseline assessments and Home Performance with ENERGY STAR thermal evaluation, were also reviewed for scope and results where available.
- Technical Reference Manual (TRM): Maintaining, updating, and ensuring the reliability of the TRM, which characterizes energy-saving measures on the basis of numerous parameters: annual electric savings, annual coincident peak savings, annual fossil fuel energy savings, incremental costs and measure lives, and other applicable resource savings such as water savings and operational and maintenance cost savings. TRM efforts included continuous process improvement activities and quality assurance and evaluations of high-impact efficiency programs and measures. Several measures also underwent a standard reliability review process to ensure all assumptions had been reviewed and updated within the last three years.
- Quality Management: Following rigorous protocols in alignment with QPIs (see Section 3) and with the following areas:
  - Program Implementation Efficiency: Process improvement skills and techniques reached maturity in the final year of the performance period as staff became proficient in the nuanced skills of process analysis, meaningful metric selection, and

consistent monitoring of improvement impact and results. This was documented by Efficiency Vermont's submission of year-end reports on program improvement efforts for 2017 in fulfillment of the Order Determining Quantifiable Performance Indicator Targets for Efficiency Vermont and BED (EEU-2013-01; October 10, 2014, QPI 13, Appendix C, Milestone 2). This completed fulfillment of all required milestone requirements for this QPI for the 2015–2017 performance period.

- Service Quality and Reliability Plan (see Section 3.6), which defines customer service performance standards in four service categories:
  1. General Customer Satisfaction with Efficiency Vermont's Contact Center: Efficiency Vermont engaged in regular collection of data for use in required single-performance-period reporting, after completion of the 2015–2017 period. In total, 90.8% of responding customers were satisfied or very satisfied with Efficiency Vermont Customer Support.
  2. Transactional Customer Satisfaction: Efficiency Vermont surveyed customers upon completion of business projects (prescriptive and custom), residential new construction, and retrofit projects. More than 90% of respondents rated the service as a three or greater on a scale of one to five (five being excellent), exceeding the Service Quality and Reliability Plan performance standard.
  3. Incoming Call Responsiveness:
     - Average speed to answer: Eight seconds.
     - Average percentage of calls answered by a live agent during normal business hours: 89%.
     - Average percentage of abandoned calls: 3%.[9]
  4. Complaint Rate and Resolution: Efficiency Vermont conducted tracking of all customer concerns or comments requiring internal referral and subsequent follow-up for resolution. Results:
     - Percentage of complaint follow-up calls attempted by end of next business day: 100%.
     - Proportion of complaints to participants: One complaint out of 121,950 participants.
     - Percentage of complaints closed within 12 business days of initial complaint: 100%.

2.5.5 Policy and Public Affairs

Public Affairs

Efficiency Vermont provided energy, financial, and economic information and analysis to policy makers, state agencies, utilities, and other key stakeholders. These efforts were undertaken in ongoing support of Efficiency Vermont's statutory and regulatory mandates, the State's Comprehensive Energy Plan goals, and other relevant energy policy goals, and included:

[9]An abandoned call is defined as a call disconnected by a customer who has been waiting in a calling queue for more than 15 seconds.

- Working as a resource for policy makers, regulators, businesses, and community organizations
- Briefing the Legislature and state officials on energy efficiency issues
- Assisting legislators and state officials with review and development of policy proposals related to the Efficiency Vermont scope of work
- Providing expert testimony and input on pieces of legislation consistent with Efficiency Vermont's status as an appointed EEU
- Working collaboratively with distribution utilities on public affairs and communications efforts
- Making presentations at public forums and meetings.

Efficiency Vermont also strategically disseminated information aligned with Vermont energy policy priorities and Efficiency Vermont goals, in order to deepen knowledge of and engagement in energy efficiency actions among targeted populations. Efforts included:

- In-depth discussion of energy issues and their relation to Efficiency Vermont's work, through publication on www.efficiencyvermont.com of:
  - Efficiency Vermont's blog *Energy. Forward.*, providing timely discussion of efficiency activities under way throughout the state and presenting Efficiency Vermont research of value to Vermonters wanting to deepen their involvement in their energy use.
  - A library of white papers developed by Efficiency Vermont, sharing the latest thinking, analysis, and cutting-edge research on the future of energy efficiency.
- Outreach and response to media in developing and publishing stories that raised awareness of Efficiency Vermont program offerings, highlighted the experiences of Efficiency Vermont customers, and educated the public on energy efficiency issues.

Regulatory Affairs (Non-Demand Resources Plan)

In 2017, Efficiency Vermont continued to:

- Work with the Department to write, revise, and maintain governing documents necessary for Efficiency Vermont to operate as a regulated EEU
- Work with RGGI to help inform the model rule, report greenhouse gas reductions as a result of Vermont's RGGI-funded programs, and help maximize efficiency benefits from the regional cap and trade
- Develop and support policy instruments that can serve as useful tools for electricity and thermal energy savings through voluntary action or government adoption
- Pursue regulatory approval of flexible and robust strategies to cost-effectively avoid or control capacity and energy supply in support of electric DU integrated resource planning
- Participate in Commission proceedings with impact on energy efficiency services
- Work with energy efficiency stakeholders to ensure that the State's related regulatory proceedings on clean energy development (e.g., the Comprehensive Energy Plan and the RES) can leverage the expertise of Efficiency Vermont's team in a manner that is cost-effective for the state's ratepayers

- Participate in New England Power Pool discussions on the integration of markets and public policy
- Research regulatory policies to support best practices for efficiency programs
- Ensure regulatory compliance of Efficiency Vermont internal policies.

Financial and Leveraged Product Development
As part of its efforts to bring efficiency within reach of more Vermonters, Efficiency Vermont continued to:

- Manage relationships with financial institutions, utilities, and government leaders to reduce barriers to implementing financing mechanisms for energy efficiency projects.
- Engage in activities designed to acquire public and private resources for Vermonters undertaking efficiency projects in their homes and businesses. This approach multiplies the impact of ratepayer dollars by using a modest amount of funds to draw greater levels of new resources without additional ratepayer investment.

In 2017, Efficiency Vermont:

- Engaged in dialogue with the U.S. Department of Agriculture Rural Development's Rural Utilities Service (RUS) to find an acceptable structure for a loan program to benefit Vermont ratepayers. After evaluation of possible options for meeting RUS requirements contained in a September 2015 commitment letter, it was determined that VEIC, as Efficiency Vermont administrator, was unable to meet the conditions imposed on Efficiency Vermont. This was communicated to the Commission in July, at which time it was requested that the related docket be closed.
- Continued to offer the Green Revolving Fund for Colleges and Universities, leveraging funds through the deployment of private capital as a financing mechanism for efficiency projects on Vermont higher education campuses.
- Participated in Clean Energy Finance Collaborative meetings hosted by the Department.

2.5.6 Information Technology

Efficiency Vermont continued to align technical and information technology staff in a Data and Technical Services division. This division consisted of staff of Strategic Technology Services; Reporting and Analytics; Evaluation, Measurement, and Verification; and Business Solutions groups for the purpose of common management of key data-related processes. Efforts were focused in three areas:

1. Reporting and Analytics: Maintaining a long-standing focus on database management, data warehousing, data quality, and business intelligence development and support in order to meet Efficiency Vermont's regulatory, operational, program, and financial reporting needs.
2. Strategic Technology Services: Deepening Efficiency Vermont's ability to serve Vermonters through software development, data analysis tools, data acquisition, and

integration, as well as continuing best practice data stewardship to ensure customer privacy, security, and alignment with customer data usage preferences.

3. Portfolio Screening Tool: Developing a forecasting and screening tool application to replace the existing portfolio screening tool that supports the DRP Proceeding. The application was originally released in late 2016. 2017 activities focused on additional feature development to support DRP scenario comparisons, TEPF metrics and reporting, and plan metadata and documentation. The software was instrumental in the production of the DRP savings and budget models and for future scenario planning.

2.5.7 General Administration

In support of the efforts discussed in this report, Efficiency Vermont continued to focus on key activities across the organization, including general staff meetings; the coordination of service implementation across different functions; and management, monitoring, and internal communication of overall performance and spending.

3. Resources and Development and Support Services Results

The tables presented in this section contain information on results from both Resource Acquisition and Development and Support Services activity, as well as a summary of Service Quality and Reliability.

3.1 Resource Acquisition Summary

	Total Efficiency Vermont Resource Acquisition	Thermal Energy and Process Fuels Resource Acquisition	Electric Resource Acquisition[1]	Customer Credit Resource Acquisition
Efficiency Vermont Costs				
Year to Date Costs	$56,586,396	$7,402,500	$46,432,156	$2,751,740
Annual Budget Estimate[2]	$55,875,895	$7,405,326	$46,520,738	$1,949,831
Unspent Annual Budget Estimate	($710,501)	$2,826	$88,582	($801,909)
% Annual Budget Estimate Unspent	-1.3%	0.0%	0.2%	-41.1%
Other Costs and Commitments				
Participant Costs Year to Date	$43,225,105	$19,518,721	$23,383,380	$323,004
Third Party Costs Year to Date	$384,826	$291,243	$93,583	$0
Savings Results				
MWh Year to Date	155,773	-18,566	157,942	16,397
MWh Cumulative starting 1/1/15	392,550	-23,238	390,373	25,415
Winter Peak Coincident kW Savings Results				
Winter Coincident Peak kW Year to Date	24,734	-4,518	29,252	0
Winter Coincident Peak kW Cumulative Starting 1/1/15	65,099	-5,305	70,065	340
Summer Peak Coincident kW Savings Results				
Summer Coincident Peak kW Year to Date	17,831	-692	18,523	0
Summer Coincident Peak kW Cumulative Starting 1/1/15	44,687	-950	45,297	340
TRB Savings Results				
TRB Year to Date	$125,151,112	$25,483,247	$95,617,532	$4,050,333
TRB Cumulative Starting 1/1/15	$390,312,507	$62,895,918	$321,004,854	$6,411,736
MMBtu Savings Results				
MMBtu Year to Date	201,836	213,103	-11,267	0
MMBtu Cumulative Starting 1/1/15	426,097	379,926	46,171	0
Participation				
Partic.w/ installs Year to Date	121,957	5,695	116,261	1
Partic.w/ installs Cumulative starting 1/1/15	288,741	12,017	276,723	1

[1] Includes Resource Acquisition Research and Development costs

[2] Annual budgets are estimates only and provided for informational purposes.

3.2 Budget Summary

	Budget Current Year 2017[1]	Actual Current Year 2017	%	Budget 2015-2017	Actual 2015-2017	%
RESOURCE ACQUISITION						
Electric Efficiency Funds Activities						
Business Sector	$ 24,487,485	$ 22,154,822	90%	$ 81,805,167	$ 66,034,187	81%
Customer Credit	$ 1,949,831	$ 2,747,404	141%	$ 3,027,960	$ 3,825,533	126%
Residential Sector	$ 19,530,554	$ 21,844,616	112%	$ 45,561,683	$ 61,314,061	135%
Research & Development	$ 1,680,132	$ 1,612,678	96%	$ 5,004,067	$ 4,936,614	99%
Total Electric Efficiency Funds Activities	**$ 47,648,002**	**$ 48,359,520**	**101%**	**$ 135,398,877**	**$ 136,110,395**	**101%**
Thermal Energy and Process Fuels Funds Activities						
Business Sector	$ 1,890,945	$ 1,126,466	60%	$ 3,593,225	$ 2,828,755	79%
Residential Sector	$ 5,383,442	$ 6,145,144	114%	$ 14,849,700	$ 15,611,411	105%
Total Thermal Energy and Process Fuels Funds Activities	**$ 7,274,387**	**$ 7,271,611**	**100%**	**$ 18,442,925**	**$ 18,440,166**	**100%**
TOTAL RESOURCE ACQUISITION	**$ 54,922,389**	**$ 55,631,131**	**101%**	**$ 153,841,802**	**$ 154,550,561**	**100%**
DEVELOPMENT & SUPPORT SERVICES						
Education and Training	$ 690,943	$ 623,636	90%	$ 1,902,880	$ 1,835,573	96%
Applied Research and Development	$ 537,702	$ 537,143	100%	$ 1,311,000	$ 1,310,441	100%
Planning and Reporting	$ 705,190	$ 703,940	100%	$ 1,585,690	$ 1,584,441	100%
Evaluation	$ 811,227	$ 810,400	100%	$ 2,442,000	$ 2,441,173	100%
Policy and Public Affairs	$ 575,113	$ 572,100	99%	$ 1,998,000	$ 1,994,987	100%
Information Technology	$ 1,449,256	$ 1,425,821	98%	$ 4,368,000	$ 4,344,564	99%
General Administration	$ 275,314	$ 254,702	93%	$ 772,830	$ 752,218	97%
TOTAL DEVELOPMENT & SUPPORT SERVICES	**$ 5,044,745**	**$ 4,927,741**	**98%**	**$ 14,380,400**	**$ 14,263,396**	**99%**
Smart Grid (2014 Carryover)	**$ -**	**$ -**	**0%**	**$ 18,652**	**$ 18,652**	**100%**
Operations Fee	$ 1,079,400	$ 1,090,060	101%	$ 3,028,500	$ 3,038,931	100%
SUB-TOTAL COSTS (prior to Performance-Based Fee)	**$ 61,046,534**	**$ 61,648,932**	**101%**	**$ 171,269,354**	**$ 171,871,539**	**100%**
Performance-Based Fee	$ -	$ -	0%	$ 4,460,245	$ -	0%
TOTAL COSTS (including Performance-Based Fee)	**$ 61,046,534**	**$ 61,648,932**	**101%**	**$ 175,729,599**	**$ 171,871,539**	**98%**

[1] Annual budgets are provided for information purposes only. Efficiency Vermont operates under three-year Board approved budgets.

In accordance with both statutory and Vermont Public Utility Commission requirements, the funding source for Efficiency Vermont's electric efficiency services was separate and distinct from funding sources for efficiency services related to thermal energy and process fuels (TEPF). Electric services were funded through the Energy Efficiency Charge, whereas TEPF services were funded by Vermont's Regional Greenhouse Gas Initiative revenues and by revenues earned from meeting electric capacity commitments (Efficiency Vermont demand savings) bid into the regional grid's Forward Capacity Market (FCM). The Efficiency Vermont administrator—the Vermont Energy Investment Corporation—bid these expected demand savings into the FCM on behalf of the State of Vermont. 2017 FCM activities are discussed in Section 2.5.3.

3.3 Electric Performance Indicators & Minimum Requirements

QPI#	Title	Performance Indicator / Milestone	Target	Status	%
1	Electricity Savings	Annual incremental net MWh savings	321,800	390,373	121%
2	Total Resource Benefits	Present worth of lifetime electric, fossil, and water benefits	$335,509,000	$321,004,854	96%
3	Statewide Summer Peak Demand Savings	Cumulative net summer peak demand (kW) savings	41,300	45,297	110%
4	Statewide Winter Peak Demand Savings	Cumulative net winter peak demand (kW) savings	53,700	70,065	130%
5	Business Comprehensiveness	Savings as a % of baseline year usage for Companies who complete Business Existing Facilities efficiency projects	11.0%	9.7%	88%
6	Market Transformation Residential	Residential new construction project completions with substantial energy savings in 2015-2017 as % of total residential new construction permits in 2014-2016	42%	32%	77%
7	Market Transformation Business	Number of energy efficiency measure supply chain partners linked to at least three (completed) projects	500	640	128%

MPR#	Title	Minimum Requirement	Minimum	Status	%
8	Minimum Electric Benefits	Total electric benefits divided by total costs	1.2	2.0	170%
9	Threshold (or minimum acceptable) Level of Participation by Residential Customers	Total residential sector spending	$32,500,000	$62,417,662	192%
10	Threshold (or minimum acceptable) Level of Participation by Low-Income Households	Total low-income single and multifamily services spending	$10,500,000	$11,310,183	108%
11	Threshold (or minimum acceptable) Level of Participation by Small Business Customers	Number of total non-residential premises with annual electric use of 40,000 kWh/yr or less that acquire kwh savings	2,000	5,197	260%
12	Geographic Equity	TRB for each geographic area is greater than values shown on Geo-Equity Table	12	12	100%
13	Program Efficiency	Meet all pre-determined milestones on schedule	6	6	100%
14	Service Quality	Achieve 92 or more metric points	92	107	116%
15	Resource Acquisition Performance Period Spending	Total spending for a three-year performance period (including applicable operations fees) is less than threshold	$136,181,694	$134,734,849	99%
16	Development & Support Services Performance Period Spending	Total spending for a three-year performance period (including applicable operations fees) is less than threshold	$14,788,290	$14,520,137	98%

3.4 Electric Minimum TRB per Geographic Area (QPI #12)

Geographic Area[1]	Required TRB per Geographic Area[2]	Actual TRB	% of Goal
Addison	$9,569,786	$17,441,747	182%
Bennington	$11,755,268	$23,031,103	196%
Caledonia	$7,381,188	$18,120,892	246%
Chittenden	$34,376,179	$87,753,721	255%
Essex/Orleans	$8,700,557	$15,642,192	180%
Franklin	$14,422,521	$17,702,458	123%
Grand Isle/Lamoille	$9,155,602	$14,613,415	160%
Orange	$5,985,825	$8,724,130	146%
Rutland	$19,819,855	$30,564,168	154%
Washington	$16,412,881	$37,726,702	230%
Windham	$16,951,229	$23,623,851	139%
Windsor	$16,433,720	$26,060,474	159%
Total	$170,964,610	$321,004,854	188%

[1] All geographic names above refer to Vermont Counties.

[2] Required TRB targets have been adjusted for Customer Credit

3.5 Thermal Energy and Process Fuels Funds
Performance Indicators & Minimum Requirements

QPI#	Title	Performance Indicator / Milestone	Target	Actual	%
1	Thermal & Mechanical Energy Efficiency Savings	Annual incremental net MMBtu savings	255,000	379,926	149%
2	Residential Single Family Comprehensiveness	a. Average air leakage reduction per project	34%	32%	94%
		b. Percent of projects with square feet of insulation added equivalent to at least 50% of the home's finished square feet of floor area	44%	61%	139%
		c. Percent of households (premises) with both shell measures and heating system measures installed, within contiguous calendar years	16%	12%	75%

MPR#	Title	Minimum Requirement	Minimum	Actual	%
3	Threshold (or minimum acceptable) Level of Participation by Residential Customers	Residential sector spending as % of total spending	62.5%	84.7%	135%
4	Threshold (or minimum acceptable) Level of Participation by Low-Income Households	Low-income single- and multi-family spending as % of total spending	17.0%	19.4%	114%
5	Performance Period Spending	Total spending for a three-year performance period (including applicable operations fees) is less than threshold	$18,997,058	$18,772,089	99%

3.6 Service Quality and Reliability Summary Report

Metric #	Metric Description	Reporting Frequency	Actual Performance this Period	Points Earned this Period	Cumulative 2015-17 Points Earned	Total Possible 2015-17 Points	Points Earned % of Total Possible
1	Residential Customer Service Satisfaction: Percentage of Residential Customers who contact Efficiency Vermont and are satisfied or very satisfied with Efficiency Vermont Customer Service will be greater than or equal to 80%	performance period	90.7%	12	12	12	100%
2	Business Customer Service Satisfaction: Percentage of Business Customers who contact Efficiency Vermont and are satisfied or very satisfied with Efficiency Vermont Customer Service will be greater than or equal to 80%	performance period	91.5%	12	12	12	100%
3	Customer Satisfaction upon Project Completion: Per each market segment, annual percentage of survey respondents with average service ratings of 3 (or better) shall be ≥ 90%	annually	98.2%	4	12	12	100%
4	Average answer time shall be ≤ 15 seconds per call	quarterly	7.0	1	12	12	100%
5	Average percentage of calls answered shall be ≥ 85%	quarterly	90.0%	1	12	12	100%
6	Average percentage of abandoned calls shall be ≤ 3%	quarterly	3.0%	1	12	12	100%
7	Percentage of complaint follow-up call attempted by end of next business day shall be ≥ 95%	quarterly	100.0%	1	12	12	100%
8	Percentage of complaints closed within 12 business days of initial complaint call shall be ≥ 95%	quarterly	100.0%	1	11	12	92%
9	For each reporting year, the ratio of total complaints received per total number of Efficiency Vermont participants shall be ≤ 0.5% (one-half of one percent)	annually	0.001%	4	12	12	100%
	Totals			**37**	**107**	**108**	**99%**

3.7 Electric Resource Acquisition Summary

	Totals				Business Energy Services		Residential Energy Services			Other
Services	All Resource Acquisition (including CC)	Efficiency Vermont Resource Acquisition	Subtotal Business Energy Services	Subtotal Residential Energy Services	Business New Construction	Business Existing Facilities	Residential New Construction	Efficient Products	Existing Homes	Customer Credit Program
Electric Resource Acquisiton Costs										
Year to Date Costs	$47,588,284	$44,836,544	$22,598,726	$22,237,818	$2,676,675	$19,922,051	$3,234,118	$14,008,113	$4,995,587	$2,751,740
Annual Budget Estimate[1]	$46,795,400	$44,810,500	$24,928,300	$19,882,200	$3,563,300	$21,365,000	$3,510,600	$12,720,700	$3,650,900	$1,984,900
Unspent Annual Budget Estimate	($792,884)	($26,044)	$2,329,574	($2,355,618)	$886,625	$1,442,949	$276,482	($1,287,413)	($1,344,687)	($766,840)
% Annual Budget Estimate Unspent	-2%	0%	9%	-12%	25%	7%	8%	-10%	-37%	-39%
Savings Results										
MWh Year to Date	174,339	157,942	69,516	88,426	7,817	61,699	2,001	75,791	10,634	16,397
MWh Cumulative starting 1/1/15	415,788	390,373	181,694	208,679	28,286	153,408	7,176	186,363	15,141	25,415
3-Year MWh Goal	nap	321,800	221,900	99,900	29,900	192,000	5,700	84,600	9,600	nap
% of 3-Year MWh Goal	nap	121%	82%	209%	95%	80%	126%	220%	158%	nap
Winter Coincident Peak kW Year to Date	29,252	29,252	9,956	19,296	1,137	8,820	485	16,318	2,493	0
Winter Coincident Peak kW Cumulative starting 1/1/15	70,405	70,065	26,929	43,136	4,186	22,743	1,583	38,114	3,439	340
3-Year Winter Coincident Peak kW Goal	nap	53,700	31,100	22,600	3,500	27,600	1,100	19,800	1,700	nap
% of 3-Year Winter Coincident Peak kW Goal	nap	130%	87%	191%	120%	82%	144%	192%	202%	nap
Summer Coincident Peak kW Year to Date	18,523	18,523	9,208	9,315	977	8,231	226	8,341	747	0
Summer Coincident Peak kW Cumulative starting 1/1/15	45,636	45,297	24,347	20,950	4,363	19,984	812	19,060	1,077	340
3-Year Summer Coincident Peak kW Goal	nap	41,300	27,800	13,500	4,500	23,300	700	11,900	900	nap
% of 3-Year Summer Coincident Peak kW Goal	nap	110%	88%	155%	97%	86%	116%	160%	120%	nap
TRB Year to Date	$99,667,865	$95,617,532	$53,883,076	$41,734,456	$7,213,628	$46,669,448	$5,573,339	$34,104,654	$2,056,463	$4,050,333
TRB Cumulative starting 1/1/15	$327,416,590	$321,004,854	$176,229,980	$144,774,874	$49,412,658	$126,817,322	$21,800,524	$117,230,836	$5,743,514	$6,411,736
3-Year TRB Goal	nap	$335,509,000	$236,180,876	$99,328,124	$47,718,197	$188,462,678	$28,109,729	$60,892,739	$10,325,657	nap
% of 3-Year TRB Goal	nap	96%	75%	146%	104%	67%	78%	193%	56%	nap
Associated Benefits										
MMBtu Year to Date	(11,267)	(11,267)	(10,847)	(420)	1,761	(12,608)	12,202	(11,749)	(874)	0
MMBtu Cumulative starting 1/1/15	46,171	46,171	32,576	13,595	51,867	(19,291)	43,387	(28,211)	(1,581)	0
Participation										
Partic.w/ installs Year to Date	116,262	116,261	15,309	100,952	176	15,133	1,477	97,428	2,047	1
Partic.w/ installs Cumulative starting 1/1/15	276,725	276,723	23,463	253,260	669	22,794	4,522	241,157	7,581	2

[1] Annual budgets are provided for information purposes only. Efficiency Vermont operates under three-year Board approved budgets.

3.8 Electric Resource Acquisition including Customer Credit

	Prior Year	Current Year 2017	Cumulative starting 1/1/15	Cumulative starting 1/1/12
# participants with installations	77,907	116,262	276,724	407,818
Operating Costs				
Administration	$3,963,324	$3,893,497	$11,753,689	$17,860,817
Programs and Implementation	$4,883,591	$4,723,648	$14,920,529	$29,210,399
Strategy and Planning	$1,510,748	$853,957	$3,827,623	$8,480,557
Subtotal Operating Costs	**$10,357,663**	**$9,471,102**	**$30,501,840**	**$55,551,774**
Technical Assistance Costs				
Services to Participants	$5,615,040	$6,016,836	$17,590,421	$31,186,597
Services to Trade Allies	$1,493,664	$1,463,150	$3,935,048	$6,231,515
Subtotal Technical Assistance Costs	**$7,108,704**	**$7,479,986**	**$21,525,469**	**$37,418,111**
Support Services				
Business Development	$0	$0	$14,044	$65,109
Business Solutions Group	$256,683	$398,203	$654,886	$654,886
Consulting	$217,085	$353,234	$802,009	$1,713,291
Customer Support	$150,517	$312,021	$650,956	$1,438,467
Evaluation, Monitoring & Verification	$132,340	$109,132	$385,286	$901,724
Information Technology	$10,521	$28,445	$42,252	$124,663
Marketing	$1,255,447	$2,287,705	$4,923,296	$10,896,401
Policy & Public Affairs	$10,493	$16,652	$84,178	$283,195
Public Relations and Internal Communications	$35,328	$67,309	$102,637	$102,637
Targeted Implementation	$1,032	$0	$17,321	$23,312
Transportation	$13,520	$0	$15,580	$20,203
Subtotal Support Services Costs	**$2,082,965**	**$3,572,702**	**$7,692,445**	**$16,223,888**
Incentive Costs				
Incentives to Participants	$22,641,515	$27,018,668	$73,711,483	$130,435,229
Incentives to Trade Allies	$523,543	$45,827	$103,528	$268,502
Subtotal Incentive Costs	**$23,165,058**	**$27,064,495**	**$73,815,010**	**$130,703,731**
Total Efficiency Vermont Costs	**$42,714,390**	**$47,588,285**	**$133,534,764**	**$239,897,504**
Total Participant Costs	$29,050,434	$23,706,384	$75,499,987	$123,132,554
Total Third Party Costs	($134,840)	$93,583	($114,246)	$3,007,792
Total Resource Acquisition Costs	**$71,629,984**	**$71,388,252**	**$208,920,505**	**$366,037,850**

Annualized MWh Savings	134,490	174,339	415,788	707,851
Lifetime MWh Savings	1,412,913	1,477,212	4,264,216	7,652,391
TRB Savings (2015 $)	$114,053,258	$99,667,865	$327,416,590	617,072,102
Winter Coincident Peak kW Savings	22,642	29,252	70,405	125,666
Summer Coincident Peak kW Savings	14,907	18,523	45,636	82,398
Annualized MWh Savings/Participant	1.726	1.500	1.503	1.736
Weighted Lifetime	10.5	8.5	10.3	10.8

Annualized MWh Savings (adjusted for measure life)	681,969
Winter Coincident Peak kW Savings (adjusted for measure life)	122,361
Summer Coincident Peak kW Savings (adjusted for measure life)	77,837

3.9 Electric Resource Acquisition excluding Customer Credit

	Prior Year	Current Year 2017	Cumulative starting 1/1/15	Cumulative starting 1/1/12
# participants with installations	77,906	116,261	276,723	247,354
Operating Costs				
Administration	$3,912,725	$3,656,200	$11,411,269	$17,379,200
Programs and Implementation	$4,883,591	$4,723,648	$14,885,110	$29,128,464
Strategy and Planning	$1,510,748	$853,957	$3,819,723	$8,470,927
Subtotal Operating Costs	**$10,307,064**	**$9,233,804**	**$30,116,102**	**$54,978,591**
Technical Assistance Costs				
Services to Participants	$5,612,087	$6,010,234	$17,533,299	$31,066,338
Services to Trade Allies	$1,493,664	$1,463,150	$3,929,346	$6,208,489
Subtotal Technical Assistance Costs	**$7,105,751**	**$7,473,384**	**$21,462,646**	**$37,274,828**
Support Services				
Business Development	$0	$0	$13,572	$63,998
Business Solutions Group	$256,683	$398,203	$654,886	$654,886
Consulting	$217,085	$353,234	$799,002	$1,706,154
Customer Support	$150,517	$312,021	$647,471	$1,431,322
Evaluation, Monitoring & Verification	$132,340	$107,761	$381,800	$894,822
Information Technology	$10,521	$28,445	$42,157	$124,017
Marketing	$1,255,447	$2,287,705	$4,907,251	$10,858,022
Policy & Public Affairs	$10,493	$16,652	$82,439	$275,137
Public Relations and Internal Communications	$35,328	$67,309	$102,637	$102,637
Targeted Implementation	$1,032	$0	$16,787	$22,744
Transportation	$13,520	$0	$15,543	$20,130
Subtotal Support Services Costs	**$2,082,965**	**$3,571,331**	**$7,663,547**	**$16,153,870**
Incentive Costs				
Incentives to Participants	$22,641,515	$24,512,198	$70,354,968	$124,422,824
Incentives to Trade Allies	$338	$45,827	$103,528	$268,490
Subtotal Incentive Costs	**$22,641,853**	**$24,558,025**	**$70,458,495**	**$124,691,314**
Total Efficiency Vermont Costs	**$42,137,633**	**$44,836,544**	**$129,700,790**	**$233,098,602**
Total Participant Costs	$29,038,459	$23,383,380	$75,007,300	$123,200,505
Total Third Party Costs	($134,840)	$93,583	($114,246)	$3,007,792
Total Resource Acquisition Costs	**$71,041,252**	**$68,313,507**	**$204,593,844**	**$359,306,900**

Annualized MWh Savings	127,433	157,942	390,373	677,280
Lifetime MWh Savings	1,404,006	1,374,538	4,131,175	7,444,613
TRB Savings (2015 $)	$113,527,659	$95,617,532	$321,004,854	$605,294,915
Winter Coincident Peak kW Savings	22,624	29,252	70,065	124,542
Summer Coincident Peak kW Savings	14,889	18,523	45,297	81,276
Annualized MWh Savings/Participant	1.636	1.359	1.411	2.738
Weighted Lifetime	11.0	8.7	10.6	11.0

Annualized MWh Savings (adjusted for measure life)	651,398
Winter Coincident Peak kW Savings (adjusted for measure life)	121,237
Summer Coincident Peak kW Savings (adjusted for measure life)	76,715

3.10 Electric Resource Acquisition - End Use Breakdown

End Use	# of Participants	Net MWH Saved	Gross MWH Saved	Net Lifetime MWH Saved	Net Winter KW Saved	Net Summer KW Saved	Net Other Fuel MMBTU Saved	Net TRB Saved	Participant Incentives Paid	Participant Costs
Air Conditioning Eff.	1,201	1,353	1,313	23,306	58	222	37	$1,544,489	$304,129	$444,987
Behavior Change	13	8,489	7,479	8,489	2,006	560	0	$534,652	$962,000	$0
Cooking and Laundry	2,932	1,025	908	12,292	141	120	1,791	$2,381,385	$361,378	$897,898
Design Assistance	205	361	322	1,507	19	11	2,087	$157,768	$1,055,531	$46,675
Electronics	1,321	526	457	2,879	58	53	0	$174,596	$54,981	$23,708
Hot Water Efficiency	2,648	3,413	2,780	43,843	525	270	-4,341	$2,214,976	$1,319,394	$271,991
Hot Water Fuel Switch	3	10	10	306	2	1	-34	$10,554	$4,023	$10,050
Industrial Process Eff.	62	8,330	8,466	120,375	1,256	621	1,453	$7,226,570	$1,446,939	$3,754,497
Lighting	103,568	110,020	96,705	814,178	21,384	13,422	-36,686	$52,697,439	$14,690,870	$12,199,343
Motors	1,672	9,936	9,363	125,469	1,277	1,986	2,512	$9,977,890	$861,086	$1,902,427
Other Efficiency	1,880	340	299	4,045	58	25	2,164	$1,110,771	$347,940	-$278,759
Other Fuel Switch	63	529	531	10,877	82	7	-2,000	$30,118	$19,070	$67,591
Other Indirect Activity	391	1	1	4	0	0	0	$290	$794,502	-$508,502
Refrigeration	3,013	4,399	4,236	56,192	465	814	0	$3,948,771	$823,818	$1,059,640
Space Heat Efficiency	3,532	7,953	7,704	130,023	1,755	245	16,250	$11,299,469	$1,301,711	$2,853,659
Space Heat Fuel Switch	16	142	125	3,432	62	0	-691	$42,106	$1,200	$90,367
Ventilation	1,040	1,109	1,041	17,294	104	167	6,190	$2,183,170	$163,277	$541,365
Water Conservation	5	4	4	25	1	0	0	$82,520	$350	$6,443
Totals		157,942	141,744	1,374,538	29,252	18,523	-11,267	$95,617,532	$24,512,198	$23,383,380

3.11 Electric Resource Acquisition - Utility Breakdown

Utility	# of Participants	Net MWH Saved	Gross MWH Saved	Net Lifetime MWH Saved	Net Winter KW Saved	Net Summer KW Saved	Net Other Fuel MMBTU Saved	Net TRB Saved	Participant Incentives Paid	Participant Costs
Barton	368	552	488	5,105	97	65	-225	$309,532	$118,761	$75,275
Burlington	4,458	3,260	2,856	16,712	723	369	-815	$1,107,942	$458,479	$111,743
Enosburg Falls	623	1,304	1,211	17,840	240	118	-171	$1,144,192	$141,035	$108,893
Green Mountain	91,144	126,975	114,015	1,107,959	23,510	14,668	-7,692	$76,687,208	$19,761,829	$19,316,234
Hardwick	1,638	1,513	1,327	12,125	334	169	-352	$827,426	$325,984	$47,475
Hyde Park	526	671	590	6,437	119	107	-66	$502,395	$92,211	$87,302
Jacksonville	55	54	48	370	11	7	78	$56,734	$8,295	$8,603
Johnson	338	368	324	2,573	68	46	-81	$176,405	$58,063	$45,122
Ludlow	854	3,270	2,981	31,338	507	463	-276	$2,193,136	$176,571	$657,867
Lyndonville	1,635	1,979	1,799	20,455	422	188	-458	$1,282,052	$400,071	$373,745
Morrisville	1,522	1,379	1,223	10,755	272	163	-288	$730,963	$277,380	$139,650
Northfield	455	457	410	3,992	82	57	163	$305,016	$53,125	$76,827
Orleans	229	184	163	1,256	39	20	-41	$84,704	$32,146	$15,878
Stowe	1,444	2,440	2,180	15,256	404	352	61	$1,316,846	$320,076	$228,889
Swanton	1,368	1,504	1,341	12,134	281	189	-390	$821,628	$260,044	$191,313
VT Electric Coop	7,931	10,581	9,512	97,921	1,848	1,384	-523	$7,177,403	$1,738,599	$1,735,821
Washington Electric	1,673	1,451	1,276	12,311	295	158	-190	$893,950	$289,529	$162,743
Totals	116,261	157,942	141,744	1,374,538	29,252	18,523	-11,267	$95,617,532	$24,512,198	$23,383,380

3.12 Electric Resource Acquisition - County Breakdown

County	# of Participants	Net MWH Saved	Gross MWH Saved	Net Lifetime MWH Saved	Net Winter KW Saved	Net Summer KW Saved	Net Other Fuel MMBTU Saved	Net TRB Saved	Participant Incentives Paid	Participant Costs
Addison	5,013	8,634	7,796	81,866	1,551	998	395	$5,814,765	$1,299,704	$1,073,382
Bennington	9,852	12,005	10,642	86,415	2,305	1,466	-2,593	$5,859,341	$1,724,804	$1,223,663
Caledonia	5,136	5,865	5,239	52,991	1,176	668	-1,615	$3,454,762	$1,182,249	$774,636
Chittenden	35,012	44,384	39,610	366,737	8,044	5,461	-2,354	$26,462,373	$6,107,016	$6,546,835
Essex	497	657	581	5,759	121	81	-180	$410,907	$136,675	$87,686
Franklin	6,748	9,555	8,599	89,591	1,744	1,149	-528	$6,434,225	$1,450,887	$1,454,738
Grand Isle	1,055	1,076	975	9,436	208	109	204	$719,507	$201,884	$188,965
Lamoille	4,854	6,044	5,364	44,864	1,088	814	-354	$3,479,261	$947,376	$651,128
Orange	3,354	3,743	3,344	30,207	734	426	-904	$1,990,443	$954,657	$408,825
Orleans	5,180	7,114	6,349	64,725	1,226	972	-1,231	$4,503,644	$1,134,019	$1,075,661
Rutland	12,547	16,477	14,730	141,743	3,164	1,898	-2,160	$9,572,743	$2,851,011	$2,638,693
Washington	12,321	16,446	14,863	150,753	3,085	1,857	430	$10,783,784	$2,705,005	$2,239,387
Windham	6,658	11,644	10,705	112,506	2,239	1,012	-1,948	$6,767,878	$2,073,755	$2,110,852
Windsor	8,034	14,298	12,946	136,944	2,566	1,612	1,571	$9,363,898	$1,743,157	$2,908,930
Totals	116,261	157,942	141,744	1,374,538	29,252	18,523	-11,267	$95,617,532	$24,512,198	$23,383,380

3.13 Electric Resource Acquisition Total Resource Benefits

Avoided Cost Benefits	2017	Lifetime (Present Value)
Avoided Cost of Electricity	nap	$92,252,003
Fossil Fuel Savings (Costs)	($157,633)	$1,423,305
Water Savings (Costs)	$91,314	$1,942,225
Total	**($66,318)**	**$95,617,532**

Electric Energy & Demand Benefits	Savings at Meter		Savings at Generation
	Gross	Net	Net
Annualized Energy Savings (MWh): Total	**141,744**	**138,906**	**157,942**
Winter on peak	57,444	56,262	64,589
Winter off peak	41,876	41,007	46,050
Summer on peak	24,014	23,548	27,080
Summer off peak	18,419	18,089	20,241
Coincident Demand Savings (kW)			
Winter	26,681	26,282	29,252
Shoulder	0	0	0
Summer	16,967	16,657	18,523

Thermal & Other Benefits	Gross	Net	Lifetime Net
Annualized Water Savings (ccf)	**21,316**	**21,236**	**225,458**
Annualized fuel savings (increase) MMBtu Total	**(10,025)**	**(11,267)**	**155,287**
LP	7,531	6,924	119,322
NG	10,056	10,093	209,582
Oil/Kerosene	(27,147)	(27,602)	(165,917)
Wood	(496)	(666)	(7,441)
Solar	0	0	0
Other	0	0	0
Annualized savings (increase) in O&M($)	**$2,196,858**	**$2,197,542**	**$14,995,174**

Net Societal Benefits	**$114,995,431**

3.14 Electric Business Energy Services Summary

	Prior Year	Current Year 2017	Cumulative starting 1/1/15
# participants with installations	8,073	15,309	23,463
Operating Costs			
Administration	$2,132,621	$1,815,061	$5,848,011
Programs and Implementation	$1,791,171	$1,929,148	$5,592,902
Strategy and Planning	$1,219,488	$519,760	$2,940,894
Subtotal Operating Costs	**$5,143,280**	**$4,263,968**	**$14,381,807**
Technical Assistance Costs			
Services to Participants	$3,915,356	$4,230,536	$12,552,050
Services to Trade Allies	$868,858	$877,773	$2,346,667
Subtotal Technical Assistance Costs	**$4,784,214**	**$5,108,309**	**$14,898,717**
Support Services			
Business Development	$0	$0	$10,164
Business Solutions Group	$140,413	$207,914	$348,327
Consulting	$81,539	$142,605	$319,570
Customer Support	$36,800	$147,514	$260,023
Evaluation, Monitoring & Verification	$75,145	$76,814	$247,023
Information Technology	$5,978	$10,226	$18,274
Marketing	$251,489	$1,048,026	$1,646,001
Policy & Public Affairs	$5,338	$9,869	$53,409
Public Relations and Internal Communications	$17,207	$41,127	$58,334
Targeted Implementation	$586	$0	$12,101
Transportation	$6,413	$0	$7,206
Subtotal Support Services Costs	**$620,908**	**$1,684,095**	**$2,980,434**
Incentive Costs			
Incentives to Participants	$12,037,881	$11,540,880	$34,968,648
Incentives to Trade Allies	$338	$1,473	$53,522
Subtotal Incentive Costs	**$12,038,219**	**$11,542,353**	**$35,022,170**
Total Efficiency Vermont Costs	**$22,586,621**	**$22,598,726**	**$67,283,128**
Total Participant Costs	$18,148,624	$14,026,204	$50,578,906
Total Third Party Costs	$0	$0	$0
Total Resource Acquisition Costs	**$40,735,244**	**$36,624,930**	**$117,862,034**
Annualized MWh Savings	62,604	69,516	181,694
Lifetime MWh Savings	718,491	819,891	2,198,578
TRB Savings (2015 $)	$58,444,309	$53,883,076	$176,229,980
Winter Coincident Peak kW Savings	9,927	9,956	26,929
Summer Coincident Peak kW Savings	8,646	9,208	24,347
Annualized MWh Savings/Participant	7.755	4.541	7.744
Weighted Lifetime	11.5	11.8	12.1

3.15 Electric Business Energy Services - End Use Breakdown

End Use	# of Participants	Net MWH Saved	Gross MWH Saved	Net Lifetime MWH Saved	Net Winter KW Saved	Net Summer KW Saved	Net Other Fuel MMBTU Saved	Net TRB Saved	Participant Incentives Paid	Participant Costs
Air Conditioning Eff.	74	1,087	1,031	20,203	52	141	37	$1,274,513	$153,520	$465,175
Behavior Change	1	13	12	13	2	1	0	$690	$0	$0
Cooking and Laundry	20	99	92	1,334	8	21	179	$170,163	$25,224	$85,706
Design Assistance	120	361	322	1,507	19	11	2,087	$157,768	$1,017,471	$38,735
Electronics	2	121	108	606	13	14	0	$37,055	$14,800	$43,712
Hot Water Efficiency	7	33	31	339	5	6	408	$111,708	$10,402	$25,210
Industrial Process Eff.	62	8,330	8,466	120,375	1,256	621	1,453	$7,226,570	$1,446,939	$3,754,497
Lighting	14,905	43,352	38,357	458,919	6,383	6,065	-21,421	$29,213,892	$7,348,347	$6,559,673
Motors	154	8,702	8,278	110,476	1,180	1,372	2,512	$8,342,624	$483,106	$1,647,106
Other Efficiency	31	22	20	657	2	3	0	$40,863	$7,672	$4,023
Other Fuel Switch	3	495	491	9,895	75	2	-1,897	-$42,422	$15,824	$32,698
Other Indirect Activity	273	0	0	0	0	0	0	$0	$455,000	-$190,576
Refrigeration	215	3,943	3,725	50,884	423	759	0	$3,611,062	$369,550	$1,039,332
Space Heat Efficiency	36	1,962	1,920	29,317	445	41	800	$1,801,723	$50,983	$59,682
Space Heat Fuel Switch	2	12	10	173	2	0	-240	-$20,844	$1,200	-$420
Ventilation	61	983	929	15,185	90	152	5,234	$1,876,419	$140,494	$456,901
Water Conservation	3	1	1	5	0	0	0	$81,291	$350	$4,750
Totals		69,516	63,791	819,891	9,956	9,208	-10,847	$53,883,076	$11,540,880	$14,026,204

3.16 Electric Residential Energy Services Summary

	Prior Year	Current Year 2017	Cumulative starting 1/1/15
# participants with installations	69,833	100,952	253,260
Operating Costs			
Administration	$1,780,105	$1,841,139	$5,563,258
Programs and Implementation	$3,092,420	$2,794,500	$9,292,207
Strategy and Planning	$291,259	$334,197	$878,829
Subtotal Operating Costs	**$5,163,784**	**$4,969,836**	**$15,734,295**
Technical Assistance Costs			
Services to Participants	$1,696,732	$1,779,698	$4,981,249
Services to Trade Allies	$624,806	$585,377	$1,582,680
Subtotal Technical Assistance Costs	**$2,321,538**	**$2,365,075**	**$6,563,928**
Support Services			
Business Development	$0	$0	$3,408
Business Solutions Group	$116,270	$190,289	$306,559
Consulting	$135,546	$210,629	$479,433
Customer Support	$113,717	$164,508	$387,448
Evaluation, Monitoring & Verification	$57,195	$30,947	$134,777
Information Technology	$4,543	$18,219	$23,883
Marketing	$1,003,958	$1,239,679	$3,261,250
Policy & Public Affairs	$5,154	$6,783	$29,030
Public Relations and Internal Communications	$18,121	$26,182	$44,303
Targeted Implementation	$446	$0	$4,686
Transportation	$7,107	$0	$8,337
Subtotal Support Services Costs	**$1,462,057**	**$1,887,236**	**$4,683,113**
Incentive Costs			
Incentives to Participants	$10,603,634	$12,971,317	$35,386,319
Incentives to Trade Allies	$0	$44,354	$50,005
Subtotal Incentive Costs	**$10,603,634**	**$13,015,672**	**$35,436,325**
Total Efficiency Vermont Costs	**$19,551,012**	**$22,237,818**	**$62,417,662**
Total Participant Costs	$10,889,835	$9,357,176	$24,428,394
Total Third Party Costs	($134,840)	$93,583	($114,246)
Total Resource Acquisition Costs	**$30,306,007**	**$31,688,578**	**$86,731,810**
Annualized MWh Savings	64,829	88,426	208,679
Lifetime MWh Savings	685,515	554,647	1,932,596
TRB Savings (2015 $)	$55,083,350	$41,734,456	$144,774,874
Winter Coincident Peak kW Savings	12,697	19,296	43,136
Summer Coincident Peak kW Savings	6,243	9,315	20,950
Annualized MWh Savings/Participant	0.928	0.876	0.824
Weighted Lifetime	10.6	6.3	9.3

3.17 Electric Residential Energy Services - End Use Breakdown

End Use	# of Participants	Net MWH Saved	Gross MWH Saved	Net Lifetime MWH Saved	Net Winter KW Saved	Net Summer KW Saved	Net Other Fuel MMBTU Saved	Net TRB Saved	Participant Incentives Paid	Participant Costs
Air Conditioning Eff.	1,127	266	282	3,102	5	81	0	$269,976	$150,609	-$20,187
Behavior Change	12	8,476	7,467	8,476	2,004	559	0	$533,962	$962,000	$0
Cooking and Laundry	2,912	926	817	10,958	134	98	1,612	$2,211,221	$336,154	$812,193
Design Assistance	85	0	0	0	0	0	0	$0	$38,060	$7,940
Electronics	1,319	405	349	2,273	45	39	0	$137,541	$40,181	-$20,004
Hot Water Efficiency	2,641	3,380	2,750	43,503	519	264	-4,749	$2,103,268	$1,308,993	$246,781
Hot Water Fuel Switch	3	10	10	306	2	1	-34	$10,554	$4,023	$10,050
Lighting	88,663	66,668	58,348	355,259	15,001	7,357	-15,265	$23,483,547	$7,342,522	$5,639,670
Motors	1,518	1,235	1,085	14,992	97	614	0	$1,635,266	$377,981	$255,321
Other Efficiency	1,849	318	279	3,389	56	22	2,164	$1,069,908	$340,268	-$282,782
Other Fuel Switch	60	34	40	982	7	5	-103	$72,539	$3,246	$34,892
Other Indirect Activity	118	1	1	4	0	0	0	$290	$339,502	-$317,926
Refrigeration	2,798	456	511	5,308	42	55	0	$337,709	$454,268	$20,308
Space Heat Efficiency	3,496	5,991	5,784	100,706	1,310	204	15,450	$9,497,746	$1,250,729	$2,793,976
Space Heat Fuel Switch	14	130	115	3,259	60	0	-451	$62,950	$0	$90,787
Ventilation	979	126	113	2,110	14	15	956	$306,751	$22,783	$84,464
Water Conservation	2	3	3	20	0	0	0	$1,229	$0	$1,693
Totals		88,426	77,952	554,647	19,296	9,315	-420	$41,734,456	$12,971,318	$9,357,176

3.18 Thermal Energy and Process Fuels Resource Acquisition Summary

				Business Energy Services		Residential Energy Services		
Services	Efficiency Vermont Services and Initiatives	Subtotal Business Energy Services	Subtotal Residential Energy Services	Business New Construction	Business Existing Facilities	Residential New Construction	Efficient Products	Existing Homes
Costs								
Year to Date Costs	$7,402,500	$1,146,743	$6,255,757	$54,962	$1,091,781	$7,002	$2,541,330	$3,707,425
Annual Budget Estimate[1]	$7,405,326	$1,924,982	$5,480,344	$184,944	$1,740,038	$8,805	$1,781,179	$3,690,359
Unspent Annual Budget Estimate	$2,826	$778,239	($775,413)	$129,982	$648,257	$1,804	($760,150)	($17,066)
% Annual Budget Estimate Unspent	0%	40%	-14%	70%	37%	20%	-43%	0%
Savings Results								
MMBtu Year to Date	213,103	42,594	170,509	3,416	39,178	347	150,547	19,616
MMBtu Cumulative starting 1/1/15	379,926	119,733	260,193	13,134	106,598	1,918	195,029	63,246
3-Year MMBtu Goal	255,000	103,000	152,000	13,000	90,000	2,000	85,000	65,000
% of 3-Year MMBtu Goal	149%	116%	171%	101%	118%	96%	229%	97%
Associated Electric Benefits								
MWh Year to Date	(18,566)	17	(18,583)	(25)	43	0	(18,807)	223
MWh Cumulative starting 1/1/15	(23,238)	340	(23,579)	88	253	(1)	(24,372)	794
Winter Coincident Peak kW Year to Date	(4,518)	15	(4,534)	2	13	(0)	(4,634)	100
Winter Coincident Peak kW Cumulative starting 1/1/15	(5,305)	83	(5,388)	9	74	(0)	(5,775)	387
Summer Coincident Peak kW Year to Date	(692)	22	(714)	9	13	(0)	(715)	1
Summer Coincident Peak kW Cumulative starting 1/1/15	(950)	44	(994)	19	24	(0)	(992)	(2)
Participation								
Partic.w/ installs Year to Date	5,695	224	5,471	24	200	42	4,053	1,376
Partic.w/ installs Cumulative starting 1/1/15	12,017	754	11,263	86	668	114	5,367	5,782

[1] Annual budgets are provided for information purposes only. Efficiency Vermont operates under three-year Board approved budgets.

3.19 Thermal Energy and Process Fuels Resource Acquisition

	Prior Year	Current Year 2017	Cumulative starting 1/1/15
# participants with installations	4,029	5,695	12,017
Operating Costs			
Administration	$591,111	$637,734	$1,615,978
Programs and Implementation	$909,649	$961,227	$3,160,049
Strategy and Planning	$136,353	$111,388	$404,221
Subtotal Operating Costs	**$1,637,113**	**$1,710,349**	**$5,180,248**
Technical Assistance Costs			
Services to Participants	$381,294	$317,591	$1,120,534
Services to Trade Allies	$32,320	$0	$32,409
Subtotal Technical Assistance Costs	**$413,614**	**$317,591**	**$1,152,943**
Support Services			
Business Development	$0	$0	$1,324
Business Solutions Group	$40,279	$45,801	$86,080
Consulting	$83,407	$38,659	$233,257
Customer Support	$122,684	$105,733	$319,034
Evaluation, Monitoring & Verification	$4,647	$2,110	$17,072
Information Technology	$320	$8,337	$9,550
Marketing	$449,129	$276,982	$1,098,209
Policy & Public Affairs	$1,283	($363)	$6,679
Public Relations and Internal Communications	$4,898	$2,426	$7,324
Targeted Implementation	$313	$0	$1,813
Transportation	$228	$0	$646
Subtotal Support Services Costs	**$707,189**	**$479,684**	**$1,780,990**
Incentive Costs			
Incentives to Participants	$3,185,052	$4,754,426	$10,459,239
Incentives to Trade Allies	$33,200	$140,450	$198,650
Subtotal Incentive Costs	**$3,218,252**	**$4,894,876**	**$10,657,889**
Total Efficiency Vermont Costs	**$5,976,168**	**$7,402,500**	**$18,772,070**
Total Participant Costs	$12,099,548	$19,518,721	$42,167,437
Total Third Party Costs	$243,202	$291,243	$697,241
Total Resource Acquisition Costs	**$18,318,918**	**$27,212,464**	**$61,636,748**
Annualized MMBtu Savings	119,810	213,103	379,926
Lifetime MMBtu Savings	1,704,282	3,177,480	5,705,372
TRB Savings (2015 $)	$19,898,486	$25,483,247	$62,895,918
Annualized MMBtu Savings/Participant	29.737	37.419	31.616
Weighted Lifetime	14.2	14.9	15.0

3.20 Thermal Energy and Process Fuels Services & Initiatives - End Use Breakdown

End Use	# of Participants	Net MWH Saved	Gross MWH Saved	Net Lifetime MWH Saved	Net Winter KW Saved	Net Summer KW Saved	Net Other Fuel MMBTU Saved	Net TRB Saved	Participant Incentives Paid	Participant Costs
Air Conditioning Eff.	9	3	3	24	0	1	44	$7,722	$1,440	$960
Cooking and Laundry	49	-4	-4	-52	0	1	937	$175,865	$36,733	$140,839
Design Assistance	6	0	0	0	0	0	109	$21,588	$66,950	-$37,220
Hot Water Efficiency	696	-532	-426	-6,919	-82	-41	9,860	$1,704,674	$373,840	$289,043
Hot Water Fuel Switch	5	15	17	297	2	1	-42	$4,533	$0	$10,500
Industrial Process Eff.	34	-17	-17	-189	-2	2	14,132	$1,671,629	$192,517	$403,773
Motors	3	26	26	383	6	8	173	$67,067	$3,560	$28,352
Other Efficiency	706	0	0	0	0	0	0	$0	$0	$0
Other Fuel Switch	4	0	0	0	0	0	331	$41,123	$6,500	$38,758
Other Indirect Activity	237	0	0	0	0	0	0	$0	$451,749	$14,901
Refrigeration	1	7	7	101	1	1	0	$7,232	$3,000	$2,352
Space Heat Efficiency	4,860	-18,061	-18,103	-270,504	-4,450	-674	177,470	$19,002,663	$3,400,825	$16,630,597
Space Heat Fuel Switch	58	11	13	248	5	0	1,840	$1,012,477	$82,992	$1,317,738
Ventilation	185	-13	-11	-185	1	9	8,249	$1,766,674	$134,319	$678,130
Totals		-18,566	-18,496	-276,797	-4,518	-692	213,103	$25,483,247	$4,754,426	$19,518,721

3.21 Thermal Energy and Process Fuels Resource Acquisition
Total Resource Benefits

Avoided Cost Benefits	2017	Lifetime (Present Value)
Avoided Cost of Electricity	nap	($16,425,431)
Fossil Fuel Savings (Costs)	$3,482,692	$41,873,595
Water Savings (Costs)	$1,603	$35,083
Total	**$3,484,295**	**$25,483,247**

Electric Energy & Demand Benefits	Savings at Meter		Savings at Generation
	Gross	Net	Net
Annualized Energy Savings (MWh): Total	**(18,496)**	**(16,362)**	**(18,566)**
Winter on peak	(7,684)	(6,796)	(7,802)
Winter off peak	(8,925)	(7,879)	(8,848)
Summer on peak	(1,009)	(903)	(1,038)
Summer off peak	(878)	(784)	(877)
Coincident Demand Savings (kW)			
Winter	(4,603)	(4,060)	(4,518)
Shoulder	0	0	0
Summer	(701)	(622)	(692)

Thermal & Other Benefits	Gross	Net	Lifetime Net
Annualized Water Savings (ccf)	**402**	**373**	**4,302**
Annualized fuel savings (increase) MMBtu Total	**236,903**	**213,103**	**3,177,480**
LP	48,523	44,614	705,790
NG	31,375	27,641	416,198
Oil/Kerosene	129,434	116,706	1,818,713
Wood	19,263	16,610	159,094
Solar	0	0	0
Other	0	0	0
Annualized savings (increase) in O&M($)	**$4,745**	**$4,303**	**$53,775**

Net Societal Benefits	$16,381,307

3.22 Thermal Energy and Process Fuels
Business Energy Services Summary

	Prior Year	Current Year 2017	Cumulative starting 1/1/15
# participants with installations	308	224	754
Operating Costs			
Administration	$151,586	$119,066	$330,822
Programs and Implementation	$1,589	$11,666	$33,987
Strategy and Planning	$68,873	$23,413	$115,639
Subtotal Operating Costs	**$222,048**	**$154,145**	**$480,448**
Technical Assistance Costs			
Services to Participants	$89,408	$95,601	$219,675
Services to Trade Allies	$918	$0	$964
Subtotal Technical Assistance Costs	**$90,326**	**$95,601**	**$220,639**
Support Services			
Business Development	$0	$0	$379
Business Solutions Group	$1,794	$8,885	$10,679
Consulting	$6,463	$2,737	$11,622
Customer Support	$8,869	$6,807	$29,327
Evaluation, Monitoring & Verification	$2,466	$134	$4,909
Information Technology	$37	$2,168	$2,281
Marketing	$17,879	$13,310	$44,121
Policy & Public Affairs	$310	($94)	$1,618
Public Relations and Internal Communications	$440	$224	$664
Targeted Implementation	$84	$0	$514
Transportation	$29	$0	$59
Subtotal Support Services Costs	**$38,371**	**$34,171**	**$106,173**
Incentive Costs			
Incentives to Participants	$817,511	$857,226	$2,066,812
Incentives to Trade Allies	$0	$5,600	$5,600
Subtotal Incentive Costs	**$817,511**	**$862,826**	**$2,072,412**
Total Efficiency Vermont Costs	**$1,168,257**	**$1,146,743**	**$2,879,672**
Total Participant Costs	$2,554,617	$2,884,415	$7,335,889
Total Third Party Costs	$0	$75,000	$75,000
Total Resource Acquisition Costs	**$3,722,874**	**$4,106,158**	**$10,290,561**
Annualized MMBtu Savings	61,073	42,594	119,733
Lifetime MMBtu Savings	756,115	586,809	1,619,605
TRB Savings (2015 $)	$10,207,257	$7,466,206	$23,308,913
Annualized MMBtu Savings/Participant	198.288	190.151	158.796
Weighted Lifetime	12.4	13.8	13.5

3.23 Thermal Energy and Process Fuels Business Energy Services - End Use Breakdown

End Use	# of Participants	Net MWH Saved	Gross MWH Saved	Net Lifetime MWH Saved	Net Winter KW Saved	Net Summer KW Saved	Net Other Fuel MMBTU Saved	Net TRB Saved	Participant Incentives Paid	Participant Costs
Air Conditioning Eff.	9	3	3	24	0	1	44	$7,722	$1,440	$960
Cooking and Laundry	41	-4	-4	-52	0	1	937	$175,865	$36,733	$139,316
Design Assistance	6	0	0	0	0	0	109	$21,588	$66,950	-$37,220
Hot Water Efficiency	21	0	0	0	0	0	2,026	$444,861	$46,506	$91,760
Industrial Process Eff.	34	-17	-17	-189	-2	2	14,132	$1,671,629	$192,517	$403,773
Motors	3	26	26	383	6	8	173	$67,067	$3,560	$28,352
Other Efficiency	27	0	0	0	0	0	0	$0	$0	$0
Other Fuel Switch	3	0	0	0	0	0	331	$41,123	$6,500	$38,458
Other Indirect Activity	1	0	0	0	0	0	0	$0	$60,600	$0
Refrigeration	1	7	7	101	1	1	0	$7,232	$3,000	$2,352
Space Heat Efficiency	101	14	14	306	8	0	15,383	$2,495,337	$268,259	$998,641
Space Heat Fuel Switch	9	2	2	33	1	0	1,530	$820,145	$36,992	$830,554
Ventilation	24	-13	-12	-186	1	9	7,929	$1,713,637	$134,169	$387,470
Totals		17	20	420	15	22	42,594	$7,466,206	$857,226	$2,884,415

3.24 Thermal Energy and Process Fuels
Residential Energy Services Summary

	Prior Year	Current Year 2017	Cumulative starting 1/1/15
# participants with installations	3,721	5,471	11,263
Operating Costs			
Administration	$439,525	$518,668	$1,285,156
Programs and Implementation	$908,060	$949,560	$3,126,062
Strategy and Planning	$67,479	$87,975	$288,582
Subtotal Operating Costs	**$1,415,065**	**$1,556,204**	**$4,699,800**
Technical Assistance Costs			
Services to Participants	$291,885	$221,989	$900,858
Services to Trade Allies	$31,403	$0	$31,445
Subtotal Technical Assistance Costs	**$323,288**	**$221,989**	**$932,304**
Support Services			
Business Development	$0	$0	$945
Business Solutions Group	$38,485	$36,916	$75,401
Consulting	$76,944	$35,922	$221,635
Customer Support	$113,815	$98,926	$289,707
Evaluation, Monitoring & Verification	$2,181	$1,976	$12,163
Information Technology	$283	$6,169	$7,269
Marketing	$431,250	$263,671	$1,054,088
Policy & Public Affairs	$973	($268)	$5,062
Public Relations and Internal Communications	$4,458	$2,201	$6,660
Targeted Implementation	$229	$0	$1,299
Transportation	$199	$0	$588
Subtotal Support Services Costs	**$668,818**	**$445,514**	**$1,674,817**
Incentive Costs			
Incentives to Participants	$2,367,541	$3,897,200	$8,392,427
Incentives to Trade Allies	$33,200	$134,850	$193,050
Subtotal Incentive Costs	**$2,400,741**	**$4,032,050**	**$8,585,477**
Total Efficiency Vermont Costs	**$4,807,911**	**$6,255,757**	**$15,892,397**
Total Participant Costs	$9,544,930	$16,634,306	$34,831,549
Total Third Party Costs	$243,202	$216,243	$622,241
Total Resource Acquisition Costs	**$14,596,044**	**$23,106,306**	**$51,346,187**
Annualized MMBtu Savings	58,737	170,509	260,193
Lifetime MMBtu Savings	948,167	2,590,671	4,085,767
TRB Savings (2012$)	$9,691,229	$18,017,041	$39,587,004
Annualized MMBtu Savings/Participant	15.785	31.166	23.102
Weighted Lifetime	16.1	15.2	15.7

3.25 Thermal Energy and Process Fuels Residential Energy Services - End Use Breakdown

End Use	# of Participants	Net MWH Saved	Gross MWH Saved	Net Lifetime MWH Saved	Net Winter KW Saved	Net Summer KW Saved	Net Other Fuel MMBTU Saved	Net TRB Saved	Participant Incentives Paid	Participant Costs
Cooking and Laundry	8	0	0	0	0	0	0	$0	$0	$1,523
Hot Water Efficiency	675	-532	-426	-6,919	-82	-41	7,834	$1,259,813	$327,334	$197,283
Hot Water Fuel Switch	5	15	17	297	2	1	-42	$4,533	$0	$10,500
Other Efficiency	679	0	0	0	0	0	0	$0	$0	$0
Other Fuel Switch	1	0	0	0	0	0	0	$0	$0	$300
Other Indirect Activity	236	0	0	0	0	0	0	$0	$391,149	$14,901
Space Heat Efficiency	4,759	-18,075	-18,117	-270,809	-4,458	-674	162,087	$16,507,326	$3,132,566	$15,631,956
Space Heat Fuel Switch	49	9	10	214	5	0	310	$192,332	$46,000	$487,184
Ventilation	161	0	0	1	0	0	320	$53,037	$150	$290,660
Totals		-18,583	-18,515	-277,216	-4,534	-714	170,509	$18,017,041	$3,897,200	$16,634,306

4. Major Market Resource Acquisition Results

4.1 Electric Business New Construction Summary

	Prior Year	Current Year 2017	Cumulative starting 1/1/15
# participants with installations	273	176	669
Operating Costs			
Administration	$303,188	$199,999	$779,442
Programs and Implementation	$217,762	$194,393	$627,733
Strategy and Planning	$298,717	$84,485	$633,103
Subtotal Operating Costs	**$819,668**	**$478,877**	**$2,040,277**
Technical Assistance Costs			
Services to Participants	$741,744	$654,562	$2,244,760
Services to Trade Allies	$130,142	$112,284	$318,529
Subtotal Technical Assistance Costs	**$871,886**	**$766,846**	**$2,563,289**
Support Services			
Business Development	$0	$0	$1,118
Business Solutions Group	$16,017	$35,983	$52,001
Consulting	$24,152	$26,751	$81,617
Customer Support	$8,995	$26,193	$43,658
Evaluation, Monitoring & Verification	$7,535	$9,865	$23,560
Information Technology	$894	$1,483	$2,605
Marketing	$37,604	$151,980	$227,704
Policy & Public Affairs	$730	$1,212	$6,075
Public Relations and Internal Communications	$2,560	$5,964	$8,524
Targeted Implementation	$88	$0	$1,354
Transportation	$959	$0	$1,046
Subtotal Support Services Costs	**$99,534**	**$259,431**	**$449,261**
Incentive Costs			
Incentives to Participants	$1,604,196	$1,171,521	$4,483,577
Incentives to Trade Allies	$50	$0	$11,508
Subtotal Incentive Costs	**$1,604,246**	**$1,171,521**	**$4,495,085**
Total Efficiency Vermont Costs	**$3,395,333**	**$2,676,675**	**$9,547,913**
Total Participant Costs	$3,607,145	$2,343,802	$9,474,959
Total Third Party Costs	$0	$0	$0
Total Resource Acquisition Costs	**$7,002,478**	**$5,020,477**	**$19,022,872**
Annualized MWh Savings	9,559	7,817	28,286
Lifetime MWh Savings	144,276	101,794	406,821
TRB Savings (2015 $)	$13,954,683	$7,213,628	$49,412,658
Winter Coincident Peak kW Savings	1,346	1,137	4,186
Summer Coincident Peak kW Savings	1,523	977	4,363
Annualized MWh Savings/Participant	35.016	44.417	42.281
Weighted Lifetime	15.1	13.0	14.4

4.2 Electric Business New Construction - End Use Breakdown

End Use	# of Participants	Net MWH Saved	Gross MWH Saved	Net Lifetime MWH Saved	Net Winter KW Saved	Net Summer KW Saved	Net Other Fuel MMBTU Saved	Net TRB Saved	Participant Incentives Paid	Participant Costs
Air Conditioning Eff.	32	217	191	3,154	16	28	0	$203,895	$41,064	$66,113
Cooking and Laundry	8	30	28	391	2	6	14	$38,284	$4,849	$14,536
Design Assistance	9	0	0	0	0	0	0	$0	$232,031	$35,905
Hot Water Efficiency	3	0	0	0	0	0	334	$76,371	$3,130	$9,871
Industrial Process Eff.	5	1,918	1,943	25,536	252	72	35	$1,356,957	$222,193	$868,711
Lighting	158	2,932	2,583	43,253	450	411	-1,044	$2,912,952	$512,380	$598,522
Motors	28	2,153	1,891	22,957	330	354	937	$1,846,991	$54,867	$569,328
Other Indirect Activity	9	0	0	0	0	0	0	$0	$0	$0
Refrigeration	21	263	232	2,875	47	34	0	$208,572	$32,429	$30,360
Space Heat Efficiency	11	31	27	478	21	1	263	$104,936	$6,631	$27,698
Space Heat Fuel Switch	2	12	10	173	2	0	-240	-$20,844	$1,200	-$420
Ventilation	33	262	231	2,977	16	71	1,463	$475,899	$60,747	$118,778
Water Conservation	2	0	0	0	0	0	0	$9,615	$0	$4,400
Totals		7,817	7,137	101,794	1,137	977	1,761	$7,213,628	$1,171,521	$2,343,802

4.3 Electric Business New Construction Total Resource Benefits

Avoided Cost Benefits	2017	Lifetime (Present Value)
Avoided Cost of Electricity	nap	$6,903,691
Fossil Fuel Savings (Costs)	$19,559	$256,042
Water Savings (Costs)	$2,768	$53,896
Total	**$22,327**	**$7,213,628**

Electric Energy & Demand Benefits	Savings at Meter		Savings at Generation
	Gross	Net	Net
Annualized Energy Savings (MWh): Total	**7,137**	**6,870**	**7,817**
Winter on peak	2,988	2,871	3,295
Winter off peak	1,966	1,873	2,103
Summer on peak	1,301	1,273	1,464
Summer off peak	881	853	955
Coincident Demand Savings (kW)			
Winter	1,055	1,021	1,137
Shoulder	0	0	0
Summer	889	879	977

Thermal & Other Benefits	Gross	Net	Lifetime Net
Annualized Water Savings (ccf)	**647**	**644**	**6,235**
Annualized fuel savings (increase) MMBtu Total	**1,713**	**1,761**	**24,890**
LP	510	510	8,382
NG	1,141	1,141	16,909
Oil/Kerosene	381	387	4,873
Wood	(303)	(261)	(5,015)
Solar	0	0	0
Other	0	0	0
Annualized savings (increase) in O&M($)	**$23,784**	**$23,838**	**$351,888**

Net Societal Benefits	**$7,644,747**

4.4 Electric Business Existing Facilities Summary

	Prior Year	Current Year 2017	Cumulative starting 1/1/15
# participants with installations	7,800	15,133	22,794
Operating Costs			
Administration	$1,829,432	$1,615,062	$5,068,569
Programs and Implementation	$1,573,409	$1,734,755	$4,965,169
Strategy and Planning	$920,771	$435,275	$2,307,791
Subtotal Operating Costs	**$4,323,613**	**$3,785,092**	**$12,341,530**
Technical Assistance Costs			
Services to Participants	$3,173,611	$3,575,974	$10,307,290
Services to Trade Allies	$738,717	$765,489	$2,028,138
Subtotal Technical Assistance Costs	**$3,912,328**	**$4,341,463**	**$12,335,428**
Support Services			
Business Development	$0	$0	$9,046
Business Solutions Group	$124,396	$171,931	$296,327
Consulting	$57,386	$115,854	$237,953
Customer Support	$27,805	$121,321	$216,365
Evaluation, Monitoring & Verification	$67,610	$66,949	$223,463
Information Technology	$5,084	$8,743	$15,670
Marketing	$213,885	$896,046	$1,418,297
Policy & Public Affairs	$4,608	$8,656	$47,335
Public Relations and Internal Communications	$14,647	$35,163	$49,810
Targeted Implementation	$498	$0	$10,746
Transportation	$5,454	$0	$6,160
Subtotal Support Services Costs	**$521,374**	**$1,424,664**	**$2,531,172**
Incentive Costs			
Incentives to Participants	$10,433,685	$10,369,359	$30,485,071
Incentives to Trade Allies	$288	$1,473	$42,014
Subtotal Incentive Costs	**$10,433,973**	**$10,370,832**	**$30,527,085**
Total Efficiency Vermont Costs	**$19,191,288**	**$19,922,051**	**$57,735,215**
Total Participant Costs	$14,541,478	$11,682,402	$41,103,947
Total Third Party Costs	$0	$0	$0
Total Resource Acquisition Costs	**$33,732,766**	**$31,604,453**	**$98,839,162**
Annualized MWh Savings	53,044	61,699	153,408
Lifetime MWh Savings	574,216	718,096	1,791,757
TRB Savings (2015 $)	$44,489,626	$46,669,448	$126,817,322
Winter Coincident Peak kW Savings	8,581	8,820	22,743
Summer Coincident Peak kW Savings	7,124	8,231	19,984
Annualized MWh Savings/Participant	6.801	4.077	6.730
Weighted Lifetime	10.8	11.6	11.7

4.5 Electric Business Existing Facilities - End Use Breakdown

End Use	# of Participants	Net MWH Saved	Gross MWH Saved	Net Lifetime MWH Saved	Net Winter KW Saved	Net Summer KW Saved	Net Other Fuel MMBTU Saved	Net TRB Saved	Participant Incentives Paid	Participant Costs
Air Conditioning Eff.	42	871	841	17,049	37	113	37	$1,070,617	$112,456	$399,061
Behavior Change	1	13	12	13	2	1	0	$690	$0	$0
Cooking and Laundry	12	68	64	943	6	15	166	$131,880	$20,375	$71,170
Design Assistance	111	361	322	1,507	19	11	2,087	$157,768	$785,440	$2,830
Electronics	2	121	108	606	13	14	0	$37,055	$14,800	$43,712
Hot Water Efficiency	4	33	31	339	5	6	74	$35,337	$7,272	$15,339
Industrial Process Eff.	57	6,413	6,523	94,839	1,004	549	1,418	$5,869,613	$1,224,745	$2,885,786
Lighting	14,747	40,420	35,773	415,666	5,932	5,655	-20,377	$26,300,940	$6,835,968	$5,961,150
Motors	126	6,549	6,387	87,520	850	1,018	1,575	$6,495,632	$428,239	$1,077,778
Other Efficiency	31	22	20	657	2	3	0	$40,863	$7,672	$4,023
Other Fuel Switch	3	495	491	9,895	75	2	-1,897	-$42,422	$15,824	$32,698
Other Indirect Activity	264	0	0	0	0	0	0	$0	$455,000	-$190,576
Refrigeration	194	3,679	3,493	48,010	376	726	0	$3,402,490	$337,122	$1,008,972
Space Heat Efficiency	25	1,931	1,893	28,839	424	40	537	$1,696,787	$44,351	$31,985
Ventilation	28	721	698	12,207	74	81	3,771	$1,400,520	$79,747	$338,123
Water Conservation	1	1	1	5	0	0	0	$71,676	$350	$350
Totals		61,699	56,655	718,096	8,820	8,231	-12,608	$46,669,448	$10,369,359	$11,682,402

4.6 Electric Business Existing Facilities Total Resource Benefits

Avoided Cost Benefits	2017	Lifetime (Present Value)
Avoided Cost of Electricity	nap	$48,459,587
Fossil Fuel Savings (Costs)	($157,787)	($1,565,027)
Water Savings (Costs)	($3,447)	($225,111)
Total	**($161,234)**	**$46,669,448**

Electric Energy & Demand Benefits	Savings at Meter		Savings at Generation
	Gross	Net	Net
Annualized Energy Savings (MWh): Total	**56,655**	**54,220**	**61,699**
Winter on peak	23,511	22,487	25,815
Winter off peak	15,109	14,453	16,230
Summer on peak	10,729	10,280	11,822
Summer off peak	7,305	7,000	7,833
Coincident Demand Savings (kW)			
Winter	8,263	7,924	8,820
Shoulder	0	0	0
Summer	7,715	7,402	8,231

Thermal & Other Benefits	Gross	Net	Lifetime Net
Annualized Water Savings (ccf)	**(926)**	**(802)**	**(29,784)**
Annualized fuel savings (increase) MMBtu Total	**(12,092)**	**(12,608)**	**(120,749)**
LP	4,228	3,802	36,368
NG	(583)	(685)	(5,213)
Oil/Kerosene	(15,701)	(15,683)	(151,283)
Wood	(41)	(41)	(622)
Solar	0	0	0
Other	0	0	0
Annualized savings (increase) in O&M($)	**$861,566**	**$842,862**	**$7,946,805**

Net Societal Benefits	**$55,835,490**

4.7 Electric Residential New Construction Summary

	Prior Year	Current Year 2017	Cumulative starting 1/1/15
# participants with installations	1,838	1,477	4,522
Operating Costs			
Administration	$271,421	$187,505	$630,725
Programs and Implementation	$392,126	$413,425	$1,330,848
Strategy and Planning	$33,050	$34,402	$98,625
Subtotal Operating Costs	**$696,597**	**$635,332**	**$2,060,197**
Technical Assistance Costs			
Services to Participants	$1,252,686	$1,249,971	$3,696,421
Services to Trade Allies	$31,712	$25,098	$72,202
Subtotal Technical Assistance Costs	**$1,284,398**	**$1,275,069**	**$3,768,624**
Support Services			
Business Development	$0	$0	$367
Business Solutions Group	$7,188	$22,479	$29,667
Consulting	$38,464	$52,930	$126,541
Customer Support	$16,229	$22,225	$56,352
Evaluation, Monitoring & Verification	$6,043	$3,695	$14,001
Information Technology	$708	$1,463	$2,314
Marketing	$56,769	$136,525	$284,494
Policy & Public Affairs	$578	$1,196	$4,480
Public Relations and Internal Communications	$3,241	$5,233	$8,474
Targeted Implementation	$70	$0	$866
Transportation	$760	$0	$1,157
Subtotal Support Services Costs	**$130,050**	**$245,745**	**$528,714**
Incentive Costs			
Incentives to Participants	$1,538,772	$1,077,472	$3,542,501
Incentives to Trade Allies	$0	$500	$3,500
Subtotal Incentive Costs	**$1,538,772**	**$1,077,972**	**$3,546,001**
Total Efficiency Vermont Costs	**$3,649,817**	**$3,234,118**	**$9,903,536**
Total Participant Costs	$1,463,785	$792,295	$3,302,527
Total Third Party Costs	$71,385	$75,400	$204,760
Total Resource Acquisition Costs	**$5,184,987**	**$4,101,813**	**$13,410,823**
Annualized MWh Savings	3,135	2,001	7,176
Lifetime MWh Savings	54,200	33,163	123,433
TRB Savings (2015 $)	$9,030,620	$5,573,339	$21,800,524
Winter Coincident Peak kW Savings	684	485	1,583
Summer Coincident Peak kW Savings	370	226	812
Annualized MWh Savings/Participant	1.706	1.355	1.587
Weighted Lifetime	17.3	16.6	17.2

4.8 Electric Residential New Construction - End Use Breakdown

End Use	# of Participants	Net MWH Saved	Gross MWH Saved	Net Lifetime MWH Saved	Net Winter KW Saved	Net Summer KW Saved	Net Other Fuel MMBTU Saved	Net TRB Saved	Participant Incentives Paid	Participant Costs
Air Conditioning Eff.	103	18	16	313	0	12	0	$41,922	$98,516	-$83,248
Cooking and Laundry	540	54	46	709	21	13	348	$283,530	$43,218	$61,539
Design Assistance	85	0	0	0	0	0	0	$0	$38,060	$7,940
Hot Water Efficiency	514	12	10	191	2	1	1,002	$241,990	$3,048	$90,026
Lighting	1,268	910	831	8,420	215	78	-70	$526,594	$425,009	-$66,687
Motors	0	2	2	57	0	0	0	$4,091	$0	$25,500
Other Efficiency	193	10	9	314	1	1	0	$19,719	$171,205	-$169,572
Other Fuel Switch	56	26	33	793	5	4	-90	$59,844	$41	$26,458
Other Indirect Activity	30	0	0	0	0	0	0	$0	$75,000	-$75,000
Refrigeration	596	41	47	695	4	5	0	$43,840	$1,467	$19,008
Space Heat Efficiency	437	837	706	20,110	226	102	10,056	$4,081,741	$219,409	$878,161
Ventilation	661	90	81	1,560	10	11	956	$270,067	$2,499	$78,170
Totals		2,001	1,782	33,163	485	226	12,202	$5,573,339	$1,077,472	$792,295

4.9 Electric Residential New Construction Total Resource Benefits

Avoided Cost Benefits	2017	Lifetime (Present Value)
Avoided Cost of Electricity	nap	$2,294,824
Fossil Fuel Savings (Costs)	$206,354	$3,007,254
Water Savings (Costs)	$11,423	$271,261
Total	**$217,776**	**$5,573,339**

Electric Energy & Demand Benefits	Savings at Meter		Savings at Generation
	Gross	Net	Net
Annualized Energy Savings (MWh): Total	**1,782**	**1,763**	**2,001**
Winter on peak	672	668	766
Winter off peak	719	718	807
Summer on peak	188	182	209
Summer off peak	203	196	219
Coincident Demand Savings (kW)			
Winter	438	435	485
Shoulder	0	0	0
Summer	205	203	226

Thermal & Other Benefits	Gross	Net	Lifetime Net
Annualized Water Savings (ccf)	**2,678**	**2,656**	**33,299**
Annualized fuel savings (increase) MMBtu Total	**11,718**	**12,202**	**279,834**
LP	4,189	4,369	102,330
NG	7,307	7,600	171,823
Oil/Kerosene	81	86	1,984
Wood	141	148	3,697
Solar	0	0	0
Other	0	0	0
Annualized savings (increase) in O&M($)	**$24,198**	**$23,107**	**$254,591**

Net Societal Benefits	**$5,073,223**

4.10 Electric Efficient Products Summary

	Prior Year	Current Year 2017	Cumulative starting 1/1/15
# participants with installations	66,184	97,428	241,157
Operating Costs			
Administration	$1,248,618	$1,302,199	$4,038,382
Programs and Implementation	$1,719,406	$1,234,335	$4,274,545
Strategy and Planning	$201,084	$176,191	$536,648
Subtotal Operating Costs	**$3,169,108**	**$2,712,726**	**$8,849,575**
Technical Assistance Costs			
Services to Participants	$221,543	$272,821	$632,453
Services to Trade Allies	$554,122	$534,189	$1,420,378
Subtotal Technical Assistance Costs	**$775,665**	**$807,010**	**$2,052,831**
Support Services			
Business Development	$0	$0	$1,852
Business Solutions Group	$46,636	$113,395	$160,031
Consulting	$43,935	$54,019	$140,902
Customer Support	$57,242	$77,388	$188,869
Evaluation, Monitoring & Verification	$24,037	$11,840	$46,271
Information Technology	$2,862	$5,296	$8,535
Marketing	$541,549	$762,808	$1,861,845
Policy & Public Affairs	$2,500	$4,329	$16,066
Public Relations and Internal Communications	$10,365	$15,836	$26,201
Targeted Implementation	$281	$0	$2,379
Transportation	$4,683	$0	$5,151
Subtotal Support Services Costs	**$734,089**	**$1,044,912**	**$2,458,102**
Incentive Costs			
Incentives to Participants	$7,825,355	$9,399,610	$26,564,828
Incentives to Trade Allies	$0	$43,854	$46,013
Subtotal Incentive Costs	**$7,825,355**	**$9,443,464**	**$26,610,841**
Total Efficiency Vermont Costs	**$12,504,217**	**$14,008,113**	**$39,971,350**
Total Participant Costs	$9,399,785	$8,587,883	$20,593,244
Total Third Party Costs	$0	$0	$0
Total Resource Acquisition Costs	**$21,904,002**	**$22,595,996**	**$60,564,593**

Annualized MWh Savings	59,691	75,791	186,363
Lifetime MWh Savings	609,638	491,323	1,720,523
TRB Savings (2015 $)	$44,571,059	$34,104,654	$117,230,836
Winter Coincident Peak kW Savings	11,605	16,318	38,114
Summer Coincident Peak kW Savings	5,722	8,341	19,060
Annualized MWh Savings/Participant	0.902	0.778	0.773
Weighted Lifetime	10.2	6.5	9.2

4.11 Electric Efficient Products - End Use Breakdown

End Use	# of Participants	Net MWH Saved	Gross MWH Saved	Net Lifetime MWH Saved	Net Winter KW Saved	Net Summer KW Saved	Net Other Fuel MMBTU Saved	Net TRB Saved	Participant Incentives Paid	Participant Costs
Air Conditioning Eff.	971	237	257	2,680	5	58	0	$203,967	$42,390	$52,322
Cooking and Laundry	2,237	736	651	9,531	94	71	1,239	$1,765,868	$189,959	$746,644
Electronics	1,077	382	328	2,169	43	36	0	$130,765	$33,583	-$19,584
Hot Water Efficiency	1,481	2,822	2,257	36,680	437	219	-5,193	$1,400,548	$882,200	$151,762
Lighting	85,758	64,880	56,737	340,855	14,534	7,208	-15,191	$22,545,909	$6,720,119	$5,644,890
Motors	1,508	1,227	1,078	14,832	96	611	0	$1,619,058	$377,981	$221,957
Other Efficiency	618	277	244	2,773	50	19	2,002	$959,667	$130,198	-$86,124
Other Indirect Activity	1	0	0	0	0	0	0	$0	$160,238	-$160,238
Refrigeration	1,670	150	228	2,551	14	17	0	$159,120	$88,015	-$43,127
Space Heat Efficiency	2,895	5,080	5,012	79,251	1,045	102	5,394	$5,319,753	$774,928	$2,079,381
Totals		75,791	66,792	491,323	16,318	8,341	-11,749	$34,104,654	$9,399,610	$8,587,883

4.12 Electric Efficient Products Total Resource Benefits

Avoided Cost Benefits	2017	Lifetime (Present Value)
Avoided Cost of Electricity	nap	$32,607,733
Fossil Fuel Savings (Costs)	($205,686)	($51,313)
Water Savings (Costs)	$66,472	$1,548,235
Total	**($139,214)**	**$34,104,654**

Electric Energy & Demand Benefits	Savings at Meter		Savings at Generation
	Gross	Net	Net
Annualized Energy Savings (MWh): Total	**66,792**	**66,685**	**75,791**
Winter on peak	26,792	26,760	30,720
Winter off peak	20,797	20,681	23,225
Summer on peak	10,570	10,590	12,179
Summer off peak	8,643	8,654	9,684
Coincident Demand Savings (kW)			
Winter	14,684	14,662	16,318
Shoulder	0	0	0
Summer	7,484	7,501	8,341

Thermal & Other Benefits	Gross	Net	Lifetime Net
Annualized Water Savings (ccf)	**15,613**	**15,459**	**188,378**
Annualized fuel savings (increase) MMBtu Total	**(10,488)**	**(11,749)**	**(10,496)**
LP	(737)	(1,098)	(14,512)
NG	2,165	2,008	26,495
Oil/Kerosene	(11,829)	(12,312)	(19,619)
Wood	(128)	(347)	(2,861)
Solar	0	0	0
Other	0	0	0
Annualized savings (increase) in O&M($)	**$1,273,905**	**$1,294,444**	**$6,340,917**

Net Societal Benefits	**$46,535,478**

4.13 Electric Existing Homes Summary

	Prior Year	Current Year 2017	Cumulative starting 1/1/15
# participants with installations	1,811	2,047	7,581
Operating Costs			
Administration	$260,066	$351,435	$894,152
Programs and Implementation	$980,888	$1,146,740	$3,686,815
Strategy and Planning	$57,125	$123,603	$243,556
Subtotal Operating Costs	**$1,298,078**	**$1,621,778**	**$4,824,523**
Technical Assistance Costs			
Services to Participants	$222,502	$256,906	$652,374
Services to Trade Allies	$38,972	$26,090	$90,099
Subtotal Technical Assistance Costs	**$261,474**	**$282,996**	**$742,474**
Support Services			
Business Development	$0	$0	$1,189
Business Solutions Group	$62,446	$54,414	$116,860
Consulting	$53,147	$103,679	$211,990
Customer Support	$40,246	$64,895	$142,227
Evaluation, Monitoring & Verification	$27,115	$15,412	$74,505
Information Technology	$973	$11,460	$13,034
Marketing	$405,641	$340,347	$1,114,910
Policy & Public Affairs	$2,076	$1,259	$8,483
Public Relations and Internal Communications	$4,515	$5,113	$9,628
Targeted Implementation	$95	$0	$1,442
Transportation	$1,664	$0	$2,029
Subtotal Support Services Costs	**$597,918**	**$596,578**	**$1,696,298**
Incentive Costs			
Incentives to Participants	$1,239,507	$2,494,236	$5,278,991
Incentives to Trade Allies	$0	$0	$492
Subtotal Incentive Costs	**$1,239,507**	**$2,494,236**	**$5,279,483**
Total Efficiency Vermont Costs	**$3,396,978**	**$4,995,587**	**$12,542,776**
Total Participant Costs	$26,266	($23,001)	$532,623
Total Third Party Costs	($206,225)	$18,183	($319,006)
Total Resource Acquisition Costs	**$3,217,019**	**$4,990,769**	**$12,756,394**
Annualized MWh Savings	2,002	10,634	15,141
Lifetime MWh Savings	21,677	30,162	88,640
TRB Savings (2015 $)	$1,481,670	$2,056,463	$5,743,514
Winter Coincident Peak kW Savings	408	2,493	3,439
Summer Coincident Peak kW Savings	151	747	1,077
Annualized MWh Savings/Participant	1.106	5.195	1.997
Weighted Lifetime	10.8	2.8	5.9

4.14 Electric Existing Homes - End Use Breakdown

End Use	# of Participants	Net MWH Saved	Gross MWH Saved	Net Lifetime MWH Saved	Net Winter KW Saved	Net Summer KW Saved	Net Other Fuel MMBTU Saved	Net TRB Saved	Participant Incentives Paid	Participant Costs
Air Conditioning Eff.	53	10	9	110	0	12	0	$24,087	$9,703	$10,739
Behavior Change	12	8,476	7,467	8,476	2,004	559	0	$533,962	$962,000	$0
Cooking and Laundry	135	136	120	717	19	15	25	$161,823	$102,978	$4,009
Electronics	242	23	21	104	2	3	0	$6,776	$6,599	-$419
Hot Water Efficiency	646	546	483	6,633	80	44	-558	$460,730	$423,745	$4,992
Hot Water Fuel Switch	3	10	10	306	2	1	-34	$10,554	$4,023	$10,050
Lighting	1,637	878	779	5,983	252	71	-5	$411,044	$197,394	$61,468
Motors	10	6	5	103	0	2	0	$12,118	$0	$7,864
Other Efficiency	1,038	30	26	301	5	2	162	$90,521	$38,864	-$27,085
Other Fuel Switch	4	8	7	188	2	1	-13	$12,695	$3,205	$8,435
Other Indirect Activity	87	1	1	4	0	0	0	$290	$104,264	-$82,688
Refrigeration	532	266	236	2,062	25	32	0	$134,748	$364,786	$44,426
Space Heat Efficiency	164	74	65	1,344	39	1	0	$96,251	$256,392	-$163,566
Space Heat Fuel Switch	14	130	115	3,259	60	0	-451	$62,950	$0	$90,787
Ventilation	318	35	31	550	4	4	0	$36,684	$20,283	$6,294
Water Conservation	2	3	3	20	0	0	0	$1,229	$0	$1,693
Totals		10,634	9,378	30,162	2,493	747	-874	$2,056,463	$2,494,236	-$23,001

4.15 Electric Existing Homes Total Resource Benefits

Avoided Cost Benefits	2017	Lifetime (Present Value)
Avoided Cost of Electricity	nap	$1,986,169
Fossil Fuel Savings (Costs)	($20,072)	($223,650)
Water Savings (Costs)	$14,098	$293,944
Total	**($5,974)**	**$2,056,463**

Electric Energy & Demand Benefits	Savings at Meter		Savings at Generation
	Gross	Net	Net
Annualized Energy Savings (MWh): Total	**9,378**	**9,368**	**10,634**
Winter on peak	3,481	3,477	3,991
Winter off peak	3,285	3,282	3,686
Summer on peak	1,225	1,223	1,407
Summer off peak	1,387	1,386	1,551
Coincident Demand Savings (kW)			
Winter	2,242	2,240	2,493
Shoulder	0	0	0
Summer	673	672	747

Thermal & Other Benefits	Gross	Net	Lifetime Net
Annualized Water Savings (ccf)	**3,304**	**3,279**	**27,331**
Annualized fuel savings (increase) MMBtu Total	**(877)**	**(874)**	**(18,192)**
LP	(659)	(659)	(13,246)
NG	26	29	(432)
Oil/Kerosene	(79)	(79)	(1,873)
Wood	(164)	(164)	(2,641)
Solar	0	0	0
Other	0	0	0
Annualized savings (increase) in O&M($)	**$13,406**	**$13,290**	**$100,973**

Net Societal Benefits	**($93,507)**

4.16 Thermal Energy and Process Fuels
Business New Construction Summary

	Prior Year	Current Year 2017	Cumulative starting 1/1/15
# participants with installations	46	24	86
Operating Costs			
Administration	$12,491	$6,610	$21,138
Programs and Implementation	$300	$226	$650
Strategy and Planning	$770	$1,222	$2,296
Subtotal Operating Costs	**$13,561**	**$8,058**	**$24,084**
Technical Assistance Costs			
Services to Participants	$2,066	$4,051	$7,019
Services to Trade Allies	$164	$0	$164
Subtotal Technical Assistance Costs	**$2,230**	**$4,051**	**$7,183**
Support Services			
Business Development	$0	$0	$12
Business Solutions Group	$39	$871	$911
Consulting	$139	$268	$484
Customer Support	$106	$524	$719
Evaluation, Monitoring & Verification	$792	$13	$860
Information Technology	$1	$213	$215
Marketing	$386	$1,305	$2,105
Policy & Public Affairs	$7	($9)	$42
Public Relations and Internal Communications	$10	$22	$32
Targeted Implementation	$2	$0	$16
Transportation	$1	$0	$3
Subtotal Support Services Costs	**$1,483**	**$3,207**	**$5,398**
Incentive Costs			
Incentives to Participants	$97,372	$39,645	$151,520
Incentives to Trade Allies	$0	$0	$0
Subtotal Incentive Costs	**$97,372**	**$39,645**	**$151,520**
Total Efficiency Vermont Costs	**$114,647**	**$54,962**	**$188,186**
Total Participant Costs	$348,881	$216,182	$1,063,836
Total Third Party Costs	$0	$0	$0
Total Resource Acquisition Costs	**$463,528**	**$271,144**	**$1,252,022**
Annualized MMBtu Savings	8,420	3,416	13,134
Lifetime MMBtu Savings	152,409	56,896	236,314
TRB Savings (2015 $)	$2,256,296	$868,497	$4,532,773
Annualized MMBtu Savings/Participant	183.045	142.319	152.723
Weighted Lifetime	18.1	16.7	18.0

4.17 Thermal Energy and Process Fuels Business New Construction - End Use Breakdown

End Use	# of Participants	Net MWH Saved	Gross MWH Saved	Net Lifetime MWH Saved	Net Winter KW Saved	Net Summer KW Saved	Net Other Fuel MMBTU Saved	Net TRB Saved	Participant Incentives Paid	Participant Costs
Cooking and Laundry	2	-3	-3	-40	0	0	41	$6,711	$1,283	$1,763
Hot Water Efficiency	6	0	0	0	0	0	305	$41,834	$5,781	$12,661
Industrial Process Eff.	1	0	0	0	0	0	193	$53,220	$2,800	$4,200
Motors	2	-9	-8	-142	0	1	173	$28,477	$3,560	$10,590
Space Heat Efficiency	12	0	0	0	0	0	1,175	$318,946	$8,375	$37,334
Space Heat Fuel Switch	3	1	1	12	0	0	326	$169,206	$5,992	$101,548
Ventilation	8	-14	-12	-182	2	8	1,203	$250,105	$11,854	$48,086
Totals		-25	-22	-352	2	9	3,416	$868,497	$39,645	$216,182

4.18 Thermal Energy and Process Fuels
Business New Construction Total Resource Benefits

Avoided Cost Benefits	2017	Lifetime (Present Value)
Avoided Cost of Electricity	nap	$10,355
Fossil Fuel Savings (Costs)	$45,605	$856,185
Water Savings (Costs)	$83	$1,957
Total	**$45,688**	**$868,497**

Electric Energy & Demand Benefits	Savings at Meter		Savings at Generation
	Gross	Net	Net
Annualized Energy Savings (MWh): Total	**(22)**	**(22)**	**(25)**
Winter on peak	(8)	(8)	(9)
Winter off peak	(5)	(5)	(5)
Summer on peak	(6)	(6)	(7)
Summer off peak	(4)	(4)	(4)
Coincident Demand Savings (kW)			
Winter	2	2	2
Shoulder	0	0	0
Summer	8	8	9

Thermal & Other Benefits	Gross	Net	Lifetime Net
Annualized Water Savings (ccf)	**20**	**19**	**239**
Annualized fuel savings (increase) MMBtu Total	**3,474**	**3,416**	**56,896**
LP	3,991	3,815	63,701
NG	117	116	1,725
Oil/Kerosene	131	127	1,489
Wood	(765)	(642)	(10,019)
Solar	0	0	0
Other	0	0	0
Annualized savings (increase) in O&M($)	**$466**	**$396**	**$8,354**

Net Societal Benefits	**$1,102,650**

4.19 Thermal Energy and Process Fuels
Business Existing Facilities Summary

	Prior Year	Current Year 2017	Cumulative starting 1/1/15
# participants with installations	262	200	668
Operating Costs			
Administration	$139,095	$112,456	$309,684
Programs and Implementation	$1,289	$11,441	$33,337
Strategy and Planning	$68,103	$22,190	$113,343
Subtotal Operating Costs	**$208,487**	**$146,087**	**$456,364**
Technical Assistance Costs			
Services to Participants	$87,342	$91,550	$212,656
Services to Trade Allies	$754	$0	$800
Subtotal Technical Assistance Costs	**$88,096**	**$91,550**	**$213,456**
Support Services			
Business Development	$0	$0	$367
Business Solutions Group	$1,755	$8,013	$9,768
Consulting	$6,323	$2,469	$11,138
Customer Support	$8,764	$6,283	$28,608
Evaluation, Monitoring & Verification	$1,674	$121	$4,049
Information Technology	$36	$1,955	$2,066
Marketing	$17,493	$12,005	$42,016
Policy & Public Affairs	$304	($85)	$1,576
Public Relations and Internal Communications	$430	$202	$633
Targeted Implementation	$82	$0	$498
Transportation	$28	$0	$56
Subtotal Support Services Costs	**$36,888**	**$30,963**	**$100,775**
Incentive Costs			
Incentives to Participants	$720,139	$817,581	$1,915,292
Incentives to Trade Allies	$0	$5,600	$5,600
Subtotal Incentive Costs	**$720,139**	**$823,181**	**$1,920,892**
Total Efficiency Vermont Costs	**$1,053,610**	**$1,091,781**	**$2,691,486**
Total Participant Costs	$2,205,736	$2,668,233	$6,272,053
Total Third Party Costs	$0	$75,000	$75,000
Total Resource Acquisition Costs	**$3,259,346**	**$3,835,014**	**$9,038,540**
Annualized MMBtu Savings	52,653	39,178	106,598
Lifetime MMBtu Savings	603,706	529,913	1,383,291
TRB Savings (2015 $)	$7,950,961	$6,597,709	$18,776,141
Annualized MMBtu Savings/Participant	200.965	195.891	159.578
Weighted Lifetime	11.5	13.5	13.0

4.20 Thermal Energy and Process Fuels Business Existing Facilities - End Use Breakdown

End Use	# of Participants	Net MWH Saved	Gross MWH Saved	Net Lifetime MWH Saved	Net Winter KW Saved	Net Summer KW Saved	Net Other Fuel MMBTU Saved	Net TRB Saved	Participant Incentives Paid	Participant Costs
Air Conditioning Eff.	9	3	3	24	0	1	44	$7,722	$1,440	$960
Cooking and Laundry	39	-1	-1	-12	0	1	896	$169,155	$35,450	$137,553
Design Assistance	6	0	0	0	0	0	109	$21,588	$66,950	-$37,220
Hot Water Efficiency	15	0	0	0	0	0	1,721	$403,027	$40,725	$79,099
Industrial Process Eff.	33	-17	-17	-189	-2	2	13,939	$1,618,410	$189,717	$399,573
Motors	1	35	35	524	6	7	0	$38,590	$0	$17,762
Other Efficiency	27	0	0	0	0	0	0	$0	$0	$0
Other Fuel Switch	3	0	0	0	0	0	331	$41,123	$6,500	$38,458
Other Indirect Activity	1	0	0	0	0	0	0	$0	$60,600	$0
Refrigeration	1	7	7	101	1	1	0	$7,232	$3,000	$2,352
Space Heat Efficiency	89	14	14	306	8	0	14,208	$2,176,390	$259,885	$961,306
Space Heat Fuel Switch	6	1	1	21	0	0	1,204	$650,939	$31,000	$729,006
Ventilation	16	1	1	-4	-1	1	6,726	$1,463,532	$122,315	$339,385
Totals		43	42	771	13	13	39,178	$6,597,709	$817,581	$2,668,233

4.21 Thermal Energy and Process Fuels
Business Existing Facilities Total Resource Benefits

Avoided Cost Benefits	2017	Lifetime (Present Value)
Avoided Cost of Electricity	nap	$65,140
Fossil Fuel Savings (Costs)	$609,882	$6,517,977
Water Savings (Costs)	$569	$14,592
Total	**$610,451**	**$6,597,709**

Electric Energy & Demand Benefits	Savings at Meter		Savings at Generation
	Gross	Net	Net
Annualized Energy Savings (MWh): Total	**42**	**38**	**43**
Winter on peak	13	11	13
Winter off peak	8	7	8
Summer on peak	7	6	7
Summer off peak	15	13	15
Coincident Demand Savings (kW)			
Winter	13	12	13
Shoulder	0	0	0
Summer	13	12	13

Thermal & Other Benefits	Gross	Net	Lifetime Net
Annualized Water Savings (ccf)	**142**	**132**	**1,853**
Annualized fuel savings (increase) MMBtu Total	**43,559**	**39,178**	**529,913**
LP	11,542	10,531	184,451
NG	0	0	0
Oil/Kerosene	22,601	19,861	288,214
Wood	1,104	1,254	(20,436)
Solar	0	0	0
Other	0	0	0
Annualized savings (increase) in O&M($)	**$5,377**	**$4,785**	**$71,781**

Net Societal Benefits	**$7,358,403**

4.22 Thermal Energy and Process Fuels
Residential New Construction Summary

	Prior Year	Current Year 2017	Cumulative starting 1/1/15
# participants with installations	71	42	114
Operating Costs			
Administration	$1,070	$442	$1,942
Programs and Implementation	$15	$5	$219
Strategy and Planning	$22	$39	$65
Subtotal Operating Costs	**$1,107**	**$486**	**$2,227**
Technical Assistance Costs			
Services to Participants	$987	$61	$1,048
Services to Trade Allies	$13	$0	$13
Subtotal Technical Assistance Costs	**$1,000**	**$61**	**$1,061**
Support Services			
Business Development	$0	$0	$0
Business Solutions Group	$3	$38	$41
Consulting	$9	$12	$21
Customer Support	$821	$1,023	$2,125
Evaluation, Monitoring & Verification	$1	$1	$2
Information Technology	$0	$9	$9
Marketing	$1,564	$2,273	$4,462
Policy & Public Affairs	$0	($0)	($0)
Public Relations and Internal Communications	$1	$1	$2
Targeted Implementation	$0	$0	$0
Transportation	$0	$0	$0
Subtotal Support Services Costs	**$2,399**	**$3,355**	**$6,660**
Incentive Costs			
Incentives to Participants	$3,493	$3,100	$10,093
Incentives to Trade Allies	$0	$0	$0
Subtotal Incentive Costs	**$3,493**	**$3,100**	**$10,093**
Total Efficiency Vermont Costs	**$7,999**	**$7,002**	**$20,041**
Total Participant Costs	$63,510	$27,685	$119,897
Total Third Party Costs	$0	$0	$0
Total Resource Acquisition Costs	**$71,508**	**$34,686**	**$139,938**
Annualized MMBtu Savings	213	347	1,918
Lifetime MMBtu Savings	4,463	7,471	45,158
TRB Savings (2015 $)	$120,657	$89,632	$765,028
Annualized MMBtuSavings/Participant	2.999	8.261	16.825
Weighted Lifetime	21.0	21.5	23.5

4.23 Thermal Energy and Process Fuels Residential New Construction - End Use Breakdown

End Use	# of Participants	Net MWH Saved	Gross MWH Saved	Net Lifetime MWH Saved	Net Winter KW Saved	Net Summer KW Saved	Net Other Fuel MMBTU Saved	Net TRB Saved	Participant Incentives Paid	Participant Costs
Hot Water Efficiency	32	0	0	0	0	0	78	$12,770	$0	$0
Space Heat Efficiency	42	0	0	0	0	0	259	$74,809	$2,950	$26,878
Ventilation	10	0	0	1	0	0	10	$2,053	$150	$807
Totals		0	0	1	0	0	347	$89,632	$3,100	$27,685

4.24 Thermal Energy and Process Fuels
Residential New Construction Total Resource Benefits

Avoided Cost Benefits	2017	Lifetime (Present Value)
Avoided Cost of Electricity	nap	$25
Fossil Fuel Savings (Costs)	$5,158	$89,607
Water Savings (Costs)	$0	$0
Total	**$5,158**	**$89,632**

Electric Energy & Demand Benefits	Savings at Meter		Savings at Generation
	Gross	Net	Net
Annualized Energy Savings (MWh): Total	**0**	**0**	**0**
Winter on peak	0	0	0
Winter off peak	0	0	0
Summer on peak	0	0	0
Summer off peak	0	0	0
Coincident Demand Savings (kW)			
Winter	(0)	(0)	(0)
Shoulder	0	0	0
Summer	(0)	(0)	(0)

Thermal & Other Benefits	Gross	Net	Lifetime Net
Annualized Water Savings (ccf)	**0**	**0**	**0**
Annualized fuel savings (increase) MMBtu Total	**342**	**347**	**7,471**
LP	83	84	1,681
NG	181	181	3,746
Oil/Kerosene	0	0	0
Wood	78	82	2,044
Solar	0	0	0
Other	0	0	0
Annualized savings (increase) in O&M($)	**$0**	**$0**	**$0**

Net Societal Benefits	**$107,253**

4.25 Thermal Energy and Process Fuels
Efficient Products Summary

	Prior Year	Current Year 2017	Cumulative starting 1/1/15
# participants with installations	1,101	4,053	5,367
Operating Costs			
Administration	$69,039	$258,559	$370,326
Programs and Implementation	$13,174	$26,387	$39,562
Strategy and Planning	$1,611	$3,609	$6,647
Subtotal Operating Costs	**$83,824**	**$288,555**	**$416,535**
Technical Assistance Costs			
Services to Participants	$2,221	$5,693	$10,833
Services to Trade Allies	$904	$0	$904
Subtotal Technical Assistance Costs	**$3,125**	**$5,693**	**$11,737**
Support Services			
Business Development	$0	$0	$40
Business Solutions Group	$166	$4,105	$4,271
Consulting	$5,702	$7,433	$13,385
Customer Support	$461	$1,893	$2,644
Evaluation, Monitoring & Verification	$437	$1,223	$1,836
Information Technology	$3	$859	$871
Marketing	$22,815	$13,583	$37,793
Policy & Public Affairs	$29	($37)	$136
Public Relations and Internal Communications	$40	$89	$129
Targeted Implementation	$8	$0	$52
Transportation	$3	$0	$6
Subtotal Support Services Costs	**$29,664**	**$29,147**	**$61,163**
Incentive Costs			
Incentives to Participants	$552,190	$2,217,935	$3,120,057
Incentives to Trade Allies	$0	$0	$0
Subtotal Incentive Costs	**$552,190**	**$2,217,935**	**$3,120,057**
Total Efficiency Vermont Costs	**$668,803**	**$2,541,330**	**$3,609,491**
Total Participant Costs	$406,330	$6,044,779	$6,241,686
Total Third Party Costs	$0	$0	$0
Total Resource Acquisition Costs	**$1,075,134**	**$8,586,109**	**$9,851,177**
Annualized MMBtu Savings	37,028	150,547	195,029
Lifetime MMBtu Savings	532,366	2,212,812	2,842,441
TRB Savings (2015 $)	3,028,247	$11,453,046	$16,376,838
Annualized MMBtu Savings/Participant	33.631	37.145	36.339
Weighted Lifetime	14.4	14.7	14.6

4.26 Thermal Energy and Process Fuels Efficient Products - End Use Breakdown

End Use	# of Participants	Net MWH Saved	Gross MWH Saved	Net Lifetime MWH Saved	Net Winter KW Saved	Net Summer KW Saved	Net Other Fuel MMBTU Saved	Net TRB Saved	Participant Incentives Paid	Participant Costs
Hot Water Efficiency	534	-532	-426	-6,919	-82	-41	7,202	$973,574	$326,060	$79,108
Other Efficiency	1	0	0	0	0	0	0	$0	$0	$0
Other Indirect Activity	1	0	0	0	0	0	0	$0	-$160,238	$160,238
Space Heat Efficiency	3,559	-18,274	-18,311	-274,469	-4,552	-674	143,345	$10,479,472	$2,052,112	$5,805,433
Totals		-18,807	-18,737	-281,388	-4,634	-715	150,547	$11,453,046	$2,217,935	$6,044,779

4.27 Thermal Energy and Process Fuels
Efficient Products Total Resource Benefits

Avoided Cost Benefits	2017	Lifetime (Present Value)
Avoided Cost of Electricity	nap	($16,762,567)
Fossil Fuel Savings (Costs)	$2,419,714	$28,215,613
Water Savings (Costs)	$0	$0
Total	**$2,419,714**	**$11,453,046**

Electric Energy & Demand Benefits	Savings at Meter		Savings at Generation
	Gross	Net	Net
Annualized Energy Savings (MWh): Total	**(18,737)**	**(16,575)**	**(18,807)**
Winter on peak	(7,788)	(6,889)	(7,908)
Winter off peak	(9,041)	(7,983)	(8,965)
Summer on peak	(1,014)	(906)	(1,042)
Summer off peak	(893)	(797)	(892)
Coincident Demand Savings (kW)			
Winter	(4,718)	(4,164)	(4,634)
Shoulder	0	0	0
Summer	(723)	(643)	(715)

Thermal & Other Benefits	Gross	Net	Lifetime Net
Annualized Water Savings (ccf)	**0**	**0**	**0**
Annualized fuel savings (increase) MMBtu Total	**168,594**	**150,547**	**2,212,812**
LP	26,861	24,380	348,148
NG	31,025	27,302	409,531
Oil/Kerosene	86,978	78,027	1,142,070
Wood	23,736	20,838	313,063
Solar	0	0	0
Other	0	0	0
Annualized savings (increase) in O&M($)	**$0**	**$0**	**$0**

Net Societal Benefits	**$8,123,997**

4.28 Thermal Energy and Process Fuels
Existing Homes Summary

	Prior Year	Current Year 2017	Cumulative starting 1/1/15
# participants with installations	2,549	1,376	5,782
Operating Costs			
Administration	$369,416	$259,668	$912,887
Programs and Implementation	$894,871	$923,167	$3,086,281
Strategy and Planning	$65,847	$84,327	$281,870
Subtotal Operating Costs	**$1,330,134**	**$1,267,163**	**$4,281,039**
Technical Assistance Costs			
Services to Participants	$288,678	$216,236	$888,978
Services to Trade Allies	$30,486	$0	$30,528
Subtotal Technical Assistance Costs	**$319,163**	**$216,236**	**$919,506**
Support Services			
Business Development	$0	$0	$905
Business Solutions Group	$38,316	$32,774	$71,090
Consulting	$71,233	$28,478	$208,229
Customer Support	$112,534	$96,010	$284,939
Evaluation, Monitoring & Verification	$1,743	$752	$10,326
Information Technology	$280	$5,302	$6,389
Marketing	$406,871	$247,815	$1,011,834
Policy & Public Affairs	$944	($231)	$4,926
Public Relations and Internal Communications	$4,417	$2,112	$6,528
Targeted Implementation	$221	$0	$1,247
Transportation	$197	$0	$581
Subtotal Support Services Costs	**$636,754**	**$413,012**	**$1,606,994**
Incentive Costs			
Incentives to Participants	$1,811,858	$1,676,165	$5,262,277
Incentives to Trade Allies	$33,200	$134,850	$193,050
Subtotal Incentive Costs	**$1,845,058**	**$1,811,015**	**$5,455,327**
Total Efficiency Vermont Costs	**$4,131,109**	**$3,707,425**	**$12,262,865**
Total Participant Costs	$9,075,091	$10,561,842	$28,469,966
Total Third Party Costs	$243,202	$216,243	$622,241
Total Resource Acquisition Costs	**$13,449,402**	**$14,485,511**	**$41,355,072**
Annualized MMBtu Savings	21,496	19,616	63,246
Lifetime MMBtu Savings	411,338	370,388	1,198,167
TRB Savings (2015 $)	$6,542,325	$6,474,363	$22,445,138
Annualized MMBtu Savings/Participant	8.433	14.256	10.938
Weighted Lifetime	19.1	18.9	18.9

4.29 Thermal Energy and Process Fuels Existing Homes - End Use Breakdown

End Use	# of Participants	Net MWH Saved	Gross MWH Saved	Net Lifetime MWH Saved	Net Winter KW Saved	Net Summer KW Saved	Net Other Fuel MMBTU Saved	Net TRB Saved	Participant Incentives Paid	Participant Costs
Cooking and Laundry	8	0	0	0	0	0	0	$0	$0	$1,523
Hot Water Efficiency	109	0	0	0	0	0	554	$273,470	$1,274	$118,175
Hot Water Fuel Switch	5	15	17	297	2	1	-42	$4,533	$0	$10,500
Other Efficiency	678	0	0	0	0	0	0	$0	$0	$0
Other Fuel Switch	1	0	0	0	0	0	0	$0	$0	$300
Other Indirect Activity	235	0	0	0	0	0	0	$0	$551,386	-$145,337
Space Heat Efficiency	1,158	200	194	3,659	93	0	18,483	$5,953,045	$1,077,504	$9,799,644
Space Heat Fuel Switch	49	9	10	214	5	0	310	$192,332	$46,000	$487,184
Ventilation	151	0	0	0	0	0	311	$50,984	$0	$289,853
Totals		223	221	4,171	100	1	19,616	$6,474,363	$1,676,165	$10,561,842

4.30 Thermal Energy and Process Fuels
Existing Homes Total Resource Benefits

Avoided Cost Benefits	2017	Lifetime (Present Value)
Avoided Cost of Electricity	nap	$261,616
Fossil Fuel Savings (Costs)	$402,333	$6,194,214
Water Savings (Costs)	$951	$18,533
Total	**$403,284**	**$6,474,363**

Electric Energy & Demand Benefits	Savings at Meter		Savings at Generation
	Gross	Net	Net
Annualized Energy Savings (MWh): Total	**221**	**197**	**223**
Winter on peak	100	89	102
Winter off peak	114	102	114
Summer on peak	4	3	4
Summer off peak	4	3	4
Coincident Demand Savings (kW)			
Winter	100	90	100
Shoulder	0	0	0
Summer	1	1	1

Thermal & Other Benefits	Gross	Net	Lifetime Net
Annualized Water Savings (ccf)	**239**	**221**	**2,211**
Annualized fuel savings (increase) MMBtu Total	**20,934**	**19,616**	**370,388**
LP	6,047	5,805	107,809
NG	51	42	1,196
Oil/Kerosene	19,724	18,690	386,941
Wood	(4,889)	(4,921)	(125,557)
Solar	0	0	0
Other	0	0	0
Annualized savings (increase) in O&M($)	**($1,098)**	**($879)**	**($26,360)**

Net Societal Benefits	**($310,997)**

5. SPECIAL PROGRAMS

5.1 CUSTOMER CREDIT PROGRAM

5.2 DESIGNATED DOWNTOWNS INITIATIVE

5.1 CUSTOMER CREDIT PROGRAM NARRATIVE

The Customer Credit Program (CCP) provides an alternative path for qualified large businesses showing the capability and resources to identify, analyze, and undertake efficiency projects, and to self-implement energy efficiency measures. Approved project costs are reimbursed up to a maximum of 90% of the company's electric Energy Efficiency Charge payments with time bound limitations.

CCP customers can receive reimbursement for any retrofit or market-driven project that saves electrical energy and passes the Vermont societal cost-effectiveness test. Once a qualifying customer elects to participate in the CCP, that customer is no longer eligible to participate in other Efficiency Vermont programs.

All CCP projects must be initiated by the customer. In addition, the customer or its contractors must complete all technical analysis. Market-driven projects are eligible for incentives equal to 100% of the incremental measure cost. For retrofit projects, customers can receive incentives that reduce the customer payback time to 12 months. If qualifying incentives exceed the net present value of the savings when screened, the incentive is capped at the net present value amount.

ELIGIBLE MARKET

Commercial and industrial customers that meet the following criteria are eligible for this program:

1. The customer has never accepted financial incentives from a Vermont energy efficiency utility- or distribution utility sponsored Demand Side Management (DSM) program; and

2. The customer has demonstrated a commitment to pursuing cost-effective energy efficiency on its own by:

    a. Certification under ISO (International Standards Organization) standard 14001; and
    b. Describing their energy efficiency plan, either already established and/or negotiated with the Public Service Department that shows a commitment to implementing cost-effective energy efficiency measures in the customer's facility or facilities.

5.1.1 Customer Credit Summary

	Prior Year	Current Year 2017	Cumulative starting 1/1/15
# participants with installations	1	1	1
Operating Costs			
Administration	$50,599	$237,298	$342,419
Programs and Implementation	$0	$0	$35,419
Strategy and Planning	$0	$0	$7,900
Subtotal Operating Costs	**$50,599**	**$237,298**	**$385,738**
Technical Assistance Costs			
Services to Participants	$2,953	$6,602	$57,122
Services to Trade Allies	$0	$0	$5,701
Subtotal Technical Assistance Costs	**$2,953**	**$6,602**	**$62,823**
Support Services			
Business Development	$0	$0	$471
Business Solutions Group	$0	$0	$0
Consulting	$0	$0	$3,007
Customer Support	$0	$0	$3,484
Evaluation, Monitoring & Verification	$0	$1,371	$3,486
Information Technology	$0	$0	$95
Marketing	$0	$0	$16,044
Policy & Public Affairs	$0	$0	$1,739
Public Relations and Internal Communications	$0	$0	$0
Targeted Implementation	$0	$0	$534
Transportation	$0	$0	$36
Subtotal Support Services Costs	**$0**	**$1,371**	**$28,898**
Incentive Costs			
Incentives to Participants	$523,205	$2,506,470	$3,356,515
Incentives to Trade Allies	$0	$0	$0
Subtotal Incentive Costs	**$523,205**	**$2,506,470**	**$3,356,515**
Total Efficiency Vermont Costs	**$576,757**	**$2,751,740**	**$3,833,974**
Total Participant Costs	$11,975	$323,004	$492,687
Total Third Party Costs	$0	$0	$0
Total Resource Acquisition Costs	**$588,731**	**$3,074,744**	**$4,326,661**
Annualized MWh Savings	7,057	16,397	25,415
Lifetime MWh Savings	8,906	102,675	133,041
TRB Savings (2015 $)	$525,599	$4,050,333	$6,411,736
Winter Coincident Peak kW Savings	17	0	340
Summer Coincident Peak kW Savings	17	0	340
Annualized MWh Savings/Participant	7,057.427	16,396.572	25,415.169
Weighted Lifetime	1.3	6.3	5.2

5.1.2 Customer Credit - End Use Breakdown

End Use	# of Participants	Net MWH Saved	Gross MWH Saved	Net Lifetime MWH Saved	Net Winter KW Saved	Net Summer KW Saved	Net Other Fuel MMBTU Saved	Net TRB Saved	Participant Incentives Paid	Participant Costs
Design Assistance	1	0	0	0	0	0	0	$0	$169,878	$0
Industrial Process Eff.	1	16,397	14,452	102,675	0	0	0	$4,050,333	$2,336,592	$323,004
Totals		16,397	14,452	102,675	0	0	0	$4,050,333	$2,506,470	$323,004

5.1.3 Customer Credit Total Resource Benefits

Avoided Cost Benefits	2017	Lifetime (Present Value)
Avoided Cost of Electricity	nap	$4,050,333
Fossil Fuel Savings (Costs)	$0	$0
Water Savings (Costs)	$0	$0
Total	**$0**	**$4,050,333**

Electric Energy & Demand Benefits	Savings at Meter		Savings at Generation
	Gross	Net	Net
Annualized Energy Savings (MWh): Total	**14,452**	**14,452**	**16,397**
Winter on peak	4,581	4,581	5,259
Winter off peak	5,044	5,044	5,664
Summer on peak	2,298	2,298	2,643
Summer off peak	2,529	2,529	2,830
Coincident Demand Savings (kW)			
Winter	0	0	0
Shoulder	0	0	0
Summer	0	0	0

Thermal & Other Benefits	Gross	Net	Lifetime Net
Annualized Water Savings (ccf)	**0**	**0**	**0**
Annualized fuel savings (increase) MMBtu Total	**0**	**0**	**0**
LP	0	0	0
NG	0	0	0
Oil/Kerosene	0	0	0
Wood	0	0	0
Solar	0	0	0
Other	0	0	0
Annualized savings (increase) in O&M($)	**$0**	**$0**	**$0**

5.2 DESIGNATED DOWNTOWNS INITIATIVE

The Designated Downtowns Initiative is described in Section 2.4.5 in the "Targeted Communities" description.

BENEFITS TO VERMONT'S DESIGNATED DOWNTOWNS, NEW TOWN CENTERS AND GROWTH CENTERS
All results are cumulative for the period 2015 - 2017

Efficiency Vermont Service Area[1]	Annual Net MWh Saved	Lifetime Net MWh Saved	Net Total Resource Benefits Delivered[2]
Designated Downtowns[3]			
Barre City	919	16,936	$1,298,942
Bellows Falls	59	844	$76,185
Bennington	60	680	$164,056
Bradford	27	400	$23,008
Brandon	651	9,205	$564,393
Brattleboro	427	4,917	$1,116,466
Bristol	144	1,544	$389,495
Middlebury	539	6,762	$1,044,457
Montpelier	858	10,832	$1,222,443
Morrisville	Not Available	Not Available	Not Available
Newport City	1,158	18,058	$1,210,524
Poultney	212	3,156	$572,268
Randolph	175	2,547	$259,036
Rutland City	192	2,401	$224,339
Saint Albans	600	7,492	$564,628
Saint Johnsbury	876	13,106	$1,834,659
Springfield	36	470	$177,758
Vergennes	13	87	$39,590
Waterbury	504	6,621	$531,921
White River Junction	273	4,853	$451,821
Wilmington	237	3,920	$620,018
Windsor	187	3,254	$230,053
Winooski	577	6,087	$806,805
Totals:	**8,720**	**124,174**	**$13,422,866**
New Town Centers[3]			
Colchester	116	1,477	$129,276
South Burlington	1,505	19,365	$1,431,988
Totals:	**1,622**	**20,842**	**$1,561,264**
Growth Centers[3]			
Bennington	5,414	75,792	$8,630,929
Colchester	117	1,479	$129,368
Hartford	1,580	20,901	$3,929,583
Montpelier	1,729	24,060	$3,601,691
Saint Albans	1,829	22,776	$1,581,425
Williston	2,657	34,283	$3,092,349
Totals:	**13,326**	**179,292**	**$20,965,346**

[1]Burlington is excluded from reporting because it is not part of Efficiency Vermont service territory.
[2]Vermont Agency of Commerce & Community Development - Department of Housing and Community Development (http://accd.vermont.gov/strong_communities/opportunities/revitalization/downtown)
[3]Present Value of Lifetime Reductions in Electric, Fuel, and Water Costs from all Efficiency Vermont programs and services accomplished through both Energy Efficiency Charge and Thermal Energy and Process Fuels funding.

Accurate Designated Downtown reporting is dependent on the ability to map VT electric utility premises to the designated areas. Efficiency Vermont coordinated with the necessary VT electric distribution utilities and the Vermont Agency of Commerce and Community Development (ACCD) to complete the mapping process. In June 2018, Efficiency Vermont added new Vermont Electric Cooperative (VEC) premise mappings. As a result, this table now includes all ACCD identified areas in VEC and Green Mountain Power (GMP) service territory.

6. List of Support Documents, by Service

6.1 DOCUMENTS, CORRESPONDING MARKETS, AND 2017 STATUS

#	Document Name / Title	Major Market	Status	Date
107	Residential Behavior	RES, LI	Implemented	7/11/17
116	Upstream lighting product quantity limits	RES/C&I	Pending DPS Response	10/23/17
117	DIY Home Performance	RES	Implemented	10/27/17

Key:

RES	Residential
LI	Low Income
LIMF	Low Income Multi - Family
BES	Business Energy Services
MF	Multi-Family
C&I	Commercial & Industrial

7. Definitions and End Notes

7.1 DATA TABLES OVERVIEW

1 – Section **7.2** includes a list of definitions for items in the data tables.

2 – Data items for which data are not available are labeled "nav." Data items for which data are not applicable are labeled "nap" or "NA"

3 – Except where noted, Efficiency Vermont expenditures data in this report were incurred during the period January 1, 2017, through December 31, 2017. Similarly, measure savings are for measures installed during the period January 1, 2017, through December 31, 2017.

4 – Efficiency Vermont Resource Acquisition and Development and Support Services costs include an operations fee of 1.8% and are reported in all applicable cost categories. The operations fees for "Incentives to Participants" are reported with the "Administration" costs.

5 – Data for "Incentives to Participants" in Tables **3.8, 3.9, 3.14, 3.16, 3.19, 3.22 3.24, 4.1, 4.4, 4.7, 4.10, 4.13, 4.16, 4.19, 4.22, 4.25, 4.28,** and **5.1.1** are based on financial data from Vermont Energy Investment Corporation's (VEIC's) accounting system. "Participant Incentives Paid" on all other tables are based on data entered in Efficiency Vermont's Knowledge-based Information Technology Tool (KITT) tracking system and exclude non-measure customer incentives.

6 – "Annualized MWh Savings (adjusted for measure life)," "Winter Coincident Peak kW Savings (adjusted for measure life)," and "Summer Coincident Peak kW Savings (adjusted for measure life)" on Tables **3.8** and **3.9** are provided for reference only. These data exclude savings for measures that have reached the end of their specified lifetime.

7- Whenever Efficiency Vermont works in collaboration with other providers of efficiency services, the same savings might be counted and reported by more than one organization. As a result, the total statewide savings might be less than the sum of all the organizations' reported savings.

7.2 DEFINITIONS AND REPORT TEMPLATE

The table templates that appear in the Efficiency Vermont Savings Claim Summary and Annual Report were developed as a collaborative effort between Efficiency Vermont and the Vermont Public Service Department. Note that there are two major table formats, one for the markets and services summary and the other for breakdowns by end use, utility and county savings.

The definitions of the data reported in these tables follow. The numbers in parentheses on the template refer to the footnoted definitions that immediately follow.

	Prior Year	Current Year 2017	Cumulative starting 1/1/15	Cumulative starting 1/1/12
	(1)	(2)	(3)	(4)
# participants with installations	(5)			
Operating Costs				
Administration	(6)			
Programs and Implementation	(7)			
Strategy and Planning	(8)			
Subtotal Operating Costs	(9)			
Technical Assistance Costs				
Services to Participants	(10)			
Services to Trade Allies	(11)			
Subtotal Technical Assistance Costs	(12)			
Support Services				
Business Development	(13)			
Business Solutions Group	(14)			
Consulting	(15)			
Customer Support	(16)			
Evaluation, Monitoring & Verification	(17)			
Information Technology	(18)			
Marketing	(19)			
Policy & Public Affairs	(20)			
Public Relations & Internal Communications	(21)			
Targeted Implementation	(22)			
Transportation	(23)			
Subtotal Support Services Costs	(24)			
Incentive Costs				
Incentives to Participants	(25)			
Incentives to Trade Allies	(26)			
Subtotal Incentive Costs	(27)			
Total Efficiency Vermont Costs	(28)			
Total Participant Costs	(29)			
Total Third Party Costs	(30)			
Total Resource Acquisition Costs	(31)			
Annualized MWh/MMBtu Savings	(32)			
Lifetime MWh/MMBtu Savings	(33)			
TRB Savings (2015 $)	(34)			
Winter Coincident Peak kW Savings	(35)			
Summer Coincident Peak kW Savings	(36)			
Annualized MWh/MMBtu Savings/Participant	(37)			
Weighted Lifetime	(38)			

	Prior Year	Current Year 2017	Cumulative starting 1/1/15	Cumulative starting 1/1/12
	(1)	(2)	(3)	(4)
Annualized MWh Savings (adjusted for measure life)			(39)	
Winter Coincident Peak kW Savings (adjusted for measure life)			(40)	
Summer Coincident Peak kW Savings (adjusted for measure life)			(41)	

X.X.X. Breakdown Report

End Use or Utility or County	# of Participants	Net MWh Saved	Gross MWh Saved	Net Lifetime MWh Saved	Net Winter KW Saved	Net Summer KW Saved	Net Other Fuel MMBtu Saved	Net TRB Saved	Participant Incentives Paid	Participant Costs
	(42)	(43)	(44)	(45)	(46)	(47)	(48)	(49)	(50)	(51)

DEFINITIONS FOR THE FIELDS IN THE REPORT TABLE TEMPLATES:

(1) Activity for the prior reporting year.

(2) Activity for the current reporting year. For savings, the figures reported are estimated savings for measures actually implemented for the current reporting period. Savings are reported at generation and net of all approved adjustment factors, except as otherwise noted.

(3) Data reported for the current performance period (2015-2017) starting January 1, 2015 through December 31, 2017.

(4) Data reported starting January 1, 2012 through December 31, 2017.

(5) Number of customers with installed measures. The "# participants with installations" is counted by summing unique physical locations (sites) where efficiency measures have been installed for the reporting period. For multifamily, the "# of participants with installations" is counted by summing the number of individual apartment units. Beginning in 1/1/2015 a new methodology is used to count Efficient Products (EP) lighting buy down participants. For all Efficient Products (EP) lighting buy down and upstream measures without customer specific data such as name, address, etc., participants are counted using the total quantity of lighting products and/or units sold. For Residential EP buy down participants, this is 12 lighting units per participant and for Commercial it is 25 lighting units per participant.

Under "Cumulative starting 1/1/12" customers are counted once, regardless of the number of times the customer participates in Efficiency Vermont services throughout the period. Whenever Efficiency Vermont works in collaboration with other providers of efficiency services,

the same participants may be counted and reported by more than one organization. As a result, total statewide participation might be less than the sum of all the organizations' reported participants.

(6) Costs include Efficiency Vermont senior management, budgeting and financial oversight. Administration costs also include the operations fee (margin) and corporate indirect charges that were applied to (25) Incentives to Participants[1].

(7) Costs directly associated with the operations and implementation of resource acquisition activities.

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

(9) Subtotal of all operating costs detailed in the categories above: (6) + (7) + (8).

(10) Costs related to technical assistance, conducting technical analyses, preparing packages of efficiency measures, contract management, and project follow-up provided to customers.

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

(12) Subtotal reflecting total technical assistance costs: (10) + (11).

(13) Costs related to support provided by the VEIC Business Development division.

(14) Costs related to support provided by the VEIC Business Solution Group division.

(15) Costs related to support provided by the VEIC Consulting division.

(16) Costs related to support provided by the VEIC Customer Support division.

(17) Costs related to support provided by the VEIC Evaluation, Monitoring & Verification division.

(18) Costs related to support provided by the VEIC Information Technology division.

(19) Costs related to support provided by the VEIC Marketing division.

[1] All costs for fields 6 through 28 include a 1.8% operations fee (or margin) paid to VEIC as administrator of Efficiency Vermont. Other than the 1.8% mark-up, VEIC is reimbursed at cost for the administration of Efficiency Vermont.

(20) Costs related to support provided by the VEIC Policy & Public Affairs division.

(21) Costs related to support provided by the VEIC Public Relations & Internal Communications division.

(22) Costs related to support provided by the VEIC Targeted Implementation division.

(23) Costs related to support provided by the VEIC Transportation division.

(24) Total cost of Support Services.

(25) Direct payments to participants to defray the costs of specific efficiency measures.

(26) Incentives paid to manufacturers, wholesalers, builders, retailers, or other non-customer stakeholders that do not defray the costs of specific efficiency measures.

(27) Subtotal reflecting total incentive costs: (25) + (26).

(28) Total costs incurred by Efficiency Vermont. All costs are in nominal dollars: (9) + (12) + (24) + (27).

(29) Total costs incurred by participants and related to Efficiency Vermont or utility activities. This category includes the participant contribution to the capital costs of installed measures and to specific demand-side-management (DSM)-related services, such as technical assistance or energy ratings.

(30) Total costs incurred by third parties (i.e., entities other than Efficiency Vermont and participants) and directly related to Efficiency Vermont or utility DSM activities. This category includes contributions by third parties to the capital costs of installed measures and to specific DSM-related services, such as technical assistance or energy ratings.

(31) Total cost of Resource Acquisition: (28) + (29) + (30).

(32) Annualized MWh savings at generation or MMBtu savings, net of all approved adjustment factors (e.g., free riders, spillover, line loss) for measures installed during the current reporting period.

(33) Lifetime estimated MWh or MMBtu savings for measures installed during the current reporting year, at generation and net of all approved adjustment factors. Prior to 2016, this value is calculated by multiplying estimated annualized savings by the life of the installed measure. Beginning on 1/1/2016 a new lifetime calculation methodology was implemented for all lifetime electric and fuel savings fields in Efficiency Vermont's Reporting Warehouse. During and after 2016 this value is calculated by adding up estimated annualized savings for each year

of the life of the installed measure, taking into account partial years and mid-life savings adjustments at the measure level if appropriate.

Inclusion of these midlife adjustments results in increased accuracy of lifetime savings estimates and impact reporting. This change also results in better alignment and consistency of all reporting systems, software and tools. Tools such as Tracker Custom, Navigator, etc. already included these adjustments.

(34) Total Resource Benefits (TRB) savings for measures installed during the current reporting period. TRB includes gross electric benefits, fossil fuel savings, and water savings. TRB is stated in 2015 dollars throughout the report.

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

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

(37) Annualized MWh savings per participant, net at generation or MMBtu savings per participant: (32) ÷ (5).

(38) Average lifetime, in years, of measures weighted by savings: (33) ÷ (32).

(39) Adjusted annualized MWh savings at generation and net of all approved adjustment factors (e.g., free riders, spillover, line loss) for measures installed during the current reporting period. These data include savings for measures that have not yet expired during the reporting period and exclude savings for measures that have reached the end of their specified lifetime.

(40) Adjusted impact of measures at time of winter system peak, at generation, net of adjustment factors. These data include savings for measures that have not yet expired during the reporting period and exclude savings for measures that have reached the end of their specified lifetime.

(41) Adjusted impact of measures at time of summer system peak, at generation, net of adjustment factors. These data include savings for measures that have not yet expired during the reporting period and exclude savings for measures that have reached the end of their specified lifetime.

ITEMS 40-49 REFLECT INSTALLED MEASURES FOR THE CURRENT REPORTING PERIOD.

(42) Number of participants with installed measures for the “End Use, Utility and County Breakdown.” Whenever Efficiency Vermont works in collaboration with other providers of efficiency services, the same participants may be counted and reported by more than one

organization. As a result, total statewide participation might be less than the sum of all the organizations' reported participants.

(43) Annualized MWh savings at generation, net of all approved adjustment factors (e.g., free riders, spillover, line loss) for measures installed during the current reporting period. This is the same number as reported on line (32).

(44) Annualized MWh savings, gross at the customer meter.

(45) Lifetime estimated MWh savings for measures installed during the current reporting period, at generation and net of all approved adjustment factors. This is the same number as that reported on line (33).

(46) Estimated impact of measures at time of winter system peak, at generation, net of adjustment factors. This is the same number as that reported on line (35).

(47) Estimated impact of measures at time of summer system peak, at generation, net of adjustment factors. This is the same number as that reported on line (36).

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

(49) Total Resource Benefits (TRB) savings for measures installed during the current reporting period. TRB includes gross electric benefits, fossil fuel savings, and water savings. TRB is stated in 2015 dollars throughout the report. This is the same number as that reported on line (34).

(50) Incentives paid by Efficiency Vermont to participants for measures installed during the current reporting period. This is the same number as that reported on line (25).

(51) Costs incurred by participants and related to Efficiency Vermont or utility activities. This is the same number as that reported on line (29).

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