

# WORKING TOGETHER FOR AN ENERGY-EFFICIENT VERMONT



# PART OF THE FABRIC OF VERMONT

It's been five years since Efficiency Vermont first opened its doors. In that time, we have grown from being a pioneering approach to energy efficiency to becoming part of the fabric of Vermont. In every county of our state, our staff has been privileged to help over one in three Vermonters reduce annual energy costs in their businesses and homes by a total of more than \$24,500,000.

We are proud to work in partnership with these committed people, to improve the energy efficiency of their buildings, lighting, equipment and appliances. We are equally proud to have built strong relationships with the skilled tradespeople, building design professionals, suppliers and retailers who Vermonters turn to for energy-efficient products and services.

Each of these people can rightfully share in our state's success as a national leader in saving energy. That's because Vermonters working with Efficiency Vermont are doing much more than reducing their own energy costs. Together, they are strengthening Vermont's economy, preserving our environment and creating a more stable energy future for the state.

It is an honor to contribute our expertise to this vital effort. We look forward to continuing and strengthening our valued partnerships with Vermonters, statewide, in 2005.

# 2004 ACCOMPLISHMENTS

In 2004, Efficiency Vermont helped 40,000 Vermonters – 12% of the state’s electric ratepayers – to complete efficiency investments that resulted in:

- 52,000,000 kilowatt-hours (kWh) of annual electric energy savings. These savings cost Vermont electric customers 39% of what utilities would have paid to purchase comparable energy supply on the wholesale market and deliver it to their retail customers. The benefit of these savings will continue for an average of 14 years.
- A 7,800 kilowatt (kW) reduction in summer peak capacity requirements. This brings the total peak capacity that Efficiency Vermont has offset since 2000 to 26,000 kW.
- \$36 million in total lifetime economic value over the 14-year average lifetime of the efficiency measures installed in 2004. This value is defined as the present dollar value of the electricity, fossil fuels and water that are saved over the lifetime of the efficiency measures.
- A 460,000 ton reduction in greenhouse gases that otherwise would have been emitted by conventional electric generation.
- A savings of 1.5 million gallons of propane, 205 million cubic feet of natural gas, 1.2 million gallons of oil and 360 million gallons of water.
- Transformation of Vermont’s markets, resulting in our state ranking among the nation’s highest in market share sales of ENERGY STAR® qualified appliances and homes.

## RECOGNITION OF LEADERSHIP

Vermont was honored with multiple awards in 2004 for Efficiency Vermont’s achievements.

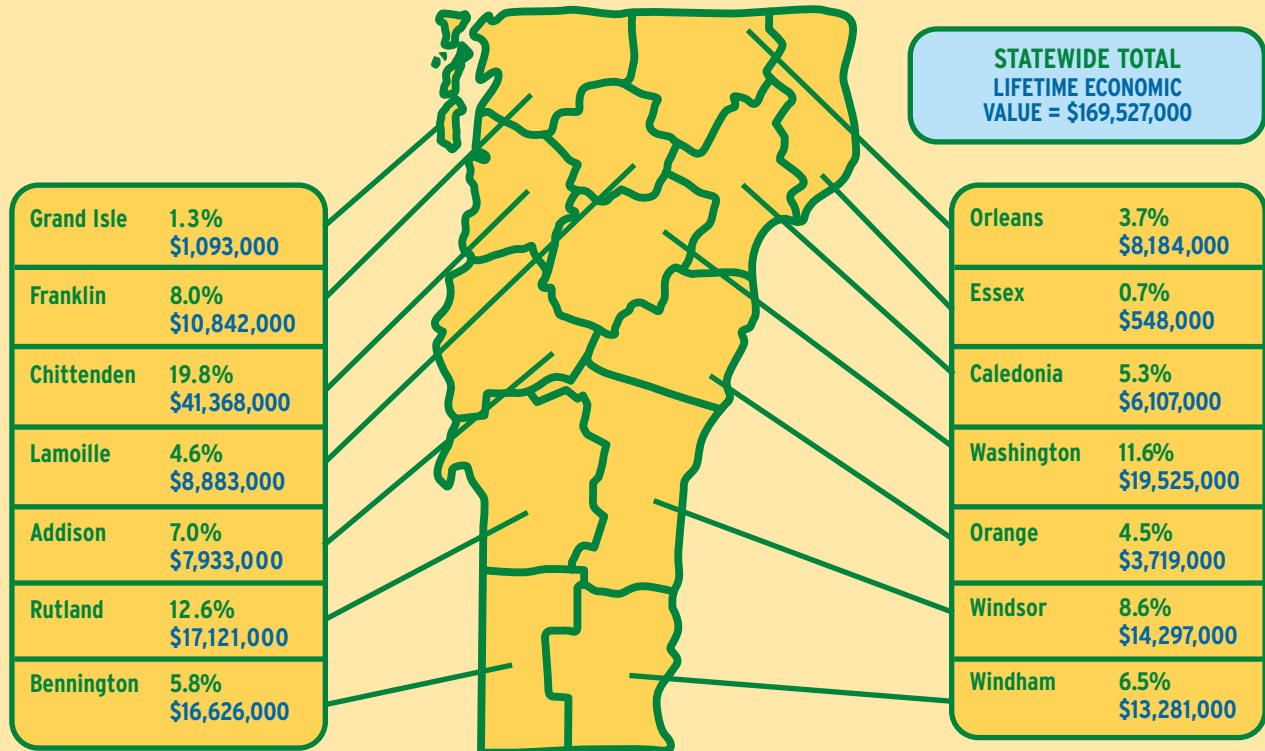
- Two U.S. Environmental Protection Agency (EPA) and Department of Energy ENERGY STAR *Excellence in Energy Efficiency Awards*, for:
  - Retail Efficient Products services, as a member of the Northeast Energy Efficiency Partnerships;
  - Efficiency Vermont’s role in the 2003 Poultney Change A Light Challenge.
- The EPA’s *Environmental Merit Award*, recognizing outstanding efforts in preserving New England’s environment.
- Two *Certificates of Recognition* from The American Council for an Energy-Efficient Economy, for serving as a model of best practices for energy efficiency programs across the nation for service to the:
  - Residential New Construction market, with Vermont Gas Systems;
  - Multifamily Low-Income Housing market, with Vermont Gas Systems and Burlington Electric Department.
- Two *Vermont Governor’s Awards for Environmental Excellence and Pollution Prevention* for:
  - The 2003 Poultney Change A Light Challenge, with event partners the Village of Poultney, Williams Hardware and Green Mountain College;
  - The nation’s first methane co-generation system installed in a small wastewater treatment facility, with project partner Jim Jutras of the Village of Essex Junction Wastewater Treatment Facility.

## BENEFITS BY SECTOR

	BUSINESS	RESIDENTIAL	TOTAL
<b>BENEFITS ACHIEVED IN 2004</b>			
Annual kWh Savings	29,249,000	22,614,000	51,863,000
Lifetime Economic Value	\$22,025,000	\$13,546,000	\$35,571,000
<b>CUMULATIVE BENEFITS ACHIEVED 2000 - 2004</b>			
Annual kWh Savings	117,184,000	87,481,000	204,665,000
Lifetime Economic Value	\$98,842,000	\$70,685,000	\$169,527,000

## PARTICIPATION AND LIFETIME ECONOMIC VALUE BY COUNTY 2000-2004

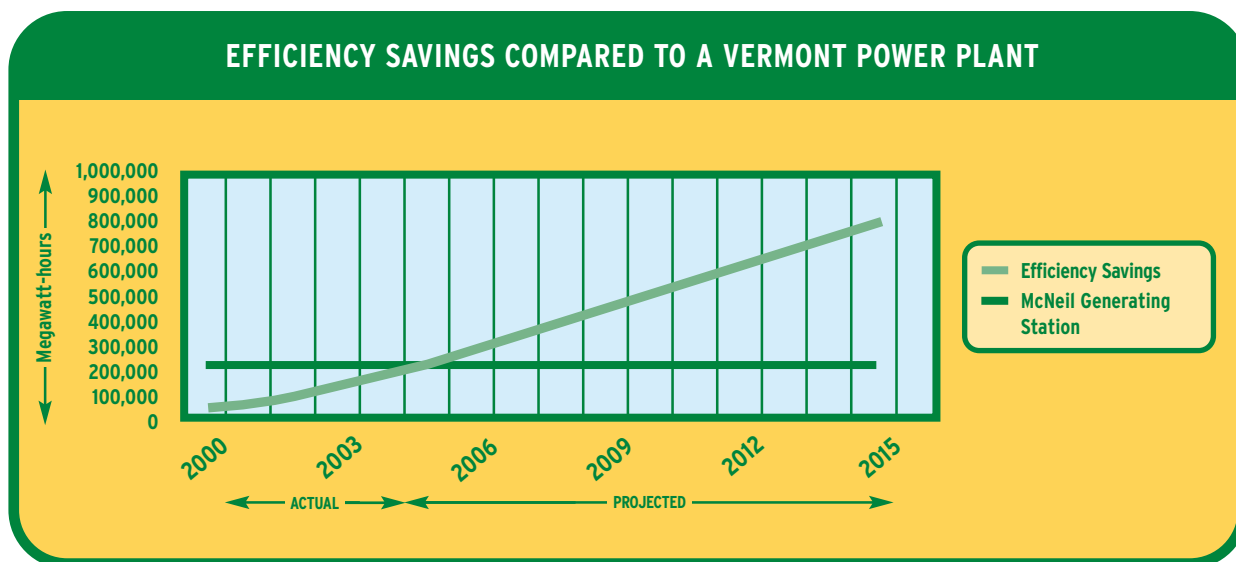
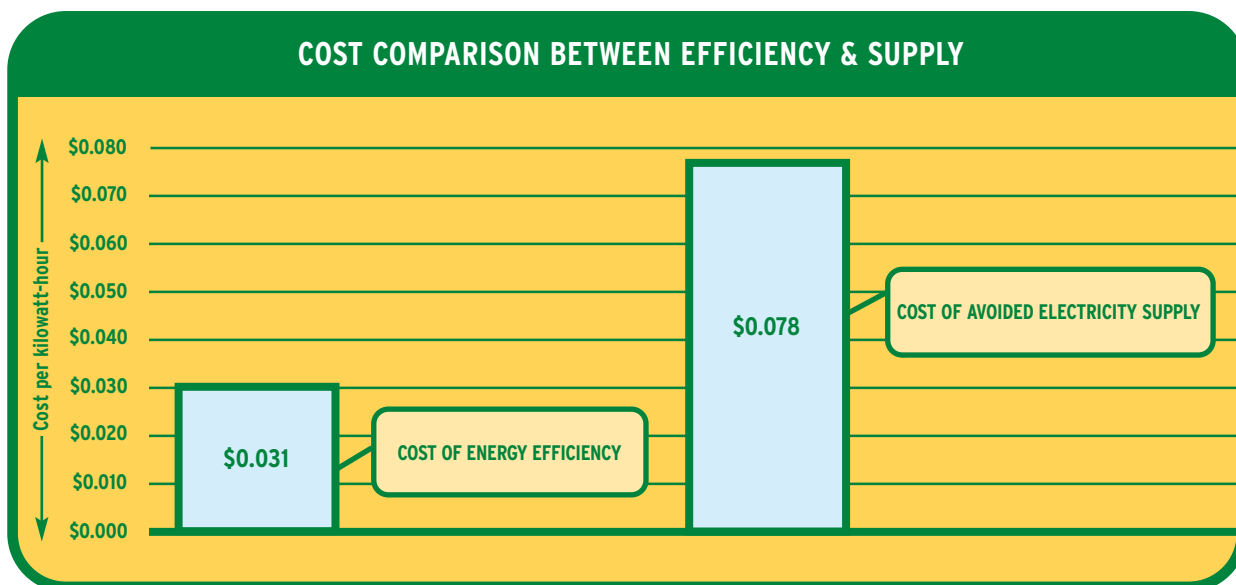
GREEN=% OF EFFICIENCY VERMONT PARTICIPATION | BLUE=LIFETIME ECONOMIC VALUE FROM EFFICIENCY INVESTMENTS



# VERMONT'S MOST COST-EFFECTIVE ENERGY SUPPLY

When Vermonters use less electricity, Vermont reduces its need to generate or buy power. By working with Efficiency Vermont to make cost-effective efficiency investments in 2004, Vermonters reduced their annual electricity use by 52 million kWh. These savings are expected to continue each year for an average of 14 years.

Moreover, these savings met 33% of the growth in the state's energy needs in 2004 while costing ratepayers just 3.1 cents per kWh. That's 39% of the cost of generating, transmitting and distributing power to Vermont's homes and businesses.



# SUCCESS SNAPSHOT: TWIN OAKS SPORTS & FITNESS



Last year, Twin Oaks Sports and Fitness Center on Farrell Street in South Burlington wanted to upgrade the lighting system for its tennis courts. The existing system – an older fluorescent technology that did not provide enough light and caused distracting glare – had been a frequent source of members’ complaints. The owner was interested in upgrading the lighting but was concerned about fitting it into the budget.

Efficiency Vermont Project Manager Arun Veda worked with Twin Oaks and determined that a new fluorescent system would provide better quality light while reducing energy costs. Veda found that the energy savings, plus an incentive from Efficiency Vermont, would bring the cost of the system within budget. According to Mike Feitelberg at Twin Oaks, “Not only is the lighting better, but we are now able to use the court for multi-sport activities. Everybody loves it.”

	Twin Oaks Sports & Fitness	All Amusement & Recreational Services Projects Served by Efficiency Vermont
Number of Completed Projects Since 2000		173
Energy Efficiency Upgrade Costs	\$45,100	\$4,500,000
Efficiency Vermont Incentives	\$4,600	\$1,200,000
Net Investment	\$40,500	\$3,300,000
Annual Energy Cost Savings	\$5,500	\$2,200,000
Return on Investment	11%	67%
Annual kWh Savings	88,300	20,600,000
Annual Summer kW System Peak Savings	10	700

# STRENGTHENING VERMONT'S ECONOMY

In 2004, Efficiency Vermont continued to have a positive and lasting economic impact on the state. Vermonters who worked with Efficiency Vermont in 2004 are bringing more disposable income to their households and a stronger bottom line to their businesses. The benefits of these activities are being felt in local communities and statewide. Here's how:

- Instead of sending dollars out of state to purchase electricity, Vermonters are able to spend more on local goods and services, thereby strengthening local businesses as well as Vermont's economy.
- When Vermont businesses and households invest in cost-effective energy-efficient equipment, local suppliers are able to sell more top-quality energy-efficient models that bring a greater profit than less efficient models.
- Because savings from energy efficiency investments continue for an average of 14 years, the state's households and businesses will continue to benefit from a lower cost of doing business and residing in Vermont for years to come.



NRG incorporated comprehensive energy-efficient design and equipment in its new state-of-the-art facility in Hinesburg.

## STIMULATING VERMONT'S ECONOMY: NET LIFETIME ECONOMIC VALUE FOR 2000-2004

<b>Total Benefits</b>	<b>\$170 Million</b>	<b>Cumulative Lifetime Economic Value of Efficiency Investments</b>
<b>Minus Costs</b>	<b>\$52 Million</b>	<b>Costs paid for by investments through Efficiency Vermont</b>
	<b>\$37 Million</b>	<b>Costs paid for by participant and third-party investments</b>
	<b>\$89 Million</b>	<b>Total Costs</b>
<b>Equals Net Benefits</b>	<b>\$81 Million</b>	<b>Net Lifetime Economic Value to Vermont</b>

# SUCCESS SNAPSHOT: NATIONAL HANGER



National Hanger Company in North Bennington has been using plastics injection molding technology for decades. When one of its machines needed to be replaced, company President Michele Pilcher had to decide between the standard hydraulic and the newer all-electric technologies. Pilcher knew from previous work with Efficiency Vermont that all-electric machines reduce energy consumption and maintenance costs, improve control and increase productivity through faster cycle times. However, they have a significantly higher price tag.

Pilcher worked with Efficiency Vermont Project Manager Michael Socks to estimate the costs and the payback time associated with replacing the equipment. The lower energy costs of the all-electric machine, combined with an incentive from Efficiency Vermont, reduced the company's payback time to less than two years. Motivated by this and by the potential to own equipment with better reliability and performance, Pilcher plans to replace all of the company's machines with all-electric models over the next five to six years.

	National Hanger	All Manufacturing Projects Served by Efficiency Vermont
Number of Completed Projects Since 2000		454
Energy Efficiency Upgrade Costs	\$47,800	\$7,800,000
Efficiency Vermont Incentives	\$19,000	\$3,200,000
Net Investment	\$28,800	\$4,600,000
Annual Energy Cost Savings	\$19,300	\$2,800,000
Return on Investment	67%	61%
Annual kWh Savings	195,100	31,400,000
Annual Summer kW System Peak Savings	50	5,600



# EFFICIENCY ENHANCES RELIABILITY

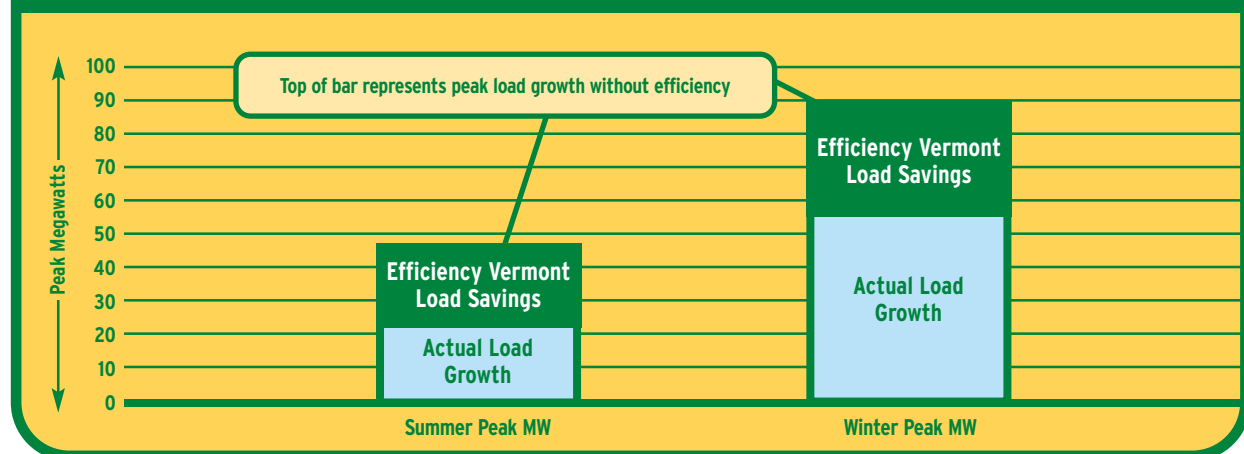
While costs fluctuate for electricity and gas, and concerns grow regarding oil supplies, Vermont is providing people with power – now and as our electricity needs increase – through energy efficiency. The energy saved by Vermonters through energy efficiency reduces demand on the state’s energy supply during times of peak use. These are the times when the region’s generation, transmission and distribution infrastructure is strained to capacity. By lowering peak demand, energy efficiency not only reduces the need for the state to buy electricity at some of the year’s highest prices, but also makes Vermont’s energy supply system less subject to disruptions and, therefore, more reliable and stable.

Since its inception in 2000, Efficiency Vermont’s work has lowered Vermont’s summer peak load by a total of 26,000 kW (26 MW) and winter peak load by 35,000 kW (35 MW).

## THE IMPORTANCE OF PEAK LOAD

*Electricity load (kilowatts) represents the pace at which customers use electric energy (kilowatt-hours) at any particular time. When the combined loads of all customers reach their maximum for the year, the system reaches its peak load. The capacity of Vermont’s electricity infrastructure is limited by how much of the peak load it can support. Using energy efficiency to slow growth in peak load eases pressure to expand generation, transmission and distribution capacity.*

## REDUCING VERMONT’S PEAK LOAD GROWTH 2000-2004



# SUCCESS SNAPSHOT: ENOSBURG FALLS SCHOOL



When Black River Design was hired to design a major renovation of the Enosburg Falls Middle & High School, the firm called Efficiency Vermont Project Manager Alison Hollingsworth to help optimize the energy efficiency of the project. By working in partnership, the design team and Efficiency Vermont staff developed a design that incorporated a comprehensive set of cost-effective approaches to heating, ventilating, cooling, and lighting the new building as efficiently as possible.

The result is a facility that not only met budget needs, but also provides a top-quality, comfortable learning environment that will save the school district energy costs for years to come. The partnership model between the architects and Efficiency Vermont was so successful that Black River Design now employs it in a majority of its projects. For their exceptional leadership on this and other projects, Black River Design was the recipient of the overall award for *Excellence in Energy Efficiency* at the Better Buildings By Design Conference.

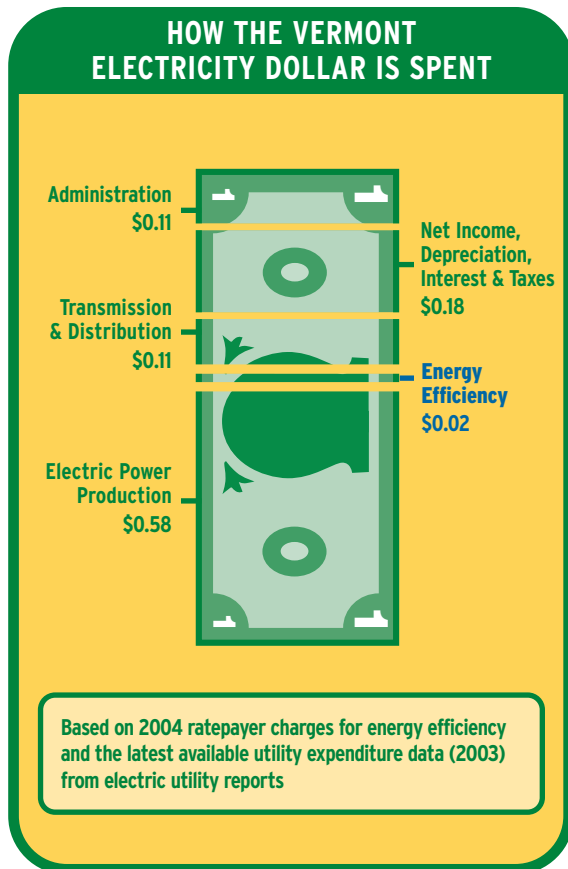
	Enosburg Falls School	All Educational Services Projects Served by Efficiency Vermont
Number of Completed Projects Since 2000		311
Energy Efficiency Upgrade Costs	\$119,600	\$3,200,000
Efficiency Vermont Incentives	\$62,000	\$1,100,000
Net Investment	\$57,600	\$2,100,000
Annual Energy Cost Savings	\$29,200	\$1,000,000
Return on Investment	50%	48%
Annual kWh Savings	166,000	9,000,000
Annual Summer kW System Peak Savings	36	1,400

# A SOUND INVESTMENT

Vermonters are investing in energy efficiency and seeing a solid and lasting return. In 2004, Vermont ratepayers invested \$15 million (2% of the cost of their electricity service) in energy efficiency, through an Energy Efficiency Charge (EEC) on their electric bills. The lifetime economic value of this investment is \$36 million. Since Efficiency Vermont began operations in 2000, the cumulative lifetime economic value of efficiency investments totals more than \$170 million. That represents a return on energy efficiency investments of 71%.

This highly cost-effective use of funds for direct service to ratepayers is a result of Efficiency Vermont's ongoing commitment to greater organizational efficiency, enabling maximum yield on Vermont's investment in energy efficiency.

In 2004, Efficiency Vermont spent approximately \$14 million of the year's EEC allocation to provide energy efficiency services to Vermonters. The remaining funds were used by the State for evaluation and oversight costs of Efficiency Vermont.



### EFFICIENCY VERMONT 2004 EXPENDITURES

Outreach and Technical Assistance	\$5,000,000
Services and Initiatives	\$2,800,000
Financial Incentives	\$5,600,000
Administration and Information Technology	\$600,000
<b>Total Expenditures</b>	<b>\$14,000,000</b>

# SUCCESS SNAPSHOT: WESTMINSTER FAMILY HOUSING



For years, Westminster Family Housing residents had high electric bills due to poor insulation and inefficient electric heating, lighting and refrigerators. During winter peak hours, the apartments were so cold – typically between 50 and 60 degrees – that residents hung blankets on windows and doors to try to keep warm.

When Vermont Housing Finance Agency (VHFA) acquired the three-building property in 2004, VHFA wanted to make the buildings more efficient and livable, while increasing the property value and decreasing resident turnover.

John Burczy of VHFA contacted Bret Hamilton of Efficiency Vermont to consult on the project. Partnering also with Southeastern Vermont Community Action, VHFA had the building insulated and air-sealed, replaced the electric heat with an oil-fired baseboard hot water system, and installed energy-efficient lighting fixtures and bulbs, indirect-fired water heaters, and low-flow shower heads and aerators. Today, Westminster Family Housing is a more comfortable, affordable and healthy place for its residents.

	Westminster Family Housing	All Multifamily Housing Projects Served by Efficiency Vermont
Number of Completed Projects Since 2000		353
Energy Efficiency Upgrade Costs	\$72,700	\$7,100,000
Efficiency Vermont Incentives	\$25,100	\$2,100,000
Net Investment	\$47,600	\$5,000,000
Annual Energy Cost Savings	\$10,900	\$1,800,000
Return on Investment	23%	36%
Annual kWh Savings	138,200	11,900,000
Annual Summer kW System Peak Savings	7	1,200

# PRESERVING OUR ENVIRONMENT AND NATURAL RESOURCES

Vermont businesses and homes investing in energy efficiency are not only seeing economic benefits but also are preserving our environment and natural resources. By lowering energy use, Vermonters reduce air pollution caused by electric energy generation and by the consumption of fossil fuels. This also means that Vermont is reducing its release of greenhouse gases, thereby reducing our contribution to acid rain, water pollution and global climate change.

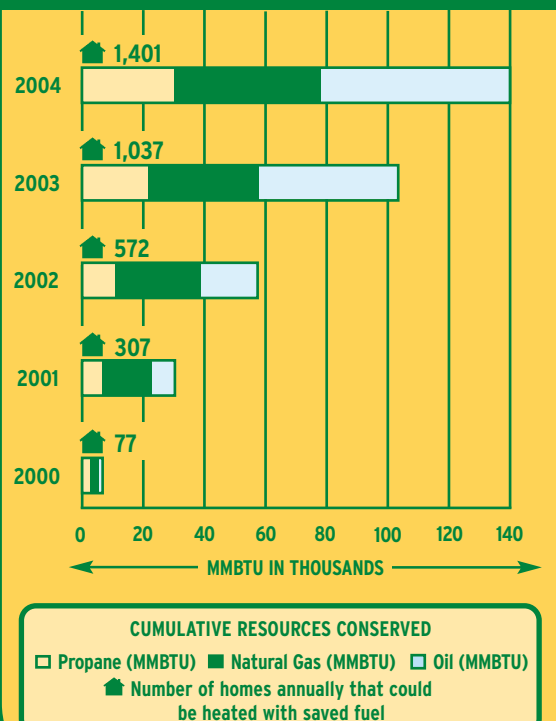
In 2004, Vermonters working with Efficiency Vermont took actions that will reduce energy use sufficient to keep more than 460,000 tons of pollutants from our air over the lifetime of the energy-efficient approaches taken this year.

## ENVIRONMENTAL IMPACT OF ENERGY EFFICIENCY – 2000 TO 2004

*The work of Efficiency Vermont contributes to a significant reduction in the total lifetime emissions resulting from energy efficiency investments made in Vermont. Over 2 million tons of carbon dioxide greenhouse gases will be kept out of the environment over the 14-year lifetime of the measures installed from 2000 to 2004 because electricity did not need to be generated. That level of emissions reduction is equal to avoiding burning 900 barrels of oil per day. Investments in energy efficiency also save other resources, including:*

- 1.4 billion gallons of water;
- 5 million gallons of propane;
- 830 million cubic feet of natural gas;
- 4 million gallons of oil.

### NUMBER OF HOMES ANNUALLY THAT COULD BE HEATED WITH SAVED FOSSIL FUEL



# SUCCESS SNAPSHOT: ENERGY STAR CENTERS



In 2004, Efficiency Vermont partnered with three Vermont hardware stores to launch the nation's first ENERGY STAR Centers. Designated spaces within existing stores for the exclusive display of ENERGY STAR qualified products, the Centers are designed to raise Vermonters' awareness of and access to a wide range of energy-efficient products.

The ENERGY STAR Centers are located at Pick & Shovel in Newport, Fogg's Ace Hardware in Norwich, and H. Greenberg and Son in Bennington. In addition to ENERGY STAR and other energy-efficient products, the Centers showcase educational and fun interactive displays, ENERGY STAR literature, and ENERGY STAR signage.

All three store operators are very pleased with their Centers and have reported increases in business both on opening day and in the months following. The store owners also have noted that more customers are now coming in and asking for ENERGY STAR and are appreciative of the ENERGY STAR displays.

Based on the success of this effort in transforming Vermont's retail market, Efficiency Vermont is planning to work with other Vermont retailers to open additional ENERGY STAR Centers during 2005.

Chris Hamblett of Pick & Shovel says: "By demonstrating to our customers the new technology and quality of ENERGY STAR products, people who would never have considered ENERGY STAR before are now buying it."

# THE POWER OF ONE

## THE POWER OF ONE DECISION

- One renter decides to try an ENERGY STAR qualified lightbulb for a lamp in her apartment.
- One builder and one future homeowner decide to build a new ENERGY STAR labeled home.
- One business manager decides, while renovating, to approve energy-efficient light fixtures.
- One engineer decides to specify energy-efficient controls for the ventilation in a new building.
- One family decides to replace its old refrigerator with an ENERGY STAR qualified model.
- One retailer decides to carry a wider selection of ENERGY STAR qualified lighting and appliances.
- One refrigeration contractor recommends an energy-efficient reach-in cooler to a convenience store owner.

One decision, made one at a time, is why Vermont is using 3% less energy through energy efficiency since 2000. The relatively small individual actions of one-third of Vermont's households and businesses, added together, create significant savings. That is the power of decisions that Vermonters are making every day to save energy and money.

Working together, Vermonters are leading the nation in the purchase of many energy-efficient products and practices.

- Vermont ranked #5 nationally in market share of completed ENERGY STAR qualified homes for 2004. Through the third quarter of 2004, our state ranked #1 in sales of ENERGY STAR qualified clothes washers, #2 in sales of ENERGY STAR qualified room air conditioners, #3 in sales of ENERGY STAR qualified refrigerators and #8 in sales of ENERGY STAR qualified dishwashers.
- Owners of virtually all the large commercial buildings built in Vermont in 2004 worked with Efficiency Vermont to increase the energy efficiency of their structures. Because these buildings will be part of Vermont for many

years to come, incorporating energy efficiency into their design is the most cost-effective way to reduce the energy needs of these buildings.

Vermont is also leading the nation by example. In 2004, the American Council for an Energy-Efficient Economy cited Efficiency Vermont as a national model for energy efficiency service delivery. In addition, Vermont continues to be the model that several regions are using to deliver energy efficiency services. In the last year, representatives from California, Colorado, Iowa, Kansas, New Jersey, New Mexico, New Orleans, Louisiana, Manitoba and New Brunswick Provinces in Canada, New South Wales in Australia, and Jiangsu Province in China visited or sought detailed information about the creation, structure and services of Efficiency Vermont.

Together, individual decisions by Vermonters to save money and energy become not only an economic and environmental asset here at home, but also a model that government leaders around the nation and the world are using to address their regions' energy needs. That is the power of one.

# A TALE OF CHEESE

## HOW ENERGY EFFICIENCY REDUCES COSTS

### FROM FARM TO MARKET TO TABLE



Dairy farmers reduce their costs with energy-efficient refrigeration, lighting and process equipment.

- Efficiency Vermont has worked with 226 farmers.
- First-Year Energy Savings: \$290,000 and 3,300,000 kWh.



Since 2000, Cabot Creamery has worked with Efficiency Vermont to install efficient lighting, motors and controls in its cheese processing plant to reduce energy use.

- First-Year Energy Savings: \$54,000 and 740,000 kWh.



The energy-efficient lighting, controls and refrigeration system in Cabot's new warehouse will reduce the energy costs for long-term storage of cheese.

- First-Year Energy Savings: \$104,000 and 1,400,000 kWh.



Middlebury Natural Foods Coop included energy-efficient lighting, refrigeration and air conditioning to reduce the energy use in its new store.

- First-Year Energy Savings: \$10,400 and 120,000 kWh.



# PARTNERING WITH VERMONTERS

Our ability to help Vermonters save energy depends on numerous decisions that they make when investing in equipment, lighting, appliances and new buildings. Critical to these decisions is the influence of the businesses and professionals who provide products and services to Vermonters. That's why we partner with hundreds of Vermont retailers, suppliers, tradespeople and design professionals to promote energy-efficient approaches to designing, building and improving Vermont's homes and business facilities.

Here's a sampling of Efficiency Vermont's numerous partnering activities in 2004:

- With the Vermont chapter of the American Institute of Architects, we created *The Vermont High Performance Design Guide to Energy-Efficient Commercial Buildings*.
- We distributed more than 3,000 copies of this publication providing step-by-step guidance to designers and builders of energy-efficient structures.
- We partnered with the Vermont chapter of the American Society of Heating, Refrigerating and Air Conditioning Engineers at an event where we informed 165 contractors and suppliers about energy-efficient heating, ventilation and cooling technologies.
- Efficiency Vermont teamed with Middlebury's Aubuchon Hardware and Kinney Drugs to present "Middlebury 72 Hours of Light." In coordination with Middlebury College, the Middlebury Area Global Warming Task Force and Vermont Energy Education Program, the event motivated more than 880 households to switch to energy-efficient lighting.



# SUCCESS SNAPSHOT: WATER & WASTEWATER PARTNERSHIPS



Vermont’s water and wastewater treatment facilities are energy-intensive operations. That’s why Efficiency Vermont partners with two key advocacy organizations – Northeast Rural Water Association (NeRWA) and the Green Mountain Water Environment Association (GMWEA) – to help facility operators use less energy while keeping Vermont’s facilities running strong.

Together, this team develops workshops for facility operators, offering practical ways to lower energy use, such as this year’s “Basics of Electricity, Drives and Energy Efficiency,” presented by Efficiency Vermont and NeRWA. Efficiency Vermont is privileged to be a member of NeRWA and GMWEA, and a regular exhibitor and presenter at these organizations’ annual meetings and trade shows.

In 2004, with assistance from Efficiency Vermont, NeRWA purchased equipment to help facilities locate water leaks, thereby eliminating electricity costs associated with extraneous pumping and preventing the waste of significant amounts of water.

## All Water & Wastewater Public Utilities Projects Served by Efficiency Vermont

Number of Completed Projects Since 2000	65
Energy Efficiency Upgrade Costs	\$1,200,000
Efficiency Vermont Incentives	\$300,000
Net Investment	\$900,000
Annual Energy Cost Savings	\$300,000
Return on Investment	33%
Annual kWh Savings	2,900,000
Annual Summer kW System Peak Savings	500