State & Utility Administered Energy Efficiency Programs
Experience, Opportunities and Examples

M.J. Bradley & Associates LLC
A Climate Change Capital Group Company

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Acknowledgements

This report was developed by Environment Northeast (ENE) and M.J. Bradley & Associates LLC with input from participating efficiency program administrators.

ENE is a non-profit organization that researches and advocates innovative policies that tackle our environmental challenges while promoting sustainable economies. ENE is at the forefront of state and regional efforts to combat global warming with solutions that promote clean energy, clean air and healthy forests.

M.J. Bradley & Associates assists private industry, nonprofit organizations, and government agencies in the strategic assessment of environmental and energy policies, programs, and technologies. We strive to help clients achieve responsible environmental goals consistent with their strategic and business objectives. Our team has extensive experience in energy markets, environmental policy, law, engineering, economics and business.

Report Authors

Derek K. Murrow, Peter Shattuck
Environment Northeast
Phone: (203) 285-1946
http://www.env-ne.org

Christopher Van Atten, Lea Reynolds, Kathleen Robertson
M.J. Bradley & Associates LLC
Phone: (978) 369-5533
http://www.mjbradley.com

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Austin Energy
Efficiency Vermont
Energizer
National Grid
Pacific Gas & Electric Company
Princeton Properties
Seattle City Light
Stella Color
Background

State and utility administered energy efficiency programs are saving Americans billions of dollars each year by reducing energy consumption at a fraction of the cost of conventional energy supplies. At the same time, these programs are providing improved services—such as light, warm houses and cold beverages—that enrich our daily lives.

Energy efficiency programs provide additional benefits to society as a whole. Efficiency investments create high quality green jobs and energy bill savings that flow back into the economy to stimulate additional job creation on a broader scale. Efficiency programs lower energy costs for all consumers by reducing total energy demand, which in turn limits greenhouse gas emissions—making climate goals more achievable and affordable in the future.

This report is intended as an educational tool for policy makers on state and utility administered energy efficiency programs. The report profiles a diverse cross-section of leading programs that have been established throughout the country by different types of program administrators.

Current U.S. Efficiency vs. Supply Spending for Electric and Natural Gas Customers

Energy efficiency measures are often cheaper than efforts to increase energy supply. Americans spend about $215 billion annually on the production of electricity, at a price of 6 to 12 cents per kilowatt hour (kWh). However, we invest only $2.6 billion in securing electricity savings through energy efficiency programs, a resource that can cost as little as 3 cents per kWh saved. For natural gas the picture is even more imbalanced. Natural gas efficiency costs $1 to $2 per thousand cubic feet (Mcf) saved compared with $6 to $8 per Mcf supplied. We have a choice between low-cost efficiency and high-cost supply—yet more often than not we invest in the more expensive alternative.

Many states have recognized the benefits of efficiency investments and have created or expanded their energy efficiency programs. Data gathered by the Consortium for Energy Efficiency (CEE) show that 2008 energy efficiency investments topped $3.13 billion nationwide, a 30 percent increase from the prior year. In 2009 these ratepayer-funded investments will be augmented by hundreds of millions of dollars raised in auctions of CO₂ emission allowances in the nation’s first greenhouse gas cap-and-trade program, the Regional Greenhouse Gas Initiative (RGGI) among Northeast and Mid-Atlantic states. RGGI member states determined that state and utility administered energy efficiency programs provided significant public benefit, and will therefore direct the vast majority of revenue to efficiency investments.

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1 See www.cee1.org for national energy efficiency spending levels.
Existing State-level Efficiency Programs
In 2008, electric and natural gas efficiency programs were up and running in 38 states and the District of Columbia. Program focus and level of investment varies across states, but it is clear that a growing commitment to energy efficiency nationwide has created the political momentum and practical mechanisms to increase federal support for efficiency.

Energy Savings Opportunity
Despite recent increases in energy efficiency investments, significant additional funding is needed to realize the vast opportunity to use energy more efficiently. An illustrative example is provided by Connecticut, where a utility plan recommends spending approximately $71 per capita to capture all cost-effective efficiency in the electric sector. The country as a whole would need to increase its electric energy efficiency spending to $22 billion annually to achieve the levels proposed by the Connecticut proposal. This would be a dramatic increase over current spending levels of just $3.13 billion for electric efficiency. For natural gas and fuel oil a funding increase on the order of $10 billion annually would be needed.

Planned Spending Increases
Connecticut is not alone in examining increased investments in energy efficiency spending as a solution to escalating energy prices. Rhode Island has expanded efficiency programs to natural gas, and is well on the way to tripling its electric programs over 3 years. Massachusetts will require utilities to procure all cost-effective efficiency that is cheaper than supply, many states have passed new energy efficiency resource standards that require higher levels of energy savings over time, and Maine, New Hampshire, Vermont, New York, and New Jersey will direct the majority of RGGI funds to saving energy.

In the 2009 federal recovery package, policy-makers appear poised to support state and federal energy efficiency programs as a means of creating employment opportunities while addressing energy security and environmental concerns. Building on this foundation, continuing efficiency investment should be funded by revenue raised in a national cap-and-trade system. This would ensure that we continue to capture the lowest cost resource (which expands with technology), while containing costs by reducing demand for electricity and lowering the cost of achieving greenhouse gas reduction goals.

Accountability: Monitoring & Verification of Real and Lasting Savings
Demonstrating results is a critical concern in implementing state and utility administered energy efficiency programs. Having been entrusted with ratepayer dollars, program administrators are required to demonstrate the energy savings they generate through well-documented records and independent monitoring and verification. Energy efficiency programs undergo rigorous review and verification through independent financial audits, savings verification processes conducted by state utility commissions, and other independent audit processes.
The Residential Sector

With more than 100 million households in the United States, the residential sector offers a multitude of opportunities for energy efficiency improvements.

The residential sector in the U.S. accounts for 37 percent of electricity sales, 22 percent of natural gas consumption, and roughly 5 billion gallons of oil consumption each year.

Source: U.S. Energy Information Administration

Households use energy to cool and heat their homes, to heat water, and to operate a wide range of appliances such as refrigerators, stoves, televisions, and computers. High efficiency appliances, energy efficient lighting, programmable thermostats, and improved insulation offer some of the best strategies to reduce home energy use and save consumers money. This chapter features case studies of some of the leading energy efficiency programs from around the nation aimed at reducing household energy use.

Featured Case Studies
(1) Seattle City Light’s Twist & Save program reduces the cost of energy efficient light bulbs to help Seattle residents save on their utility bills (2) PG&E’s Energy Partners program helps low-income customers in northern and central California reduce their energy bills by making energy saving upgrades and repairs (3) National Grid’s EnergyWise program works with multi-family property owners to help reduce energy use, reducing building operating costs and improving home affordability.
Seattle City Light’s Twist & Save program encourages the sale and installation of Energy Star® compact fluorescent light bulbs (CFLs) by working directly with retailers to negotiate discounted prices for customers and buying-down the cost of the bulbs. Customers require no coupons or rebate forms, as the utility discount is already reflected in the price of the bulbs on the store shelves.

Special in-store events call attention to the promotion throughout the year, supplemented by radio, print and web-based advertising and community-based marketing. Seattle City Light has two designated full time field staff responsible for visiting stores that stock Twist & Save bulbs. City Light staff verify that the products are priced correctly and point-of-purchase materials are accurate and visible. Forty-two retail locations throughout Seattle City Light’s service territory currently participate.

The success of the Twist & Save program is largely based on the ability to recruit retail partners willing to mark down prices and provide monthly sales reports, and on the ability to maintain consistent contact with each store location in the field. Due to the success of the Twist & Save program, other utility companies in the region have adopted Seattle City Light’s innovative “mark-down” approach as a more effective and convenient method for offering rebates to customers.

Home Depot, a partner in Seattle City Light’s compact fluorescent light bulb buy-down program, offers a full range of high efficiency lighting products.
PG&E Energy Partners Program

Since 1983, PG&E’s Energy Partners program for low income households has been providing qualified customers with free energy audits, weatherization upgrades, and energy-efficient appliances to reduce their gas and electricity usage. The program is offered to low income homeowners and renters in PG&E’s northern and central California service territory. Based on the current guidelines, a family of four with an annual household income below $43,200 would be eligible to participate.

PG&E-certified energy specialists provide free audits that help customers to identify strategies to reduce their energy use. After assessing the home and educating the customer on the options for reducing their energy use, a certified contractor will replace doors, install attic insulation, weather stripping, and energy efficient light bulbs, or conduct minor home repairs. The energy specialist may also recommend replacing outdated and inefficient appliances, including refrigerators and air conditioners. In 2008, 59,000 households participated in the program, saving an estimated 26 million kilowatt hours of electricity and more than a million therms of natural gas.

PG&E has developed a successful outreach strategy to promote awareness of the Energy Partners Program by using multi-lingual educational materials, networking with church organizations and community groups, airing radio and TV announcements, and participating in community events. Since 1983, more than one million households have participated in the program.

<table>
<thead>
<tr>
<th>Energy Partners Program</th>
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<tr>
<td>Annual Budget: $77,733,500†</td>
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<tr>
<td>Customers Served: 59,000†</td>
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<tr>
<td>Electricity Savings: 26,387,657 kWh††</td>
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<tr>
<td>Natural Gas Savings: 1,080,580 therms††</td>
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† 2008 data provided by PG&E.
†† Estimated annual energy savings.

Note: All data are preliminary and subject to final measurement and verification.
National Grid Energy Wise Program

The Princeton Reserve apartment complex, in Dracut, Massachusetts, consists of 168 electrically heated apartment units in seven buildings. The property manager turned to National Grid’s EnergyWise program to help reduce the residents’ electricity consumption and energy bills.

National Grid contractors installed specialized air sealing, high efficiency compact fluorescent lighting, and programmable thermostats, enabling the residents to greatly reduce their electricity consumption. In total, eight people worked on-site: four electricians, three air-sealing crew members, and one project coordinator. National Grid also provided training to facility staff in the best use of the technologies.

National Grid’s EnergyWise program is specifically intended for multi-family buildings and condominium complexes. The program provides on-site analysis of all electric end uses. Based on the results, National Grid contractors install lighting system upgrades and other electric efficiency measures throughout the facility. The program reduces building operating costs, improves home affordability, and increases comfort.

“No only does the program promote energy awareness, customers save energy by following the suggestions provided,” observed Kurt Shillington, Operations Manager of Princeton Properties. “The program has been an incredible service for our residents,” said Shillington.

EnergyWise Program

| Annual Budget: $4,479,060† |
| Customers Served: 7,489† |
| Energy Savings: 6,448,356 kWh†† |

† 2007 data provided by National Grid.
†† Estimated annual electricity savings for the energy efficiency investments made in 2007.

Energy Wise Program
Recognized as an “Exemplary Program” among Residential Multifamily Energy Efficiency Programs
American Council for an Energy-Efficient Economy, 2008

$176,150 Total project cost for the Princeton Reserve energy efficiency upgrade.
$174,710 Incentive funding provided by National Grid.
245,800 Estimated annual electricity savings in kilowatt hours from the energy efficiency upgrades.
$12,625 Estimated annual electric cost savings from the energy efficiency upgrades.
Chapter 2

The Commercial Sector

Office buildings, universities, hospitals, and other commercial buildings provide an opportunity for large-scale reductions in energy use.

The commercial sector in the U.S. accounts for 36 percent of electricity sales and 14 percent of natural gas consumption.

Source: U.S. Energy Information Administration

Common uses of energy in the commercial sector include space heating, water heating, air conditioning, lighting, cooking, and running a wide variety of electronic equipment. In some cases, commercial buildings produce electricity and steam on-site, providing additional opportunities for energy efficiency upgrades. This chapter features case studies of some of the leading energy efficiency programs from around the nation aimed at reducing commercial sector energy use, including public lighting.

Featured Case Studies
(1) National Grid worked with the AstraZeneca Hope Lodge to install a solar thermal system and high-efficiency natural gas heating and water heating to minimize natural gas use (2) Seattle City Light’s Smart Business Program provides financial incentives to small businesses to install high efficiency lighting equipment (3) Austin Energy has achieved dramatic reductions in electricity use (upwards of 90%) by replacing conventional traffic signals with advanced lighting technologies, known as LEDs.
The American Cancer Society’s AstraZeneca Hope Lodge provides a nurturing, home-like environment where cancer patients and caregivers can retreat to private rooms or connect with others who are going through similar experiences. Because of National Grid’s commitment to energy efficiency and social responsibility, the Hope Lodge was able to build a healthier and safer facility for its occupants.

With technical assistance and incentive programs provided by National Grid, the 64,000 square foot facility was able to install a solar thermal system and high-efficiency natural gas heating and water heating systems during construction. The first guests to the 350-patient facility at 125 South Huntington Avenue, in the Jamaica Plain neighborhood of Boston, arrived the second week of November 2008.

The Hope Lodge obtained the U.S. Green Building Council’s Leadership in Energy and Environmental Design (LEED) certification. This provides independent, third-party verification that the project meets the highest green building and performance measures.

The American Cancer Society enjoys lower operating costs due to the conservation of energy and water in its facility. By reducing harmful greenhouse gas emissions and waste sent to landfills, the project becomes an admirable example of environmental stewardship for other facilities in Boston.

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<tr>
<th>Massachusetts Commercial and Industrial Natural Gas Program</th>
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<tr>
<td><strong>Annual Budget:</strong> $4,723,150†</td>
</tr>
<tr>
<td><strong>Customers Served:</strong> 1,891†</td>
</tr>
<tr>
<td><strong>Energy Savings:</strong> 3,052,073 therms††</td>
</tr>
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† 2008 preliminary data provided by National Grid.
†† Estimated annual natural gas savings, preliminary data provided by National Grid.

National Grid has proposed a 33 percent increase in natural gas energy efficiency spending for 2009 to deliver even greater savings to customers.

National Grid Press Release, Nov. 2008

The AstraZeneca Hope Lodge project by the numbers

- **$66,799** Incentive funding provided by National Grid.
- **$19,080** Estimated annual natural gas cost savings.
- **15,900** Estimated annual natural gas savings in therms.
Seattle City Light Smart Business Program

Stella Color, based in Seattle, offers a wide variety of large format digital printing services, including poster printing, wallpaper murals, portable exhibit and trade show graphic displays, and indoor and outdoor banners. Lynn Krinsky founded the print shop in 1988, after moving to Seattle from Boston. Over the past 20 years, the business has expanded, employing sixteen full-time employees and working with an impressive list of clients such as Microsoft, Calvin Klein, Neutrogena, Hormel, and the Seattle Mariners.

Stella Color was introduced to Seattle City Light’s Smart Business Program in October 2008 when a City Light employee noticed the high pressure sodium lights in the print shop, explaining to Krinsky that she could improve her energy efficiency and save money with some simple upgrades. When asked what motivated her to join the program, Krinsky responded, “Sometimes you need someone to tell you what you are missing.” The Smart Business Program provides financial incentives to small businesses for replacing existing lighting with energy efficient lighting equipment. Rebates range from $30 to $65 per fixture.

Seattle City Light offered Krinsky a sizable incentive to replace the outdated lights in her warehouse with new, high efficiency lamps and ballasts, and provided a list of recommended contractors. The contractors spent roughly four days completing the retrofit. According to Krinsky, the contractors were “fabulous; efficient, neat, and always on time.” Not only did the Smart Business Program reduce Stella Color’s energy use and operating costs, it dramatically improved working conditions. “I have a much better appreciation of the great work we are doing,” said Krinsky, commenting on the superior lighting quality afforded by the retrofit.

Stella Color project by the numbers

<table>
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<tr>
<th>Description</th>
<th>Amount</th>
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<tbody>
<tr>
<td>Total project cost for Stella Color energy efficient lighting upgrade.</td>
<td>$9,521</td>
</tr>
<tr>
<td>Incentive funding provided by Seattle City Light.</td>
<td>$5,990</td>
</tr>
<tr>
<td>Estimated annual electricity savings in kilowatt hours from the lighting equipment upgrades.</td>
<td>$34,196</td>
</tr>
<tr>
<td>Estimated annual electric cost savings from the energy efficiency upgrade.</td>
<td>$2,052</td>
</tr>
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Seattle City Light

In 2008, City Light announced plans to invest $185 million in energy saving measures over the next five years—seven times the national per capita average.
Austin Energy Traffic Signal Project

The light emitting diode, commonly known as the LED, offers dramatic energy savings over conventional lighting technologies and can last many times longer. In an effort to help promote the technology, the City of Austin’s electric utility, Austin Energy, has been demonstrating LED technology in a wide variety of applications, including its city streets.

In 2003, the City of Austin replaced over 5,200 traffic signals and 3,700 pedestrian signals with LEDs. The wattage of the traffic signals was reduced from 135 watts to 11-15 watts each, a 90 percent reduction in energy use. Annually, the effort has realized savings of 7.25 million kilowatt hours and removed 830 kilowatts of demand load from the City grid. The City estimates it has saved taxpayers $1.4 million per year plus additional maintenance and labor savings.

Austin Energy continues to promote LED technology in outdoor lighting and commercial buildings. In December 2007, the City of Austin and Austin Energy retrofitted a floor of the One Texas Center Parking Garage with LED fixtures. LED fixtures have also been installed in a hallway at Austin Energy headquarters, in streetlights on Barton Springs, in the Palmer Events Center marquee sign and in the water fountain at the new Palmer Events Center Park.

Austin’s LED lighting strategy is part of the City’s efforts to achieve Energy Star and LEED Accreditation for City of Austin buildings. The effort will also help the City achieve its climate protection goals.

Austin Energy, the nation's 9th largest community-owned electric utility, is deploying LED lighting in a variety of applications throughout its service territory.
The Industrial Sector

Manufacturers, both large and small, provide important opportunities for energy savings because of their heavy reliance on energy inputs in the manufacturing process.

Energy use in the industrial sector is largely for process heat and cooling and powering machinery, with lesser amounts used for facility heating, air conditioning, and lighting. Petroleum refineries, paper mills, chemical plants, and other manufacturing plants are all examples of industrial sector facilities. Energy efficiency is often fundamental to economic competitiveness in the industrial sector. This chapter features case studies of some of the leading energy efficiency programs from around the nation aimed at reducing industrial sector energy use.

Featured Case Studies

(1) The Energizer battery plant in St. Albans, Vermont has completed a number of equipment upgrades to reduce its energy use with assistance from the state’s efficiency program, Efficiency Vermont (2) When the Asti Winery expanded its operations, it turned to the Savings By Design program for support in designing an energy efficient facility.
Efficiency Vermont and Energizer

Energizer is a world leader in battery technology with facilities in both St. Albans and Bennington, Vermont. In 2007, Energizer made a business decision to explore opportunities for energy efficiency improvements and turned to Efficiency Vermont for help.

Efficiency Vermont is a statewide provider of energy efficiency services operated by an independent, non-profit organization under contract to the Vermont Public Service Board. Efficiency Vermont provides technical assistance and financial incentives to households and businesses to help reduce energy use. The program is funded by an energy efficiency charge on the electric bill of all Vermont electric customers. In 2006, Efficiency Vermont saved customers an estimated $5.7 million in annual electric, fuel and water bill costs, delivering services to 38,655 customers.

After Energizer officials in the St. Albans facility asked for help in reducing their energy use, Efficiency Vermont began installing meters to track energy use on specific equipment and completed an energy-walk through of the facility. Efficiency Vermont project managers identified several opportunities for energy savings. Guided by the evaluation of the company’s equipment, and prioritizing its new equipment needs relative to the incentives Efficiency Vermont was offering, Energizer installed a new, high-efficiency injection molding machine. The company also upgraded a compressed air system, replaced an existing air dryer with a new energy-efficient model, and upgraded facility lighting.

Efficiency Vermont
Since 2000, when Efficiency Vermont was established, the cumulative lifetime economic value of efficiency investments in Vermont totals more than $313 million.

www.efficiencyvermont.com

Efficiency Vermont
Annual Budget: $19,334,720
Customers Served: 43,593
Energy Savings: 1,061,927,000 kWh
Energy Cost: 2.4 cents per kWh

† 2007 data provided by Efficiency Vermont.
‡ Estimated lifetime energy savings from 2007 projects.
§ This includes both the participant costs as well as the Efficiency Vermont’s costs. This compares to a Vermont state average retail electricity rate of 9.01 cents per kilowatt hour in 2008 (industrial customers).
Source: U.S. Energy Information Administration

The Energizer Company project by the numbers

59,000
Estimated annual electricity savings in kilowatt hours from the Energizer equipment upgrades.

$5,000
Projected annual electricity cost savings.
Savings By Design Program

In 2006, the Asti Winery in Sonoma County, California began planning a major facility expansion. The winery wanted to create a facility that was sustainable, environmentally sound and good for business consistent with their green corporate mission. With the help of PG&E, Asti Winery found solutions to its challenges in the Savings By Design program. The Savings By Design program is a state-wide utility administered initiative that supports energy-efficient commercial, industrial and agricultural building construction and design.

In planning and constructing the new facility, PG&E presented the Asti Winery with an array of insulation, lighting and compressor efficiency recommendations to minimize energy use. Asti’s final design included motion-sensor lighting, automated compressors and fans, and tank insulation that maximizes refrigeration efficiency.

Asti’s new facility covers nearly 100,000 square feet, including 93 wine storage tanks in addition to a cold storage facility. Upon installation and completion of the project, PG&E estimated total combined annual electricity savings of 1,224,191 kilowatt hours, enough to supply 177 homes for a year, and 462.5 kilowatts in electricity demand savings. The company also earned incentives from PG&E of $165,325. Simple payback for the wine tank insulation measure was 3 years, but with the PG&E incentives factored in, the payback was reduced to less than two years. Similarly, the combined lighting, fan and compressors measures simple payback time was 1.2 years and with the PG&E rebate included, the adjusted payback time was only 5 months.

“We couldn’t be happier with the results,” said Jeff Collins, General Manager of Asti Winery. “We’re seeing significant energy savings and reduced costs across the board.”

Savings By Design Program

Annual Budget: $23,299,676
Customers Served: 391
Energy Savings: 56,611,051 kWh
Energy Cost: 2.19 cents/kWh

† Expenditures and customer count recorded for January-September 2008 provided by PG&E. Although Savings By Design is a state wide program, the expenditures represent only PG&E projects.
†† Annual Net kWh savings reported for January-September 2008 by PG&E. Expenditures divided by the lifecycle net kWh savings reported for January-September 2008. This compares to a California state average retail electricity rate of 13.12 cents per kilowatt hour in 2008 (commercial customers).
Source: U.S. Energy Information Administration

PG&E Corporation

Through its energy efficiency programs, PG&E has worked with its customers to prevent more than 135 million tons of CO₂ emissions from being released into the atmosphere.

PG&E Press Release, March 5, 2008

Asti Winery’s new facility covers nearly 100,000 square feet and includes 93 wine storage tanks in addition to a cold storage facility.
Contact Information

Environment Northeast
Contact: Derek Murrow
E-mail: dmurrow@env-ne.org

M.J. Bradley & Associates LLC
Contact: Christopher Van Atten
E-mail: vanatten@mjbradley.com

Austin Energy
Contact: Alicia Loving
E-mail: alicia.loving@austinenergy.com

National Grid
Contact: Michelle Eburn
E-mail: michelle.eburn@us.ngrid.com

Efficiency Vermont
Contact: George Twigg
E-mail: gtwigg@veic.org

Seattle City Light
Contact: Robert Balzar
E-mail: robert.balzar@Seattle.gov

Pacific Gas & Electric Co.
Contact: Duane Larson
E-mail: duane.larson@pge.com