

Connecticut Energy Efficiency Fund
Activities in 2009
 Produced Substantial
 Economic and
 Environmental Benefits
 for Residents, Businesses
 and Municipalities



Customers Served

Number of Households Served	348,538
Number of Businesses Served	3,163



Energy Savings

kWh Annual 237 Million	kWh Lifetime 2.6 Billion
CCF Annual 2.3 Million	CCF Lifetime 38.4 Million
Gallons Annual 923 Thousand	Gallons Lifetime 17.8 Million



Emissions Reduced

CO₂: 1.9 Million Tons (Lifetime)
 SO_x: 811 Tons (Lifetime)
 NO_x: 398 Tons (Lifetime)



Dollars Saved

Annual \$46 Million	Lifetime \$533 Million
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AN INVESTMENT IN CONNECTICUT
Energy Efficiency



Connecticut's Energy Efficiency Programs are funded by a charge on customer energy bills. The Programs are designed to help customers manage their energy usage and cost.

Energy Conservation Management Board
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Connecticut Department of Public Utility Control
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Report of the Energy Conservation Management Board
 Year 2009 Programs and Operations
 March 1, 2010



Connecticut Energy Efficiency Programs are funded by a charge on customer energy bills.

Results in Energy Efficiency

1 Leading with Efficiency

ENERGY EFFICIENCY: AN INVESTMENT IN CONNECTICUT

Year Summary from the Chair and Vice-Chair

As the Energy Conservation Management Board's (ECMB) Chair and Vice-Chair, we proudly deliver the ECMB's Year 2009 Programs and Operations Report to the Connecticut legislature. Within this legislative report, we detail how the ECMB has fulfilled its primary objectives of advancing the efficient use of energy to: (1) reducing ratepayer bills; (2) promoting economic development and providing energy security/affordability; and (3) reducing air pollution and other negative environmental impacts.¹

2009 was a great year for championing energy efficiency. Energy efficiency has been recognized as the key to some of today's leading issues—rising energy costs, skyrocketing unemployment rates, energy independence and climate change. **Energy efficiency is the easiest, most cost-effective way to collectively save money, create jobs, reduce greenhouse gas emissions, enhance energy security, and reduce the need for additional generation plant construction.** The 2009 American Recovery and Reinvestment Act makes it clear that investing in energy-efficiency projects is critical to the American economy, job force and a sustainable future.

Since 2000, Connecticut has been ranked as one of the top three states in the nation for energy efficiency. This leadership position is due to the foresight of Connecticut's legislature in 1998 in creating the ECMB and the

Connecticut Energy Efficiency Fund (CEEF), funded by utility ratepayers.² In 2009, the state's leadership role was recognized on national, regional and state levels, and Connecticut has received funding through the 2009 American Recovery and Reinvestment Act as a result of the state's existing, award-winning energy-efficiency programs.

Support and maintenance of the CEEF is an investment strategy for deficit reduction. **For every \$1 spent on electric efficiency, Connecticut receives electric system benefits of more than \$4. For every \$1 spent on gas efficiency, more than \$4 in natural gas system benefits are realized.** These returns on investments are phenomenal in today's economic climate and demonstrate that CEEF programs are an important part of resolving the state's economic crisis by reducing customer costs, generating green jobs, and making the state more competitive due to lower business operating costs.

CEEF programs are imperative for the well-being of Connecticut. Energy-efficiency strategies should always be pursued first as it makes all forms of generation, including renewables, more valuable and cost-effective. The ECMB is



Jeffrey R. Gaudiosi



Richard W. Steeves

grateful that the General Assembly recognized the merit of Connecticut's energy-efficiency programs in 2009 budget legislation and is committed to working cooperatively with legislators and all of Connecticut's energy stakeholders to continue the state's leadership prominence in the realm of energy efficiency.

Jeffrey R. Gaudiosi
ECMB Chairperson

Richard W. Steeves
ECMB Vice-Chairperson

¹ Conn. Gen. Stat. §16-245m.
² Conn. Gen. Stat. §16-245m.

Connecticut is a leader in implementing high-quality energy-efficiency programs. Since 2000, the American Council for an Energy-Efficient Economy (ACEEE) has ranked Connecticut as one of the top states for energy efficiency. In the ACEEE's 2009 State Energy Efficiency Scorecard, Connecticut ranked third in the nation. This top-tier ranking clearly indicates that Connecticut's energy-efficiency codes, legislation, policies and programs are national models to be emulated.

Energy efficiency is an invaluable energy resource to the state. Connecticut's energy-efficiency programs help create jobs, lower energy bills, lessen dependence on foreign fuels, reduce energy consumption, and decrease the emissions of carbon dioxide, nitrogen oxides and sulfur oxides from power plants. Connecticut's residents, businesses and governments profit from these economic, environmental and societal benefits.

Since 1998, Connecticut's energy-efficiency programs have delivered critical peak demand reductions and energy savings equivalent to the generating capacity of a 595 megawatt power plant. In 2009, CEEF programs activities resulted in 2.6 billion kilowatt-hour lifetime savings. This is equivalent to:

- ▶ Providing electricity to more than 313 thousand homes for one year
- ▶ Reducing energy costs by \$533 million
- ▶ Avoiding the emissions of 1.9 million tons of carbon dioxide

Energy efficiency is the most cost-effective resource available to policymakers to address rising energy costs and reliability challenges, meeting the greenhouse gas reduction goals in the Governor's Climate Action Plan and the federal attainment goals for nitrogen oxides emissions. **The least expensive kilowatt is the one not used.**

CEEF programs contribute to the more than 2,600 jobs³ that result directly from energy efficiency and serves as an economic development engine creating private sector businesses which deliver energy-efficiency services. Jobs such as Leadership in Energy and Environmental Design (LEED) architects, energy auditors, lighting installers, HVAC technicians and energy-efficiency entrepreneurs are among the growing options for the green workforce in the state.

CEEF 2009 Residential Program Savings

Customers Served
348,538

Energy Savings

kWh Annual 85 Million	kWh Lifetime 622 Million
CCF Annual 1.2 Million	CCF Lifetime 22.5 Million
Gallons Annual 923 Thousand	Gallons Lifetime 17.8 Million

CO₂ Emissions Reduced
65,071 Tons (Annual)

Annual Savings
\$ 20.2 Million

CEEF 2009 Commercial & Industrial Program Savings

Customers Served
3,163

Energy Savings

kWh Annual 152 Million	kWh Lifetime 2.0 Billion
CCF Annual 1.1 Million	CCF Lifetime 15.9 Million

CO₂ Emissions Reduced
89,158 Tons (Annual)

Annual Savings
\$ 25.4 Million

³ Navigant Consulting, CT Renewable Energy/Energy Efficiency Economy Baseline Study. Phase I Deliverable, March 27, 2009.

2 WHO WE ARE Organizational Structure

Connecticut Energy Efficiency Fund

The Connecticut Energy Efficiency Fund (CEEF) was created in 1998⁴ with the direct purpose of helping small and large businesses, homeowners and renters, and state and local governments use energy more efficiently. The primary objectives of the CEEF are to lower energy bills, promote economic development, enhance energy security and mitigate the negative environmental impacts of energy generation.

Energy Conservation Management Board

The Energy Conservation Management Board (ECMB) was created by the same legislation⁵ that created the CEEF. The ECMB is an appointed group of 14 members who represent private and public entities who serve voluntarily and meet year-round. The original purpose of the ECMB was to advise and assist the state's two electric distribution companies, The Connecticut Light and Power Company (CL&P) and The United Illuminating Company (UI), in both the development and implementation of CEEF programs. The ECMB's oversight was expanded with the passage of 2005 legislation⁶ to include the energy-efficiency programs of the Connecticut Municipal Electric Energy Cooperative (CMEEC) and the state's natural gas utilities—Connecticut Natural Gas Corporation, The Southern Connecticut Gas Company and Yankee Gas Services Company.

Each October, electric and natural gas utilities are required to file an annual energy-efficiency plan for the upcoming year with the Connecticut Department of Public Utility Control (DPUC). The ECMB is charged with advising the utilities in the development of this comprehensive plan to implement cost-effective efficiency and load management programs and market transformation initiatives. The DPUC reviews the plan and makes a final decision regarding proposed budgets, incentives and programs. The 2005 Act Concerning Energy Independence (EIA) directed the DPUC and ECMB to implement efficiency and load management initiatives and programs that would reduce Federally Mandated Congestion Charges (FMCCs) on electric

utility bills. A top priority of the DPUC and the ECMB is to reduce FMCCs through EIA programs.

The ECMB retains high-level energy consultants nationwide to assist with the creation of the most effective efficiency programs possible. These consultants continuously work with the ECMB and utilities to develop and enhance CEEF programs. The ECMB also utilizes independent research organizations to evaluate the effectiveness and performance of CEEF programs. These third-party evaluations are used to identify new opportunities to enhance CEEF programs and guide improvements.

Public Input

The ECMB values feedback from the public to advance the effectiveness of CEEF programs and has established five channels for public comment:

- 1 ECMB monthly meetings
- 2 Annual public forums
- 3 Public review of reports and plans
- 4 Consideration of specific products/ technologies or program revisions
- 5 Focused topic discussions at ECMB monthly meetings and subcommittee meetings

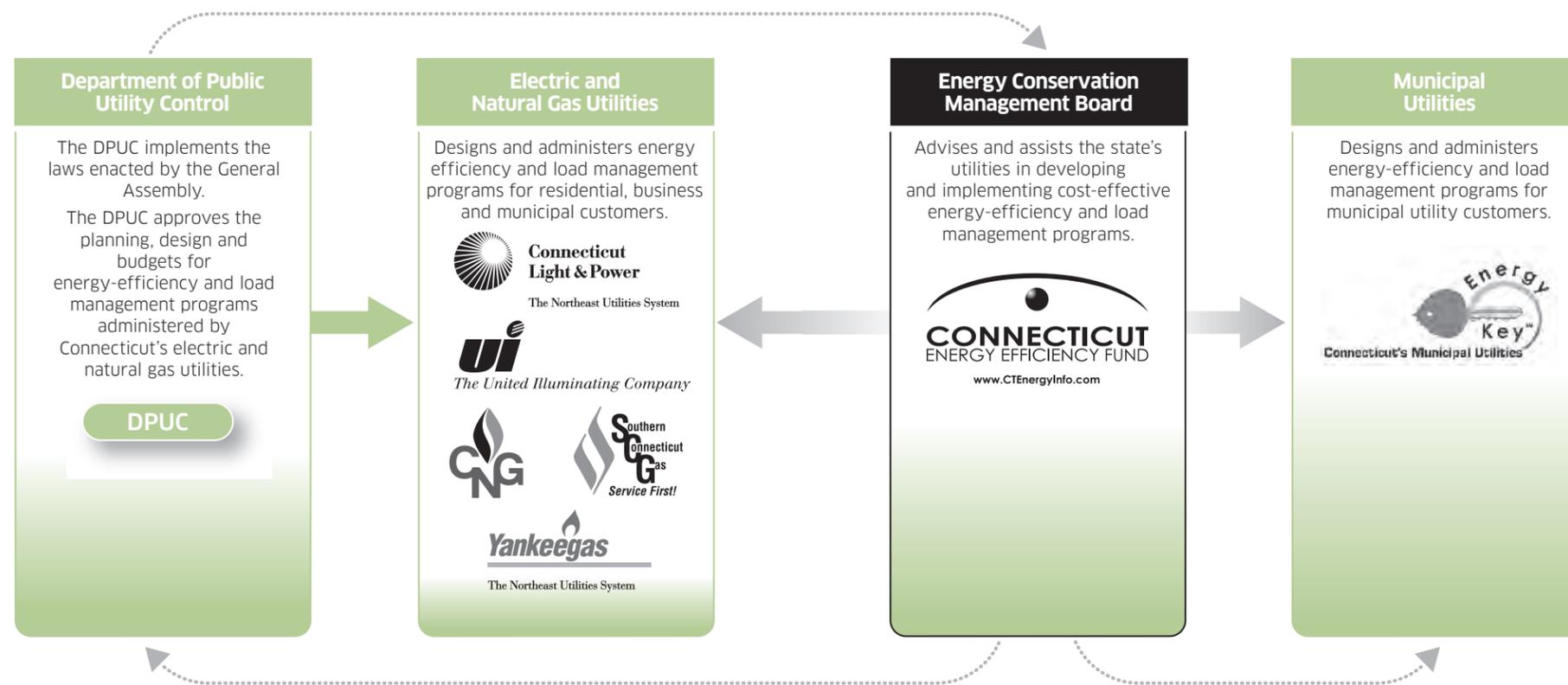
Integration of Electric, Natural Gas and Oil Programs

In 2009, the ECMB continued to oversee the seamless integration of the electric and natural gas utilities' efficiency programs and other sources of conservation assistance. This integration benefits Connecticut residents, businesses and municipalities by enabling them to focus on the most effective approach to efficiency without having to navigate multiple administrative systems.

During 2009, the ECMB and utilities also continued to work with the Office of Policy & Management (OPM) to leverage its furnace/boiler replacement rebate with CEEF programs. In addition, 2009

American Recovery and Reinvestment Act funds of \$11.5 million were made available that allowed CEEF programs to provide more natural gas, oil, kerosene and propane energy-saving measures, making them truly fuel blind. In 2010, the state of Connecticut will receive a \$3.4 million grant through the 2009 American Recovery and Reinvestment Act to fund the Connecticut Recovery Appliance Rebate program. CMEEC and the electric and natural gas utilities will implement this appliance replacement program.

4 Conn. Gen. Stat. §16-245m.
5 Conn. Gen. Stat. §16-245m.
6 Conn. Gen. Stat. §16-32f and 7-233y.



3 Understanding Energy Terms and Who We Serve



Energy Conservation vs. Energy Efficiency

The terms energy conservation and energy efficiency are often used interchangeably, however they reflect complementary strategies for using energy wisely. Energy conservation is any behavior that results in the use of less energy such as turning off lights or the television when leaving a room. Energy-efficient technologies use less energy, yet perform the same tasks as inefficient units. Compact fluorescent light bulbs (CFLs) and ENERGY STAR® appliances are examples of these technologies. Effective, comprehensive energy-saving programs utilize both strategies, as appropriate, to reduce energy consumption while improving or maintaining comfort or productivity.

Annual and Lifetime Savings

Homeowners who replace inefficient appliances with efficient units will experience a significant reduction in energy consumption and cost during the year. This reduction in energy usage is called *annual energy savings*. Each efficient technology is expected to operate for a specific number of years, defined as its lifetime. *Lifetime energy savings* are calculated by multiplying a product's annual energy savings by its lifetime. This legislative report tracks the annual and lifetime savings resulting from 2009 CEEF programs. Annual energy savings figures show the immediate benefits of electric and natural gas efficiency measures while lifetime figures illustrate the long-term energy savings.

Energy savings from 2009 CEEF programs will continue to compound into the future, revitalizing the state's economy, helping utility customers save money and protecting the environment.

Measuring Energy Savings

Annual and lifetime savings are listed separately throughout this report. Electric savings are reported in kilowatt-hours and kilowatts. A kilowatt-hour (kWh) is a measurement of the amount of electrical energy that has flowed or a customer's usage. A kilowatt (kW) is a measure of electrical energy demand. A 100-watt equivalent CFL typically uses 29 watts to illuminate a room. Natural gas energy savings are reported in 100 cubic feet (ccf) and oil energy savings are reported in gallons.

Peak Demand

An important focus of CEEF programs is balancing electric supply and demand—*load management*. Kilowatts (electrical demand) cannot be stored easily or economically, consequently electric generation suppliers and electric utilities must have sufficient generation capacity available to meet maximum customer demand on the electrical grid system, whenever it occurs. This highest point of customer demand is called peak demand. New England's electrical grid is *summer peaking*, meaning the highest electrical demand occurs on hot, humid summer weekday afternoons when air conditioners are operating the most.

A megawatt is defined as one million watts (MW). According to the Independent System Operator of New England (ISO-NE), Connecticut's peak demand is projected to grow from 7,320 MW in 2007 to 8,475 MW by 2016. Fast-start generating plants are needed to produce electricity when "peak" demand in our region requires it. CEEF and EIA programs are designed to help business and residential customers reduce the use of electricity at peak

times (typically noon to 8 p.m.) and reduce the need for these types of facilities. Using energy-efficient designs and technologies in buildings helps decrease the demand on the electrical grid and are more environmentally sound and less expensive alternatives than building new power plants. The *Wait 'til 8* campaign is an ECMB and CEEF initiative to promote energy conservation behaviors during peak demand times. The campaign encourages residents to voluntarily shift use of major energy-consuming appliances such as washing machines and dishwashers, from mid-afternoon to after 8 p.m. Since 2000, CEEF programs have reduced 518 MW of peak demand.

Customer Sectors

The ECMB and the utilities appropriately tailor programs to ensure energy-efficiency savings are broadly realized by all customer sectors. In 2009, CEEF programs served these customer sectors: limited-income, municipal, non-profit, residential, school, small business, state government, university, and large commercial and industrial customers. This holistic coverage of all customer

sectors means that everyone, even if indirectly, benefits from Connecticut's award-winning, energy-efficiency programs. Table A summarizes the annual and lifetime energy savings by the customer sector.



Table A: Summary of Energy Savings by Customer Sector

(In millions of kWh, thousands of ccf and thousands of gallons)

Customer Sector	Annual Savings 2009			Lifetime Savings 2009		
	Electric	Natural Gas	Oil	Electric	Natural Gas	Oil
Limited-Income	15	793	501	137	13,660	9,097
Residential (Non Limited-Income)	70	431	422	485	8,832	8,654
Commercial & Industrial	152	1,083	0	2,012	15,875	0
Totals	237	2,307	923	2,634	38,367	17,751

4 Home Energy Solutions



All HES program participants receive CFLs.

Most Connecticut homes leak energy (and money) through their attic hatches, doors, windows and elsewhere because they were built with aesthetic design and building cost in mind rather than energy-efficiency. This inefficiency results in high cooling and heating bills.

The Home Energy Solutions (HES) program is a whole-home solution that reduces energy consumption and costs. Technicians perform an energy assessment of the home and provide a variety of efficiency and weatherization measures. Homes with central heating/cooling receive ductwork tests to assess air leakage, and if leaks are significant, ductwork is sealed to improve efficiency. Lighting and water-saving measures are installed by technicians and the efficiency of insulation and appliances are also assessed. Technicians review the work completed at a “kitchen table” wrap-up to ensure homeowners understand the services performed and the resulting energy savings. Additional efficiency technologies and energy conservation behaviors are also discussed with the homeowner and the technicians review available appliance/insulation rebates, renewable energy options, tax credits and potential financing opportunities for future investments in efficiency.

This Old House in Stratford

Todd M. Williams lives in a 1942 Cape Cod style home in Stratford. He was contemplating replacing his 20-year-old furnace, 15-year-old A/C condenser and 17-year-old hot water heater when he learned about the HES program from some of his neighbors and signed up to receive the program’s services and rebates.

A week later, authorized HES energy technicians came to his home and performed the assessment. They made on-the-spot improvements including sealing his basement air leaks with foam, installing a low-flow showerhead and replacing his incandescent bulbs with 14 energy-efficient CFLs. During the kitchen table wrap-up, Mr. Williams was encouraged to replace his inefficient heating and cooling systems. He was



“The HES program has really improved the comfort of my home.”

Todd Williams

provided with rebate applications and information on available tax credits. Subsequently, he installed a 96 percent efficient furnace, a 15 SEER A/C unit, an efficient tankless natural gas hot water heater and he replaced existing ductwork with insulated ductwork throughout his home. “These changes have provided a noticeable difference in my energy bill,” noted Mr. Williams.

Thanks to the energy-saving improvements, Mr. Williams should realize annual and lifetime electric savings of 476 kWh and 3,084 kWh, respectively. Williams’ total incentive and rebates from the CEEF and the state came to \$2,164.75. He also earned a \$1,500 federal tax credit for installing the insulated ductwork.



Blower door technology measures home air leakage.

Energy Savings in Newington

Anna Tufankjian is grateful for the energy-saving measures performed in her 40-year-old colonial home in June 2009. The retired school teacher signed up for HES after receiving program information in her CL&P bill. Technicians supervised instrument-guided testing and checked for air leakage on every level of her home. A blower door test determined the cubic feet of air per minute (CFM) flowing through her home. This task is accomplished by placing a tarp over the front door with a built-in industrial fan to depressurize the home. This reverses the airflow and identifies the sources of air leaks and drafts.

The Tufankjian’s basement is partially heated, but lacked a door separating the kitchen from the basement. The results of the blower door test surprised Mrs. Tufankjian. “The specialist told me it was the equivalent of having four windows open—that’s how much heat I was losing! I took his recommendation and had a door installed immediately.” The test also pinpointed air leaks around windows and the attic door and technicians installed door sweeps and caulking to weatherize the home. “The specialists did an outstanding job. There was a real breeze coming in before,”

Mrs. Tufankjian stated. Incandescent bulbs were also replaced with CFLs to provide further energy savings. The Tufankjian family has realized electric



“The specialists did an outstanding job.”

Anna Tufankjian

energy savings of 449 kWh annually and 3,019 kWh over the lifetime of the measures. Oil energy savings are estimated at 45 gallons annually and 888 gallons lifetime.

2009 Home Energy Solutions



Customers Served*

16,342



Energy Savings

kWh Annual	kWh Lifetime
11,348,776	134,133,221

CCF Annual	CCF Lifetime
300,033	5,831,132

Gallons Annual	Gallons Lifetime
422,693	8,653,764



CO₂ Emissions Reduced

13,464 Tons (Annual)



Annual Savings

\$ 3,684,198

* Includes HVAC rebates

Limited-Income Programs



"They did a great job. The house is warmer since we got the insulation so I would recommend this service to anyone."

Helen Beaudry

Energy bills typically comprise a disproportionately high percentage of limited-income household budgets as compared to average income households. The Home Energy Affordability Gap in Connecticut represents the dollar amount by which *actual* home energy bills exceed *affordable* home energy bills. According to a 2009 Operation Fuel report,⁷ the Affordability Gap is substantial and is a statewide phenomenon, affecting both urban and rural areas of Connecticut. The same report found that Connecticut households at or below 185 percent of the federal poverty level faced shortfalls of \$2,550—resulting in an aggregated energy gap of \$585 million statewide.

Current economic conditions will only continue to widen this gap. Fortunately, CEEF's limited-income programs, Weatherization Residential Assistance Partnership (WRAP) and UI Helps, provide valuable weatherization measures to help renters and homeowners reduce the energy gap. These programs are fuel blind and provide services to income-eligible electric, natural gas and oil heat customers. Energy specialists assess a home's efficiency and perform a range of weatherization services such as installing CFLs, caulking cracks/leaks around doors and windows, and installing attic insulation. All program measures are designed to reduce heating and cooling losses. Additional efficiency steps include installing water-saving faucet aerators and showerheads, and upgrading appliances and heating systems.

⁷ Fisher, Sheehan & Colton. Home Energy Affordability Gap: Connecticut Legislative Districts. Rel. February 11, 2010. <http://www.operationfuel.org/publications/Connecticut-HEAG--2009--with-appendices.pdf>

Weatherization in Meriden

Helen Beaudry of Meriden called the CEEF information phone line after receiving a flyer regarding the WRAP program in her electric bill. "My house was really starting to get cold and I decided we couldn't stand another winter of drafty windows." The energy assessment team determined that she was losing money and energy not only through drafty windows, but also the doors, attic and walls. In fact, it was established that the insulation in her crawl-space attic and a few of the walls was nonexistent. Energy technicians installed three door sweeps, and caulked and sealed more than 50 linear feet in the home. Foam insulation was then blown into the attic and walls to help the Beaudrys realize significant energy savings. "They did a great job. The house is warmer since we got the



Blower door test readings indicate the tightness of a homes envelope and the process reveals drafts and leaks to be fixed.

insulation so I would recommend this service to anyone," stated Mrs. Beaudry. They also received 14 CFLs to replace the incandescent bulbs and two new table lamps. Additionally, a low-flow showerhead and several faucet aerators were installed throughout the home. The Beaudrys should see annual and lifetime electric energy savings of 603 kWh and 4,826 kWh respectively, and they should save approximately 481 gallons of oil annually with 11,083 gallons of oil lifetime savings.

Mutual Housing of Southwestern Connecticut

In July 2009, the UI Helps program worked with Mutual Housing of Southwestern Connecticut, a non-profit supportive housing organization, to provide comprehensive weatherization services to the 87 residential homes.

Energy technicians conducted numerous tests and installed multiple energy-saving products. Instrument-guided testing located air leaks in the units resulting in the installation of 43 door sweeps and weather sealing of 63 windows. More than 830 new light fixtures with standard and specialty bulbs were also installed in the units. Property Manager Magaly Rivera was very pleased with the program. "The experience was very productive. The vendors were professional and helpful. All of my questions were answered in a very professional manner." Mutual Housing of Southwestern Connecticut will realize an impressive annual energy savings of 19,992 kWh and lifetime energy savings of 83,519 kWh.



"I was so excited the day I received my letter advising that I qualified for the appliance replacement. There has been a substantial reduction in my energy from last year from both the services and appliance replacement."

Resident, Milagrosa Sequinot



Low-flow shower heads save water and associated heating costs.

2009 Limited-Income

 **Customers Served**
15,132

 **Energy Savings**

kWh Annual	kWh Lifetime
15,256,224	136,608,214
CCF Annual	CCF Lifetime
793,476	13,659,543
Gallons Annual	Gallons Lifetime
500,532	9,096,951

 **CO₂ Emissions Reduced**
19,571 Tons (Annual)

 **Annual Savings**
\$ 5,316,430

Building Green Dreams



"... it is achievable to design and create a zero-energy house that is both aesthetically pleasing and extremely high-performance."

George Keithan, Jr.

2009 Residential New Construction



Customers Served

560



Energy Savings

kWh Annual	kWh Lifetime
906,954	13,539,888

CCF Annual	CCF Lifetime
50,950	1,019,008



CO₂ Emissions Reduced

799 Tons (Annual)



Annual Savings

\$ 243,916

Energy-Efficient New Homes

The CEEF's Residential New Construction (RNC) program provides financial incentives and technical assistance to make integrating efficient design and technologies feasible in residential construction projects. This incentivizes architects, builders and homeowners to design new homes that use less energy from the beginning: the blueprint.

On a national level, new home energy-efficiency is benchmarked by the ENERGY STAR® Homes program. ENERGY STAR is a joint partnership between the U.S. Environmental Protection Agency (EPA) and the U.S. Department of Energy (DOE). Though supportive of ENERGY STAR, the RNC program challenges architects and builders to move to a new, higher level

of efficiency—high-performance and zero-net energy homes. Incentives are available for electric and natural gas efficiency measures such as ENERGY STAR for home certification, insulation, gas water heaters, geothermal heat pumps and other electrical HVAC equipment.

CT Zero Energy Challenge

In 2009, the CEEF initiated Connecticut's first residential design and build competition for single- and multi-family homes—the CT Zero Energy Challenge. The Challenge awards monetary prizes to three winners, while serving as an educational platform for the state's building community regarding high-performance homes. In addition to energy-efficiency measures, each home must incorporate clean, renewable energy technologies into the project's

design. *Zero net energy* simply means that a home uses no more energy from the electrical grid over a given period than it produces on site. The completed homes are assigned a performance score based on the presence of energy-efficient features that curb overall energy use. Specifically, the challenge will use RESNET Rating Standards to determine each completed home's Home Energy Rating System (HERS) Index. The home with the lowest HERS Index will determine the winner of the competition. Eighteen home construction projects are competing in this challenge that ends December 2010.

Inside the Walls of a Zero Energy Home

Consulting Engineering Services is building a 4,510 sq. ft. house on the central shoreline featuring high-efficiency windows and doors, AET hot water panels for radiant space heating, a super insulated hot water storage tank and photovoltaic cells for electricity generation. To provide additional space heating and cooling, a three-ton geothermal well and energy-recovery ventilator were installed. The house is fully equipped with ENERGY STAR appliances and the lighting is exclusively CFL or light-emitting diodes (LED). The building envelope was created with super-insulated foundation walls, slab, exterior walls and roof.

Consulting Engineering Services' President and CEO George Keithan, Jr. states that his firm's goal was "to bring awareness and understanding to the Connecticut population that it is achievable to design and create a zero-energy house that is both aesthetically pleasing and extremely high-performance." The home is a net producer of 2,571 kWh and has achieved a HERS Index of -6, meaning that during the course of a year it is actually a net energy producer rather than a user.



MAP 1: RNC Program Participants in 2009

Retail Products

2009 Retail Products



Customers Served

315,666



Products Sold

CFLs	2,167,442
Hard-Wired	37,597
Torchieres	2,104
Other Products	2,380



Energy Savings

kWh Annual	56,734,038	kWh Lifetime	337,881,538
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CO₂ Emissions Reduced

30,759 Tons (Annual)



Annual Savings

\$ 10,848,637

CFLs and ENERGY STAR Appliances

The CFL is the icon for energy-efficient technologies and justly so; CFLs use 75 percent less electricity than incandescent bulbs while producing the same amount of light. The CEEF's award-winning Retail Products program promotes the sale of CFLs in many of Connecticut's grocery, pharmacy, home improvement and big box stores by working with lighting manufacturers to rebate CFLs before they reach the shelf. This approach allows customers to purchase discounted CFLs without the hassle of having to submit mail-in rebates or bringing coupons to the store.

In late 2009, CEEF launched *Shining Solutions*, a fundraising program designed to provide an alternative source of funds to faith groups, green energy task forces, boy/girl scouts and schools by selling CFLs. The program also focuses on educating Connecticut residents regarding ways they can save energy and money, and about the large variety of CFL types that exist.

In 2009, the CEEF and the utilities continued their partnerships with the EPA, DOE and other efficiency programs built around the ENERGY STAR brand. The promotion of ENERGY STAR by the CEEF and its partners has helped make the reach of energy-efficient appliances ubiquitous across the state.

The CEEF partners with a local retail lighting vendor and national ENERGY STAR partner to offer lighting fairs throughout the year. These lighting fairs are hosted by commercial businesses, state agencies, public events, home shows, state and town fairs, and non-profit organizations. Consumers can

purchase a wide selection of quality ENERGY STAR CFLs and fixtures at a discount, supported by the CEEF. Information on safe CFL use and disposal is also provided at these events, along with information on other CEEF programs and services.



A new SmartLiving™ catalog was also produced and distributed in 2009. Connecticut residents can order energy-efficient lighting products including a complete line of specialty CFLs, table and desk lamps, ceiling fixtures, outside lighting, LED products and kilowatt-measuring meters. These products are also discounted by CEEF. The new 16-page catalog is being distributed at home shows and whenever CEEF and the utilities meet with residential customers.

The ductless heat pump rebate program for electric heat customers was launched in fall 2009. A new rebate of up to \$1,000, together with federal tax credits, has made this a much more viable retrofit option for residents who currently heat their homes with

electricity. A ductless heating and cooling system is a highly efficient system that is easily installed as a new primary heat source. These systems use 25-50 percent less electricity than conventional electric baseboard heating systems. The CEEF and utilities are also facilitating contractor training to ensure that these systems are sized and installed properly. Together with increased funding in 2010 for geothermal heat pumps, residents now have more energy-efficient options to choose from.

Retail Heating/Cooling Rebates

Fifty-five percent of the energy consumed in a typical U.S. home is for space heating and cooling. CEEF's Residential Rebate programs offer customers with a quick and efficient way to receive incentives for installing energy-saving heating and cooling systems. In 2009, the CEEF provided rebates for ductless heat pumps, geothermal heat pumps, HVAC systems

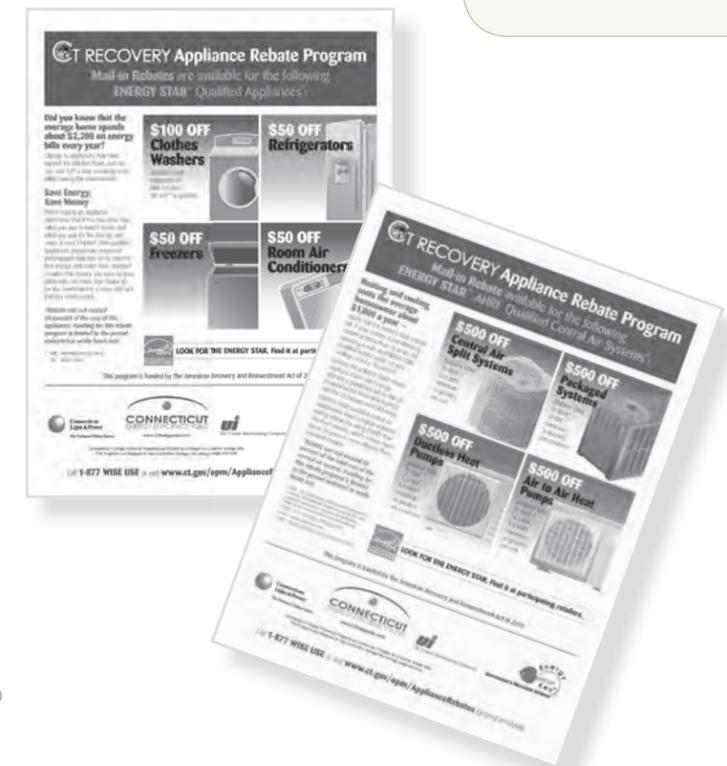


The outside unit of the ductless heat pump is quiet and has a small footprint.

and natural gas water heaters. These stand-alone rebates are different from the rebates offered exclusively to HES program participants.

Cash for Clunkers in Your Kitchen, Laundry...

In 2010, the CEEF and CMEEC will implement the Connecticut Recovery Appliance Rebate program with \$3.4 million in funding from the 2009 American Recovery and Reinvestment Act (ARRA). This is an appliance replacement program for Connecticut residents who replace their existing appliance(s) with high-efficiency units. The program will fund mail-in rebates for ENERGY STAR clothes washers, freezers, refrigerators, window air conditioners, central air systems, heat pumps, and packaged systems.



2009 Retail Rebates



Rebates by Category

Natural Gas Hot Water	838
HVAC, Including Geothermal Heat Pump	4,551

Results from Gas Hot Water Rebates



Energy Savings

CCF Annual	79,300	CCF Lifetime	1,982,538
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CO₂ Emissions Reduced

478 Tons (Annual)



Annual Savings

\$ 109,710

5 A Directive to Educate

An ECMB mandate is to educate Connecticut's residents and businesses about CEEF programs and services, new energy-efficient technologies and energy conservation tips and efforts. CEEF's educational outreach is delivered through a variety of conduits including museum exhibits, public forums, school-based programs (kindergarten through college), trade shows and training seminars. These outreach efforts are vital in providing the information and tools needed for businesses, municipalities and residents to reduce energy consumption, lower energy bills and protect the environment.

Forums and Community Events

The ECMB and utilities understand that presentations and community forums are the best way to communicate ideas and information to groups.



Students from the John Winthrop School in Bridgeport explore the Discover Green Expo exhibits.

Community interest in energy-efficiency information, literature and presentations increased by at least one-third in 2009. ECMB members and utility staff participated in nearly 150 events providing information on CEEF programs to Connecticut's community groups, municipal energy task forces and residents.

Discover Green Expo

The CEEF and its community partners held the *Discover Green Expo* at the Discovery Museum and Planetarium in Bridgeport, September 23 - 26, 2009. The four-day event for educators, students, families and businesses had various activities coordinated to support energy efficiency, the Discovery Museum and the City of Bridgeport's B-Green 2020 initiatives.

The purpose of this event was to teach residents how to be more energy efficient in their homes; provide area businesses and organizations the opportunity to promote their products and messages; and educate school children on ways to become more energy conscious. The *Sustainable Choices* exhibit engaged visitors in the topic of sustainability through everyday objects, activities and technology, showing wise choices people can make everyday to live sustainably. More than 1,700 visitors attended the four-day expo.

Green Job Training

In 2009, the CEEF partnered once again with the Connecticut Technical High School System (CTHSS) to develop and train Connecticut's future green workforce. Since 2006, the CEEF's *eEsmarts* program has worked with



Technical High School training through the *eEsmarts* program.

the CTHSS's electrical instructors to incorporate efficient and renewable energy topics in classroom lessons. In 2009, *eEsmarts* and the Connecticut Clean Energy Fund's Learning for Clean Energy Innovation (LCEI) program conducted an all-day workshop to electrician educators and students reviewing topics such as magnetism, convection currents, building an electric generator and designing high-efficiency windmills. The CEEF's *eEsmarts* program, the Institute for Sustainable Energy (ISE) and LCEI are working with the CTHSS's administration teams to upgrade the system's curriculum to include information on high-performance building standards, energy-efficiency and renewable technologies.

In Our Schools

PreK-12 Energy Education

A primary objective of the CEEF is to educate tomorrow's energy consumers—Connecticut's youth. The CEEF's Grade Pre K-12 curriculum helps students, educators, and families understand the inextricable link between energy consumption and environmental issues such as climate change and air pollution.

The CEEF's *eEsmarts* program is a Pre K-8 energy efficiency and clean energy learning initiative for Connecticut classrooms and is administered by CL&P and UI. Connecticut Energy Education is the CEEF's high school initiative administered by the ISE. Both programs offer educator training workshops and lesson materials regarding efficient and renewable energy technologies. All lessons directly align with Connecticut State Department of Education Framework Content Standards and National Science Standards.

The *eEsmarts* program has partnered with Wesleyan University to deliver high-quality science- and math-based workshops to guide educators through its lessons and challenge them to incorporate inquiry-based teaching methods in classroom instruction. Two

types of workshops are offered: (1) School District Specific; or (2) General. All *eEsmarts* lessons and workshops are free for Connecticut educators and school districts.

In 2009, *eEsmarts* hosted district-specific workshops for Colchester, Danbury, Lebanon, New Haven, West Hartford, and CTHSS electrician and science educators. The annual *eEsmarts* Summer Institute held at Wesleyan University trained more than 100 educators during two- and three-day intensive workshops.

Essays on Energy

In the spring of 2009, more than 400 fourth, fifth, sixth, seventh and eighth graders from across Connecticut submitted essays detailing their ideas for making Connecticut residents, schools and towns more energy efficient. In May 2009, 19 students were honored at the fifth annual *eEsmarts* Energy Efficiency Essay Contest ceremony by Connecticut Senate President Pro Tempore Donald E. Williams, Jr. and DPUC Commissioner Amalia Vazquez-Bzdyra. The students' essays ranged from "talking CFLs" dispensing energy-efficient advice to

persuasive essays asking town councils to install solar photovoltaic panels on school buildings.



2009 *eEsmarts* Essay Contest winners and ceremony presenters.

"Carpooling, using energy-efficient cars, appliances, and lighting are just some ways we can reduce our dependence on fuel."

Casey, 6th grader, Farmington

"By turning off every other light in our school hallway, we are saving 10% on our total energy bill."

Sarah, 7th grader, Mystic

"Installing solar panels in the Hartford school system would greatly reduce the amount of money spent on energy each year."

Eamon, 8th grader, Hartford

2009 eEsmarts

 **Teachers Trained**
418

 **Curriculum Lessons Distributed**
3,965

2009 Connecticut Energy Education

 **Teachers Trained**
46

 **Curriculum Lessons Downloaded**
1001 by 166 educators

In Our Learning Centers



Students learn about energy-efficient building design in the Energy City Gallery at the Connecticut Science Center.

SmartLiving™ Center

Located on the Boston Post Road in Orange, the SmartLiving Center is a science museum, hands-on activity center, home improvement showroom and education resource center all together in one location. Open to the public six days a week, the facility teaches adults, educators and students regarding the impact of our present day energy-consuming lifestyle on natural resources and the environment.

Visitors can participate in guided tours through the SmartLiving Center's interactive demonstrations and exhibits on efficient technologies and renewable energy sources. The purpose of these tours is to empower students of all ages to become stewards of the earth and the environment. The center also hosts family science days, training events and meetings. In 2009, the SmartLiving Center received 12,944 visitors and hosted 294 group tours, seminars and free events.

Connecticut Science Center

In June 2009, the Connecticut Science Center in downtown Hartford officially opened to the public. Since 2005, through a \$2 million partnership, the CEEF and Connecticut Clean Energy Fund worked with the center to develop and design interactive, educational exhibits on efficient and renewable energy technologies. The Energy City Gallery is a model sustainable community named "Greenslope" featuring energy-efficient technologies and clean, renewable energy sources that power the buildings instead of fossil fuels. The family-friendly gallery

contains exhibits on sustainability, product life cycles, efficient windows, passive solar design, energy-efficient appliances/lights, green building design, wind, solar photovoltaics, biomass, and fossil fuels. The multi-media exhibits illustrate the relationship between carbon dioxide emissions and energy consumption, and the interactive exhibits emphasize to Connecticut students, educators and families the importance of changing the way we use energy.

Stepping Stones Museum for Children

In 2009, the CEEF initiated an energy education project with Stepping Stones Museum for Children in Norwalk. The CEEF is a sponsor of the museum's new *Energy Gallery* on clean renewable energy which will open in December 2010. Additionally, the CEEF will sponsor a traveling energy exhibit tour designed by Stepping Stones that will stop at more than 100 schools, municipalities and museums over the next four years. The mobile energy lab will provide students, educators, and families, who do not live close to established museums where permanent energy galleries exist, the chance to learn about energy technologies and related environmental issues.

In Our Communities

eeCommunities

In 2009, the CEEF initiated a pilot eeCommunities program to expand its energy-efficiency outreach. From municipal buildings to individual residents, communities were asked to make a commitment to energy efficiency and its resulting economic, environmental and societal benefits. Bridgeport and Portland were the first two communities to take part in this pilot program.

Bridgeport's B-Green 2020 *Sustainability Initiative* members worked closely with the CEEF and utilities to promote its residential and business programs. Specific efforts included weatherization and refrigerator replacement of more than 2,500 Bridgeport Housing Authority units, and a neighborhood door-to-door canvassing project to promote CEEF's in-home energy services programs to Bridgeport residents.

Portland's Clean Energy Task Force, the CEEF and utilities worked together to plan and present several energy forums promoting CEEF programs. Other efforts included helping the municipality determine that performance contracting was the best financial approach to retrofitting the town's buildings making them more energy efficient and arranging for the CEEF's WRAP program to weatherize all 119 Portland Housing Authority units.

In fall 2009, the CEEF and the Connecticut Clean Energy Fund provided extensive outreach to municipalities and local energy task forces including seven regional

workshops on municipal and residential incentive programs and two energy benchmarking training sessions led by the EPA. Both energy funds also collaborated with federal and state representatives to provide town officials with program information in connection with Energy Efficiency and Conservation Block Grants offered under the 2009 ARRA.

In Our Workplace

The CEEF is committed to continuously educating Connecticut's business and energy vendor communities about new technologies, programs and business opportunities. Energy efficiency is a proven way to reduce the cost of doing business in Connecticut, and these economic benefits are vital to Connecticut companies trying to decrease expenses without eliminating jobs and growth. Installing energy-efficient and load management technologies in facilities reduces overhead and increases business profits. The CEEF stays connected to the business community through outreach to local chambers of commerce, business and manufacturing groups, and trade associations. ECMB members and the utilities attended events across the state to deliver the message of energy efficiency and energy conservation.



ECMB Chairman Jeff Gaudiosi helps kick-off the *B Green 2020 Initiative* at Bridgeport Mayor Finch's home.



WRAP technicians install energy-efficient ceiling fixtures for the Portland Housing Authority.

In Our Communities

Training Seminars and Technical Presentations

In 2009, the CEEF offered more than 20 technical training seminars for commercial and industrial customers, trade allies and utility administrators to learn about emerging technologies, best practices, and new building design standards and codes. More than 1,000 professionals attended these seminars. Topics included daylighting controls, innovative cooling technologies, performance contracting, retrocommissioning, high-performance lighting and LEDs, and energy-efficiency financing and tax incentives. The CEEF and utilities also hosted several technical sessions to educate and inform energy-efficiency vendors about new technologies, processes and programs effecting 2009 business operations. These technical sessions were held for both residential and commercial program vendors.



The Business Sustainability Challenge Pilot

The Business Sustainability Challenge (BSC) is a pilot program created in response to a growing need for businesses to achieve deep and long-lasting energy savings in addition to specific energy-efficiency projects or measures they complete through a CEEF program. The goal of the program is to provide sustainability education and assist businesses with designing and incorporating continuous improvement strategies into their practices and company culture. Through participation in the BSC, businesses acquire information and tools to help identify opportunities for improved management of their energy use, water use, supply chain, waste streams and transportation. With technical assistance and guidance from utility staff and expert sustainability resources, the BSC's aim is to help Connecticut's businesses improve their economic, environmental and social sustainability through responsible energy and carbon footprint management.

6 Load Management

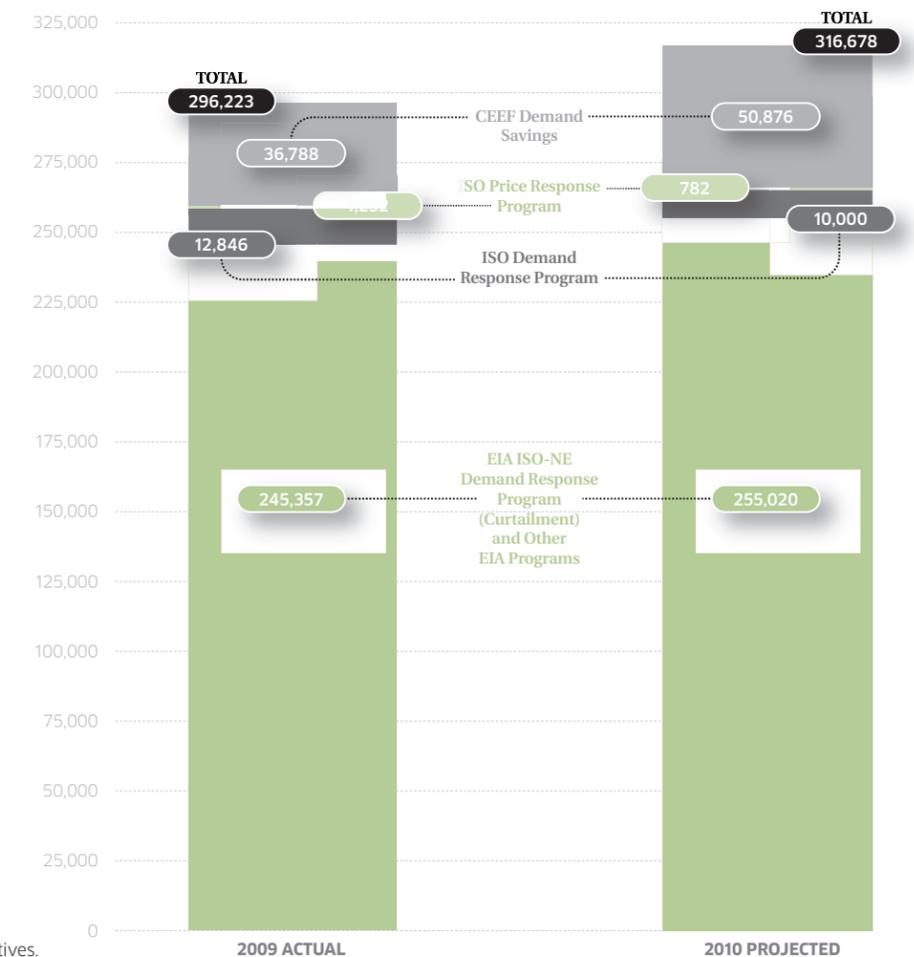
Electrical Grid System and Peak Demand

New England's electrical grid operator, ISO New England (ISO-NE), designed the system to meet peak demand for electricity—hot summer weekdays when air conditioners are operating at full force. During peak demand, ISO-NE historically depends on less-efficient, fossil fuel power plants to provide additional electricity needed to meet demand goals. These plants emit higher amounts of carbon dioxide, nitrous and sulfur oxides and severely affect Connecticut's ability to meet attainment goals for nitrogen oxides.

CEEF's energy-efficiency and load management programs reduce peak demand. These programs result in a broad range of benefits to Connecticut's residents and businesses including a reduction of Federally Mandated Congestion Charges (FMCCs) on electric bills, decrease in power plant and capital cost improvements, and improvement of transmission system reliability. Peak demand reductions also have environmental benefits. During peak hours, electricity is often generated by supplemental power plants. When energy-efficiency and demand reduction controls are utilized, the necessity for electricity from these less efficient fossil fuel plants can be decreased.

Chart A illustrates that 2009 CEEF programs are responsible for more than 296,223 kW of peak demand savings for Connecticut in 2009. The majority of these kW savings are achieved through ISO-NE's Demand Response program (see bottom segment). The peak demand savings that result from CEEF program efforts are represented in the top segment.

CHART A: Peak Demand Savings Available from the CEEF, CMEEC and EIA Programs (in kW)



Note: 2009 Actuals include 245 MWs from EIA initiatives.

Small Businesses: Connecticut's Business Backbone

Small Business Energy Advantage—with Zero Percent Financing



Three generations currently work in this family business. Efficient use of energy will help keep the business competitive for the next generation.

Small businesses are an essential and integral part of Connecticut's communities and towns, and the state's economy depends on them to provide vital products and services. Today, Connecticut's small businesses face an array of obstacles: competitive global marketplace, rough economic climate, rising energy prices, dwindling demand for products and services, and a national credit crisis that has resulted in the stagnation of the business and personal loan industry. Recent statistics from the Secretary of the State's Office indicate that in 2009 there was a 6.2 percent decrease in new business starts-ups but an 0.3 percent decrease in business dissolutions in Connecticut (more than 13,414 businesses), when compared to 2008.⁸

Services

The Small Business Energy Advantage (SBEA) program is designed to help small commercial and industrial businesses reduce their energy consumption, improve their efficiency, and provide technical and financial support through incentives and zero-percent interest loans. The program started years ago as a simple lighting retrofit program, matching pre-qualified lighting retrofit vendors with customers who typically did not have a pre-existing relationship with an electrical contractor, and then expanded to include cash incentives for those retrofit projects. Today the program's authorized contractors perform energy-

efficient upgrades for lighting, heating, ventilation and air conditioning systems, air compressors and refrigeration systems. They utilize energy-saving technologies including CFLs, variable frequency drives, premium efficiency motors, solid-state LEDs, and low-maintenance induction lighting technology.

SBEA is a turnkey program that provides small business energy customers with the expertise and means to analyze and reduce their energy usage. Program contractors assess the facility to determine potential energy-saving actions, prepare a proposal detailing possible measures, estimate the energy savings, and calculate the complete cost to achieve those actions. The contractor assessments are then reviewed by CEEF utility energy-efficiency experts who use their training and expertise to ensure reasonable energy savings before any work begins. SBEA contractors work with business owners to minimize the imposition on business hours and the project is completed with that in mind. The energy-efficient improvements translate into monthly electric bill savings that result in a quick payback and low out-of-pocket investment for small businesses. The no-interest loan payments for qualified customers appear right on the electric bill. In most cases, the monthly loan payment is less than or equal to the dollars saved by the efficiency measures.

⁸ Press Release: Bysiewicz: Slightly Lower Number of Connecticut Businesses Shut Down in 2009. Hartford, CT. January 21, 2010. http://www.sots.ct.gov/sots/lib/sots/releases/2008/1.21.10_bysiewicz_reports_slightly_lower_number_of_businesses_shut_down_in_2009.pdf

Harvesting Energy Savings on the Shoreline

Since 1871, six generations of the Bishop family have been serving the shoreline with fresh farm products. While Bishop's Orchards Farm Market in Guilford is a venerable shoreline institution, there is nothing old about their attitude regarding energy use and reducing their carbon footprint. Bishop's Orchards Farm Market has reduced their electricity consumption by more than 117,000 kWh a year due to energy-efficiency improvements installed through the SBEA program in 2009. Over the lifetime of the installed measures, they will save approximately 1.3 million kWh, resulting in 792 tons of carbon dioxide emissions avoided. The improvements include a complete interior lighting upgrade using energy-efficient fluorescent lamps, exterior high-intensity discharge (HID) metal halide lighting, lighting controls, solid state LED lighting in the freezers and exit signs, night covers for the open coolers and efficient motors for various refrigerated units.

CEO Keith Bishop had high praise for the CEEF. "The opportunity to partner with the Connecticut Energy Efficiency Fund has given us the tools to reduce our energy use, save resources and keep our costs stable," notes Bishop. "We would not have been able to do this large project without the financial incentives and payback terms provided by the SBEA program."

Health Center Gets an Energy-Efficiency Check-Up

The Orange Health Care Center, a 60-bed facility, was in need of help when the SBEA program came to visit. A SBEA contractor performed an energy physical on the facility and the lab results were clear—the center desperately needed to reduce its energy consumption and improve the working environment.

Almost every section of the facility was addressed through the retrofitting of old fluorescent lights with high-performance T8 light and ballast systems, replacement of incandescent lamps with CFLs, installation of occupancy sensors to reduce light usage in vacant areas, and the replacement of incandescent exit signs with LED units. When the project was completed, the Orange Health Care Center was given a "clean bill of health" and an expected annual energy savings of 71,414 kWh.



The residents of Orange Health Care Center enjoying the benefits of improved lighting.

2009 Small Business Energy Advantage Program

	Customers Served	1,344
	Energy Savings	kWh Annual: 31,164,251 kWh Lifetime: 363,297,382
	CO₂ Emissions Reduced	16,896 Tons (Annual)
	Annual Savings	\$ 5,021,303

New Construction & Equipment

Energy Conscious Blueprint



“The Connecticut Science Center has made a commitment to environmental stewardship, clean energy and minimizing our carbon footprint.”

Matt Fleury, President and CEO,
Connecticut Science Center

Commercial buildings, manufacturing plants and industrial factories consume large amounts of energy to produce the goods and services consumers demand. Incorporation of energy-saving technologies prior to design or purchase of equipment is just a fraction of the cost compared to a subsequent retrofit or replacement of inefficient equipment.

The CEEF’s Energy Conscious Blueprint program serves both electric and firm gas customers and provides technical assistance and financial incentives to Connecticut businesses and municipalities purchasing new equipment, making major renovations, or constructing new buildings. The CEEF and its utility energy-efficiency experts brainstorm with customers and design teams to identify energy-saving strategies and equipment.

Typically, the cost of energy-efficient equipment is higher than standard units. As a result, the CEEF offers incentives to cover a portion of the incremental cost (the cost difference between standard and efficient equipment) to entice customers to make wise energy choices the first time.

The Energy Conscious Blueprint program promotes both electric and gas efficiency measures including efficient lighting, occupancy sensors, high-efficiency natural gas furnaces and boilers, chillers, cool roofs, high-speed cooler/freezer doors and commercial kitchen cooking equipment. Additionally, it offers prescriptive rebates for high-efficiency commercial HVAC systems (Connecticut Cool Choice) and premium-efficiency motors (Connecticut MotorUp).

A Scientific Model for Efficiency

Along the I-91 corridor, a new towering center to science looms across traffic in downtown Hartford. The Connecticut Science Center, opened in June 2009, was designed by renowned Connecticut architect, Cesar Pelli. The Center’s staff and design team, CEEF and utilities were committed to making the building a cutting-edge facility that employed clean and energy-efficient technologies in its operations.

CEEF utility energy-efficiency experts worked closely with the Center’s architectural and design team to identify energy-efficient equipment and strategies to ensure the Center demonstrated the same principles and technologies that the Energy City Gallery teaches. Energy-efficient measures installed include premium-efficiency motors, demand-controlled ventilation, daylight dimming, occupancy sensors and high-performance exhibit lighting. A 200 kW fuel cell provides a source of clean, renewable energy to power the Center’s daily operations.

With assistance from the CEEF and utilities, the Center has applied to receive a Gold LEED-certified rating by the U.S. Green Building Council. LEED awards are given to building projects that show a high level of commitment to sustainability through design and operation. More than 95 percent of the steel used to build the Center was manufactured from recycled cars and 75 percent of the construction and demolition waste was recycled. Low-flow sinks and lavatories located throughout the building help reduce the Center’s water usage. Native New England plantings should help decrease water consumption by 50 percent over conventional means.

The new construction energy-efficiency measures are expected to help the Connecticut Science Center realize annual electric savings of 639,497 kWh, lifetime electric savings of 11,741,573 kWh and reduce summer peak demand by 199.24 kW.

Check-Out the Energy Savings at Big Y

In 2009, Big Y supermarkets in North Branford, North Haven and Stratford were the sites of a year-long energy-savings project. Through participation in both the CEEF retrofit and new construction programs, Big Y has made a difference that can be seen on their bottom line and in the environment.

The North Haven store was the site of a retrofit project through the Energy Opportunities program and the new stores in North Branford and Stratford participated in the Energy Conscious Blueprint program. Energy-efficient measures in the stores included high-performance T8 fluorescent lighting, LED refrigerator lighting, refrigeration controls, evaporator fan controls, condensers, high-efficiency motors, variable frequency drive controls on motors, air conditioning systems, and the installation of open cooler case night covers in the dairy and fresh foods areas.

At the North Haven location, the retrofit measures resulted in annual energy savings of 356,544 kWh while the new construction measures resulted in 795,795 kWh annual energy savings in Stratford and 787,353 kWh annual energy savings in North Branford.



Big Y employs energy-efficiency to manage bottom line.

2009 Energy Conscious Blueprint

	Business Served	
		728
	Energy Savings	
	kWh Annual	kWh Lifetime
	39,541,980	650,957,217
	CCF Annual	CCF Lifetime
	333,427	5,130,490
	CO₂ Emissions Reduced	
		23,448 Tons (Annual)
	Annual Savings	
		\$ 6,633,377

Existing Buildings: Opportunities for Energy Efficiency

Energy Opportunities



“Our tenants are very pleased with the improvements in the lighting upgrades.”

Brian Steinwurtzel

A joint electric and gas efficiency CEEF program, Energy Opportunities (EO), was created to help business owners and facility managers retrofit existing commercial, industrial or municipal facilities to reduce and manage energy consumption. The decision to retrofit can be based on many factors including productivity benefits, reduced operating costs, ease-of-use, compatibility with other systems and aesthetics/comfort.

Retrofitting involves installation of new or modified parts or equipment in a building. CEEF’s EO program works with customers to identify energy-saving projects. Customers retain complete control of the project allowing owners and facility managers to make decisions based on their business needs and funding.

Energy-saving opportunities typically include energy-efficient lighting and controls, HVAC systems and controls, refrigeration, water heating, and process-related equipment. The CEEF offers technical assistance, as well as financial incentives that help offset incremental cost differences between purchasing standard and efficient equipment. In 2009, enhanced incentives were introduced to promote energy efficiency through solid-state LED and induction lighting technologies and for comprehensive projects that result in multiple energy end uses. These new comprehensive incentives coupled with the resulting energy savings make it easier for businesses and municipalities to make smart, energy-efficient choices.

Energy Efficiency: Standard Operating Procedure for Property Management Firm

The professional and medical office building located at 1 Long Wharf Drive, New Haven is owned by the worldwide property management corporation, Newmark Knight Frank (NKF). NKF knows the value of providing their tenants with office solutions that provide operational savings as well as a comfortable work environment. NKF began its lighting upgrade project with the EO program by evaluating the facility’s lighting and HVAC systems.

By the time the project was completed, NKF had retrofitted 1,123-T12 fixtures with reduced watt and high-performance T8 lamp and ballast systems, 119-T12 fixtures with “standard” two-foot lamp and ballast systems, and replaced numerous incandescent lamps with CFLs to improve area lighting, in addition to retrofitting 17 incandescent and CFL exit signs with new LED exit-sign kits.

Due to these energy-efficient measures, NKF expects an estimated annual energy savings of 439,520 kWh and lifetime energy savings of 5,713,760 kWh. NKF maintains a policy of implementing energy efficiency and LEED certified measures into their properties as a standard operating procedure. In the near future, this facility will be updating the HVAC system, evaluating the 170 heat pump systems, and networking them with an energy management system (EMS) control system for further control.

Energy Management System Saves Electricity and Natural Gas

Mediterranean Realty, in Meriden, initially came to the EO program with a proposal to upgrade their existing stand-alone control system to a high-efficiency integrated web-based EMS. The new system was being installed to address issues of simultaneous heating and cooling in the building and included a variety of other control strategies including night setback, optimum start/stop, dual enthalpy economizers and outdoor air reset. “The process of working with the program was simple,” stated the Property Manager, Corey Kosienksi. “Both the contractors and utility engineers have made themselves very available to every question and concern that we had.”

As the EMS was being installed, an additional efficiency opportunity was identified. Engineers determined that there was no coordination between the air handling and hot water systems control, and the EMS did not have the ability to regulate temperatures when the building was vacant. The scope of the energy-efficiency project was then expanded to include the installation of new perimeter radiation control valves and integrating their operation into the EMS. The implementation of this measure resulted in additional gas and electric savings, and increased the comfort level for the building’s occupants.

When Mr. Kosienksi was asked about his rationale for these installations, he affirmed, “My main motivation was to reduce cost and waste. The environmental concerns are a plus. I have three young children and I have asthma. We all have to do our part. The incentive dollars made it all possible.”

Mediterranean Realty received a total incentive of \$39,360 of which \$25,057 was for electric measures and \$14,310 for natural gas measures. Electric savings are expected to be 42,601 kWh annually and 426,007 kWh lifetime. The natural gas savings is estimated at 5,070 ccf annually and 50,699 ccf lifetime.

Lighting Express

Businesses and municipalities focused solely on replacing lighting fixtures can utilize the CEEF’s Lighting Express Rebate program. This fixed rebate allows facility managers and business owners to be paid expeditiously for the incremental cost of installing high-efficiency lighting fixtures as compared to standard, inefficient lighting.



“The process of working with the program was simple.”

Corey Kosienksi

2009 Energy Opportunities

	Business Served 1,021
	Energy Savings
	kWh Annual 78,086,994 kWh Lifetime 965,325,610
	CCF Annual 742,721 CCF Lifetime 10,677,234
	CO₂ Emissions Reduced 46,814 Tons (Annual)
	Annual Savings \$ 13,165,784

Existing Buildings: Opportunities for Energy Efficiency

Operations & Maintenance Services

Inadequate maintenance can lead to drastic energy losses and high energy costs. The CEEF's Operations & Maintenance Services (O&M) program helps customers improve the electrical and thermal efficiency of their operations by making changes and repairs, rather than making costly capital investments. CEEF utility energy-efficiency experts work with customers to identify both electric and gas efficiency O&M improvements. Once these measures are installed, the improvements may qualify for financial incentives to offset a portion of the project cost.

O&M improvements are custom designed for a building's site as each facility is unique. Common O&M measures include economizer repairs/conversions, rewiring of lighting circuits, repairs/replacements of steam traps, and rewiring of lighting circuits for more efficient switching. In addition to identifying efficiency measures, CEEF utility energy-efficiency experts provide outreach and training to the customers' in-house personnel so energy-efficient improvements can be maintained over time.

Business Sustainability Challenge

The Business Sustainability Challenge pilot program (BSC) has been developed to assist Connecticut businesses make strategic energy and carbon management integral parts of their business practices, corporate culture and business sustainability strategy. The objective of the program is to help commercial and industrial businesses realize sustained benefits through training, continuous operational improvement, strategy development and systemic behavioral change. With funding and support, from CEEF, CL&P and UI are partnering with customers to provide the guidance and tools necessary to help them understand their energy profile and carbon footprint, and assist them in developing and implementing a sustainability strategy for their business.

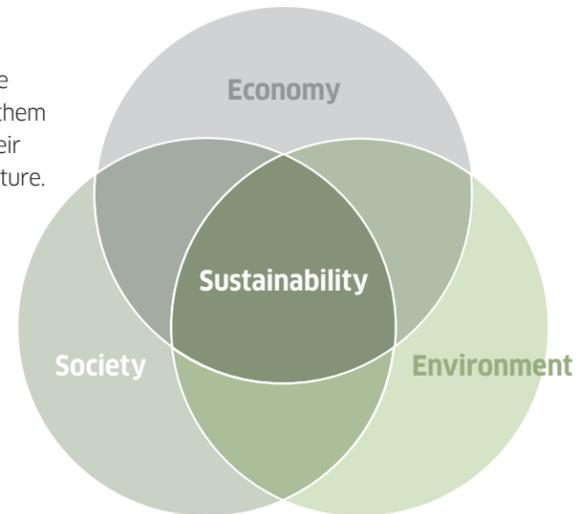
The BSC strategy will incorporate other CEEF programs, as well as external programs and tools, to help participating businesses reduce energy consumption and, consequently, carbon dioxide and other greenhouse gas emissions. When considered comprehensively, these initiatives will result in the development of a continuous energy and carbon management program and a business sustainability strategy that will help these businesses reduce energy costs and environmental impacts, and increase productivity and competitiveness. These benefits, in turn, will drive the social, environmental and financial performance of their business, leading to greater value for their company and its stakeholders.

Three UI customers began participating in the BSC pilot program in 2009: Eastern Bag & Paper, Bigelow Tea, and Radiall. The CEEF and UI have partnered with these business customers to coordinate diagnostic assessments of their facility operations and equipment, and management practices related to energy consumption, along with calculating their carbon footprints using the Climate Registry's General Reporting Protocol. Together, these assessments provide a baseline of the customers' energy use and carbon emissions from which to measure future reductions.

In collaboration with customers, BSC program administrators are providing guidance for the development of a comprehensive energy management and sustainability plan for each participating company that states measurable reduction goals and an on-going list of initiatives tailored to their unique needs. Several initiatives stemming from the diagnostic assessments and consultative meetings

were undertaken in 2009. These initiatives, supported by existing CEEF programs, include lighting retrofits, occupancy sensor projects, computer controls and computer replacement projects, various operations and maintenance measures, and PRIME lean manufacturing events.

In 2009, these businesses have collectively realized electricity savings of 214,559 kWh and carbon emissions reductions of 116 tons from projects undertaken during their participation in the BSC. The BSC represents CEEF's effort to help organizations manage energy resources in a strategic and holistic manner. The hope is that through participation in the BSC, Connecticut businesses will have the guidance and tools that will enable them to incorporate sustainability into their business strategy and corporate culture.



Sustainability in a business context is the result of maximizing economic, social and environmental benefits. It can be defined as increasing productivity while minimizing resource consumption and waste without compromising services, product quality, competitiveness or profitability.

2009 Operations & Maintenance

	Businesses Served	32
	Energy Savings	
	kWh Annual	3,614,613
	kWh Lifetime	32,279,903
	CCF Annual	6,683
	CCF Lifetime	66,830
	CO₂ Emissions Reduced	2,000 Tons (Annual)
	Annual Savings	\$ 587,656



7 Legislation & Mandates

Connecticut's History of Energy Legislation



Connecticut has been a leader in implementing high-quality energy-efficiency programs and services since 1988. In recent years, Connecticut policymakers have enacted a series of legislation and policies to benefit utility ratepayers, continuing the state's legacy of leadership in energy efficiency.

In 2004, the Federal Energy Regulatory Commission asked ISO-NE to develop market-based incentives for meeting the New England region's future capacity needs. ISO-NE proposed the Locational Installed Capacity (LICAP) market in which capacity payments were calculated using an established price curve based on supply. Because of concerns that LICAP would result in a competitive imbalance among regional generators, the program was twice delayed and ultimately replaced through a settlement process. This resulted in ISO-NE's creation of an alternate capacity market in June 2006, known as the Forward Capacity Market (FCM).

In 2005, the Connecticut Legislature passed PA 05-1, the *Energy Independence Act* (EIA) to help address the rising cost of energy. The EIA directed the DPUC to implement a variety of energy-efficiency and load management initiatives aimed at reducing FMCCs. The EIA provided for customer incentives to install or implement energy-efficiency, demand reduction, and distributed generation measures.

In 2007, the Connecticut Legislature passed PA 07-242, *An Act Concerning Electricity and Energy Efficiency*. This legislation reaffirmed Connecticut's long-term commitment to energy-efficiency as a cornerstone of the state's energy, economic development and environmental policies. During 2008 and 2009, the ECMB and the electric utilities concentrated their efforts on two sections of this legislation: the Integrated Resource Plan (§ 51) and the Electric Efficiency Partners (§ 94).

The electric companies began an integrated resource planning process in 2007. On January 4, 2010, an Integrated Resource Plan for Connecticut (IRP) was submitted to the Connecticut Energy Advisory Board (CEAB) by CL&P and UI. The 2010 IRP analyzed an all cost-effective energy-efficiency strategy and a targeted expansion of demand side management programs in Connecticut. Expanding energy-efficiency programs beyond those currently planned is predicted to lead to significant reductions in emissions and energy costs.

To carry out the legislative mandates, the ECMB has relied heavily on its expert consultants, and increased the efforts of individual board members by adding committees that focus exclusively on residential and commercial/industrial programs.

Legislative Mandates

Status of ECMB Responses to the Energy-Efficiency and Load Management Mandates Enacted by Public Act 07-242

Mandate Section 1 requires the ECMB to provide a report by January 1, 2009 regarding the cost-effectiveness of rebates for ENERGY STAR-rated boilers and furnaces.

Status

The ECMB and its consultants continue to work with the utility companies and the Office of Policy & Management to evaluate the rebate program's effectiveness.

Mandate Section 51 requires the electric companies to develop a resource procurement plan covering 3, 5, and 10-year time frames, which must satisfy resource needs first through "all available energy efficiency and demand reduction resources that are cost effective, reliable, and feasible." The goal of the procurement plan is to meet projected requirements while minimizing costs to customers over time and maximizes consumer benefits consistent with the states environmental goals and standards.

Status

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was submitted to the Connecticut Energy Advisory Board (CEAB) by CL&P and UI. The 2010 IRP analyzed an all cost-effective energy-efficiency strategy and a targeted expansion of demand side management programs in Connecticut. Expanding energy-efficiency programs beyond those currently planned is predicted to lead to significant reductions in emissions and energy costs.

Mandate Section 84

requires the ECMB contract with an independent third party to assess Connecticut's conservation and energy efficiency potential, including conservation, demand response and load management, and report to the General Assembly by February 1, 2008.

Status

A draft report has been prepared and a presentation to the General Assembly is being developed.



Protecting the Environment

Energy Efficiency Reduces Pollution



Reducing air pollution and improving air quality in the Northeast is a primary focus of the CEEF. The generation of electricity from non-renewable fossil fuels (e.g., coal, natural gas) is the single largest source of carbon dioxide emissions in the U.S. The more efficient Connecticut's businesses, homes and schools are, the less energy they consume. Reducing plant operation

time significantly lowers the emissions of carbon dioxide, nitrous and sulfur oxides.

Electricity generation produces two of the six "criteria pollutants" defined by the national Clean Air Act⁹ and the EPA as air quality pollutants—nitrogen and sulfur oxides. Both oxides in particulate form are associated with public health problems such as asthma and are linked to acid rain and acid deposits in Connecticut's lakes and rivers. Nitrogen oxides are also a primary component of summer smog. Failure to comply with federal attainment standards for nitrogen oxide emissions in Connecticut could result in large fiscal penalties for the state.

Connecticut's General Assembly, the New England Governors and the Eastern Canadian Premiers have established forward-looking goals to reduce greenhouse gas emissions in the region. On June 2, 2008, Governor

M. Jodi Rell signed "An Act Concerning Global Warming Solutions,"¹⁰ into law. The law establishes a statewide greenhouse gas emissions reduction target of 10 percent below 1990 levels by 2020. The law also established a timetable for achieving the 2020 reductions: 1) a statewide greenhouse gas inventory (published December 2009), 2) modeling scenario results by July 2010, and 3) recommended reduction strategies by July 2011.

CEEF programs play an integral part in helping reduce greenhouse gas and air pollutant emissions in Connecticut and the New England region. In 2009, CEEF program activities resulted in the following environmental benefits. (See Table B).

Table B: Reflecting Reduction in Criteria Pollutants and Carbon Dioxide
(in Tons)

	Annual Savings 2009			Lifetime Savings 2009		
	Electric	Natural Gas	Oil	Electric	Natural Gas	Oil
SO _x	73	–	–	811	–	–
NO _x	36	–	–	398	–	–
CO ₂	128,304	13,908	12,017	1,428,062	231,338	231,052

⁹ CAA § 101-131; USC § 7401-7431.

¹⁰ PA 08-98, An Act Concerning Connecticut Global Warming Solutions.

Demonstrating Economic Results

A primary goal of CEEF programs is to promote energy savings for all Connecticut customers. In 2009, these programs generated \$443.13 million in lifetime energy savings for electric customers, \$43.6 million in lifetime energy savings for natural gas customers and \$46.15 million for oil customers, for a combined total lifetime savings of \$533 million. For every \$1 spent on electric efficiency, Connecticut receives electric system benefits of more than \$4. For every \$1 spent on gas efficiency, more than \$4 in gas system benefits is realized. The CEEF programs benefited all customer sectors. Table C details the energy savings (in dollars) by sector.

Economic Development and Efficiency

The CEEF's programs are designed to support economic development for both Connecticut's large and small businesses. With rising energy and overhead costs, Connecticut's businesses turned to the array of CEEF

programs to help reduce their energy consumption and lower their energy bills and operating costs.

In 2009, CEEF programs assisted Connecticut's businesses by installing energy-saving measures to improve productivity, product quality, comfort, safety and to reduce pollution.

2009 CEEF Programs

- ▶ Assisted approximately 1,344 Connecticut small businesses save energy and money
- ▶ Helped approximately 1,819 Connecticut commercial, industrial and municipal customers save energy and money
- ▶ Reduced operating costs and improved productivity in Connecticut's commercial and manufacturing industries

Job Growth

A 2009 independent study¹¹ commissioned by the CEEF, CCEF, DECD, CL&P and UI analyzed the size of Connecticut's green jobs marketplace and its earning power. The study showed that 2,675 jobs are directly attributed to energy efficiency. These jobs create \$137 million of employment income, at an average of \$50,000 per year across all industry segments (residential, small business, commercial and industrial). The study also calculated the number of indirect jobs resulting from purchases made by companies in the energy efficiency industry and the subsequent job impact from increased household and business spending. Another 4,280 indirect and induced jobs can be attributed to energy efficiency activity in Connecticut.

Table C: Summary of Energy Savings by Customer Sector
(in millions of dollars)

Customer Sector	Annual Savings 2009			Lifetime Savings 2009		
	Electric	Natural Gas	Oil	Electric	Natural Gas	Oil
Limited-Income	2.92	1.10	1.30	26.12	18.90	23.65
Residential (Non Limited-Income)	13.19	0.60	1.10	92.85	12.22	22.50
Commercial & Industrial	24.56	0.85	0.00	324.16	12.48	0.00
Totals	40.67	2.55	2.40	443.13	43.60	46.15

¹¹ Navigant Consulting, CT Renewable Energy/Energy Efficiency Economy Baseline Study, Phase I Deliverable, March 27, 2009.

Assistance to Customers in Connecticut Towns*

This list includes energy efficiency and conservation benefits provided to residential, commercial and industrial customers of the electric and gas utilities and CMEEC; which exceeds \$65 million in incentive benefits.

Andover	\$ 8,864	East Lyme	\$ 413,844	Morris	\$ 23,048	South Windsor	\$ 651,969
Ansonia	\$ 267,187	East Windsor	\$ 122,686	Naugatuck	\$ 676,037	Southbury	\$ 305,446
Ashford	\$ 35,599	Eastford	\$ 16,841	New Britain	\$ 698,860	Southington	\$ 748,896
Avon	\$ 252,273	Easton	\$ 109,002	New Canaan	\$ 123,421	Sprague	\$ 2,143,826
Barkhamsted	\$ 13,794	Ellington	\$ 117,327	New Fairfield	\$ 80,461	Stafford	\$ 235,179
Beacon Falls	\$ 20,037	Enfield	\$ 796,072	New Hartford	\$ 62,741	Stamford	\$ 3,113,901
Berlin	\$ 319,378	Essex	\$ 43,609	New Haven	\$ 2,953,367	Sterling	\$ 8,273
Bethany	\$ 69,176	Fairfield	\$ 1,048,882	New London	\$ 195,069	Stonington	\$ 463,680
Bethel	\$ 242,165	Farmington	\$ 895,184	New Milford	\$ 259,019	Stratford	\$ 1,661,909
Bethlehem	\$ 11,368	Franklin	\$ 21,221	Newington	\$ 399,808	Suffield	\$ 167,555
Bloomfield	\$ 527,968	Glastonbury	\$ 455,567	Newtown	\$ 181,291	Thomaston	\$ 95,048
Bolton	\$ 30,174	Goshen	\$ 15,789	Norfolk	\$ 7,602	Thompson	\$ 45,461
Bozrah	\$ 42,003	Granby	\$ 85,455	North Branford	\$ 131,344	Tolland	\$ 62,447
Branford	\$ 256,706	Greenwich	\$ 533,552	North Canaan	\$ 957,880	Torrington	\$ 516,141
Bridgeport	\$ 3,354,248	Griswold	\$ 66,324	North Haven	\$ 661,869	Trumbull	\$ 556,977
Bridgewater	\$ 8,333	Groton	\$ 942,186	North Stonington	\$ 15,625	Union	\$ 1,526
Bristol	\$ 667,743	Guilford	\$ 421,181	Norwalk	\$ 1,171,604	Vernon	\$ 312,009
Brookfield	\$ 504,206	Haddam	\$ 38,685	Norwich	\$ 561,247	Voluntown	\$ 10,333
Brooklyn	\$ 49,505	Hamden	\$ 2,073,422	Old Lyme	\$ 94,119	Wallingford	\$ 1,128,678
Burlington	\$ 46,969	Hampton	\$ 7,348	Old Saybrook	\$ 113,384	Warren	\$ 1,788
Canaan	\$ 10,001	Hartford	\$ 4,545,001	Orange	\$ 552,761	Washington	\$ 39,369
Canterbury	\$ 21,852	Hartland	\$ 7,184	Oxford	\$ 50,946	Waterbury	\$ 1,697,906
Canton	\$ 202,231	Harwinton	\$ 18,446	Plainfield	\$ 112,710	Waterford	\$ 207,349
Chaplin	\$ 18,131	Hebron	\$ 59,152	Plainville	\$ 276,209	Watertown	\$ 234,083
Cheshire	\$ 317,578	Kent	\$ 34,414	Plymouth	\$ 118,199	West Hartford	\$ 1,565,484
Chester	\$ 13,451	Killingly	\$ 379,347	Pomfret	\$ 18,441	West Haven	\$ 950,184
Clinton	\$ 137,277	Killingworth	\$ 26,443	Portland	\$ 96,958	Westbrook	\$ 58,763
Colchester	\$ 136,511	Lebanon	\$ 17,775	Preston	\$ 41,967	Weston	\$ 105,766
Colebrook	\$ 13,828	Ledyard	\$ 26,461	Prospect	\$ 37,069	Westport	\$ 214,961
Columbia	\$ 31,120	Lisbon	\$ 40,096	Putnam	\$ 78,279	Wethersfield	\$ 300,149
Cornwall	\$ 134,318	Litchfield	\$ 68,173	Redding	\$ 43,671	Willington	\$ 38,371
Coventry	\$ 105,253	Lyme	\$ 11,158	Ridgefield	\$ 326,355	Wilton	\$ 181,567
Cromwell	\$ 249,006	Madison	\$ 142,520	Rocky Hill	\$ 360,164	Winchester	\$ 151,911
Danbury	\$ 1,535,140	Manchester	\$ 951,913	Roxbury	\$ 12,831	Windham	\$ 1,134,638
Darien	\$ 470,447	Mansfield	\$ 358,363	Salem	\$ 26,189	Windsor	\$ 606,689
Deep River	\$ 85,225	Marlborough	\$ 45,198	Salisbury	\$ 69,877	Windsor Locks	\$ 142,346
Derby	\$ 553,110	Meriden	\$ 827,308	Scotland	\$ 3,415	Wolcott	\$ 131,307
Durham	\$ 43,819	Middlebury	\$ 93,329	Seymour	\$ 120,344	Woodbridge	\$ 162,832
East Granby	\$ 71,569	Middlefield	\$ 101,116	Sharon	\$ 21,839	Woodbury	\$ 99,714
East Haddam	\$ 79,282	Middletown	\$ 643,762	Shelton	\$ 613,863	Woodstock	\$ 27,509
East Hampton	\$ 92,501	Milford	\$ 2,236,908	Sherman	\$ 35,554		
East Hartford	\$ 902,748	Monroe	\$ 266,184	Simsbury	\$ 409,307		
East Haven	\$ 530,866	Montville	\$ 290,985	Somers	\$ 73,459		

* Based on 2009 data. All figures are approximate and may vary due to rounding. This does not include incentives for ISO-NE Load Response program participants.

8 Funding Comes From Several Sources

Ratepayer Funding

CEEF's electric efficiency and conservation programs are funded by a 3-mill charge on customer electric bills. Natural gas programs are funded through rates and annual gross receipts tax revenues, if available.

Forward Capacity Market

In 2006, the Forward Capacity Market (FCM) was initiated by ISO-NE. Under the FCM plan, ISO-NE must create three-year forecasts of anticipated regional electrical capacity needs, defined exclusively as peak demand.

ISO-NE's FCM secures peak-demand resources (capacity) through an auction process. Various entities bid in capacity resources, such as new energy generation. For the first time in the U.S., the FCM treats energy-efficiency, load management and demand response reductions as a capacity resource. This allows CEEF administrators to bid energy-efficiency and demand response reductions into the FCM. As a result, the FCM has become another potential funding source for CEEF programs. CL&P and UI successfully bid in the first, second and third capacity auctions. 2009 payments received from ISO-NE for this activity have contributed more than \$10.2 million in revenues to CEEF for additional programming.

The FCM requires entities to bid capacity resources three years prior to the year in which they are delivered. This allows adequate time for new generation to come online. The FCM requires all capacity resources be qualified and bid with all the requisite financial assurances and performance requirements. This requires the CEEF, CL&P and UI to make financial assurance to ISO-NE regarding their ability to provide the demand reduction three years in the future, or lose all or part of their financial assurance. This existing financial commitment makes it imperative that funding for CEEF in future years remains stable or increases.

Regional Greenhouse Gas Initiative

The Regional Greenhouse Gas Initiative (RGGI) is the first mandatory, market-based effort in the U.S. to reduce greenhouse gas emissions. By 2018, 10 Northeastern and Mid-Atlantic states have committed to capping and reducing carbon dioxide emissions from the power sector by 10 percent. Participating RGGI states include Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island and Vermont. In an effort to offset carbon emissions, participating RGGI states sell emission allowances through a series of auctions to energy generators and providers. In Connecticut, RGGI auction proceeds have been earmarked for CEEF, Connecticut Clean Energy Fund, and other clean energy programs and technologies.

In 2009, four RGGI auctions were successful held on March 18, June 17, September 9 and December 2, and generated more than \$18.5 million in 2009 and 2012 vintage proceeds for CEEF programs. In 2009, the CEEF received approximately 17.3 million from 2008 and 2009 RGGI auctions.

Class III Renewable Credits

The EIA created a new distributed Resources Portfolio Standard: Class III Renewables. CL&P and UI are allowed to receive Class III Renewable Energy Credits (RECs) for commercial and industrial megawatt-hour savings from CEEF-funded projects. These RECs are sold by electricity providers to energy suppliers or marketers interested in meeting their renewable portfolio standards. The sales from the RECs are reinvested in more CEEF programming.

Leveraging of ARRA

In early 2009, President Barack Obama and the U.S. Congress passed the ARRA which, among other things, provides federal stimulus dollars to states who initiate energy-efficiency programs to benefit residential customers. Through the State Energy Program, the DOE will make funding available to the Connecticut Office of Policy and Management (OPM) to support existing CEEF programs. The electric and natural gas utilities are currently working with OPM to secure said funding which was used for the

HES program (Residential) and the EO and SBEA programs (Commercial and Industrial) commencing in 2009 and is budgeted as a revenue source in 2010. For HES, ARRA funds will allow oil and propane-heated homes to participate in the program for the same \$75 co-pay and receive the same level of core services that electric and natural gas utilities' customers receive. For the EO and SBEA programs, the ARRA monies will increase the programs' levels of funding and will target electric, natural gas, oil and propane energy-efficiency measures resulting in a truly fuel-blind program.

Efficiency Program Funding

 Ratepayer Funded (Electric)	\$ 90.8 Million
Ratepayer Funded (Gas)	\$ 9.4 Million
Forward Capacity Market	\$ 10.2 Million
RGGI	\$ 17.3 Million
Class III Renewables	\$ 13.9 Million
ARRA/Oil	\$ 1.7 Million
Total Dollars	\$ 143.3 Million



2009-2010 Budget Summaries

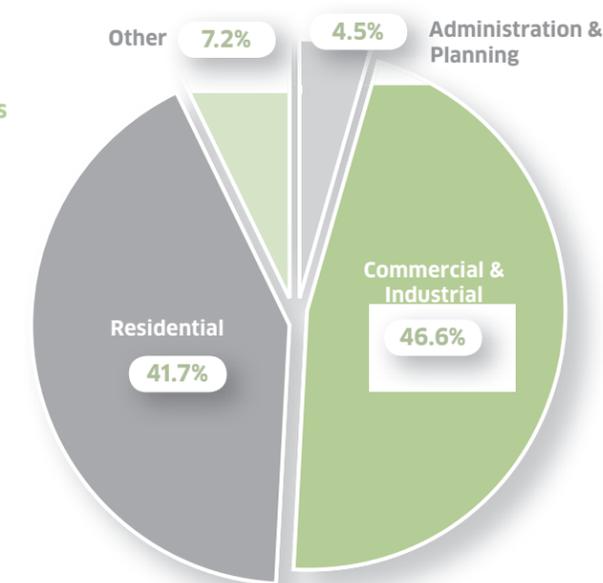
	2009 Actuals Electric	2010 Plan Electric	2009 Actuals Natural Gas	2010 Plan Natural Gas
Conservation & Load Management Programs				
RESIDENTIAL				
Residential Retail Products	\$ 4,567,700	\$ 8,811,894	\$ -	\$ -
Total – Consumer Products	\$ 4,567,700	\$ 8,811,894	\$ -	\$ -
Residential New Construction	692,343	2,356,148	681,375	750,000
Home Energy Solutions	11,290,040	20,262,988	1,575,634	2,400,000
Limited Income	11,206,415	13,194,132	2,967,260	2,325,436
Water Heating	-	-	287,210	363,000
Subtotal Residential	\$ 27,756,498	\$ 44,625,162	\$ 5,511,479	\$ 5,838,436
COMMERCIAL & INDUSTRIAL				
C&I LOST OPPORTUNITY				
Energy Conscious Blueprint	\$ 11,093,483	\$ 16,261,071	\$ 1,982,669	\$ 3,018,311
Total – Lost Opportunity	\$ 11,093,483	\$ 16,261,071	\$ 1,982,669	\$ 3,018,311
C&I LARGE RETROFIT				
Energy Opportunities	15,020,713	26,629,343	1,371,052	1,835,000
O&M (Service, RetroCx & BSC)	1,233,144	2,545,764	28,851	200,000
Prime	394,290	534,319	-	-
Total – C&I Large Retrofit	\$ 16,648,147	\$ 29,709,426	\$ 1,399,903	\$ 2,035,000
Small Business	7,049,153	13,168,456	-	-
Subtotal C&I	\$ 34,790,783	\$ 59,138,953	\$ 3,382,572	\$ 5,053,311
OTHER-EDUCATION*				
Smart Living Center/Museums	\$ 568,450	\$ 754,246	\$ -	\$ -
ee Communities	108,197	900,000	-	-
eEsports/K-8 Education	508,335	657,201	-	-
Science Center	207,171	-	-	-
Subtotal Education	\$ 1,392,154	\$ 2,311,447	\$ -	\$ -
OTHER-PROGRAMS/REQUIREMENTS				
Institute for Sustainable Energy (ECSU)	\$ 500,000	\$ 500,000	\$ -	\$ -
Residential Loan Program (Including CHIF)	18,285	225,000	147,396	180,000
C&I Loan Program	9,634	300,000	-	90,000
C&LM Loan Defaults	105,822	139,700	-	-
Subtotal Programs/Requirements	\$ 633,741	\$ 1,164,700	\$ 147,396	\$ 270,000
OTHER-LOAD MANAGEMENT				
ISO Load Response Program	\$ 107,157	\$ 350,000	\$ -	\$ -
Subtotal Load Management	\$ 107,157	\$ 350,000	\$ -	\$ -
OTHER-RD&D				
Research, Development & Demonstration	\$ 160,267	\$ 325,000	\$ -	\$ -
Subtotal RD&D	\$ 160,267	\$ 325,000	\$ -	\$ -

	2009 Actuals Electric	2010 Plan Electric	2009 Actuals Natural Gas	2010 Plan Natural Gas
Conservation & Load Management Programs				
OTHER-ADMINISTRATIVE & PLANNING				
Administration	\$ 1,372,207	\$ 1,435,000	\$ -	\$ -
Planning and Evaluation	2,144,815	3,343,000	209,707	260,000
Information Technology	1,534,981	1,943,000	124,558	95,000
ECMB	611,124	610,000	61,756	27,000
Performance Management Fee	2,937,363	5,736,813	-	-
General Awareness	5,804	100,000	-	-
Admin/Planning Expenditures	\$ 8,606,294	\$ 13,167,813	\$ 396,021	\$ 382,000
PROGRAM SUBTOTALS				
Residential	\$ 28,918,355	\$ 46,910,760	\$ 5,658,875	\$ 6,018,436
C&I	\$ 35,221,474	\$ 60,279,502	\$ 3,382,572	\$ 5,143,311
Other*	\$ 9,307,066	\$ 13,892,813	\$ 396,021	\$ 382,000
TOTAL C&LM BUDGET	\$ 73,446,895	\$ 121,083,075	\$ 9,437,467	\$ 11,543,747
Docket 05-07-14 PH01 EIA Programs				
ISO Load Response Programs (Load Curtailment & Emer. Gen)	\$ 7,489,299	\$ 2,214,574	\$ -	\$ -
Subtotal Docket 05-07-14 PH01 EIA Programs	\$ 7,489,299	\$ 2,214,574	\$ -	\$ -
Total C&LM and EIA Programs	\$ 80,936,194	\$ 123,297,649	\$ 9,437,467	\$ 11,543,747

* OTHER-EDUCATION is primarily allocated to residential programs.
Totals Vary Due To Rounding.

CHART B: 2009 Actuals: Budget Allocations

CEEF programs are administered to maximize the cost-effectiveness and impacts of energy-efficiency and load management activities. In the Northeast, CL&P and UI rank favorably in terms of program administrator cost per kilowatt-hour saved. Only 4.5 percent of the total CEEF budget was allocated to administrative expenses in 2009.



10 CMEEC Connecticut Municipal Electric Energy Cooperative



Background

The Connecticut Municipal Electric Energy Cooperative (CMEEC), a joint action supply and transmission agency established by the state's municipal electric utilities, is owned by the Cities of Groton and Norwich, the Borough of Jewett City, and South and East Norwalk. In addition, CMEEC provides all power requirements to these participating utilities: Town of Wallingford Department of Public Utilities, Bozrah Light and Power Company, and the Mohegan Tribal Utility Authority.

At the federal, regional, state and local levels, energy issues continue to be of paramount importance. In 2009, CMEEC utilities worked together proactively and in partnership with their municipalities, commercial and industrial businesses, residents and limited-income customers. By supporting the energy supply, transmission and distribution needs of all customer sectors, CMEEC utilities serve as integrated energy managers to help customers reduce and reshape their energy use and keep Connecticut in the forefront of the nation's energy efficiency efforts, as previously noted in this report.

In 2009, CMEEC's utilities realized annual savings of 14.143 million kWh and peak demand savings of 2.646 MW. These savings were achieved through the delivery of a full array of efficiency programs.

Smart Grid Project

In 2009, CMEEC's management team diligently researched and applied for funding through the Smart Grid Grant Program available through the ARRA. CMEEC's project proposal, based on an earlier, limited pilot of time-of-use rates, was one of only a few programs awarded funds in the New England area. As a result, the *Connecticut Municipal Utilities Smart Grid Project* was initiated in late 2009 and will be a collaborative, regional priority for 2010 and beyond. The project focuses on deploying advanced two-way meters for the majority of commercial customers and selected residential accounts, and utilizing data from those meters to enable time-differentiated rates over discrete time intervals. Thus, customers will have the opportunity to reduce their electric bills by shifting electricity usage away from peak-demand times.

Serving Residential Customers

The CMEEC systems delivered a full array of energy efficiency programs in 2009. Residential program efforts were centered on CMEEC's Home Energy Savings program which provides the same services offered through the CEEF's HES program. The Home Energy Savings program provides comprehensive whole-house retrofit services with a number of consumer incentives. Program measures include blower door testing and air leak sealing, duct testing and sealing, installation of CFLs, as well as water and hot water efficiency devices and pipe insulation. CMEEC's authorized contractors and local utility personnel assist customers

with the procurement of attic insulation and provide quality control and program governance. Efforts are coordinated locally with incentive offers from the natural gas and oil supply companies. In 2009, CMEEC's limited-income program continued to feature the HES service platform.

In 2009, CMEEC did not distribute CFLs, with the exception of the Home Energy Savings program's in-home installations and limited local efforts. Replacing direct distribution was a Negotiated Cooperative Purchase program, which utilized major chain stores and local retailers as CMEEC's main channel of CFL distribution. However, with new ENERGY STAR data indicating lower than expected penetration rates, the CMEEC systems will likely return to more aggressive direct distribution and installation of CFLs.

Commercial & Industrial Advances

In 2009, CMEEC continued to offer its programs to commercial and industrial customers. Ongoing initiatives, including both prescriptive and custom, offered C&I customers incentives for retrofit and new construction projects. Rebates

for C&I customers included lighting, motor replacements, HVAC units and special efforts to engage small businesses. CMEEC worked closely with its largest customers on load response and on-site generation opportunities.

CMEEC commercial and industrial programs resulted in energy savings of 10.089 million kWh and peak demand reduction of 1.422 MW.

Toward A Sustainable Future

CMEEC's supply program includes the promotion of clean energy development. An agreement is in place with the Connecticut Clean Energy Fund to administer selected residential alternative energy supply projects for its municipal systems and a companion arrangement for C&I projects is being developed. In 2010, CMEEC customers will be eligible for the Connecticut Clean Energy Fund's incentive programs for solar photovoltaic, solar thermal and geothermal projects funded through the ARRA.

Assistance to Customers

Table D details the incentives and rebates provided to CMEEC residential and C&I customers in 2009.

Table D: CMEEC Assistance to Customers by Service Area
(Rounded to \$ thousands)

Bozrah Light and Power	\$ 42,000
Groton Utilities	\$ 782,000
Jewett City Department of Public Utilities	\$ 40,000
South Norwalk Electric and Water	\$ 49,000
Norwalk Third Taxing District	\$ 135,000
Norwich Public Utilities	\$ 561,000
Wallingford Electric Division	\$ 1,095,000



2009 CMEEC Program Highlights

 **Customers Served**
15,800

 **Energy Savings**

kWh Annual	kWh Lifetime
14,153,358	169,245,569

 **CO₂ Emissions Reduced**
7,673 Tons (Annual)

 **Annual Savings**
\$ 1,839,900

CMEEC Budget Summary

Board Members

Table E: 2009-2010 CMEEC Budget Summary

Program	Program Budget 2009	Actual Utility Costs 2009	% of Budget Spent	Proj. Annual Savings (kWh)	Annual Energy Savings (kWh)	% of Annual kWh Saved	Lifetime Savings (kWh)	2009 Proj. kW Impact	kW Impact	% of kW Impact Achieved
RESIDENTIAL										
Home Energy Savings Program	\$ 972,000	\$ 765,722	79%	1,327,000	2,238,534	169%	17,761,301	255	1,070	420%
Efficient Products										
Lighting	300,000	240,229	80%	2,659,000	1,773,545	67%	12,414,817	211	141	67%
Appliances	111,000	125,843	113%	162,000	51,484	32%	818,192	23	12	52%
Subtotal-Residential	\$ 1,383,000	\$ 1,131,795	82%	4,148,000	4,063,563	98%	30,994,311	489	1,223	250%
COMMERCIAL										
Commercial New Construction	\$ 70,000	\$ 1,765	3%	74,000	9,070	12%	127,000	25	4	16%
Commercial Equipment Replacement										
Prescriptive	225,500	171,486	76%	572,000	714,213	125%	13,515,946	181	154	85%
Custom	209,000	342,365	164%	1,104,000	3,240,263	294%	46,840,422	394	209	53%
C&I Existing Facility Retrofit	1,232,500	1,057,075	86%	7,475,000	6,126,249	82%	77,767,890	929	1,056	114%
Demand Response	\$ 0	\$ 0	0%	0	0	0%	0	0	0	0%
Subtotal-Commercial	\$ 1,737,000	\$ 1,572,692	91%	9,225,000	10,089,795	109%	138,251,258	1,529	1,422	93%
Renewables	\$ 0	\$ 0	0%	0	0	0%	0	0	0	0%
Total-All Programs	\$ 3,120,000	\$ 2,704,487	87%	13,373,000	14,153,358	106%	169,245,568	2,018	2,646	131%

Note: Data for the Limited Income Customers is included under the Home Energy Savings Program



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