

**Meeting Essential Needs:
The Results of a National Search
for Exemplary Utility-Funded
Low-Income Energy Efficiency Programs**

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ABSTRACT

In the spring of 2005, ACEEE initiated a national search for “exemplary” utility-funded low-income energy efficiency programs as part of a project to identify and profile programs that provide models of “best practices” for addressing the energy needs of low-income households. ACEEE staff worked with an expert panel to select programs from those nominated and identified from around the country, and categorized selected programs to be recognized as “exemplary” or “honorable mention.” Selection criteria included positive energy and cost savings impacts; replicability; and qualitative factors, such as innovation, participant satisfaction, unique services, and stakeholder support. ACEEE also chose a mix of programs to represent the variety of approaches, structures, and services provided in this sector. This report presents summary observations and discusses common traits of top quality programs, and then provides a catalog of descriptive profiles of the 24 utility-funded low-income energy efficiency programs selected by ACEEE to represent leading examples in the field.

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BACKGROUND

Energy affordability for low- and limited-income¹ households has long been a public policy issue in recognition of the fact that such households on average pay a much higher share of their income on energy compared to households at higher income levels. Home “weatherization” and related energy efficiency improvements have proven especially valuable, as they can provide long-term benefits by decreasing household energy use and corresponding costs. Such improvements also can improve the comfort, safety, and value of individual homes and multi-family buildings.

Programs and policies to address the energy needs of low-income households have been in place since the 1970s in many areas. These weatherization and related energy efficiency programs have clearly demonstrated their value and effectiveness (Brown et al. 1994; Pye 1996). Such programs are well-established and considered essential services for low-income energy customers in most states and areas. The federal government has long supported such efforts through such programs as the “Low-Income Home Energy Assistance Program” (LIHEAP) and the “Weatherization Assistance Program” (WAP). These federal programs in many cases provide a base level of funding used to leverage available local, state, and other funding sources.

For utility companies, programs to improve the energy efficiency of low-income customers can provide several additional benefits. These include lower credit and collection costs, avoided service shut-off costs, reduced uncollectible account write-offs, and improved customer relations. Monte de Ramos (2005) presented the business case for utilities to fund and offer energy efficiency programs to their low- and limited-income households based on the multiple benefits of such programs.

The importance of low-income energy efficiency programs in the utility sector was underscored by state-level restructuring initiatives that began in the 1990s. Preserving these programs to provide ongoing services to low-income households regardless of broader restructuring decisions was a high priority across the U.S. Research and tracking by the American Council for an Energy-Efficient Economy (Kushler, Witte, and York 2004) on state “public benefits” programs shows clearly the strong and ongoing support for these programs. A total of 23 of 26 jurisdictions that have established some type of public benefits programs include specific policies and funding for low-income programs.

The importance of providing weatherization assistance and related efforts to reduce energy costs for low-income households has not diminished. In fact, recent energy cost increases have dramatically heightened the importance of these programs. Energy price and cost outlooks offer no relief in sight; for example, natural gas markets have exhibited a strong, clear, and significant upward price trend. Electricity rates in most states have similarly been

¹ Different organizations offering programs serving “low-income” or “limited-income” households use different criteria for determining eligibility for such programs. Generally, “low-income” households are defined according to federal poverty guidelines. “Limited-income” generally refers to households that fall just above the guidelines for “low-income” households. Individual program profiles in the appendix provide details about the guidelines used to determine eligibility.

increasing, with additional rate hikes pending as the industry appears to have entered a phase of infrastructure building (demonstrated by the significant growth in construction of new power plants, and major additions and upgrades to transmission and distribution systems). Other fuels (heating oil, propane, and even in some areas, firewood) are experiencing similar upward price pressures. Low-income households are being hit especially hard by these cost increases.

SCOPE AND OBJECTIVES

In 2003, ACEEE completed two major “best program practices” projects. The first of these (York and Kushler 2003) included programs that primarily addressed electricity energy efficiency across all customer classes (residential, commercial, and industrial) and a wide range of technologies and end-uses (lighting, HVAC, industrial processes, etc.). This project also included a small set of low-income residential programs. The second of these best practices studies (Kushler, York, and Witte 2003) focused on natural gas programs only. Again, the project included a small set of low-income programs.

Building upon the success of these two best practices studies, we saw a need to undertake a similar project that would focus specifically on best practices among programs that serve low- and limited-income households. The opportunity to pursue such a project arose when Xcel Energy decided to undertake a comprehensive re-examination of its low-income energy efficiency program in Minnesota and asked ACEEE to suggest potential ideas for improvement based on national experience. As a part of our assistance for that effort, we conducted the national review described in this report.

As with our previous best practices studies, the overall objective was to identify exemplary programs that could be emulated in other areas and jurisdictions. We sought to recognize and profile programs that not only demonstrate best practices, but also represent the spectrum of program types and approaches that exist among programs serving low- and limited income households. This report presents the findings of this project. The report’s intent is to provide regulators, policy makers, and program administrators with a guidebook of practical, state-of-the-art information about successful programs that are providing critical energy efficiency services to low- and limited-income households.

METHODOLOGY

In the spring of 2005, ACEEE conducted a national search to identify exemplary and noteworthy low-income energy efficiency programs. As with our earlier best practices studies, our search began with a widespread “call for nominations.” We circulated this message through various media, including posting it on our web site, e-mail distribution to selected lists of ACEEE utility and energy efficiency program contacts, and a public announcement at the 2005 National Symposium on Market Transformation (an industry event attended by over 300 people involved with energy efficiency programs). We also made selected direct contacts with industry experts both to notify them about our search and to seek input on programs to include.

We asked that nominations include the following information:

- program name
- organization (administrator and/or implementer)
- contact person (program manager) name, phone number and e-mail address
- program synopsis/summary: customers served, services provided, history
- program results (participants, market share, energy impacts, etc.)
- program annual budget and funding source(s)
- reasons why program is exemplary

As we noted in the solicitation, we were looking for programs with proven success, as well as programs that demonstrate innovation in addressing the unique needs of low-income households. We also sought different types of programs providing different services to households. A key qualifier for inclusion in this study was that program funding had to be provided at least partially through utility rates or public benefits funding received via utility rate mechanisms.

Key factors that we used to select programs in this study were:

- **Positive Energy and Cost Savings Impact.** Demonstrated ability of the program to deliver significant energy and cost savings from energy efficiency. Programs were noteworthy due to overall total magnitude of impact (i.e., very large programs) or in terms of amount of impact per dollar spent (i.e., very cost-effective programs).
- **Replicability.** Programs that were well documented and had characteristics amenable to easily replicating the program design in other settings.
- **Evaluation Results.** Programs that used good quality ex post evaluation and verification methodologies to document savings impact and/or other beneficial effects achieved by the program received more favorable consideration.
- **Qualitative Assessment.** Achievements of the program in terms of noteworthy program implementation performance, innovation, customer participation, participant satisfaction, unique services, and stakeholder support also were considered.

ACEEE staff worked with a panel of three external experts to review nominations and select programs to recognize and profile in this study. The expert review panel and ACEEE staff individually assessed each program nomination and then collectively discussed and selected programs by consensus. The panel decided to use two categories of recognition: (1) *Exemplary Program* and (2) *Honorable Mention*. The distinction between these two categories was in some instances small, based solely on the collective judgment of the expert panel using information they had available and applying the factors listed above. Readers should assume that all of these programs have admirable aspects, and that programs that are adjudged as Honorable Mention here may, in fact, serve as exemplary models to replicate within the political and regulatory environment of a particular state.

RESULTS

In this project we specifically sought utility sector low-income energy efficiency programs and reached out to the network of people involved in these types of programs. We selected 18 programs from the nominations received, which included three programs that had received past recognition in our earlier best practices projects.² We also have included other low-income energy efficiency programs in the appendix that we previously honored and profiled in our earlier best practices reports, although we did not receive new nominations for them in this project.

We have updated program information for those programs previously recognized if data were available and provided by program contacts. The combined set of programs profiled in this report thus draws from two previously completed best practices projects, as well as from new nominations received specifically for this best practices project. Our objective in this report is to provide a comprehensive set of low-income energy efficiency programs that illustrate current best practices and the range of critical services they provide. By combining programs selected in these different projects, we believe we have a very strong set of the best low-income energy efficiency programs from across the United States. Selection of programs in each project was based on similar criteria and followed similar processes.

We organized the selected programs into the categories below in order to group similar programs together and to highlight either the type of service provided or the type of organization offering the program. First, we have three major categories of programs.

- Comprehensive low-income energy efficiency programs
- Municipal and cooperative utility low-income energy efficiency programs
- Multi-family low-income housing programs

Then, we have six special niche categories, in order to profile programs that address particular customer types or feature unique service approaches:

- Integrated portfolios of low-income program services
- Programs serving mobile homes
- Refrigerator replacement programs
- Programs using “standard offer” approaches
- Programs using “expanded eligibility with co-pay” approaches
- Residential low-income single-family new construction programs

While there is some overlap among programs selected, we placed programs in categories we felt would best represent the program as a whole, according to its structure, services, and targeted end-uses, or that otherwise would highlight a noteworthy feature of the program.

² These programs are the New Jersey Comfort Partners Program, the New York Energy Smart Assisted Multifamily Program, and the portfolio of low-income programs offered by KeySpan Energy Delivery New England (recognized as one of the collaborators in the “Massachusetts Low Income Energy Affordability Network”).

OBSERVATIONS AND COMMON TRAITS OF LEADING PROGRAMS

The programs included in this report span a wide spectrum of services, budgets, and geographic areas served. This is by design. One purpose of this project is to demonstrate that programs that serve the needs of low-income customers exist in many forms and sizes—from audit programs offered by small cooperative utilities to statewide programs with multiple program partners offering comprehensive, extensive energy services.

Despite the diversity represented in the programs selected and profiled in this report, we do observe common traits among leading programs and in the field of low-income programs in general. With over two decades of experience in many cases, it is natural to see that programs have evolved and improved their operation and effectiveness over time.

We found the following common traits and trends:

- *Partnerships and multi-party collaboratives are common.* Utilities, community action agencies, social service agencies, private market providers, and other stakeholders have formed program partnerships to leverage funding from multiple sources and to create a more efficient, effective program delivery structure.
- *Community action agencies provide direct customer services for many programs.* Such agencies are generally well connected, structured, and trusted to provide services to low-income households and have, as long-term local deliverers of federally funded weatherization programs, developed the technical expertise to effectively provide low-income energy efficiency services on behalf of utility companies.
- *Single or “primary” providers of services are common.* This approach provides two complementary benefits. A single provider can generally deliver program services more cost-effectively than multiple providers. And from the customers’ perspectives, a single provider means that the customer really has a single contact—a “one-stop-shop” for receiving services. This simplifies and makes participation much easier for customers.
- *Programs employ sophisticated diagnostic and analytical tools.* Blower-door testing, infrared imaging, and other diagnostic/analytical tools (including computer software) are commonly used by leading programs to be able to identify and prioritize recommended measures for improving energy efficiency and reducing energy costs.
- *Whole-house approaches are common.* Increasingly, programs examine the house as a complete and complex system when addressing energy efficiency and related household system improvements. Measures are not analyzed and taken in isolation. Rather, analysis of measures includes interactivity among various measures under consideration. This helps assure the most accurate assessment of the most cost-effective improvements, as well as helps ensure that items aren’t missed that might be if only considered in isolation.
- *Customer education is often an integral part of the service package provided.* Household weatherization programs involve a great deal of customer contact. Programs take advantage of this contact to include important customer education about new technologies installed as well as behavioral changes that can help reduce costs further.
- *All types of energy use are targeted—electricity, natural gas, heating oil, LP, and even renewable energy (in a few selected cases).* Like other residential customers, low-income households typically rely on multiple types of energy. Programs that are “fuel-blind” or

“fuel-neutral” are common. This makes programs more cost-effective than would be separate programs by fuel-type and helps ensure that customers reduce energy costs to the greatest degree possible by taking an integrated approach to household energy use.

- *Program evaluation is an integral and ongoing element of programs.* Both process and impact evaluations are routinely done by leading programs, generally by third-party contractors with some structure and oversight in place to assure objectivity. Evaluation results are critical to assess and improve program performance.
- *Programs use innovative services and approaches for hard-to-reach customers as well as provide services to customers outside the boundaries and definitions of “low-income.”* Program marketing and materials are done in multiple languages in many areas. Certain programs attempt to serve “limited-income” customers whose income is greater than the federal poverty guidelines used by many programs.
- *Programs address the full spectrum of housing types—single-family houses, multi-family buildings, and mobile homes.* Low-income households can be found in all types of housing, and programs have recognized the need to serve all these different housing types. Some programs provide services to different housing types under a single umbrella structure, while other programs have been developed specifically to target a certain housing type, such as multi-family buildings.
- *Programs include a full menu of household energy efficiency improvements in the options considered.* While there are programs that target a single technology, such as refrigerator replacement, the trend is for comprehensive programs that offer a full range of options that can reduce household energy use and associated costs. Single- or limited-option programs clearly have a place in the range of programs, but those programs offering the broadest range of efficiency measures have the greatest potential for significantly affecting household energy use.
- *Program cost-effectiveness is a lesser issue, although still an important objective.* Because of their particular focus on the special needs of disadvantaged households, low-income energy efficiency programs are generally not held to the same cost-effectiveness criteria as utility energy efficiency “resource” programs (i.e., they are not judged with a strict “total resource cost” test, or TRC). More typically, the focus is on the magnitude of utility bill savings to participating customers, rather than the utility system avoided production costs. Also, low-income programs often include broader “non-energy benefits” (NEBs) such as lowered credit and collection costs and avoided bad debt for the utility, and improved health and safety for customers. Nevertheless, achieving an effective program is considered important and is routinely incorporated into good program management, and even built into the basic program structure (e.g., measures are only recommended if they meet program cost-effectiveness criteria, such as a “savings to investment ratio” greater than 1.0).
- *Programs are achieving significant success.* The programs we examined and profiled in this report have clear records of saving customers energy and costs, as well as yielding a host of other benefits for the health and well-being of the customers served and society in general.

CONCLUSIONS

Low-income energy efficiency programs work. With now more than two decades of experience to assess, evaluations offer consistent proof that these programs are successfully reducing energy use and costs for low- and limited-income households while at the same time improving the quality of life for low-income citizens, and upgrading the buildings they occupy. Beyond these very real and direct benefits associated with improved energy efficiency, these programs yield numerous other benefits to household occupants, the communities, and utility services providers. Also, there is no one “exemplary” program model. Successful programs can be structured under a variety of legislative or regulatory frameworks. Low-income energy efficiency programs can be done under a variety of structures and they can span a wide scope in terms of the size of the program and the types of services provided. While many of the leading programs we identify in this report have long records of achievement and are a well-established and well-respected segment of the energy efficiency services industry, we also identify and profile here some newer programs that we believe have great potential to become the “best practices” models of the future.

The need for low-income energy efficiency programs is ongoing and even growing as energy costs rise and the numbers of low- and limited-income households also increase. We encourage those people involved in the design or development of low-income energy efficiency programs to draw upon the successful experiences of the programs profiled in this report to reach additional low-income households with the proven benefits provided through improved energy efficiency within homes.

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*Comprehensive Low-Income Energy Efficiency Programs
Exemplary Program*

Appliance Management Program

*National Grid, New England
The Massachusetts Low-Income Energy Affordability Network
Rhode Island State Energy Office
Numerous community action agencies³*

PROGRAM OVERVIEW

In 1995 National Grid formed a partnership with the local low-income weatherization and fuel assistance network of Community Action Program (CAP) agencies to develop a low-income electric conservation program. The Appliance Management Program (AMP) is very successful in delivering electric savings to low income customers by a combination of home appliance surveys, education about energy used by household appliances, and the installation of energy-savings measures. The program is delivered to National Grid customers by local CAP agencies in its service territories in Massachusetts (Massachusetts and Nantucket Electric), in Rhode Island (Narragansett Electric), and New Hampshire (Granite State Electric). In Rhode Island AMP is offered in cooperation with the Rhode Island State Energy Office.

The program uses a cooperative co-learning approach of adult to adult education, innovatively designed especially for limited income households. The purpose of the in-home visit is to identify mutually beneficial outcomes rather than merely instructing or doing things for customers. One method for identifying the sources of high use is to question customers and listen actively about how they use appliances. This knowledge is used to prioritize savings opportunities and create a workable action plan allowing the customer to use their appliances more efficiently. This program has been able to actually quantify energy savings due to education and consumer action, which has rarely been documented. The local CAP personnel have strong expertise in working with low income customers and are able to tie customers into other energy efficiency and community action programs such as job training, telephone discount rates, and educational programs.

³ Local participating community action agencies in Massachusetts: Action Inc., Berkshire Community Action Inc., Citizens for Citizens, Community Teamwork, Inc., Franklin Community Action Corp., Greater Lawrence Community Action Council, Lynn Economic Opportunity, Montachusett Opportunity Council, Inc., North Shore Community Action Program, Quincy Community Action, Self Help, Inc., South Shore Community Action Council, Southern Middlesex Opportunity Council, Springfield Partners for Community Action, Tri-City Action Program Inc., and Worcester Community Action Council.

Local participating community action agencies in Rhode Island: Blackstone Valley Community Action, Comprehensive Community Action Programs, East Bay Heating Assistance (Self Help), Providence Community Action Program, South County Community Action, Tri Town Community Action, and West Bay Community Action.

In 2002 the AMP program in NH was replaced by a similar joint utility program called Home Energy Assistance. That program was selected for ACEEE recognition and is profiled elsewhere in this report. The Local participating community action agencies in NH agencies that currently deliver Home Energy Assistance for National Grid are: Rockingham Community Action, Southern New Hampshire Services, Southwestern Community Services, Inc., and Tri-County Community Action.

The program is funded by the state-required System Benefits Charges in all three states. In Massachusetts, the Low-income Energy Affordability Network (LEAN) oversees program development. Budgets vary somewhat by year, but average about \$5.6 million per year, with \$4.5 million in Massachusetts, \$1 million in Rhode Island, less than \$100,000 in New Hampshire.

PROGRAM PERFORMANCE

Since 1996, the program has delivered more than 30,000 MWh in cumulative annual savings and 425,000 MWh in lifetime savings, and has served more than 30,000 customers.

	1996	1997	1998	1999	2000	2001	2002	2003	2004	Total
Annual MWh	234	1,526	2,698	3,563	4,378	4,927	4,852	4,960	5,627	32,766
Lifetime MWh	2,344	16,786	38,211	55,983	71,029	22,892	69,182	72,614	76,598	425,638
Households	241	1,101	2,798	3,751	5,167	4,332	4,726	4,185	4,622	30,923

Average savings by measures are given below, based on an impact evaluation of the 2001 Appliance Management Program completed by Quantec, LLC and the Massachusetts state weatherization study. The program has achieved high and consistent electricity savings (average 1,200 kWh/household)—which reduces low-income household electricity bills by about \$100/year. Customers report implementing an average of 3.5 lifestyle changing “actions” as a result of education received through their participation in AMP.

Lighting	63 kWh /year per bulb installed
New refrigerator	1,106 kWh/year per replacement
New freezer	726 kWh /year per replacement
Waterbed measures	1,070 kWh/year per bed
Refrigerator removal	135 kWh/ year per removal
Electric weatherization	595 kWh/year per home
Oil heat weatherization	143 kWh/year per home
	150 gallons of oil/year per home
Oil heating system	91 kWh/year per home
	290 gallons of oil/year per home
Education and other	206 kWh/year per home

In 2000 the program began offering weatherization measures for oil heated homes. Since then the program has weatherized 2,515 homes. The average savings for weatherization is 150 gallons of oil for a total of more than 377,000 annual gallons of oil saved. Also since 2001 the program has offered oil heating system replacements. Since then a total of 758 customers received this measure and saved an average of 290 gallons of oil each for a total of almost 220,000 annual gallons of oil.

AMP has been extensively evaluated, which has both documented impacts and provided critical feedback for program improvement. Complete impact evaluations were done for the program in 1998, 1999, and 2001. Another impact evaluation is currently under way by National Grid’s vendor Quantec LLC and results will be available later in 2005. The evaluations reveal that AMP is highly cost effective. For example, the benefit to cost ratio

(based on the total resource cost test) of AMP is 2.56 as reported in the Massachusetts Electric 2003 Energy Efficiency Annual Report, based on most recent evaluation results.

AMP applies the “best practice” of training, testing and measuring and reporting results to create feedback loops that foster quality and continual learning. The appliance audit software and the recent shift to the use of blower door guided infrared scanners by each local agency are two examples of this.

Because of its long history and aggressive program targets, AMP program has served at least ten percent of the eligible population to date and continues to set and meet aggressive program targets each year. AMP also has expanded its services into new territories. National Grid used AMP’s success in Massachusetts to help convince the Rhode Island Public Utilities Commission to offer the program in Rhode Island. Because of a well-documented training program, replicating the program in Rhode Island was relatively easy. AMP’s strong emphasis on training creates local electric energy efficiency experts, who then become an on-going community resource at the CAP agencies that partner with the program. AMP was offered—and a successor program now is offered—in New Hampshire.

AMP’s successes go beyond the very real and significant benefits provided directly to participating customers. AMP has affected broader utility and weatherization program practices in the region. The program has encouraged increased utility investment in low income energy efficiency in the region. AMP also has led to the creation of a “Best Practices” Working Group for LEAN and all the electric and gas utilities in Massachusetts to meet regularly to share best practices and cooperate on program design and technical issues. Through this numerous working relationships with other organizations that share common interests, AMP has improved the partnership between National Grid, LEAN, and local CAP agencies. AMP benefits CAP programs by providing additional funding to the CAPs for electric and oil weatherization, using the existing network of services and supplementing federal funds so more clients can receive services.

LESSONS LEARNED

- The success of this program in reaching the target audience and creating real energy savings is largely attributable to the close relationships the CAP agencies have with low-income customers. The agencies provide a variety of services to these customers that have helped them gain the respect and trust of customers. This facilitates program marketing and helps in gaining customer cooperation on implementing the energy savings actions recommended in the program.
- Regulatory support has allowed AMP to meet unique customer needs. New England has a high percentage of customers who heat with oil. For a number of years, the Department of Energy’s (DOE) weatherization funds have been supplemented by gas utility energy efficiency programs. Beginning in 2000 National Grid started funding weatherization for income eligible households heating with other fuels not including natural gas. These homes may be heated by oil, propane, wood or other non-utility fuels. This only works if the regulating entity allows the Program Administrator to get credit for non-electric savings, which National Grid is able to do in Rhode Island and Massachusetts.

- Through its funding and partnership with CAP agencies, National Grid’s aim is to extend the benefits of AMP to more customers and enable the weatherization network to efficiently deliver a total package of energy efficiency services including weatherization to address heating usage and appliance services. Through AMP’s support and partnership, CAP agencies are able to deliver services more cost effectively and have fewer visits to customers’ homes per unit of energy saved. More importantly, the CAP agencies have integrated appliance usage into their “house as a system” approach, allowing for a better understanding of all energy uses in the home, and better services to their clients. CAP field staff now understand the electric use of heating system pumps and blowers, the interaction of refrigeration, lighting, and heating, and are able to solve customer problems as opposed to just dealing with a part of the consumer’s overall energy use.
- The success of the program depends largely on the skill of the CAP energy auditors and active customer participation. For that reason broad based skills are required for the auditors who work on AMP, who are called “Energy Managers.” The skills include an ability to audit electric base load conservation and diagnose causes and solutions for high electric use. Training is provided on the program requirements, electric base load auditing, and computer use. Energy Manager candidates should already have significant weatherization auditing and communication skills as well as an aptitude for computers. National Grid found it very helpful to start the program with just a few highly skilled agencies as a pilot, and then gradually add more agencies as the overall knowledge of the network improved.

Each year National Grid continues to explore new measures and refinements in how measures can be implemented in cooperation with the state-wide Best Practices group in Massachusetts and the State Energy Office in Rhode Island. In AMP added infrared scanners and training for each agency on how to ensure that their sub-contractors effectively seal key building leakage junctures and then inspect the results.

AMP collaborates with other program for outreach efforts to low income customers through a Massachusetts state-wide joint marketing effort called “Energy Bucks.” In the Energy Bucks campaign gas and electric utility companies, in collaboration with the Massachusetts Community Action Program Directors’ Association (MASSCAP) and the Low-Income Energy Affordability Network (LEAN), work together to promote energy efficiency programs (like AMP), fuel assistance, and utility discount rates to qualifying households. This educational campaign is funded by System Benefit Charge (SBC) funds.

PROGRAM AT A GLANCE

Program name: Appliance Management Program

Program eligibility (guidelines): The Appliance Management Program (AMP) income eligibility level for customers is 60% of median in Massachusetts and is indexed to the same income criteria as for fuel assistance in Rhode Island. AMP is available to customers living in 1 to 4 family facilities.

The appliance audit service component of AMP is targeted to income eligible customers who use at least 10 kWh, base load, per day and have a minimum of nine months billing history at that residence. Base load use is determined by kWh usage per day in the most recent May or September billing period.

Income eligible customers who heat with oil or other deliverable fuels and who meet the typical DOE established requirements for weatherization are eligible for weatherization and or heating system replacement measures.

A third component is called mini-AMP which is piggy backed onto other agency field services and includes refrigerator metering and replacement. It is for customers using less than 10 kWh per day.

Program start date: 1996

Program participants: From 1996–2004 a total of 30,923 households have participated. AMP served 4,622 households in 2004—and has served 4000 or more households per year since 2000.

Approximate eligible population: Not available.

Participation rate: Not available.

Annual energy savings achieved: In 2004 AMP yielded 5,227 MWH as a result of new measures installed; the cumulative annual energy savings achieved by the program from 1996-2004 is 32,766 MWH. Lifetime savings are estimated to be 425,000 MWH.

Cost effectiveness: Benefit to cost ratio of 2.56 (total resource cost test).

Budget and cost information: About \$5.6 million per year, broken out as about \$4.5 million in Massachusetts, \$1 million in Rhode Island and less than \$100,000 in New Hampshire.

Funding sources and share of program budget: State system benefits charges in all three states.

Best person to contact for information about the program

- Dave Legg, Program Manager
- Telephone: 508-421-4265
- Fax: 508-421-7265
- E-mail: dave.legg@us.ngrid.com
- Postal address: 55 Bearfoot Road, Northborough, MA 01532
- Web page: National Grid's AMP program doesn't have its own web site; however, these three sites refer to AMP:
http://www.nationalgridus.com/narragansett/home/energyeff/4_energy_svcs.asp
http://www.nationalgridus.com/masselectric/home/energyeff/4_energy_svcs.asp
<http://www.energybucks.com/>

*Comprehensive Low-Income Energy Efficiency Programs
Exemplary Program*

Energy Management Assistance

*Southern California Edison
Numerous collaborators and contractors⁴*

PROGRAM OVERVIEW

The Energy Management Assistance (EMA) Program was developed in 1984 to bring some parity to low income customers who could not participate in traditional rebate programs that required customers to first pay for conservation devices and receive a rebate at a later date. As the only single source (electricity only) investor-owned utility in California, Southern California Edison had to take a different approach than typical weatherization programs as there are few low-income households in electrically heated homes. As a result, SCE designed its program to reach out to the broadest customer base while focusing on those customers in hot climate areas whose electric bills in the summer are high.

EMA offers a comprehensive approach in delivering services to qualified low income customers by assessing each customer's home to ensure that a full range of services are provided. Customer eligibility is set by the guidelines established and updated annually by the California Public Utilities Commission. The following measures are included in the package of services available to qualified customers (some geographic limits apply, such as for home space cooling measures):

- Non-weather sensitive measures: high efficiency refrigerators, CFLs, low-flow showerheads, water heater blankets, faucet aerators, water heater pipe wrap, hard-wired porch light fixture, and in-home energy education.
- Weather sensitive measures: high efficiency window/wall air conditioners, evaporative coolers, outlet gaskets, ceiling insulation, weatherstripping, caulking and minor home repairs.

SCE uses a network of community based organizations under contract to facilitate the delivery of services. SCE contracts directly with suppliers for bulk appliance purchases through a bid process. This procurement process provides a number of benefits, including:

⁴ **Community-based organizations:** Assert, Inc., Community Action Partnership of Orange County, Community Action Partnership of San Bernardino, L.A. Works, Long Beach Community Services, Maravilla Foundation, Proteous, Inc., Ventura County Commission on Human Concerns, Veterans in Community Service, VoVi Friendship Association, Community Enhancement Services, and Pacific Asian Consortium for Employment. **Private contractors:** Commonwealth Contracting, Inter-City Energy Systems, John Harrison Contracting, Reliable Energy Management, Tri-State Home Improvement, and Winegard Energy. **Supplier:** ACH Supply. **Investor-owned utilities:** Southern California Gas Company, San Diego Gas & Electric, Pacific Gas & Electric. **California Public Utilities Commission:** Low Income Section, Energy Division and Low Income Oversight Board. **Consultant:** Jim O'Bannon, Richard Heath and Associates.

- ensuring that applicable appliances are ENERGY STAR® rated,
- reducing the unit cost of appliances and other bulk-purchase items,
- using SCE’s access and availability of capital rather than relying on that of community based organizations, which is generally much more limited, and
- reducing warehousing and inventory costs for the CBOs as they receive supplies as needed; they don’t need to stockpile large quantities.

SCE leverages its program with non-electric utilities in its service territory and with area LIHEAP (federal program) contractors. Sharing data and otherwise collaborating with other utilities helps ensure that customers receive all services available to them. It also allows for some cost sharing, such as for providing in-home energy education. SCE provides LIHEAP contractors free refrigerators to install in customers’ homes. This reduces SCE labor costs and saves LIHEAP contractors’ equipment purchase costs. This has led to greater participation in both programs.

As part of an SCE commitment to comprehensive services, SCE filed and received approval from the CPUC to increase PY 2005 funding from \$15.8 million to a \$27 million. SCE received approval in May 2005

PROGRAM PERFORMANCE

EMA’s results are summarized below:

Energy Management Assistance Results

	2001	2002	2003	2004
Program Participants	86,900	29,685	33,700	37,400
Program Expenditures (millions)	\$20.70	\$14.0	\$18.40	\$16.0
Measures Installed				
– CFLs	336,100	56,000	65,600	117,400
– Other Measures	22,800	18,600	22,800	19,200
Demand and Energy Savings				
KW Saved	17,000	6,600	3,800	4,700
KWh Saved (millions)	48	31.9	15.8	15.3

LESSONS LEARNED

- A cornerstone of SCE’s program was the development of an assessment tool utilized in identifying eligible measures to be installed in customer homes. This tool assesses each measure in the home to determine whether replacement is needed.
- Bulk purchasing of electric appliances reduces program costs and delivers services to more customers. SCE continues to be the only IOU to bulk purchase all appliances offered through EMA.

- SCE competitively bids for the purchase of appliances and now has a one vendor to supply community-based organizations and private contractors all appliances offered through the program.
 - The selection of one vendor to provide all appliances saves costs to both the utility and contractor. The utility saves costs due to bulk purchasing, reduced procurement costs required of additional vendors, and overall reduction of staff labor spent on contract monitoring etc. In addition, the utility is not restricted to one model or size of appliances. Contractors experience some of the same savings but also save money and time by having one single point of contact for ordering any appliance
- During its 2003 program year, SCE consolidated all its program measures into a “Comprehensive Service” delivery approach that, instead of installing only that measure requested by the customer, all measures offered thru the program are installed.
- The development of the Home Assessment tool was instrumental in SCE’s commitment to delivering comprehensive services. This tool is used in every customer home and is universal in its application.

PROGRAM AT A GLANCE

Program name: Energy Management Assistance

Program eligibility: Income guidelines used for qualifying SCE customers for participation in EMA Program (2005):

Number in Household	Annual Income	If 60 years or older, or permanently disabled
1 to 2	24,200	\$27,700
3	\$28,400	\$32,500
4	\$34,200	\$39,200
5	\$40,000	\$45,900

Program start date: 1984

Program participants: 37,400 participants in 2004. For the period 2001-2004 there were a total of 187,685 participants.

Approximate eligible population: 1.149 million customers

Participation rate: For 2001-2004 the cumulative total rate is 16.3%.

Annual energy savings achieved: 15.3 million kWh in 2004.

Cost effectiveness:

SOUTHERN CALIFORNIA EDISON
2004 Low Income Energy Management Assistance Program
SUMMARY OF EMA BILL SAVINGS

Program Year	Program Costs	Program Lifecycle Bill Savings	Program Bill Savings/ Cost Ratio	Per Home Average Lifecycle Bill Savings
1999	\$7,419,670	\$10,174,890	\$1.37	\$180
2000	\$7,885,542	\$13,602,273	\$1.72	\$294
2001	\$19,402,429	\$20,895,736	\$1.08	\$240
2002	\$13,971,543	\$13,095,830	\$0.94	\$441
2003	\$18,664,181	\$18,580,684	\$1.00	\$551
2004	\$15,997,665	\$15,831,079	\$1.00	\$424

SOUTHERN CALIFORNIA EDISON
2004 Low Income Energy Management Assistance Program
SUMMARY OF EMA COST EFFECTIVENESS
(Ratio of Benefits Over Costs)

	2004			2005		
	Utility Cost Test	Total Resource Cost Test	Modified Participant Test	Utility Cost Test	Total Resource Cost Test	Modified Participant Test
LIEE programs						
Energy Efficiency	0.82	0.63	1.05	0.75	0.61	0.98

Budget and cost information:

Year	Program Costs
2003	\$18.4 million
2004	\$16 million
2005 (preliminary)	\$15.8 million
2006 (projected)	\$27 million*

*In May 2005 CPUC approved SCE's request to expand EMA's budget to this amount.

Funding source and share of program budget: Low income programs are funded through a public goods charge (customer rates). This PGC provides for all funding of SCE's EMA program.

Best person to contact for information about the program:

- Jack Parkhill, Low Income Energy Efficiency Manager
- Telephone: 626-302-8040
- Fax: 626-302-9217
- E-mail: jack.parkhill@sce.com
- Postal address: P.O. Box 800, 2131 Walnut Grove Ave., Rosemead, CA 91770
- Web page: <http://www.sce.com/RebatesandSavings/LowIncome/emaprogram.htm>

*Comprehensive Low-Income Energy Efficiency Programs
Exemplary Program*

Energy Partners Program

*Pacific Gas & Electric Company
Numerous collaborators and contractors⁵*

PROGRAM OVERVIEW

Energy Partners—Pacific Gas and Electric Company’s (PG&E) low-income energy efficiency program—has demonstrated PG&E’s commitment to California’s low-income community since 1983. Among its accomplishments are 285,204 megawatt-hours of electric savings, 840,901 weatherized homes, delivery of 160,731 refrigerators, and reduced customer energy bills of more than \$350,000,000. EP has an annual budget of \$56,530,000. Over the last 21 years, PG&E has spent approximately three quarters of a billion dollars providing services to more than 840,000 customers.

Energy Partners is funded by utility customers through California’s public purpose good charges that were established in the 1990s as California’s utility industry underwent restructuring. Like other programs funded under this structure, Energy Partners is now administered under the auspices of the California Public Utilities Commission (CPUC). With this new funding and structure in place for providing energy services, Energy Partners now is based on a standardized design that has been adopted for California’s statewide low income program. California’s four investor-owned utilities have been working together with the CPUC Energy Division and the Office of Ratepayers Advocates for the past five to six years to standardize their low income program offerings so that low income ratepayers in all of the IOUs’ service areas receive the same services based on the same criteria. The statewide team assesses measure cost effectiveness by climate zone and writes statewide installation standards and policies and procedures to ensure that ratepayers are all receiving the same energy efficiency opportunities based on climate zones.

While there is a common design for statewide low-income energy efficiency programs, each utility manages program operations within its own service area, working in its communities to find and enroll qualified low income customers and to provide services to them. The Energy Partners Program is the largest low-income program in California, providing services to a widely diverse customer population: renters; homeowners; seniors, disabled; Hispanic and many other ethnicities. To meet these customers’ needs PG&E provides program literature in seven languages—Spanish, Chinese, Vietnamese, Korean, Russian, Hmong and English. PG&E and its contractors perform outreach to bring low income energy efficiency

⁵ **Administrative Contractor:** Richard Heath and Associates. **Sub contractors :** American Synergy, Atlas Systems Inc., Bo Enterprises, CAA Butte, California Workforce and Energy Services, Economic Opportunities Commission San Luis Obispo, El Concilio of San Mateo County, Bay Counties Construction, Fresno County Economic Opportunities Commission, Glenn Count Human Resource Agency, Proteus Inc., Quality Conservation Services, Renaissance, Inc., Residential Wall Insulation, Self Help Home Improvement, Sundowner Insulation, Western Insulation, Winegard Energy, Ventura TV Video Appliance Center Inc., Standards of Excellence, Western Appliance TV & Stereo

services to over 1.5 million low income customers in both rural and urban areas, from the coast through the great central valley and into the mountains, covering 47 counties and 10 climate zones.

The Energy Partners program is available to any PG&E customer who meets the income guidelines. These guidelines, set by the CPUC, are adjusted each June. The program is available to renters and owners of single family, multifamily residences and mobile homes. Additionally, some group living facilities qualify if they meet the guidelines, PG&E's rate discount program, CARE. The current income guidelines range from \$23,400 for a family size of one, to \$50,700 for families of six. The income limit increases by \$5,600 for each additional family member beyond six.

PROGRAM PERFORMANCE

To assess participants' satisfaction with the EP program, PG&E has commissioned customer satisfaction surveys for the past 15 years. Telephone surveys are conducted monthly with customers across PG&E's service area and the findings are shared with program contractors. In December 2004, overall customer satisfaction with the Program was 86%, an all time high for the Program, and an eight-point increase over the past five years. In addition, Spanish-speaking customers are surveyed and quarterly results are reviewed to identify ways to improve these ratings. Spanish customers overall satisfaction with the program is comparable to the full survey respondents.

Program accomplishments during the 20-year period, 1983-2003, include:

- Participation rate: 68% (792,445 of 1,166,567 eligible customers)
- Appliance installations:
 - 140,639 refrigerators
 - 35,172 evaporative Coolers
 - 16,166 furnaces
 - 1,021 air conditioners
- 264,300 MWh of electricity (equivalent to the electric needs of 44,050 homes for a year)
- 34,437,000 therms of natural gas (equivalent to fueling 57,000 homes for a year)
- \$352,241,802 estimated in savings on customer energy bills

In 2004 alone Energy Partners provided comprehensive weatherization and energy education to 48,456 customers, one of the largest numbers of homes serviced in one year. Other results in 2004 include:

- Appliance installations:
 - 20,092 refrigerators (old inefficient units removed and recycled)
 - 1,931 evaporative Coolers
 - 754 air conditioners
 - 115 furnaces
- Savings:
 - 20,904 MWh of electricity

- 1,572,000 therms of natural gas
- estimated average \$3,102,153 saved on customers' energy bills

Energy Partners also has been effectively collaborated with businesses and community based organizations throughout its history. For example, Richard Heath and Associates (RHA), a minority-owned firm, has served as lead contractor for PG&E's Energy Partners Program for over 20 years. RHA, in turn, in 2004 contracted with 18 sub-contractors; 44% of these sub-contractors were community based organizations.

LESSONS LEARNED

Some of the innovations that have helped Energy Partners achieve and maintain its success include the following:

Database: In May 2003, PG&E demonstrated leadership and innovation by developing and implementing a Web-based, real time database which it named, Energy Partners Online (EPO). The program's lead contractor, RHA, 18 sub-contractors and PG&E staff use the database to record all daily operational activities including invoicing. The magnitude of the database is illustrated by the following statistics:

Number of customer records in the system:	5,152,321
Program dollars invoiced:	\$68,123,143
Number of customer enrollments:	95,042
Number of customer referrals:	52,726
Number of daily users:	>100, located throughout the service area.

Following PG&E's leadership with the EPO database, the other California investor owned utilities—San Diego Gas and Electric Company, Southern California Gas Company, and Southern California Edison—have either adopted or are in the process of adopting EPO to manage their low-income energy efficiency programs.

Leveraging: PG&E was the first California utility to establish and organize coordination with the Low Income Home Energy Assistance Program (LIHEAP) providers. PG&E works with LIHEAP providers, who are not part of the Energy Partners program, to leverage their federal and state weatherization program with PG&E's Energy Partners program by providing refrigerators to their clients. With the continuing reduction of federal and state funding for low-income programs, PG&E's efforts allow some of the LIHEAP providers to continue providing service to their assigned communities.

Outreach: Community-based organizations (CBOs) are local non-profit low-income advocates for community residents. These organizations depend on state and federal funding as well as grants and donations. Some of the smaller CBO contractors found the Energy Partners program too complex. To help CBOs participate in EP, PG&E changed the design to give a CBO and small private contractor the same geographic area so that they could provide the education and weatherization together. Independently, many of the CBOs and

small private contractors could not have provided both education and weatherization services. Many of the private contractors are women and minority owned business.

PG&E provides small businesses the opportunity to break into the weatherization industry by working with CBOs and the larger subcontractors in the Energy Partners program.

Training: PG&E requires an extensive training program for everyone who works in the Energy Partners program. All contractors' employees must attend specific training provided by PG&E's Energy Training Center, Stockton (ETC). For over 25 years, the ETC has been delivering training courses showing how to effectively reduce energy use in the home. The ETC provides training courses utilizing state-of-the-art energy technologies and emphasizes the "house as a system" approach to energy efficiency and management. Each year all EP program personnel must attend update training regarding all new program changes.

Inspections: Home inspections are performed by PG&E's central inspection program. PG&E performs a random five percent inspection of all homes in the Program, including pre-work and post-work inspections. In addition, post work inspections are performed on 100% of homes receiving attic insulation. Home inspectors are trained at the ETC, Stockton and are required to receive updated training annually as measures and rules change.

Program Evaluation: PG&E conducts regular studies and evaluations and reports the results of LIEE program activities, as directed by the CPUC. PG&E files monthly reports with the CPUC detailing LIEE program activities, impacts and expenditures, and files annual LIEE reports.

Commitment to the Program: PG&E Energy Partners staff has a combined experience of over 100 years working in the low-income program. Their relationship with the EP contractors is one of mutual respect and the sharing of a common goal to provide excellent service to low-income customers. EP contractors share a long-term commitment to meeting the needs of qualified low-income customers.

PROGRAM AT A GLANCE

Program name: Energy Partners

Program eligibility: Any PG&E customer who meets income guidelines established by the California Public Utilities Commission and adjusted each June. The current income guidelines range from \$23,400 for a family of one to \$50,700 for a family of six. The program is available to both renters and owners of single family homes, multifamily units, and mobile homes.

Program start date: 1983.

Program participants: Program to date (through 2004) 840,901.

Approximate eligible population: 1,166,567 eligible customers.

Participation rate: 72% of all eligible customers served, 1983-2004.

Annual energy savings achieved: For 1983-2003: 264,300 MWH electricity saved and 34,437,000 therms of natural gas saved. For the year 2004: 20,904 MWH electricity saved and 1,572,000 therms of natural gas saved.

Cost effectiveness: PG&E performs three cost effectiveness tests on the Energy Partners program annually: the Utility Cost (UC) Test, the Total Resource Cost (TRC) Test, and the Modified Participant (MP) Test (which includes Non-Energy Benefits). Cost effectiveness results for the 2004 program were: 0.41 (UC and TRC), and 0.67 (MP), representing net benefits of: \$29,718,538 (UC and TRC), and \$16,696,509 (MP).

Budget and cost information: PG&E's Energy Partners program has had an annual authorized budget of \$56,530,000 since 2001.

Funding source and share of program budget: California's public benefits charge.

Best person to contact for information about the program:

- Frances Thompson, Energy Partners Program Manager, PG&E
- Telephone: 415-973-2486
- Fax: 415-973-2157
- E-mail: FLT2@pge.com
- Postal address: PG&E, Mail Code H14G, P.O. Box 770000, San Francisco, CA 94177-0001
- Web page: pge.com/energypartners

*Comprehensive Low-Income Energy Efficiency Programs
Exemplary Program*

Low-Income Single Family Service

Primary Partners:

*Efficiency Vermont operated by Vermont Energy Investment Corporation
Vermont Office of Economic Opportunity
Bennington-Rutland Opportunities Council
Central Vermont Community Action Council
Champlain Valley Office of Economic Opportunity
Northeast Employment and Training Organization
Southeastern Vermont Community Action
Burlington Electric Department*

Other Collaborators:

*Neighborworks of Western Vermont
Low-Income Home Energy Assistance Program
Vermont State Housing Authority
Local Public Housing Authorities*

PROGRAM OVERVIEW

The Low-Income Single Family (LISF) service provides electric efficiency measures for low-income customers, primarily provided concurrently with HVAC and thermal shell improvements by Vermont's Low-Income Weatherization Assistance Program (WAP). This "piggybacking" is done through contractual arrangements between Efficiency Vermont and each of the five nonprofit agencies that provide low-income weatherization services on the state's behalf. Efficiency Vermont is the "state energy efficiency utility" that was created by the Public Service Board of Vermont in order to provide energy efficiency programs statewide.

Prior to March 2000, electric utility-sponsored programs addressing this market focused primarily on providing compact fluorescent lamps and hot water conservation measures for those homes with electric hot water. The services were inconsistent across the state since not all utilities participated. This left gaps in services and created equity issues within the market. LISF began in March 2000 as one of the statewide programs administered by the newly created "energy efficiency utility." Primary objectives of the Efficiency Vermont LISF service were to enhance the comprehensiveness, improve service delivery mechanisms, expand service area coverage, and improve tracking and reporting.

In late 2000, Efficiency Vermont began expanding the scope of the service to include comprehensive treatment of fuel switching opportunities (both space heat and hot water), installation of efficient light fixtures, and replacement of inefficient refrigerators and freezers. The service also includes custom measures, energy efficiency education, energy bill analysis, and making arrangements with contractors for selected services for the customers.

Virtually all of LISF’s services are delivered by the five regional WAP agencies. WAP energy auditors assess the opportunities for electric efficiency improvements as they evaluate homes for weatherization services. Cost-effective electric efficiency measures, e.g. ENERGY STAR fixtures and/or CFLs, refrigerators and conversion of electric domestic hot water and space heating systems are identified as part of the WAP audit. These electric efficiency measures are then included within the scope of work developed for weatherization and installed as part of the weatherization service.

All electric efficiency and fuel switching measures are screened in the state's cost-effectiveness tool and must generate a minimum 1.0 benefit-cost ratio. It’s estimated that 35% of the homes in Vermont have electric hot water and 5% have electric space heat. Annually, on average, about 10% of the homes served in LISF are converted from electric to another source for heating hot water and about 3% are converted to an alternative space heating source.

The table below summarizes LISF’s approach to various market barriers faced by low-income customers.

Market Barriers	Description	Strategies to Address Market Barriers
First cost	Electrical efficiency measures typically have a high first cost compared to standard equipment	- Efficiency Vermont and the WAPs each contribute funding toward measure costs to ensure measures are installed at no cost for income-eligible customers
Lack of information about efficient technologies and practices reduces acceptance of products, as well as customer self-investment	-Recent developments have improved efficiency products; customers may be unaware of the improvements -Customers may be unaware of where to purchase efficient products or how to identify them -Customers may be unaware of actions they can take to reduce their energy use and cost	-Implementation protocols include the latest in product innovation -Lighting fixtures are installed at no cost to the customer -Complete contract management services are provided for major measures -Enhanced energy education components accompany measures
Lack of knowledge of savings potential reduces acceptance of services, as well as customer self-investment	Customers may be unaware of cost savings potential	WAP auditors provide savings estimates to customers
Lack of access to financing limits low-income customer self-investment	Low income customers have less access to capital	- Measures provided at no cost to income-eligible customers - Efficiency Vermont provides referrals to WAPs and linkages to financing for major measures for low and moderate income families

Market Barriers	Description	Strategies to Address Market Barriers
Lack of knowledge about energy related services for low-income community	There are multiple energy services for low-income families: WAP, LIHEAP, SHAREHEAT, WARMTH, loan and mortgage programs	-Efficiency Vermont has developed a referral network for low-income customers
Split incentives	Renters do not have the authority to make major improvements; property owners do not receive the benefits of making energy improvements	-WAPs leverage and facilitate property owner financing of major measures

Efficiency Vermont is the program administrator; this arrangement is detailed in a memorandum of understanding with the State Office of Economic Opportunity (OEO) and in individual contracts with the WAPs. The WAPs perform their normal weatherization scope of work and seamlessly piggyback the Efficiency Vermont scope onto the WAP jobs. The WAPs invoice Efficiency Vermont as jobs are completed on a monthly basis. The LISF service both provides enhanced electrical efficiency services to low-income Vermonters, and enhances the WAP's ability to provide comprehensive services by leveraging additional revenues beyond those provided through their traditional funding sources.

PROGRAM PERFORMANCE

The Low-Income Single Family service has served 4,515 customers between March 2000 and June 2005, yielding energy savings of 9,353 MWh. The program has reduced participant electric bills by an average of \$234 per year.

The structure of LISF is an important reason for the program's effectiveness and success. By partnering—or “piggy-backing”—with the existing WAP service and service providers, LISF builds on the state-wide WAP service that is delivered by the five WAP agencies in Vermont. By utilizing this existing service and adding the benefits of electric efficiency measures, low-income Vermonters receive comprehensive energy efficiency services that significantly reduce their energy burden.

LESSONS LEARNED

- Using the WAPs to deliver the service has reduced the burden of the first cost to provide electrical audits for homes and to identify and qualify potential participants. Further, their statewide coverage has enabled the service to be delivered on an equitable basis across the state.
- Consistency of services is assured by Efficiency Vermont's statewide administration; Efficiency Vermont negotiates implementation contracts with the WAPs as a group; assuring consistent services and service quality standards across the state.
- The program has evolved and changed since its inception. Key changes include:
 - In 2000 the program added fuel-switching from electric hot water and/or space heat to cost-effective fossil fuel sources. About a third of the LISF participants with electric hot water or electric space heat convert each year. LISF averages about 90 water heat conversions and 15 space heat conversions per year.

- In 2001 LISF added hard-wired and plug type efficient light fixtures to increase the lifetime savings. LISF is currently installing about 1,800 such fixtures each year, or about 1.8 fixtures per home.
- In 2002 LISF added refrigerator and freezer replacements—replacing old, inefficient units with ENERGY STAR® labeled units. Presently the program is replacing units at a rate of nearly 1 unit for every 2 participants.
- In 2004 LISF moved to prescriptive measure screening of electric water heating fuel conversions, which are based on the size of the home, not current occupancy characteristics. As a result, LISF has been able to reduce the time and cost previously spent to perform custom analysis of water heating usage based on occupancy.
- As the service matures LISF is looking for ways to assist the WAPs make efficiency gains in implementation; these include:
 - Redesigning lighting strategies to maintain savings while decreasing costs
 - Exploring the use of portable electronic data devices for data collection and reporting (currently measure and fee data are tracked on paper and then manually transferred to a database operated and maintained by Efficiency Vermont).
 - Initiating discussions with the OEO to see if it might be worthwhile to explore implementing a common database platform with the WAPs; Such a model is currently being implemented in Connecticut and may have value for Vermont as well.
- LISF is adding new services in 2005 and 2006 to attract participants outside of the weatherization scope; these include:
 - Enhancing LISF's partnership with the State Housing Authority in order to target affordable housing units across the state with services similar to those delivered through the WAPs;
 - Expanding cooperative efforts with other local low-income housing groups
 - Targeting foodshelves and pantries that serve low-income households to make efficient lighting and water conservation products more readily accessible;
 - Hiring a Vista worker to identify opportunities, develop and implement new services.

PROGRAM AT A GLANCE

Program name: Low-Income Single Family Service

Program eligibility (guidelines): Efficiency Vermont has not been mandated to follow any income criteria in this service. The primary enrollment mechanism is through the Weatherization Assistance Program (WAP) process. Anyone on the electric grid and eligible for WAP services is automatically eligible for LISF. If for some reason customers do not qualify for WAP services (e.g., previously served, missed income guidelines, etc.) LISF tries to provide services outside the WAP delivery mechanism. This has only occurred on a few occasions.

Program start date: March 2000

Program participants: 980 participants in 2004; 4,515 participants between March 2000 and June 2005.

Approximate eligible population: Efficiency Vermont does not follow specific income eligibility guidelines in determining eligible population. However, based on 2000 census data and WAP's income-eligibility figure of 60% of median income, the number of low-income single-family Vermont households can be estimated at approximately 65,000. Using the low-income definition accepted by many other income-limited programs (80% of median income), the estimate would be approximately 100,000 households. From either total, it would be

necessary to adjust the estimate downward for ineligibility due to prior participation in LISF, WAP and/or previous utility-sponsored programs.

Participation rate: About 1% of the total estimated market annually (about 1,000 households per year).

Annual energy savings achieved: 2004 program results: electricity savings of 1,852 MWh; since program inception, cumulative savings of 9,353 MWh through June 2005. Annual savings per participant of 2,071 kWh.

Cost effectiveness/other results: Costs & benefits from inception through June 2005—

- Total Resource Benefits estimated to be \$4,995,346;
- Customer Incentives Efficiency Vermont = \$2,828,100, WAPs = \$294,800;
- Direct Program costs = \$4,604,800;
- Cost per MWH saved = \$492/MWH

Budget and cost information: WAPs services in LISF address buildings with less than 5 units. Since the WAPs also provide services to buildings with 5 or more units, the budget for LISF varies from year-to-year depending on the mix of units in the two market sectors. Efficiency Vermont often adjusts LISF budget estimates to reflect changes in participant and measure installation rates. Other factors affecting budget figures include: the continual decline in the cost of screw-based CFL lighting; reduced water heating fuel conversion opportunities as a result of changes in screening protocols. In 2006, Efficiency Vermont hopes to generate cost reductions while maintaining energy savings through a change from the installation of high cost hard-wired efficient lighting to screw-based lighting.

LISF Budget 2003 through 2006

Year	Direct Program Costs
2003 Actual	\$1,237,400
2004 Actual	\$1,025,100
2005 Projected	\$1,097,300
2006 Budgeted	\$ 905,800

Funding sources and share of program budget: The funding mechanism for Efficiency Vermont is a system benefits charge on all Vermont ratepayers’ electric bills. This is called an “energy efficiency charge”. The money is collected by the utilities and turned over to a fiscal agent who acts as the disbursing agent for the Public Service Board (PSB).

In addition to funding generated through this mechanism, the cost of the measures is supported by WAP and OEO contributions. Specifically, the WAP share for electric hot water and electric space heat fuel conversions is equal to 25% of the cost of the measure. OEO funds the primary service mechanism delivered by the WAPs that enables Efficiency Vermont to piggy-back electrical efficiency services onto. Without this contribution by OEO and the WAPs statewide delivery mechanism, LISF services would be severely diminished.

Participants residing in Burlington Electric Department’s service territory receive non-WAP funding through the electric company. All reporting of costs and savings in Burlington is outside the scope of this report.

Low income services (including LISF, multi-family and other initiatives) spending has averaged between 15-19% of Efficiency Vermont’s total annual budget each of the last five years. This is in accordance with PSB Order #5980, which established the “energy efficiency utility” and associated contract performance indicators. One of these performance indicators called for a minimum of 15% of the total budget to be spent on low-income services (note: this includes multi-family services that are not captured in this report).

Best person to contact for information about the program:

- Jim Massie, LISF Market Manager

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*Comprehensive Low-Income Energy Efficiency Programs
Exemplary Program*

NHSAVES@Home, Home Energy Assistance Program

*Public Service of New Hampshire
Granite State Electric
New Hampshire Electric Cooperative
Unitil
Southern New Hampshire Services
Tri-County Community Action Agency
Southwestern Community Services
Belknap-Merrimack Community Action Agency
Rockingham Community Action Agency
Strafford County Community Action Agency*

PROGRAM BACKGROUND

The Low Income Retrofit Program (marketed as the *NHSAVES@Home, Home Energy Assistance Program*), began on July 1, 2002. This program is designed to help income-qualified customers manage their energy use and reduce their energy burden. The program is collaboratively implemented with several governmental and community organizations. Community action agencies (CAAs) are charged with determining program eligibility through income levels and number of household members. The same services are offered to all qualified candidates in the State of New Hampshire, regardless of utility.

The New Hampshire utilities developed a set of core energy efficiency programs that were approved by the New Hampshire Public Utilities Commission (NHPUC). Home Energy Assistance is included as part of these programs. Administration of the program is coordinated by the state's four electric utilities and delivered to customers by NH's six Community Action Agencies. By adopting a program design which incorporates the CAAs and the federal and state programs they operate, customers can receive up to 100% more services than they would with a program funded solely by the utilities.

The program leverages funding from several sources including Department of Energy Weatherization Assistance Program, Heating Replacement and Repair Program, the HUD Home Program via NH Housing Authority, Department of Environmental Services Oil Tank Replacement Program, local Gas company Retrofit Programs and the State of NH Community Development Block Grants.

The program process includes customer intake, scheduling and performance of the audit, the performance of quality assurance (QA) activities on 10% of participants following installation and services, and job close-out activities. The program offers improvements such as insulation, air sealing, thermostat replacement, electric hot water conservation measures, appliance and lighting upgrades and appropriate health and safety measures. The program also has an educational component specifically tailored for income-eligible customers and

designed to help them better understand their home and the factors that effect energy use. The program is coordinated closely with the Electric Assistance Program (EAP) and Fuel Assistance programs to help identify eligible customers. The program is marketed through the utilities, CAAs and other community agencies in three languages. While all income eligible customers may participate in this program, working with EAP participants to reduce their energy burden has the further benefit of increasing the EAP funds available to other customers.

The program is open to both single and multi-family households, regardless of heating fuel type. Utility personnel administer the program and contract for the delivery of program services. The table below lists the measures that are offered through the program.

List of Measures Offered in Home Energy Assistance Program

Measure
Appliance Timer
Air-Sealing
CFL
Lighting Fixtures
Torchieres
Thermostat
Heat Pump Tune Up
Insulation
Window (utility specific)
Refrigerator/Freezer
Waterbed Insulation
Water Saving Measures

The program uses a holistic approach to home weatherization using state of the art modeling software and data tracking to provide each customer with the “best practice” for their home. This software allows auditors to address each home holistically and treat each home uniquely, identifying and addressing all potential energy savings measures without compromising occupant health and safety. This software involves two components:

1) Targeted Residential Energy Analysis Tool (TREAT) is an energy analysis software tool that allows the field auditor to input site-specific information from which the software generates annual kWh and kW savings values, payback years and savings-to-investment ratios (SIRs) for individual measures or packages of improvements. It models air leakage improvements, fuel conversions, window replacements, added insulation, appliance and lighting upgrades, heating and cooling replacements, duct work improvements, hot water, ventilation, controls and more.

2) Online Tracking Tool for Energy Retrofits (OTTER) applies common New Hampshire utility avoided costs and measure life assumptions to the annual savings from TREAT to screen for cost effectiveness. It is a database-driven web application and is the common entry point for all users of the program to see the online tracking system. The program

provides the repository for all utility, customer, contractor, subcontractor, work order tracking, and quality assurance data that are to be common to all users.

The OTTER component was developed specifically for the New Hampshire utilities and was designed to ensure that all program participants receive consistent treatment and have access to the same efficiency measures regardless of the utility serving them. Data extracted from the TREAT/OTTER software is used to determine average savings and costs for each of the measures listed in the table above.

PROGRAM PERFORMANCE

The tables below summarize program results for 2004.

Table of Cost Effectiveness 2004

Customers Served	Annual Kilowatt Hours Saved	Lifetime KilowattHours Saved	Utility Program Cost	Customer Cost	Cost per lifetime Kilowatt Hour Saved
1083	3,338,087	56,747,489	\$2,390,373	0	\$.042

**Table of Average Savings per customer served 2004
Based on \$.115 per Kilowatt Hour**

Average Utility Cost per Customer	Average Annual Cost Savings	Average Annual Kilowatt Hours Saved	Average Payback in Years	Average Project Life
\$2,207.18	\$354.43	3,082	6.2 years	17 years

The program achieves relatively high electricity savings per household because it specifically focuses on electrically heated and high KWH use homes. Most of these homes use in excess of 3,000 KWH each month during the heating season. Many of these are multi family homes where the tenant does not pay for the heat—providing no incentive not to have the thermostat set relatively high in heating mode. Consequently, installation of electronic setbacks and "range programmable" thermostats yield significant savings. Home Energy Assistance provided services to many fossil fuel homes in 2003 and 2004, but the majority of homes were electrically heated. As the program matures it will provide services to greater numbers of fossil-fuel heated homes. In addition to the typical weatherization and envelope measures implemented for electrically heated homes, additional electricity savings are achieved from replacement of incandescent bulbs with CFLs, and installation of water flow restrictors for electrically heated water as well as installation of pool and appliance timers, where applicable. The program also replaces inefficient refrigerators and freezers with ENERGY STAR® products. Most homes in this program receive this full package of efficiency improvements.

Only minor changes have been made to the program. The program contribution per customer was originally capped at \$3,600. That was increased to \$4,000 in 2004. While the average home received somewhat less than \$2000 in cost effective measures, homes occasionally receive substantially more. Program staff found some customers had to be served over a two year span to “complete” the home. Increasing the cap allowed service providers to visit the home once, lowering administrative costs. If well managed, the program would work best with no cap.

The program organized a non-utility best practices organization to educate auditors and contractors involved in the delivery of energy efficient measures. The Residential Energy Performance Association (REPA) is an association of home energy raters and auditors whose mission is; “Facilitate sharing of energy efficiency technology while promoting uniform professional standards”. The purpose of this organization is to facilitate market transformation in New Hampshire by helping raters and auditors produce consistent, high quality audits and installations.

LESSONS LEARNED

- This represents the first time New Hampshire has had a common statewide program providing comprehensive fuel-blind safety and efficiency services free of charge to income eligible customers.
- Collaborating funds among all agencies has been highly beneficial to all program recipients. Leveraging DOE weatherization dollars and other federal and state dollars through community action agencies enabled the program to maximize the benefit to each recipient while keeping administrative costs low.
- Contractor involvement is important from the start. Seeking and using feedback from all users and managers has helped the program improve service and delivery.
- Taking a holistic approach and using modeling software and a tracking system that supports this approach provides each home with a unique mix of cost effective measures without compromising indoor air quality. Each home gets what it needs, no more, no less.
- Employing a reputable and passionate quality assurance (QA) contractor has improved all aspects of the program. This contractor continues to work with service delivery contractors to improve their technical knowledge and installation practices.
- Facilitating the creation of a “best practices” organization among contractors and sub-contractors can yield numerous program benefits. Such an organization should ultimately be run by the contractors, with utility representatives participating in meetings and other activities. Such an organization provides a forum where contractors can:
 - Share the best methods of dealing with typical and atypical weatherization issues,
 - Present issues and concerns to the utility as a group,
 - Introduce new technology and techniques,
 - Share success and failure stories, and
 - Train new contractors.

The program continues to improve each year and continually seeks new ways to help customers reduce their energy burden. Customer surveys show a high satisfaction.

PROGRAM AT A GLANCE

Program name: NHSAVES@Home, Home Energy Assistance Program

Program eligibility (guidelines): The program is open to all customers who meet the eligibility criteria for participation in the Fuel Assistance Program (185% of federal poverty), the NH Electric Assistance Program, the DOE Weatherization Program and anyone living in subsidized housing.

Program start date: The program began on July 1, 2002 as an eighteen month pilot. It has since changed to an annual program operating on a calendar basis.

Program participants: For the 18-month pilot period (June 2002—December 2003) there were 1,362 participants. In 2004 there were a total of 1,083 participants.

Approximate eligible population: While there are approximately 27,500 customers presently enrolled in the Electric Assistance Program, the eligible population is much higher and changes annually.

Annual energy savings achieved: 4,030 annual MWH for the initial 18-month period (June 2002–December 2003); in 2004 the program yielded 3,338 annual MWH.

Cost effectiveness: B/C ratio of 1.32 for July 2002 thru December 2003 and 1.97 for program year 2004.

Budget and cost information: \$3,273,660 for July 2002 thru December 2003 and \$2,390,373 for program year 2004

Funding sources and share of program budget: The program leverages funding from several sources including utility systems benefit charges, Department of Energy Weatherization Assistance Program, Heating Replacement and Repair Program, the HUD Home Program via New Hampshire Housing Authority, Department of Environmental Services Oil Tank Replacement Program, local Gas company Retrofit Programs and the State of New Hampshire Community Development Block Grants.

Best person to contact for information about the program:

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*Comprehensive Low-Income Energy Efficiency Programs
Exemplary Program*

New Jersey Comfort Partners Program

New Jersey Clean Energy Program

PROGRAM OVERVIEW

The New Jersey Clean Energy Program (NJCEP) was created in May 2001 as part of the Electric Discount and Competition Act (EDECA) and is operated under the direction of the New Jersey Board of Public Utilities (NJBPU). The NJCEP is a comprehensive portfolio of programs to promote and advance energy efficiency and renewable energy for both electricity and natural gas. In a joint and coordinated manner, New Jersey agencies, in partnership with energy utilities, energy businesses and environmental organizations, have developed and are implementing these programs. The programs are funded through a societal benefits charge—a non-bypassable fee assessed by the energy utilities at the point of use for both natural gas and electricity.

Within the Clean Energy Program, the New Jersey Comfort Partners (NJCP) program is one of several successful initiatives that was launched by the New Jersey Clean Energy Collaborative—a coordinated statewide effort by N.J. utilities and the Natural Resources Defense Council (NRDC). New Jersey Comfort Partners was built upon the best elements and significant achievements of preceding programs—i.e., Jersey Central Power and Light's (JCP&L) WARM program, Public Service Electric and Gas's (PSE&G) E-Team Partners program, and Conectiv Power Delivery's Comfort Connections program.

The Comfort Partners program has improved the energy affordability for approximately 26,000 low-income households that have high energy usage and spend a high percentage of their income on energy. The program employs a comprehensive whole-house approach using advanced building science diagnostics and treatment techniques to address all aspects of energy conservation and affordability in a single integrated approach. The program design allows for the installation of virtually any cost-effective energy-saving measure, provided it is effective, durable, safe, functional and aesthetically acceptable.

The Comfort Partners program is now integrating the primary participant outreach effort with the statewide Universal Service Fund (USF) that provides low-income residents with financial assistance for gas and electric bills. USF is administered by the New Jersey State Department of Human Services and is a percent of income payment plan and includes a debt reduction offer that provides low-income customers with a one-time opportunity to eliminate their past-due balance.

A Comfort Partners working group comprised of representatives from PSE&G, JCP&L, Conectiv Power Delivery, New Jersey Natural Gas, Elizabethtown Gas, and South Jersey Gas successfully developed a program material and installation specification manual and a procedures manual, selected service delivery contractors, and conducted initial program

training sessions. Each utility is responsible for meeting goals and paying for services delivered in its service territory. The working group developed both cost-sharing agreements and joint recruitment arrangements in overlapping service territories. The working group continues to meet regularly to steer program success and drive constant program improvement.

Comfort Partners requires service delivery contractors to conduct a comprehensive assessment of each customer's housing unit, to engage the customer in an effective partnership about the options for saving energy in the home and to install a comprehensive set of energy saving measures. Measure selection is determined by a spending guideline of *dollars per annual energy units used*, which establishes a cost-effective budget for each site. Within that budget, highly trained auditor-technicians, using state-of-the-art diagnostic techniques, develop a prioritized work plan which is implemented by Comfort Partners technicians and a network of specialty subcontractors including insulation, HVAC, plumbing and electrical. All program services are delivered within thirty days on average. Households with income below 175 percent of the federal poverty guideline or who participate in one of the following programs are eligible:

- Universal Service Fund (USF)
- Lifeline (a NJ Program for Seniors)
- LIHEAP
- Temporary Assistance to Needy Families (TANF)
- Supplemental Security Income (SSI)
- Pharmaceutical Assistance to the Aged and Disabled (PAAD, a N.J. Program)
- General Welfare Assistance
- Section 8 Housing

The utilities have different methods for conducting outreach and marketing for Comfort Partners. These functions differ by utility because of the characteristics of the populations that the utilities serve. With joint delivery, both electric and gas companies benefit if there is overlap because the Comfort Partners name is the same and the program message is consistent. The various methods are designed to work within each utility's infrastructure and target high-use customers. Beyond services within the scope of Comfort Partners, the auditor-technicians identify and link participants to a host of other available assistance resources from repair loans to food and childcare assistance. The program works cooperatively with a statewide network of community-based organizations to coordinate delivery of multiple assistance resources.

The working group is currently going out to bid for a three-year contract for multiple program delivery contractors. The two current service delivery contractors each have their own method for service delivery, based on their staff's skills and their infrastructure:

- *Bill Busters, Inc.* spends about one-half day conducting the first Comfort Partners visit. During this visit, it tends to install only a few items. Bill Busters usually schedules a second visit within days of the audit. All of the work on the home is completed in one to

three days, depending on the complexity of the job. Bill Busters does its own insulation work.

- *Honeywell DMC* (HDMC) uses a team approach. The team leader completes the first visit including education and diagnostic testing, determines the work plan, and then arranges for completion of the recommended work. An appointment is made for the HDMC crew to return to the home later in the day or later that week to complete most measures. Additional work is arranged through a network of professional subcontractors if insulation or trade work is required.

Site investment decisions are guided by a series of diagnostic tests including: blower door, zonal pressure, and pressure pan duct testing, gas leak, carbon monoxide, and backdraft health and safety testing, moisture level readings, appliance use monitoring and in some cases, HVAC system efficiency testing. The program delivers measures addressing all fuel sources including gas, electric, oil, propane, and even secondary fuels. This is achieved through the installation of measures improving building thermal performance (e.g., sealing against drafts and adding insulation). A wide range of measures and materials are used for addressing the house envelope including mastics, foams, caulks, insulating boards, Plexiglas, plywood, drywall, and a range of light construction materials. Envelope sealing measures can extend to window and door replacement. Contractors mostly use cellulose insulation blown into attics or dense packed into walls or floored spaces. Fiberglass batts are used to insulate kneewalls and crawl space ceilings.

Electric efficiencies are addressed through the installation of high performance lighting based on minimum burn hour standard and replacing inefficient refrigerators based on metering procedures. The program also repairs or replaces heating and air conditioning systems and thermostats. Domestic hot water-saving measures and hot water system repairs or replacement are performed in most homes. Individual customer energy education is also provided and participants are asked to partner with the program to develop and implement an energy-savings Action Plan. In addition, a wide range of health and safety concerns are reviewed, tested and corrected where problems are found.

Following are program-to-date statistics for frequencies for major measure installation groups:

Primary Measures	% of Homes Receiving Measure
Space conditioning measures	83 percent
Insulation (attic and wall)	69 percent
Refrigerator replacement	51 percent
Thermostat Installation	22 percent
HVAC Repairs	23 percent
Compact Fluorescent Bulbs replaced	92 percent

PROGRAM PERFORMANCE

The following criteria are used to judge performance:

- Number of eligible households treated.
- Energy savings impact evaluation based on pre- and post-treatment billing, consumption, and payment analysis.
- Average savings per participant (by housing type) based on consumption and pre- and post-treatment billing.
- Impacts on energy affordability of program participants are assessed based on bill and payment analysis.
- Comprehensiveness of treatment of efficiency opportunities (or, conversely, magnitude of missed opportunities).

In order to evaluate the program, all program-related interactions, relevant demographics, services provided and measures installed are maintained in data management systems. The systems manage the progress of the customer through the program, track program funds spent, and provide comprehensive invoicing and reporting capabilities to the program managers. All services and measures are tracked and billed on a per unit by customer basis.

Program participation was 6,558 households in 2004 and 26,039 households from program inception through the 1st quarter of 2005, not including 541 households treated during 2003 and 2004 through the Comfort Partners Seniors Pilot program. The Comfort Partners Seniors Pilot is a weatherization pilot for seniors with incomes up to 400% of the Federal Poverty Guideline and residing in all-electric homes in Monroe Township.

The N.J. Comfort Partners Program has undergone extensive evaluation including: tracking system evaluation, process evaluation, comprehensiveness evaluation, participant survey, affordability impact and usage impact.

During 2004 the program saved an estimated 594,200 therms and 6,786,000 kilowatt-hours for customers participating that year.

An initial energy saving analysis based on the 2002 program year indicated an average net savings of 787 kWh (or 11.7 percent) per year per participant for the electric base-load part of program. The average net savings in electrically heated households was 1,082 kWh per participant or about 8 percent of the average heating use. The net gas savings average was 82 ccf, equal to 6.9 percent of the average pre-treatment usage. The measured savings were much higher for higher use households with net savings averaging 171 ccf or 12 percent for households using more than 1,400 ccf per year.

The process and comprehensiveness evaluation found that the procedures manual, energy education notebooks, and materials specifications provide consistent statewide quality. They provide a commendable breadth of technical documentation to furnish necessary guidance for contractors.

Customer satisfaction with the program is high. A 2002 participant survey found that 96 percent of participants were somewhat or very satisfied with the program. An evaluation completed in May 2003 found similarly high levels of customer satisfaction. New Jersey

Comfort Partners provides effective and efficient coordination of all available assistance resources, which provides customers a “one-stop shop” for addressing household energy use.

LESSONS LEARNED

Like other leading programs, New Jersey Comfort Partners bundles a number of features such as energy education and installation of energy efficiency measures with health and safety and affordability services in one offering. Four New Jersey natural gas utilities deliver the program along with four electric companies and provide the same services throughout the state.

Certain program elements are designed to contribute to the comprehensiveness and improve the efficiency of service delivery. The key features that have made the program effective include:

- *Ready Access to Utility Bills*—The electric and gas utilities furnish the contractors with the customer’s electric and gas usage histories to facilitate identification of energy-saving opportunities and to target high-usage customers for program participation.
- *Customer Education*—The program pays for up to two hours of customer education at each site visit to ensure that the service delivery staff has the time to explain the service delivery procedures and motivate the customer to take energy-savings actions. The Working Group also developed an energy education notebook, a series of energy education training videos for contractors and purchased energy education cards from education consultants.
- *Testing*—The program pays for testing procedures during each phase of the service delivery to maximize the effectiveness of air sealing and duct sealing efforts and to ensure that the home is safe at the completion of service delivery.
- *Prioritization Standards and Guides*—The program specification documents furnish explicit standards of replacement of certain appliances and furnish guidelines for the priority among measure opportunities.
- *Measures Allowances*—Based on an analysis of electric and gas bills, a three-tiered measures allowance calculation gives the field crew guidance on the cost-effective spending for measures in a home with this usage level. Higher allowance expenditures are given for higher-energy-use homes.
- *Health and Safety Measures*—In addition to energy-savings measures, the program pays for the installation of certain health and safety measures. These measures are not always cost-effective in terms of energy savings, but they provide other societal benefits.
- *Professional forms and marketing*—The Working Group has developed a set of materials to be used in the field. These materials include a Comfort Partners folder that provides the contact number for the program and that holds the Application, the Landlord Permission Agreement form, a Partnership Agreement form, and an Action Plan form.
- *Quality Assurance*—Quality assurance is conducted both by third-party quality assurance inspectors and by the service delivery contractors. Quality assurance by the third-party inspectors occurs on 10 to 50 percent of installations providing for a systematic and objective inspection of the completed work and timely feedback to crews. In addition,

the inspections help to identify health and safety problems, measures installed incorrectly, missed opportunities and target subjects for future training.

Additional Insights from Evaluation

- Highest energy savings can be achieved when priority is given to the highest-energy-use homes.
- Replacing refrigerators even at a rate of 50% obtains cost-effective savings.
- Consider adding a formula to account for ambient room temperature when metering refrigerators for replacement.
- Sealing ducts in unintentionally heated spaces (i.e., basements) is not always cost-effective.

The New Jersey Comfort Partners program is complex, involving the NJ Board of Public Utilities staff, seven gas and electric utilities, two implementation contractors, two third-party quality assurance inspectors, and several subcontractors. In a similar context it could be replicated; it requires effective coordination and cooperation of multiple parties and program partners.

The program will be available throughout New Jersey with a goal of treating 7,000 eligible households in 2005 along with electric base-load measures in an additional 2,000 state Weatherization Assistance Program homes. Participant goals by utility have been established considering county population and the percentage of county residents who have incomes at or below 175% of poverty.

In 2004, the BPU took a more active role in the administration of the Clean Energy programs and will be responsible for program evaluation.

PROGRAM AT A GLANCE

Program name: New Jersey Comfort Partners program

Program eligibility: Households with income below 175 percent of the federal poverty guideline or who participate in one of the following programs are eligible:

- Universal Service Fund (USF)
- Lifeline (a NJ Program for Seniors)
- LIHEAP
- Temporary Assistance to Needy Families (TANF)
- Supplemental Security Income (SSI)
- Pharmaceutical Assistance to the Aged and Disabled (PAAD, a N.J. Program)
- General Welfare Assistance
- Section 8 Housing

Participation is prioritized by energy use with the highest energy users being served first.

Program start date: May 2001

Program participants: 6,558 in 2004; 26,039 participants to date through 1st Quarter 2005

Approximate eligible population: More than 300,000 households at 175% poverty

Participation rate: Approximately 2% annually and 9% for total participants to date

Annual energy savings achieved: 594,200* therms in 2004; 6,786,000* kilowatt hours in 2004

* Projected energy savings were capped during 2004 at 10% for each electrically heated home and 15% for each gas heated home.

Budget

Year	Program Costs*
2001	\$10,354,000
2002	\$13,268,000
2003	\$15,435,000**
2004	\$14,266,000
2005 budget	\$21,300,000

*Costs are for providing services to both gas and electric customers.

**includes seniors pilot costs.

Funding source: Non-bypassable societal benefits charge on all electric and gas bills

Best person to contact for information about the program

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- Web page: <http://www.njcleanenergy.com>

*Comprehensive Low-Income Energy Efficiency Programs
Exemplary Program*

WarmChoice

NiSource—Columbia Gas of Ohio, Corporation for Ohio Appalachian Development, Mid-Ohio Regional Planning Commission, Ground Level Solutions, and Neighborhood Housing Services of Toledo

PROGRAM OVERVIEW

Columbia Gas partnered with five community-based organizations (CBOs) to create “WarmChoice” in 1987 as a weatherization service for eligible low-income customers served by Columbia Gas. The partnering organizations are the Corporation for Ohio Appalachian Development, Mid-Ohio Regional Planning Commission, Ground Level Solutions, Lorain County Community Action Agency, and Neighborhood Housing Services of Toledo. The Ohio Department of Development provided match funding from Petroleum Violation Escrow (PVE) funds in early years of WarmChoice. To participate in the program, customers’ incomes must be at or below 150% of the federal poverty guidelines. Customers must also be eligible, or approved, for the Home Energy Assistance Program (HEAP), the Home Weatherization Assistance Program (HWAP), or Ohio’s Percentage of Income Payment Plan (PIPP). When possible, WarmChoice works in conjunction with the DOE Weatherization Assistance Program (WAP) operated by the Ohio Department of Development to combine resources to maximize energy efficiency opportunities in the homes of low-income customers. Beginning in 1988, Columbia Gas of Ohio has annually provided between \$4 and \$5 million to operate the WarmChoice program.

The Program’s guiding philosophy of offering comprehensive services enables the local weatherization community based organizations (CBOs) administering WarmChoice to provide eligible participants with a complete set of weatherization measures in order to reduce energy costs. The Program also focuses on health and safety measures to eliminate and replace antiquated, unsafe heating equipment, among other items.

The CBOs involved in the program employ trained inspectors who use blower doors, pressure gauges, combustion analyzers, gas leak detectors, energy conservation measure priority lists and their analytical skills to determine the appropriate set of energy conservation measures and heating equipment for each home. In addition, inspectors identify and attempt to eliminate potential health and safety risks within the home. Participants in WarmChoice may be eligible to receive:

- A home energy inspection
- Space and water heating system repair and/or replacement
- Attic, wall, floor, duct, water heater and water pipe insulation
- Blower door-directed sealing of major air leaks
- Safety inspections on gas-fired appliances

In most cases, the CBOs or their sub-contractors have certified technicians on staff to perform such work; otherwise private, for-profit subcontractors complete the heating and weatherization work. After heating-unit work, and again after envelope measures are completed, final inspectors or field supervisors inspect the completed work. Most inspectors and installers are trained at the Ohio Weatherization Training Center, operated by one of the Program CBOs (COAD) for the Ohio Department of Development. In addition, the Company itself performs quality control inspections on approximately 10% of all completions and uses infrared thermography to determine the completeness of sidewall insulation work.

PROGRAM PERFORMANCE

Over 45,000 families have participated in WarmChoice since its inception in 1987. The program progressed from a stand-alone service to one that permitted piggybacking of services with the DOE Weatherization Assistance Program in 1994. The most recent energy impact evaluation conducted showed control-adjusted NAC reduction of 396.8 ccf per customer with an average bill reduction of \$251.18.

Exemplary features and results of WarmChoice include:

- **Integral and regular evaluation:** Since 1991, Columbia has sponsored 13 evaluations of the WarmChoice program, including impact, process and persistence of savings evaluations.
- **Marketing:** Columbia provides WarmChoice providers with lists of eligible customers in order to market the program effectively.
- **Proven energy savings:** WarmChoice improved its average savings to customers from 13% in 1990 to 30.5% of pre-treatment Normalized Annual Consumption (NAC) in 1998.
- **Arrearage reductions:** Without targeting customers with high arrearages, the program still achieved an average annual net impact of the program was about \$60 and \$147 reduction in arrears during periods ending August 1999 and April 2001.
- **Effective partnerships:** WarmChoice was one of the first utility weatherization programs to use the low-income, community-based organization weatherization network to provide services. While WarmChoice was originally designed as a stand-alone service, in 1994 the program experimented with a cost-share (also referred to as “Combo” or “piggyback”) approach in which the program could share resources with the DOE Weatherization Assistance Program..
- **Data management/warehouse:** Columbia archives energy use, payment, arrearage and other customer data for all eligible customers and participants in a series of data tables in order to be able to provide customer marketing lists and for short- and long-term evaluation purposes. This data enabled Columbia to conduct a persistence of savings study in 2003.
- **Innovation:** WarmChoice was one of the first programs in the nation to require the use of blower doors and combustion analyzers during the inspection/audit process. WarmChoice was an early implementer of high efficiency replacement heating systems. WarmChoice integrated formal evaluation into its program design from the start, using the evaluation results to improve the program impacts. In addition, the program focuses

heavily on insulation measures, which are the key to achieving energy use reductions in the housing stock treated through the WarmChoice program. WarmChoice was nominated in 2004 for and received in 2005 the Ohio Governor's Award for Excellence in Energy Efficiency.

LESSONS LEARNED

- Program participants reduce energy consumption (by just over 30%), which leads to lower bills.
- Participants begin to pay down past debt and/or avoid accumulating new debt (average arrearage reduction of \$147).
- Energy savings persist over time resulting in a perpetual flow of program impacts. According to a persistence of savings study, WarmChoice homes weatherized between 1990 and 2000 show no deterioration in savings over a one to 11-year post-treatment period.
- Program cost effectiveness improved over time due to on-going monitoring and evaluation efforts.
- Homes treated by both WarmChoice and HWAP outperformed homes treated by either program individually by 2.5% and 19.2%, respectively.
- Energy savings improved over time (30.5% in 1998 versus 13% in 1990), while pre-Program consumption levels remained flat.
- Based on an analysis of 25,334 customer records, air leakage levels were reduced from an average of 4127 CFM50 to 1843 CFM50.
- Wall insulation and air leakage measures were used more often in homes with higher energy consumption
- Homes receiving both furnace treatments and insulation measures achieved greater savings than homes receiving just envelop treatments and were more cost-effective
- Homes with no pre-treatment attic insulation were most cost-effective
- Furnace treatments improved energy savings
- Pre-treatment energy use is highly correlated with post-treatment energy savings.

PROGRAM AT A GLANCE

Program name: WarmChoice

Program eligibility (guidelines): Customers' incomes must be at or below 150% of the federal poverty guidelines.

Program start date: 1987.

Program participants: About 1300 participants per year for most recent years.

Approximate eligible population: About 120,000 eligible customers.

Participation rate 45,000 customers have been served to date—about 38%.

Annual energy savings achieved: The most recent impact evaluation showed a reduction of 397 ccfs per customer—an average bill reduction of \$251. A program evaluation performed in 1998 found that the average savings per household to be 30.5%.

Cost effectiveness: According to the most recent benefit-cost analysis, WarmChoice had a net present value of cumulative benefit/total cost of 1.08.

Budget and cost information

Year	Program Costs
2003	\$5,090,000
2004	\$5,590,000
2005 (preliminary)	\$5,590,000
2006 (projected)	\$5,590,000

Funding source: Funding source from 1987-2003 was through a base rate charge. Funding from 2004-2008 is provided through a base rate charge and shareholder funds.

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- Web page: www.columbiagasohio.com

*Comprehensive Low-Income Energy Efficiency Programs
Honorable Mention*

EmPower New YorkSM

*New York State Energy Research and Development Authority
Honeywell Utility Solutions
New York State Electric and Gas and Niagara Mohawk—A National Grid Company
Cornell Cooperative Extension of Tompkins County*

PROGRAM OVERVIEW

During the past six years NYSERDA has successfully increased energy affordability for 12,881 low-income households by providing energy efficiency measures that achieve significant energy and demand savings. NYSERDA has now built an infrastructure that will allow it to serve an estimated 6,100 households this year alone. These services are provided through a network of weatherization agencies and private contractors, all of whom are certified by the Building Performance Institute (BPI). Average annual cost savings exceed \$150 per household over the entire program; for the 2,000 most recently completed projects annual savings are now averaging over \$230 per household.

To ensure that households see immediate energy savings, contractors can complete a number of pre-qualified measures during the initial visit, such as CFL and hardwired fixture installation, halogen torchiere replacement, set-back thermostat and hot water tank wrapping. Many jobs can be then completed quickly, with a single follow-up visit for appliance replacements or other measures. A simple energy savings calculator was developed to allow for a quick determination of measure cost-effectiveness. While the primary focus is on electric use reduction, the program addresses shell and heating system measures when the needed services are unavailable from other programs.

EmPower New YorkSM uses trained, certified contractors spread across New York State. BPI supports an infrastructure that can respond to the energy efficiency needs of all residential consumers. In addition to utilizing a “house as a system” approach while installing energy-saving measures, contractors address health and safety issues as the need arises.

EmPower New YorkSM has worked closely with the Weatherization Assistance Program (WAP), administered by the New York State Department of Housing and Community Renewal, and the weatherization agencies to ensure coordination of efforts and funding to maximize benefits to low-income households.

In July 2004 NYSERDA incorporated two utility-run low-income efficiency programs under its EmPower New YorkSM umbrella. This expansion included shell and heating system measures when they offer the best means to reduce the household energy burden and services through WAP are not available.

NYSERDA also established a protocol for the electronic transfer of monthly utility energy consumption data from the utility to the program implementer prior to installation to assist in identifying cost-effective measures. Recently the protocol was expanded to include post-installation utility consumption data. The electronic data transfer will be expanded to include all residential programs and will permit program managers to more easily verify projects are achieving predicted results.

A customer education component provides consistent energy education and awareness messages. Educational materials are provided through mail and through in-home education sessions provided by the BPI contractor network. The energy education is reinforced during statewide energy and money management workshops conducted by Cornell Cooperative Extension. These education components engage the customer to empower themselves by taking actions that will reduce their energy costs.

NYSERDA's programs are evaluated under a comprehensive plan approved by a 24-member System Benefits Charge Advisory Group representing varied interests, including utilities, business and environmental groups, energy service companies, community organizations, professional and trade associations, and national energy efficiency and energy research and development organizations.

PROGRAM PERFORMANCE

To date a total of 12,881 low-income households have received services. Summaries of the measures and savings are illustrated in the following tables.

Summary of Installed Measures

Measure	Number of units	Annual Energy Savings (kWh)	Annual Energy Savings (MMBtus)
Refrigerators	5,611	4,782,322	
CFLs	41,023	2,493,115	
Hardwired Fluorescent Fixtures	32,618	7,058,439	
Custom Measures	142	63,560	
Shell/Heating System	375		9,421
Total		14,397,436	9,421

The average annual energy savings per household exceed 1,100 kilowatt hours, which translates to an average annual energy cost savings per household exceeding \$150. The average total cost per household is \$960.

Coincident Peak Demand Reduction

<u>Installed Measures</u>	<u>Megawatt Reduction</u>
Lighting	.5
Refrigerators	1.4
Total	1.9

The reported energy and demand savings are consistent with results confirmed by NYSERDA's measurement and verification contractor. The M&V contractor evaluated the procedures for calculating, tracking, and reporting energy and demand savings on the first 10,236 units. In general, the savings calculations and methodology were found to be based on reasonable engineering assumptions and accepted M&V practices. Additional M&V activities on more recent project completions are planned.

LESSONS LEARNED

The blueprint for the EmPower New YorkSM program began with involvement from multiple organizations (regulators, utilities, administrators, implementers, weatherization agencies, and contractors) whose input was incorporated into the design. The program was created with a solid backbone of policies and procedures to keep it consistent across multiple utilities and contractor territories, while allowing for customization to meet the individual needs of customers and different requirements of the participating utilities.

This communication allowed for partnering with other state and local agencies to leverage multiple funding sources in an effort to package the most cost-effective energy solutions and to minimize customer inconveniences.

Features that have been especially important for the program's success include:

- A web-based referral system incorporates reporting, tracking and work scope approval. It also provides contractors with pre and post utility billing data.
- The quality assurance/quality control component provides a feedback loop for contractors that allows for continuous improvement.
- The wide menu of electric efficiency measures, such as refrigerator and freezer replacement, waterbed replacement and hardwired lighting, strengthens the cost effectiveness of the program. The program also looks at new, emerging technologies for inclusion in the program. Non-electric measures are pursued when that is the most effective way to reduce household energy costs.
- The energy education involves the customers in identifying and committing to energy saving strategies that are appropriate for their home.
- Customer surveys prior to implementation allow the program to target homes where the greatest opportunities exist.
- A simple energy savings calculator was created to allow for fast decision making for measure selection.
- Energy auditors can install a number of pre-qualified measures during the first visit.

Through EmPower New YorkSM, NYSERDA has created opportunities to serve families that were not eligible for services under existing programs. It expanded the infrastructure of trained contractors by creating this business opportunity. EmPower New YorkSM yields benefits both the households it serves and has expanded economic activity in the state by helping to build and expand the infrastructure of providing home energy services.

PROGRAM AT A GLANCE

Program name: EmPower New YorkSM

Program eligibility: Households below 60% of the state median income that are either: enrolled in the utility payment assistance programs; seniors with high energy bills referred by a local Office for the Aging; previously served by weatherization and currently ineligible for electric reduction measures; or on a weatherization waiting list exceeding six months in length.

Program start date: 1999.

Program participants: Currently 6,100 per year.

Approximate eligible population: An estimated 10,000 households are referred for services annually.

Participation rate: Approximately 60% of those referred for services are provided with energy efficiency measures.

Annual energy savings achieved: Cumulative annual savings achieved to date are 14,397 MWh.

Cost effectiveness/benefits: Average annual energy savings per household exceed 1,100 kilowatt hours—an average annual cost savings greater than \$150.

Budget and cost information

Year	Program Costs (in millions)
1999–2002	\$10.0
2003–2004	\$4.5
2005	\$5.5
2006 (projected)	\$7.5

Funding source: Systems benefit charge and funds leveraged from other state and federal programs.

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*Comprehensive Low-Income Energy Efficiency Programs
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Energy Savings Partners

*Governor's Office of Energy Management and Conservation—State of Colorado
Xcel Energy
Colorado Low-Income Home Energy Assistance Program—Colorado Department of
Health and Human Services*

PROGRAM OVERVIEW

The Energy Saving Partners (ESP) Program is a partnership between the state's low-income weatherization program and Colorado's largest electric and gas utility company. (Xcel Energy serves approximately 70% of the households in Colorado.) The government-funded weatherization program provides the service delivery infrastructure, including client outreach/intake, staff training, the provision of tools/equipment, quality assurance activities, related health & safety services and general management. The utility funds are targeted exclusively at cost effective energy conservation investments concerning electricity and gas consumption. The Colorado Public Utilities Commission approved ESP in 1992, and the program began in 1993.

Significant resources are dedicated to instilling and reinforcing technical competencies within the local field staff. A training center has been established, providing training in combustion appliance testing/performance modification, basic principles of weatherization and various insulation techniques. The center is also capable of designing and producing training videos, thereby improving the reach of the training efforts.

Currently the partnership reaches approximately 4,000 households per year, of which approximately 2,600 are Xcel Energy customers. Services are available to homeowners and renters with incomes at or below 185% of the federal poverty definition. For each Xcel Energy customer served, the local agency receives \$1,000 from Xcel. All other expenses are covered via the government funds (U.S. DOE Weatherization and U.S. HHS- LIHEAP funds). The Colorado program effectively delivers weatherization services in a wide variety of climates (from 5,000 to over 10,000 heating degree days) and from dense urban areas to extremely sparse rural communities. The program has also pioneered effective strategies for significantly reducing the heating costs of mobile homes.

The services provided include the following, which are performed as indicated per auditing calculations: combustion safety testing; building shell air leakage reduction; building shell insulation (attic, sidewall, underfloor/perimeter); incandescent bulb replacement with CFLs; refrigerator replacement; heating system adjustments (and occasional replacement for safety reasons); occasional fuel conversions (from Xcel electricity to Xcel gas for water and space heating). ESP also provides selected health and safety services, within U.S. DOE WAP regulations, such as repair or replacement of unsafe combustion appliances (space and water

heating systems), replacement of gas flex connectors and electrical system upgrades (as necessary and cost-effective when installing insulation or replacing a refrigerator).

E\$P “piggybacks” upon the existing DOE Weatherization Assistance Program (WAP), which has been operating in Colorado since 1976. Colorado’s WAP began as a program focusing primarily on doors and windows, with limited insulation and air leakage work. It evolved during the 1980s and 1990s into a highly technical program with substantial emphasis on training of in-house crews and reliance on energy auditing principles. E\$P grew out of regulatory proceedings before the Colorado Public Utilities Commission. As part of a 1991 rate increase filing by Public Service Company of Colorado (now Xcel Energy), the PUC opened the “Low-Income Docket.” Within this docket the utility was asked to review existing low-income customer services and propose programs/strategies for improving these services.⁶

The E\$P concept was proposed as a way to: (1) increase the number of Xcel customers served (relative to what WAP could serve); (2) concentrate the utility’s investment on direct services (materials and installation labor) by using the WAP infrastructure, thereby improving the utility’s return on investment, and (3) allow for the inclusion of cost effective measures not yet allowable under WAP rules (such as fuel conversions and lighting retrofits). The program was approved in December 1992 and implemented by April 1993. The utility and state co-manage the partnership, with both parties establishing contractual relationships with the same local service providers.

The State of Colorado continues to manage the “core” program. This includes: establishing the technical standards and program policies; annually soliciting and negotiating proposals; providing technical and administrative training and monitoring performance. Xcel Energy is able to bring the resources of its utility operations to bear upon improving program performance. Xcel Energy assists with outreach via its customer communications channels and has assisted the program to implement “Total Quality Management” principles into state and local operations.

PROGRAM PERFORMANCE

The Xcel Energy funding results in approximately 1,000 additional Xcel Energy customers receiving residential energy efficiency services each year (beyond the government funding). The utility’s involvement in the program has also served to expand the program’s focus from strictly home heating to also including non-heating related electricity consumption (lighting and refrigeration).

⁶ Colorado PUC Decision No. C92-1519 regarding Docket No. 91A-783EG. Key points:

- Approved the partnership concept for delivering low-income residential energy conservation services.
- Called for selection of the service delivery contractors via competitive bidding, starting in the second year.
- Deemed the program a component of the utility’s overall DSM initiative; affirmed it to be cost effective per the TRC test.
- Allowed for a utility incentive of \$60 for each completed unit.
- Provided for cost recovery via a DSM cost adjustment.

Xcel Energy reports annually to the Colorado Public Utilities Commission on the E\$P Program. The program is evaluated using a Total Resource Cost (TRC) calculation.⁷ In its most recent filing (March 2, 2005), Xcel reported a TRC value of 1.12:1 for the period July 1, 2003—June 30, 2004 (\$1,106 in benefits against \$942 in costs). This value includes both energy and non-energy benefits (debt reduction and arrearage savings).

Since 1993, Xcel Energy (formerly Public Service Co. of Colorado) has provided up to \$2.6 million per year for E\$P services. The balance of the funding is provided via federal grant sources: U.S. Department of Energy Weatherization Assistance Program (currently funding at \$5.4 million/year) and a portion of the Low-Income Home Energy Assistance Program (LIHEAP) block grant funds received by the state (currently contributing about \$4.4 million/year).

The program's success can be attributed to a variety of factors; these include:

- The program achieves demonstrable benefits, both for the utility and the customers/clients.
- The cost recovery design is innovative in that it uses financial incentives to encourage the utility to make this program a priority. The costs incurred are recoverable on an accelerated schedule and a bonus of \$60/home served is included in the recovery.
- The program design allows both partners to meet their specific objectives while supporting each other. The utility is focused upon utility system benefits. It is able to target its investments toward sound investments by taking advantage of the existing weatherization infrastructure. Thus, the utility is able to consistently achieve positive returns on investment. The state is driven by a more macro definition of return on investment, taking into account societal benefits, such as reduced demand for fuel bill assistance; reduced injury/illness/mortality associated with unsafe heating practices; and reduced homelessness due to unaffordable living situations in addition to the very direct energy benefits (principally reduced energy costs) to clients served by the program.
- The government program continues to excel at creating a skilled labor force and has informally “set the standards” for services provided by private sector residential energy service companies.
- The partnership approach to program management allows each party to bring its best practices into the relationship. The state excels at technical training of semi-skilled laborers and related quality assurance practices. The state has also maintained an effective weatherization service delivery system for over 20 years. The utility is proficient at marketing, thus improving client outreach, and project management; “total quality management” techniques have been implemented throughout the program statewide, serving to improve the entire system's focus upon maximizing return on investment.

⁷ While reported as a TRC, the exact calculation is more of a “Utility Cost Test” with the utility's investment compared against total program benefits.

LESSONS LEARNED

- E\$P has begun to use generic priority lists to determine which measures to install in clients' homes instead of site-specific audits on every unit. The reason is because program staff most often see similar housing types throughout the state and the measures to be performed on the various types of housing are the same. Therefore, program staff generated a number of generic priority lists to address the needs of the vast majority of the units served, saving the crews a lot of time and saving the program money that can be channeled into more homes weatherized and/or more services.
- In anticipation for a large reduction in federal funding for Colorado's weatherization program, E\$P went through a massive restructuring in 1996-1997 in an attempt to reduce the number of agencies providing services throughout the state, thus reducing the overhead costs of the program, and freeing up more dollars to be put into weatherized units. This restructuring resulted in eight agencies and five satellite offices delivering services throughout the state, as opposed to 19 agencies. This program structure has continued to work well for Colorado.
- E\$P added refrigerator replacements to its list of services January 1, 2003. Offering refrigerator replacements enhances our services to our clients by reducing their home's electric baseload, as well as reducing gas consumption. Our clients have been thrilled with the program since it gives them a brand new appliance while also lowering their utility bills.
- The State's agreement with Xcel Energy includes a flat rate reimbursement per Xcel home serviced. An improvement from the State's perspective would be to base the reimbursement on a percentage of certain costs (materials & labor) since all homes don't need the same level of service.

The agreement between Xcel Energy and the State of Colorado is slated to end 12/31/06. Negotiations are underway to extend the agreement.

PROGRAM AT A GLANCE

Program name: *Energy Savings Partners*

Program eligibility (guidelines): Services are available to homeowners and renters with incomes at or below 185% of the federal poverty definition.

Program start date: April 1993.

Program participants: Approximately 4,000 customers per year statewide; about 2,600 of these are within Xcel Energy customers.

Approximate eligible population: According to 2000 Census, there are approximately 363,991 households in Colorado whose incomes fall below 185% of the federal poverty guideline.

Participation rate: For the 2005–06 Program Year, E\$P plans to complete weatherization services on approximately 3900 homes. Total homes served by weatherization since program inception (1976) is over 80,000—meaning that approximately 22% of the eligible population in Colorado has been served by this and predecessor programs. Because of the partnership agreement, over 11,000 more Xcel customers have received services than would have occurred if only the federally-funded program had been operating.

Annual energy savings achieved:

Program Year	Total Units Weatherized From DOE Funds*	Total Units Weatherized From All Funds*	Estimated savings per unit in Mbtu**	Estimated Total Annual Savings from DOE Funds in Mbtu	Estimated Total Annual Savings from All Funds in Mbtu
2005-06	3562	3902	21.3 Mbtu	75871	83113

* Total Units Weatherized is based on the Proposal information for each program year. The actual number of units reported to DOE will be used in the algorithm as they become available.

** For the 2005-06 program year, a statewide average of 247 ccf's x 863 Btu's/ccf = 213,161 or 21.3 Mbtu.

Cost effectiveness: In its most recent regulatory filing Xcel reported a TRC value of 1.12:1 for the period July 1, 2003—June 30, 2004. This value includes both energy and non-energy benefits (debt reduction and arrearage savings).

Budget and cost information

Year	Program Costs
2003	\$ 12,256,108
2004	\$ 13,204,849
2005 (preliminary)	\$ 13,623,176
2006 (projected)	\$ 12,922,197

Funding sources and share of program budget: Xcel Energy contributes \$1,000 to every unit weatherized by the program that is heated by Xcel Energy. Colorado HHS's LIHEAP program gives 15% of their budget to E\$P to weatherize LIHEAP homes.

Best person to contact for information about the program

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*Comprehensive Low-Income Energy Efficiency Programs
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Residential Energy Affordability Partnership Program

Long Island Power Authority

PROGRAM OVERVIEW

Developed by the Long Island Power Authority (LIPA) as a component of its energy portfolio of energy conservation programs, the Residential Energy Partnership (REAP) Program addresses LIPA's concerns for energy affordability on Long Island and its high living costs. Eligibility for program benefits exceed the usual 150% of the poverty guidelines offered by most similar programs and extends to 60% of the area median income. This expands program eligibility and thereby allows the program to address the needs of customer classes not normally reached by these programs, such as the working poor and seniors on fixed incomes. At the same time, this has provided an outreach challenge as these particular customer segments often "falls through the cracks" when using standard marketing methods.

The program is designed to improve energy affordability for LIPA's lower income households in two ways: (1) installing cost-effective energy efficiency measures, and (2) providing extensive in-home energy education and counseling. Modeled after successful programs in other parts of the country, REAP utilizes both a private contractor (Honeywell Utility Solutions, Inc.) and the local weatherization provider (Community Development Corporation of Long Island) to offer qualifying customers free installation. Energy efficiency measures such as air sealing, insulation, refrigerators, central air conditioning duct repairs, filter replacement, and lighting, as well as other custom measures are installed when determined to be cost-effective. Through its integrated approach, the program seeks to make energy bills more affordable for participating households.

The program also includes establishment of "partnerships" between the customer and LIPA. Each "partner" makes mutually beneficial commitments to help each other's needs with respect to energy consumption, management, efficiency and bill payment. In the partnership, LIPA provides substantial electric efficiency investment, and extensive customer energy education and counseling.

This program has also yielded another kind of partnership that has resulted in a management culture of continual improvement. LIPA management, evaluators, providers and other parties have continued to look at program results with a cooperative and open eye towards constant improvement. This has resulted in increased savings per site, increased cost effectiveness (as measured by better energy savings/costs ratios) and more effective program implementation. Some of the specific changes include new and more flexible installation measure selection protocols, elimination of a tiered delivery system in favor of a more holistic approach, and increased marketing presence in the community as well as with the community based agencies.

Specific program goals are to:

- Achieve maximum level of cost-effective energy savings possible in each participant's dwelling.
- Achieve persistence of energy savings through effective energy education and appropriate choice of efficiency measures.
- Improve participant bill payment capability and bill payment practices.
- Improve participant comfort, health and safety.

Program implementation contractors install electric efficiency measures using "smart protocols" to determine site-specific cost-effectiveness. Diagnostic tools, such as blower-doors, CO and gas leak detectors, and pressure-differential gauges, also are used by field implementation staff to determine appropriateness of otherwise cost-effective building shell measures to ensure occupant health and safety.

The income-eligibility threshold, currently 60% of area median, is periodically reviewed for suitability in meeting utility needs. Units in multi-family buildings must be individually metered and each customer must have an individual LIPA account.

LIPA has leveraged the federally funded Low-Income Weatherization Assistance Program (WAP) so that approximately 400 low-income households in LIPA's service territory receive both REAP and WAP services each year. In coordination with Community Development Corporation of Long Island (CDCLI), WAP-eligible customers (incomes at or below 60% of NY state, versus Long Island, median income) receive REAP services directly through the WAP delivery network under a separate contract between CDCLI and LIPA. By leveraging both the WAP and REAP dollars, CDCLI participants are getting the benefit of having their homes weatherized, regardless of heating fuel, while also receiving electric energy efficiency measures under the REAP program.

Offered in an area where low income residents are exceptionally hard pressed to make ends meet, this program not only reduces their energy cost burden but goes beyond to address the human issues where possible. By including a full-time social worker, the program implementers have resources to help address these equally important human issues which also affect customers.

PROGRAM PERFORMANCE:

The REAP Program was initiated in February, 2000 and has consistently exceeded the participant, MW and MWh goals for each year. The following table summarizes program performance to date and annual budgets.

Year	Jobs	MW	MWh	Budget Actuals
2000	2,848	0.2144	2,267	\$1,535,171
2001	4,250	0.3500	3,991	\$2,284,713
2002	4,201	0.4458	4,312	\$2,226,779
2003	4,485	0.5661	4,450	\$2,296,906
2004	4,599	0.7002	4,773	\$2,436,880
Totals	20,383	2.2764	19,794	\$10,780,449

The success of REAP may be traced to its program design. Unlike earlier generations of electric utility programs, it does not rely on identifying a prescriptive set of so-called “typically” cost-effective measures. Nor does it provide artificial caps on expenditures. The underlying principle behind the REAP design is that any, and all, cost-effective measures should be installed for each qualifying household addressed. Further, instead of a static program design, feedback from installers and evaluators is used to continually refine program delivery mechanisms and other aspects of its design. Installation protocols are also adjusted to reflect changes in pricing and in utility avoided costs. The program also explicitly acknowledges the need for strong community ties and support by directly contracting with the local community-based organization for a portion of the annual participant goal (approximately 10%) as well as by employing social workers to establish and maintain community relationships. LIPA REAP participants, routinely provide unsolicited testimonials, praising both the program and its sponsoring utility.

LESSONS LEARNED

- Program policies/procedures are not “cast in stone”. The program manager and implementation contractor work collaboratively, along with the program consultant, to promote continual program improvement, while maintaining the core principle that all cost-effective measures (based on avoided cost) are eligible for installation and encouraged, including custom measures.
- The addition of the Social Worker to the program team has been very beneficial to the program. She not only promotes the program to local agencies but she can help customers who are in need of other services, beyond REAP, and refer them to the agencies for further assistance.
- Given this program culture, changes have been initiated from a variety of sources including implementation field and administrative personnel, outside evaluators and even participants
- A key element to the program’s success and replicability is the utility’s commitment to a program that does not place artificial barriers to comprehensive treatment for a given participant, independently of cost-effectiveness, such as restricting the number or type of measures that may be installed.

PROGRAM AT A GLANCE

Program name: Residential Energy Affordability Partnership Program (REAP)

Program eligibility (guidelines): 60% of the area median income.

Program start date: February 2000

Program participants: Since its inception, REAP through 2004, REAP has provided services to 20,383 customers. The table below gives annual data.

Program Year	Participating Households
2000	2,848
2001	4,250
2002	4,201
2003	4,485
2004	4,599
Total	20,383

Approximate eligible population: At least 260,000 households based on 1999 data from the New York Data Center

Participation rate: 7.8% of the estimated eligible households have been served over 5 years.

Annual energy savings achieved:

Program Year	MW savings	MWh savings
2000	0.2144	2,267
2001	0.3500	3,991
2002	0.4458	4,312
2003	0.5661	4,450
2004	0.7002	4,773
TOTAL	2.2764	19,794

Cost effectiveness:

- Cost per kWh saved, all costs included = \$0.545/kWh for year 2000 savings (1st year savings—not life-cycle).
- Program averages, 2000-2004 = \$529 total program cost per participant and an average savings of approximately 1,000 kWh and 0.112kW per participant. In 2004 the average customer will save about \$129.70 per year in energy costs.
- Third party evaluations suggest high satisfaction rates with the program across customer classes

Budget and cost information:

Year	Program Costs
2003	\$2,296,906
2004	\$2,436,880
2005 (preliminary)	\$2,500,000
2006 (projected)	\$2,500,000

Total program expenditure through 2004 is \$10,780,449 and is expected to average approximately \$2,500,000 annually during the 2005–2008 authorization period.

Funding source and share of program budget: REAP is part of the Clean Energy Initiative portfolio of programs authorized by the LIPA board of Directors in 1998 and re-authorized in 2004. Funding is through utility rates.

Best person to contact for information about the program:

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*Comprehensive Low-Income Energy Efficiency Programs
Previously Selected Exemplary Program*

Low-Income Gas Program

NSTAR Gas Company

PROGRAM OVERVIEW

The Residential Low-Income Program offers weatherization measures to NSTAR's neediest customers. The objective of the program is to increase energy efficiency and reduce the energy cost burden for low-income customers through energy efficiency education and the installation of gas energy efficiency measures. The weatherization services available include an energy audit, attic insulation, wall insulation, air sealing, heating system repair/replacement (on a qualifying basis), and safety inspections. The program allows each eligible customer to receive up to \$4,500 for these measures. When possible, the program is leveraged with Department of Energy (DOE) weatherization funds.

The program is administered by NSTAR in conjunction with the South Middlesex Opportunity Council (SMOC), which is the lead vendor. NSTAR works closely with SMOC on all aspects of program design and implementation. Community Action Program (CAP) agencies are responsible for providing the actual weatherization services to the customer. The CAP agencies work with installation contractors to ensure that proper program guidelines are enforced. They are also responsible for ensuring that the customer meets the eligibility requirements for program participation. The CAP agencies provide SMOC with the required documentation of all work performed.

This program directly targets residential low-income customers with annual incomes at 60% of the Massachusetts median income level. NSTAR Gas works with the CAP agencies to market the program to qualifying customers in its service area. Priority is given to high use (high-energy burden) customers.

Various methods of marketing are used to promote this program. NSTAR markets the program via bill inserts and messages, marketing brochures, and literature, company newsletters, and the Company web site. Marketing efforts are also conducted by the CAP agencies. While telemarketing proves the most effective, direct mail and community events are also used.

Currently, NSTAR and other Massachusetts utilities and low-income advocates are working collaboratively to sponsor a marketing campaign intended to increase participation levels in the discount rate, energy efficiency, and fuel assistance programs for customers who are income eligible.

NSTAR Gas has offered this program for low-income single-family households since November 1996. The company added a multi-family component to the program in May 2001.

NSTAR works collaboratively with the Massachusetts Division of Energy Resources (DOER), the Low Income Energy Affordability Network (LEAN), and the Massachusetts Department of Telecommunications and Energy's (DTE) Settlement Intervention Staff in the design of its energy efficiency programs. A Joint Motion for Approval of a Settlement Agreement is then submitted to DTE for final approval. The NSTAR Gas energy efficiency programs are currently in the third year of NSTAR Gas' three-year pre-approval period.

NSTAR Gas recovers its energy efficiency costs, along with any applicable incentives and lost margins, through the conservation charge (CC) cost recovery mechanism reviewed and approved by DTE.

PROGRAM PERFORMANCE

The company has realized great savings through the low-income programs. Since May 2001, this program has saved over 96,500 therms, which is equivalent to heating over 98 homes in Massachusetts for one year. Further, the program produces other non-energy benefits for customers who participate. Struggling low-income customers who pay their own bills not only save energy through NSTAR's program, but also save money that can be put toward other essential household expenses. In addition, their weatherized homes provide greater levels of comfort, health, and safety as a result of the measures implemented through the program.

The program's success was publicly recognized recently when it received a 2003 award by the Worcester Community Action Council for low-income services provided to residents of Worcester County, Massachusetts.

For the period May 2001 through April 2003, the program served 770 customers, saving an estimated 96,500 therms annually. While there is no formal survey process in place, SMOC and their sub-contracting agencies providing services to the customers have received very positive feedback from customers who have realized significant savings and assistance through these programs.

LESSONS LEARNED

One element that contributed greatly to the success of the low-income gas program was the addition of the multi-family component. Prior to 2001, the low-income program only served single-family units; multi-family units at that time were handled by the Energy Conservation Services (ECS) program regardless of income level. Recognizing low-income multi-family dwellings as an underserved market, NSTAR worked closely with the low-income network to develop a unique extension of the single-family program. As a result of adding the multi-family element, NSTAR has reaped the rewards of great publicity. On November 20, 2002, SMOC held a grand opening for a shelter it opened in Framingham, Massachusetts. The completely renovated building provides housing for twenty-four clients as part of an 18-month transitional program. NSTAR was noted for its significant contribution to this project by providing funding for heating equipment through the Low-Income Multi-Family Gas Program.

Ramp-up for this type of program may be time consuming in the planning stages, but overall is not very complicated. Whether it is working with low-income agencies at the federal or state level, or even down to the community level, an interested utility/organization simply needs to meet with the appropriate stakeholders to develop a program that meets the needs of their customers. Many of the agencies already provide services for the low-income sector; therefore, the utility/organization may be able to subsidize or enhance efforts already being conducted.

Having a good working relationship with the vendor providing services is key to having a successful program. In particular, working with the local weatherization network helps to overcome possible skepticism of a utility-funded program and encourages customers to take advantage of community-based resources. SMOG and NSTAR continually strive to improve their low-income programs and the services provided to their customers.

PROGRAM AT A GLANCE

Program name: Low-Income Gas Program

Targeted customer segments: Low-income gas customers in single- and multi-family housing

Program start dates: Low-income single-family = November 1, 1996; low-income multi-family = May 1, 2001

Program participants: 770 customers between May 1, 2001 and April 30, 2003; total since program inception (1996): 1,876

Approximate eligible population: 18,000 customers

Participation rate: About 10% of eligible customers have been served by the program since its inception.

Annual energy savings achieved

Year	1997	1998	1999	2000	2001	2002
Annual Savings (therms)	34,150	81,660	37,740	90,710	58,527	37,977

Program cumulative total = 340,764 therms

Other notable measures of program results to date

The benefit/cost ratios have been calculated using the Total Resource Cost (TRC) test, as specified by the guidelines established by DTE. The TRC test, which includes the value of avoided gas supply, transmission, and distribution costs, also takes into account the direct economic benefits and costs of a program to participating customers.

Lifetime impacts of measures installed from 2003 through 2013 as filed in its Annual Report are:

- Low-Income Single Family
 - Benefits (2003\$) = \$3,430,797
 - Costs (2003\$) = \$1,668,747
 - B/C Ratio = 2.06

- Low-Income Multi-Family
 - Benefits (2003\$) = \$1,469,947
 - Costs (2003\$) = \$922,450
 - B/C Ratio = 1.59

Budget and cost information

Year	Budget/Actual Program Costs
2001	\$739,000/\$800,072
2002	\$813,000/\$740,166
2003 (preliminary)	\$1,000,000/NA
2004 (projected)	\$1,000,000/NA

Funding source: NSTAR Gas recovers its energy efficiency costs, along with any applicable incentives and lost margins, through the conservation charge (CC) cost recovery mechanism reviewed and approved by DTE.

Best person to contact for information about the program:

- Colleen Lovejoy
- NSTAR Gas Company, One NSTAR Way, SW360, Westwood, MA 02090
- Telephone: 781-441-3875
- Fax: 781-441-8168
- E-mail: colleen_lovejoy@nstaronline.com
- Web page: www.nstaronline.com

*Comprehensive Low-Income Energy Efficiency Programs
Previously Selected Exemplary Program*

Low-Income Usage Reduction Program

National Fuel

PROGRAM OVERVIEW

The Low-Income Usage Reduction Program (LIURP) is a mandated program designed to establish a fair, effective, and efficient energy usage program for low-income customers in Pennsylvania. All major natural gas distribution companies are required to offer programs to address low-income customer needs. This requirement is further supported by Pennsylvania's natural gas choice legislation. The Pennsylvania Public Utility Commission has regulatory oversight over the individual company programs. The regulations mandate specific activities and services, including program announcement, solicitation, income eligibility verification, energy audits, installation of efficiency measures, consumer education, post inspection, and program evaluation. However, each gas distribution company has flexibility in how it approaches provision of these services and what methods it employs to meet objectives of the regulatory mandate. As a result, there are many differences among the mandated programs.

National Fuel's program has been particularly effective at serving low-income customers under the requirement of LIURP. National Fuel's program objectives are to conserve energy; reduce residential energy bills; and improve the health, safety, and comfort levels for participating households. The reduction in energy bills should decrease the incidence and risk of payment delinquencies and the costs associated with uncollectible accounts, late payment collections, and termination of service expenses.

Households participating in National Fuel's program receive a full package of services, which include a heating system check, an energy audit, consumer education, installation of weatherization and infiltration measures, and a post-installation inspection by a National Fuel Representative.

Measures chosen must not exceed specified "payback" periods. National Fuel collects data on consumption and payment behavior for the 12-month periods before and after program measure installation for evaluation purposes.

Eligibility requirements for LIURP are:

- Income under the 200% federal poverty guidelines.
- Natural gas consumption must be a minimum of 130 Mcf (thousand cubic feet) per year.
- Must be in arrears for a past due balance.
- Must have been an active account and resident of the household for at least one year prior to weatherization.

Some LIURP funds are available for a corollary program, Heating/Water Heating Repair or Replacement. This program allows for the repair or replacement of faulty, hazardous, or non-operational primary heating/water heating equipment for certain National Fuel customers who meet the following eligibility requirements:

- Active account using natural gas for heat.
- Income under the 200% federal poverty guidelines.
- Owner/occupant living in particular household at least one year with the intent of living in the dwelling at least a year after measure installation.
- Renters (tenants) are not eligible.

Clients under the Heating/Water Heating Repair or Replacement Program are screened and referred to National Fuel by the agencies that administer the Neighbor-for-Neighbor Heat Fund. Due to funding limitations, customers receive priority on a first-come, first-served and needs basis throughout National Fuel's territory. A National Fuel representative or contractor visits the homes of clients to initiate services. If only repairs are necessary, the qualified heating contractor immediately corrects the problem. If the equipment has been tagged, shut off, or cannot be repaired, the representative or contractor will verify the problem and properly size replacement equipment. In a majority of cases where installation of new equipment is warranted, the customer also may be eligible for LIURP weatherization. If applicable to LIURP, the equipment is sized as though the home has already been weatherized. Soon after the equipment installation, weatherization is performed. This procedure assures that the new equipment will not be oversized while it addresses the hazardous or no-heat situation immediately.

Normally the arrangement to repair or replace the equipment is made within 48 hours of referral notification. In many instances, additional work is required to improve efficiencies or to have a safe, proper installation. These may include piping changes, addition or revamping of duct work, and thermostat changes. Replacements will not be made where malfunctioning was caused by physical abuse, structural problems (e.g., flooding basements), or when there are other health and safety issues. Normally repairs over \$400 and heating/water heating replacements are post-inspected by a National Fuel representative.

National Fuel staff perform a "drive-by" analysis of potential participants after they qualify for LIURP based on consumption, income, arrearage status, and residency requirements. This evaluation determines inclusion in the program. It also identifies dwellings that may be rejected due to a number of factors, including prior participation in weatherization assistance programs, ineligible housing types (e.g., apartment houses, government housing, mobile homes, brick or stone homes, and houses that require too many fundamental repairs to prepare it for weatherization).

Once potential clients are judged eligible for the program and their names are subsequently provided to a contractor, over 70% of them receive full services. National Fuel sends a letter to customers, which briefly describes the program and identifies the contractor assigned to the job. This minimizes administrative costs by the contractor and increases acceptance and confidence in the selected contractors by clients. National Fuel maintains records of the

addresses of all homes that are rejected for the program for any reason. This prevents a future drive-by analysis if the address shows up with the name of another party who may be eligible in the future. If a client that was eligible moves before the name was submitted to a contractor, the address is held in a file for sites “okay to weatherize, but not currently eligible.” If the new party resides in the home for a year, the party may then be eligible for program services. This system of record-keeping allows National Fuel to maintain a backlog of homes that may later qualify for services, which in turn can expedite a listing of potential clients to a contractor when new names are requested.

By establishing income eligibility at 200% of the federal poverty level, LIURP is able to serve many clients who otherwise fail to qualify for other programs that typically set an upper limit at 150% of the federal poverty level. LIURP complements and supplements other low-income programs, particularly filling in voids that occur when non-profit organizations deplete their funding. At times, many of the non-profit agencies can “piggy-back” services with LIURP services to perform a complete job. This is to the benefit of the non-profit agencies, as their clients are typically addressed on a “first come, first served” basis, while National Fuel’s eligible clients are more selectively chosen based on energy efficiency potential.

The program also educates its clients about ongoing no- or low-cost actions they can take to reduce their energy use and costs. At post inspection, program staff normally give a number of such tips, including:

- Check and/or change filters every 30 days in heating season.
- Turn water heater setting as low as possible and try turning down thermostat at night and/or when no one is home by at least 5–8° F.
- Close storm windows in the winter.
- Do not block registers.
- Utilize shades and drapes to heat and cool.

PROGRAM PERFORMANCE

The National Fuel Low-Income Usage Reduction Program has a long record of success in serving low-income households. Program results are summarized below:

Average	Annual	
	2003	(1994/2002)
Full-service jobs completed	243	211
Mean energy reduction (MCF)	42	57
Mean energy reduction (%)	23	27
Mean cost per MCF reduced	\$84	\$62
Average annual bill reduction	\$412	\$455
Total participant reduction in sales due to weatherization	\$128,380	\$89,971

Since the program's inception in 1988, LIURP has served over 3,200 low-income households.

Customers are periodically surveyed about the program, and have generally been very satisfied with the program. The comments below typify customer responses:

- *House feels much warmer, more comfortable.*
- *House was cooler in the summer.*
- *House is quieter.*
- *Furnace and/or air conditioner do not run as much as before.*
- *Bills not as high so easier to pay.*
- *Crew was very cordial, good workers, etc.*
- *Thanks—didn't know such a service was available at no cost.*
- *I never bad-mouth the utility—they've been good to me.*

LESSONS LEARNED

Long-running programs like LIURP provide time for program services to evolve and change. Some of the changes that LIURP has enacted over the program's life to improve its services and respond better to customer needs include:

- Wall insulation was added as a measure in mid-1994, which significantly reduced consumption in those households.
- Furnace replacement along with weatherization began in 1999. This measure, along with the proper sizing of replacement furnaces, reduced consumption by over one-half in some cases.
- In the mid-1990s, a cap of \$450 was established for incidental repairs. Earlier customer and some contractors were more interested in esthetics and a remodeling aspect rather than energy reduction.
- Replacement of incandescent bulbs with compact fluorescent bulbs has required inter-utility coordination. Some electric utilities cover the costs of CFLs provided by the program's non-profit contractors. To maintain program consistency, National Fuel pays for up to three CFLs to the contracting agencies in cases where customers are served by electric utilities that do not provide CFLs.
- Furnaces replaced under the Heating/Water Heating Repair or Replacement Program are not used in the evaluation since no weatherization services were provided. However, this measure generates the most positive customer feedback from customers because of improved safety and the immediacy of installation and energy savings. This program service serves many households that might not otherwise be eligible, since many programs cap eligibility at 150% of federal poverty guidelines, while LIURP serves customers up to 200% of these guidelines.
- Contractors receive routine feedback. When the mandated annual LIURP Activity Report is sent to the Pennsylvania Public Utility Commission each spring, information is also provided to program contracts on their activity and performance. This information includes a list of homes they weatherized, 12-month pre- and 12-month post-consumption history, dollars spent per site, percent energy reduction, and

payback. Another chart provided to contractors presents their activity by year where their participation in the program is measured by such data as number of jobs, service provided (full or partial weatherization), cost per job, average MCF saved per job, payback, customer feedback, and timeliness of completions. National Fuel also uses these data for contractor evaluation.

National Fuel’s LIURP is exemplary for the success and innovation it has achieved for delivery of energy efficiency services to low-income households. LIURP has yielded a successful collaboration among non-profit and for-profit contractors in locations where there was little prior cooperation and mutual trust. It also has established clear priorities among potential recipients referred from local community action programs, federal/state programs (LIHEAP), and other sources in order to address those households with greatest need and to be able to have the greatest impact in energy and related cost savings.

PROGRAM AT A GLANCE

Program name: Low Income Usage Reduction Program

Targeted customer segment: Low income residential homeowners

Program start date: 1988

Program participants: In 2003, there were 243 participants. Since the program began, it has served over 3,200 households.

Approximate eligible population: Not available

Participation rate: Not available

Annual energy savings: 2003 program results = 42 MCF (420 therms) per job and 10,206 MCF (102,206 therms) total; cumulative annual program savings = 152,338 MCF (1,523,380 therms)

Cost effectiveness: \$69/MCF saved

Budget

Year	Program Costs
2002	\$1,227,394
2003	992,280
2004	1,183,566
2005	1,183,566

Funding source: Funding for LIURP is mandated at 0.4% of gross revenues per National Fuel’s 1994 rate case before the Pennsylvania PUC. Customers pay no costs for program services.

Best person to contact for information about the program:

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- Fax: 814-871-8602
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*Municipal and Cooperative Utility Low-Income Programs
Exemplary Program*

Low-Income Demand-Side Management Programs

*Eugene Water & Electric Board and its partners:
Lane County Housing and Community Services Agency (HACSA);
St. Vincent de Paul;
Neighborhood Economic Development Corporation,
Human Service Commission of Lane County;
City of Eugene, Planning and Development Department: Emergency Home
Repair, Rental and Homeowner Rehabilitation programs;
Oregon Department of Energy—BETC;
Metro Affordable Housing; and Public Private Partnership, Inc (P3)*

PROGRAM OVERVIEW

Eugene Water & Electric Board (EWEB) has developed a comprehensive array of energy efficiency programs and services for low-income customers. Beginning in the mid-1980s, EWEB developed a component of its residential weatherization program that targeted low-income customers to ensure that they were able to receive the same benefits from the weatherization program that other customers received. This effort was undertaken in cooperation with local low-income housing agencies and service providers. Low-income program services expanded in the early 1990s to include new energy-efficient housing. Again working with low-income housing agencies, EWEB conferred with the agency's developers during the design process to certify their developments were built to the energy efficiency standards of the Super Good Cents program. The energy efficiency services offered to low-income customers has continued to expand to include energy-efficient appliances, mobile home and site-built home duct sealing, thermostat replacement, energy efficient lighting retrofits, heat pump and heating system repairs. In 2005 the program will include solar water heating retrofits. EWEB has also been involved with the installation of a 14.kW grid connected photovoltaic system on the community building of a large low-income housing development.

EWEB has a comprehensive program that addresses all residential building types, new and existing, and covers all end uses including space heating, water heating, appliances, lighting, HVAC equipment, and renewable resource applications. This program also represents a significant portion of EWEB's overall residential program. The money spent and energy savings in the low-income sector has continually grown, and in 2005 it is projected that expenditures for low-income energy efficiency activities will be approximately 45 percent of the budget expenditures for residential energy efficiency programs. Energy savings in the low-income sector are projected to be 30 percent of the total residential energy savings captured in 2005.

EWEB has strong ties to and relies heavily on working with several agencies to deliver its programs to low-income customers. The weatherization program is a partnership between

EWEB and the Lane County Housing and Community Services Agency (HACSA). HACSA oversees the installation of measures installed. Duct sealing, CheckMe! and electronic thermostat replacement programs are overseen by EWEB. EWEB coordinates delivering these services through referrals from HACSA. EWEB also works closely with the local St. Vincent de Paul's office that owns and manages low-income housing.

In the new construction area EWEB coordinates its program services with all of the local low-income housing developers. EWEB has worked with every developer since 1991 that has built low-income housing. The low-income units built since 1991 have all been certified through EWEB's Super Good Cents program and have also received energy efficient appliances and water heaters.

The primary customer needs and barriers are affordable weatherization services and accessibility to funding. EWEB's program attacks these barriers in several ways. First, since most low-income customers are renters, EWEB targets rental property owners and property management companies to work with them in having their tenants submit information needed to qualify them as low-income. Having qualified low-income tenants expands those incentives that the property owner receives for weatherization to 100% funding for insulation and up to 50% funding for window retrofits.

Secondly, in addition to providing matching funds to the local CAP agency (HACSA) for U.S. DOE and BPA low-income weatherization funds, EWEB also spends additional money through its own Weatherization Plus (W+) program to provide financial support to low-income customers who are in the lower Federal priority categories who may otherwise be on a waiting list for many years to receive funding through the U.S. DOE and BPA low-income programs.

As a municipal utility in the state of Oregon, a 5-member elected citizen board provides regulatory oversight for EWEB. The EWEB Board since 1998 has had an operational practice of budgeting 5% of total retail revenues for demand-side program activity. Prior to 1998, funding was allocated regionally to utilities through the Bonneville Power Administration and supplemented with utility funds.

In 2005 the projected expenditures for EWEB's low-income energy efficiency programs is approximately \$1.1 million. The source of this funding is from utility rate revenues. This money is also used by local housing agencies to leverage additional funds from other local, state, and national sources.

PROGRAM PERFORMANCE

EWEB and its housing agency partners have weatherized over half of the homes occupied by low-income customers—a total of approximately 7000 low-income units. All of the new low-income housing units built since 1990 have been certified by EWEB to meet the highly efficient standards of the Super Good Cents (SGC) program. All of the SGC units have also had one or more energy efficient appliances installed, including water heaters, dishwashers and refrigerators. EWEB also has pioneered a mobile home duct sealing program in the late

90s whereby mobile home parks with older vintage homes that are typically occupied by low-income seniors were targeted in an effort to seal the ducts in all homes in the parks. This effort to improve the energy efficiency in homes of low-income occupants has been so successful that local low-income housing agencies are now working with EWEB to implement the next level of energy efficiency measures including lighting and solar water heating retrofits. In 2005 EWEB projects the installation of over 150 solar water heaters in homes owned and managed by local low income housing agencies.

The weatherization contract with HACSA manages costs based on an average job cost rather than limiting costs on an individual job basis. This allows HACSA to more fully weatherize homes by using unspent funds from low cost jobs to help pay for higher cost jobs. In new construction, EWEB water utility has a system development charge (SDC) for new developments. EWEB provides grants administered by the City of Eugene to low-income housing developers that cover SDC if the development participates in EWEB's energy-efficient new homes program. This has encouraged developers to build energy-efficient housing. EWEB also runs pilots to test new technologies and program delivery strategies. In the mid-1990s EWEB piloted the mobile home duct-sealing program known as "Knock Once," which was a once through "blitz" of services in mobile home parks. This program has become a model that has been used by other utilities in the northwest and most recently the Energy Trust of Oregon. Other pilots include line-voltage electronic thermostats, ENERGY STAR® outdoor porch light change outs, and currently a solar thermal water heating retrofit program with St. Vincent de Paul and HACSA.

LESSONS LEARNED

- Early in the weatherization program EWEB retained oversight and inspection of completed weatherization work, including reviewing HACSA conducted audits. EWEB subsequently realized it did not need to retain this quality assurance function if HACSA field staff received sufficient training on all aspects of services—not just auditing, but also post-installation inspection, use of blower doors and testing of duct work. EWEB provided this training; HACSA staff now has full responsibility for field auditing, testing and post-installation inspection. This transfer of responsibility has reduced program overhead along with the time needed to complete weatherization work.
- Work closely with the local housing agency to leverage funds from U.S. DOE and/or state low-income programs.
- Employ local housing and service agencies services to certify customer income eligibility for utility low-income programs.
- Provide adequate matching funds may allow the local housing agency to petition to receive unspent funds from other housing agencies and increase program impact.
- Manage costs on an average job cost basis rather than a per job cap.
- Set utility income eligibility guidelines to cover a majority of low-income customers.
- Allow deductions for out-of pocket medical expenses.
- Target utility funds at the federal lower priority customer groups that may otherwise not receive federal funding.
- Offer a broad spectrum of programs covering new and retrofit, insulation and appliances, lighting and heating systems.

- Provide training for housing agency staff so that they are fully capable of providing all services.
- Collaboratively manage the program with the housing agency and other low income service providers
- Organize a local network or resource group of agencies and utilities that provide low-income services that meets regularly to share information.
- Provide energy education services and training to caseworkers, low-income service providers and their clients.

With the low-income population continuing to grow, EWEB projects that its low-income program will need to continue to provide basic weatherization services to customers. At the same time, having worked closely with local agencies and property owners to weatherize their stock of housing, EWEB’s program for these clients will need to expand to include other technologies such as solar and heat pump water heating retrofits, energy efficient lighting, and planned early replacement of appliances with new energy efficient models.

PROGRAM AT A GLANCE

Program name: Low-Income Demand Side Management Programs. EWEB serves its low- and limited-income customers through a number of its residential programs, including HACSA/EWEB Weatherization, EWEB’s Weatherization Plus, Duct Sealing/CheckMe! (refrigerant charge check), Electronic Thermostat Replacement, Heat Pump Replacement/Upgrades, Energy-Efficient Appliances/Water Heaters, and Energy-Efficient New Homes.

Program eligibility guidelines: Customers may qualify according to federal poverty guidelines for the HACSA/EWEB weatherization program. EWEB’s Weatherization Plus program sets eligibility at 60% of state median annual income and allows deduction of out-of-pocket medical expenses.

Program start date: Present program evolved from over 20 years of prior program experience—beginning in the mid-1980s.

Program participants: For the period 1999-2004 EWEB’s low-income DSM programs provided services to a total of 6,387 participants. In 2003 there were 1,128 participants. In 2004 there were 885 participants. For the entire period 1982 to 2004, EWEB has had 11,643 participants in its menu of low-income DSM programs.

Approximate eligible population: 14,000 or more households.

Participation rate: Over half of the eligible households have received weatherization services throughout the history of EWEB’s programs.

Annual energy savings achieved

Year	Annual Savings (kWh)	Average savings per participant (kWh)
2001	1,502,546	1,102
2002	1,997,617	1,055
2003	1,432,264	1,207
2004	1,204,315	1,208
1982-2004	*8,950,313	769

* Cumulative kWh savings not average or annual kWh savings

Cost effectiveness: Levelized cost for all low-income programs 1999-2004 is 37.3 mills/kWh; for just programs in 2004 the levelized cost is 49.6 mills/kWh.

Budget and cost information:

Year	Program Costs
2003	\$1,033,601
2004	\$921,493
2005 (preliminary)	\$1,100,000
2006 (projected)	NA

Funding source and share of program budget: Utility rate revenues. This money is also used by local housing agencies to leverage additional funds from other local, state and national sources.

Best persons to contact for information about the program:

- Kathy Grey, Energy Management Programs Supervisor
Bob Lorenzen, DSM Programs Manager
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- Web page: www.eweb.org

*Municipal and Cooperative Utility Low-Income Programs
Honorable Mention—Audit Program*

HomeSense Program

*Golden Valley Electric Association
Interior Weatherization, Inc.,*

PROGRAM OVERVIEW

The HomeSense program is GVEA's electrical energy efficiency audit service for the utility's residential customers. The primary goal of the HomeSense program is to offer a broad-based and effective client education program focusing on electrical energy efficiency and demand-side management. In addition to the audit and education services, HomeSense also provides for installation of selected electrical energy efficiency measures, principally a water heater insulating blanket and CFLs. Program marketing is through print, broadcast advertising and public presentations.

Interior Weatherization, the State of Alaska's local low-income weatherization assistance program provider, continues to collaborate with GVEA and deliver the HomeSense program to GVEA's income-eligible clients at no cost to the recipients (which is normally a \$40 fee). Over 1,430 weatherization clients have received GVEA's HomeSense program at no cost through the State of Alaska's local weatherization program. The number of low-income members served at no cost to those members represents about 37 percent of the total members who participated in the HomeSense program. These participants also receive weatherization services, such as shell insulation, sealing the home against air infiltration and heating system repair and upgrades through the State of Alaska weatherization program. The weatherization providers bill the services covered under the HomeSense program agreement back to GVEA.

Educating members and recommending best practices about electrical use and energy efficiency are the key features of the HomeSense program. Besides the electrical energy efficiency devices installed in each in-home visit, additional educational material includes an flyer produced by GVEA, "Understanding Your Electric Usage," and the U.S. Department of Energy booklet, "Energy Savers: Tips on Saving Energy and Money at Home."

Program annual budget is \$55,000 per year and funding source is approved by the Golden Valley Electric Association board of directors as an expense by the cooperative utility. All GVEA members pay for the HomeSense and other "EnergySense" programs—the utility's suite of DSM programs. The programs receive no other funding.

PROGRAM PERFORMANCE

The program has an excellent reputation according to GVEA customer satisfaction surveys, and GVEA continues to receive many favorable comments about the service. To date, over 3,840 residential households have participated in the HomeSense program. This figure represents about 10 percent of the service area members.

GVEA estimates that since 1992, the average cost per kilowatt-hour for a "nega-watt" of electrical energy efficiency produced by GVEA's HomeSense program is 4.4 cents per kWh. (The current cost for GVEA to produce power is about 5 cents a kWh). The cost of the HomeSense program is about \$810 per kilowatt. GVEA estimates that between 5% and 9% of the total electrical energy used in a house—particularly a low-income house (which is more prone to have an electric water heater)—is averted by participating in the HomeSense program. Since its inception HomeSense has saved members over 28 million kWh and reduced the potential load by over 1,500 KW.

In 1994, the United States Department of Energy awarded GVEA the National Energy Award for Utility Technology for HomeSense program.

LESSONS LEARNED

- Regular communications and performance reviews. About twice a year, the GVEA HomeSense program manager communicates with the regional low-income weatherization agency to review and assess HomeSense performance. Based on these communications, GVEA can then adjust HomeSense to improve performance.
- Focus on client education and best practices. The HomeSense program focuses on changing practices, improving the operating procedures within the home and motivating residents to make better decisions regarding their use and purchase of electricity. The HomeSense program also educates residents about energy efficiency devices, especially the benefits associated with reduced use and lower life cycle costs while demonstrating the same, or better, level of comfort.
- Effective training of program specialists. With its emphasis on customer education, it is important that those energy specialists providing the HomeSense service are well trained in assessing electric energy use, understanding and identifying potential high-use devices in the house and explaining the living dynamics of using electricity, particularly residents' behavior and use patterns.
- Simple, effective tools. The HomeSense program energy specialists who deliver the electrical energy efficiency audit service are provided with several simple tools to help educate and assist clients. For example, in order to encourage some clients to overcome stereotypical thinking about compact fluorescent lamps not illuminating as bright as incandescent, we give each energy specialist a lighting meter to compare levels of light before and after retrofit. Program specialists also use a watt meter/monitoring tool to show residents how much a 120V device is using and to estimate its operating costs.
- Flexible scheduling. To maximize the audience of people who might participate in the HomeSense program audit, GVEA offers a flexible schedule for making appointments. The program seeks to get everyone in a residence involved in the learning process. Consequently, GVEA offers appointments (depending on the auditor's availability) that can be made after regular business hours or even on weekends.
- Interactive use of educational publications. GVEA provides educational materials that not only cover electrical energy efficiency and options but also whole house energy efficiency suggestions. It is important not to just leave these publications for the homeowner to read, but to go over each page with the homeowner so that review of each publication we leave is part of the audit program.

Changes to the program over the years have primarily been to improve client education, deliverability and marketability. GVEA has increased the amount of client education information provided and the way it is presented to the client. GVEA also uses its customer data to identify high use customers and targets HomeSense to these customers. GVEA also target program marketing to subsidized-housing clusters as another means to reach low-income customers.

PROGRAM AT A GLANCE

Program name: HomeSense

Program eligibility: Customers who qualify for the State of Alaska's Low-Income Weatherization Assistance Program can receive HomeSense services at no cost to them. This eligibility is based on federal poverty guidelines. The income guidelines for qualifying range from a maximum household income of \$22,275 for a single person household to \$42,837 for a family of four and upward.

Program start date: 1992

Program participants: Over 3,880 total weatherization customers since the program's inception, including low-income participants.

Approximate eligible population: Roughly 3,600 households in GVEA's service territory based on state statistics on income levels.

Participation rate: The program serves about 115 low-income households per year in partnership with State of Alaska's weatherization program. Based on a rough estimate of total low-income households served by GVEA, the program has reached about 40% of this population since the program's inception.

Annual energy savings achieved: HomeSense (total, not just low-income customers) has saved an estimated 28 million kWh and reduced load by over 1,500 kW.

Cost effectiveness: Cost of conserved energy is estimated to be 4.4 cents/kWh. Cost of the HomeSense Program is \$810/kW.

Budget and cost information: Annual program budget is \$55,000.

Funding source and share of program budget: Program is funded entirely from cooperative (GVEA) members.

Best person to contact for information about the program:

- Todd Hoener, Energy Efficiency Specialist
- Telephone: 907 452 1151
- Fax: 907 458 6365
- E-mail: tmh@gvea.com
- Postal address: PO Box 71249, Fairbanks, AK 99707-1249
- Web page: <http://www.gvea.com/memserv/energysense/>

*Multi-Family Low-Income Housing Programs
Exemplary Program*

Assisted Multi-Family Building Program

*New York State Energy Research and Development Authority
Hamilton, Rabinovitz & Alschuler, Inc.
Community Environmental Center
Association for Energy Affordability*

PROGRAM OVERVIEW

The Assisted Multi-Family Program (AMP) was developed to improve energy efficiency and reduce the energy bills of low- and moderate-income families in multifamily residential buildings where the average income of the residents is no greater than 80% of the State median. AMP provides a range of technical and financial services to help buildings identify, finance, implement and monitor energy-saving measures. Eligible measures include windows, boilers, insulation, appliances, and a host of other items. Financial assistance includes low-interest loans and need-based grants. AMP also provides free training to owners, maintenance staff, and building operators in the effective use and maintenance of energy-efficient technologies.

The benefits that owners and managers realize from participating in AMP are:

- In excess of \$12,000 in free consulting, including a comprehensive energy audit, identification of low cost financing, and negotiation on owner/managers' behalf with regulators to secure reserve releases, approval of debt, and rent increases;
- A recommended scope of work with a savings-to-investment ratio normally substantially greater than one;
- Significant operating expense savings after installation of recommended measures;
- Construction cost gap funding in the form of grants and subsidized loans;
- Supervision of contractors' work to ensure that measures are installed in a way that will ensure energy efficient operation;
- Three years of free monitoring of energy savings for a sample of buildings; and
- Building operator training.

AMP is a New York Energy \$martSM program. New York Energy \$martSM programs are designed to offer public benefits during the transition to a more competitive electricity market. They are funded by a systems benefits charge on the electricity transmitted and distributed by the State's investor-owned utilities. AMP's total annual budget is \$19.3 million; \$14.5 million of the budget goes for construction and installation incentives.

Most energy improvements recommended by AMP engineers generate savings that can be used to finance the capital work itself. HR&A created two lending instruments for NYSERDA that utilize energy savings to finance debt. The first, the New York Energy \$martSM Loan, is a collaboration with conventional lenders across New York State, lowering

the interest rate on loans for energy efficiency improvements. HR&A and the Community Environmental Center designed the second instrument, the Multi-Family Loan Program, in collaboration with the Low Income Investment Fund (LIIF). The program works with buildings that would not qualify for a conventional loan and offers low-interest financing secured by 80 percent of the projected savings from energy efficiency rehabilitations. Over time, these programs will prove the value of lending against energy savings and transform the marketplace for energy efficiency financing.

PROGRAM PERFORMANCE

Since its launch in 2000 through 2002, AMP has helped more than 480 affordable housing properties in 44 counties throughout New York State. This represents approximately 7.5% of eligible units in the State. NYSERDA has committed approximately \$70 million for this effort to date, spread across approximately 100,000 units statewide. NYSERDA funds under this initiative are expected to leverage commitments of an additional \$258 million from other sources, for a total of more than \$328 million in new investments for energy efficiency renovations of affordable housing. Upon the completion of energy efficient renovation of these 100,000 units statewide, AMP is projected to save consumers \$70-\$80 million.

On average, low-income residents save \$103 per unit per year in direct benefits (including rent increases averted). AMP provides an additional \$252 in per unit annual savings to property owners, savings that, by the terms of the financings on these properties, will overwhelmingly be used for improvements in resident health, comfort, and safety.

In March of 2004, NYSERDA released a process evaluation of the program that it had retained Research Into Action, Inc. (RIA) to perform. The evaluation period was essentially the first year of operations of the program. RIA stated that:

- Significant accomplishments had been made after only a single year. These included development of productive relationships with regulatory agencies and lending institutions, hiring and training of engineers, refinement of audits, and development of policies for working with subcontractors and with Weatherization Assistance Program agencies.
- It agreed that program refinements that had been proposed by the implementation team should be made. These included refinements to simplify the “appearance” of the program for building owners, soften the “last money in” approach to guarantee a minimum grant and permit owners to share in savings achieved through bidding, and continue to build relationships with regulatory agencies.

In February of 2005, NYSERDA released an impact evaluation of the reported energy savings achieved by the program that it had retained Nexant to perform. Nexant’s review of a random sample of completed projects found that 93% of individual measures were installed and operating. Building owners typically expressed satisfaction with the measures and the resulting savings they had seen in their energy bills.

Finally, the implementation team has a wealth of anecdotal evidence of the high regard in which the program is held, including testimonials from most of the owners whose projects have been completed to date.

On average, AMP spends \$1.53 in public funds per MMBtu saved and \$0.01 in public funds per kWh saved. AMP currently operates at a very high average leverage ratio of 4:1 (private dollars leveraged for public dollars invested). AMP leverages funds from replacement reserve funds and other equity contributions; loans, including state and locally subsidized loans; Weatherization Assistance Program funds; other, specially targeted NYSERDA programs (e.g. the New York Energy Smart Photovoltaic program) and contributions by utility companies and housing regulators.

AMP uses a “whole building” approach to energy modeling to ensure accurate projections of savings and to avoid the excessive estimates produced by simply adding the savings projected for each individual measure. By using sophisticated computer modeling to estimate the overall savings accurately, including interactions among measures, AMP avoids the pitfalls that follow from excessive optimism in fuel and electric savings projections. AMP provides gap funding to projects so that the collective set of measures can be installed.

As part of its quality assurance activities, AMP is monitoring the fuel and electric use of all projects completed or currently in construction. Results to date demonstrate that the conservative, whole building approach regularly results in projects that exceed expectations.

LESSONS LEARNED

Program Approach: From the beginning, HR&A has applied a “gap funding” approach to the AMP as the most efficient way to use NYSERDA resources. Faced with a scope of recommended energy improvements that, depending on the size of the property, may cost anywhere from tens of thousands to millions of dollars, HR&A evaluates building finances to determine how much of the scope a property can afford to pay for on its own, either through a cash contribution or the assumption of a loan. Where there is a gap between the cost of the work and the amount a property can finance alone, HR&A seeks to tap other local, state, federal, and utility programs that might be able to contribute to the work. If all available funding sources have been explored and a gap remains, HR&A may recommend that NYSERDA provide the remaining funding in the form of a grant. This results in significant leverage of NYSERDA program funds with other funds.

Developing and Testing Policies: The implementation of a statewide program to renovate many thousands of low-income apartments each year requires the development of a host of policies, both to establish operational consistency and to navigate potential barriers. HR&A has worked closely with NYSERDA management to develop and refine policies for energy auditing, financing, coordination with other programs and agencies, procurement and bidding, construction oversight, cost estimating, construction specifications energy management and monitoring, submetering, and a broad array of other issues. The flexibility of the program—its capacity to apply new technologies and methods and to respond to changes in the marketplace—is the principal reason for its success.

Forging Relationships with Housing Regulators: In its first year, more than three-quarters of the properties requesting assistance from AMP were regulated by local, state or federal government agencies. Each agency has its own set of regulations, its own requirements for capital improvements, its own restrictions regarding the assumption of debt, and its own approach to energy. From the beginning of the program, HR&A established relationships with regulators that have facilitated the approval of energy efficiency work in regulated properties and raised the level of awareness within the government agencies. HR&A's work has led to several collaborative efforts to modify construction specifications and regulations used by government agencies to incorporate higher standards of energy efficiency.

Saving Energy while Increasing Comfort and Viability of Low-Income Housing: Energy inefficiency in low-income housing frequently means discomfort and high bills for tenants, contributing to vacancy and effectively lowering the quality and quantity of housing for the low-income population. For building owners, inefficiency can mean lower reserves, deferred maintenance, and consistent deficits, leading in some cases to vacancy or even foreclosure. At the level of the property itself, energy efficiency rehabilitations financed through AMP (more than \$350 per unit) will help assure financial solvency into the future, providing some properties with positive cash flow for the first time in years. In its first year, the program will save the average utility-paying tenant \$115 each year. Moreover, since health and safety measures are a standard part of AMP analyses, tenants frequently enjoy better lighting, improved ventilation, reduced indoor air pollution, and safer buildings (due to upgrades in emergency and exit lighting and the installation of carbon monoxide detectors).

Quality Assurance: AMP places a high priority on quality assurance and control. Practices employed by AMP to assure high program quality include firm underwriting standards, a detailed Policy and Procedures Manual, and rigorous documentation requirements. This approach ensures that practices are consistent and easily replicated.

PROGRAM AT A GLANCE

Program name: Assisted Multi-Family Building Program (AMP).

Program start date: November 30, 2000

Program participants: 480 properties in 44 counties.

Eligible population: All residential buildings larger than four units that meet eligibility criteria. NYSERDA estimates the population of assisted apartments in multi-family buildings eligible for the program at about 1 million units.

Participation rate: About 7.5% of eligible units.

Energy savings achieved: Those projects financed by the program through 2003 are projected to save assisted properties in New York State 58.5 million kWh and 128,300 MMBtu per year.

Cost effectiveness: AMP spends an average of \$1.53 in public funds per MMBtu saved (natural gas) and spends \$0.01 per kWh saved (electricity). AMP leverages an average of \$4 in private funds for every \$1 public program funds.

Budget: \$19.3 million.

Funding sources

Administration: New York State Energy Research and Development Authority (NYSERDA)

Construction Funds:

- Property owners
- NYSERDA
- New York State Weatherization Assistance Program
- Empire State Development Corporation
- Department of Housing and Urban Development
- New York State Division of Housing and Community Renewal
- New York City Department of Housing Preservation and Development
- New York State Electric and Gas
- Consolidated Edison
- National Fuel Gas
- KeySpan
- Lenders participating in the New York Energy \$martSM Loan Fund

Best persons to contact for information about the program

- Program Implementer: Candace Damon
- Telephone: 212-977-5597 ext. 227
- Fax: 212-977-6202
- cdamon@ny.hra-inc.com
- Postal address: Hamilton, Rabinovitz & Alschuler, Inc., 1790 Broadway, Suite 800, New York, NY 10019

- Program Sponsor: James Reis, Program Manager
- Telephone: 518-862-1090 ext. 3251
- Fax: 518-862-1091
- Postal address: New York State Energy Research and Development Authority, 17 Columbia Circle, Albany, NY 12203-6399

*Multi-Family Low-Income Housing Programs
Previously Selected Exemplary Program*

Multifamily Low-Income Program

Efficiency Vermont, Vermont Gas Systems, and the Burlington Electric Department

PROGRAM OVERVIEW

The Multifamily Low-Income Program collaboratively administered by Efficiency Vermont, Vermont Gas Systems, and the Burlington Electric Department offers a comprehensive treatment of all end-uses, including natural gas, to new and existing residential low-income multifamily housing. Energy efficiency measures include building shell measures, lighting, appliances, high-efficiency space heating and cooling systems, high-efficiency water heating systems, ventilation, and fuel substitution where applicable in existing buildings.

Vermont Gas Systems is Vermont's sole natural gas provider, with a geographical service territory covering the more densely populated areas of northwestern Vermont. When projects occur in Vermont Gas' territory, Vermont Gas Systems and Efficiency Vermont staffmembers work together to develop recommended efficiency levels and rebate proposals. The same joint-approach is used in the city of Burlington, where the Burlington Electric Department delivers electrical efficiency programs. Outside of Burlington, Efficiency Vermont delivers this program independently in areas of the state where natural gas is not available.

The program's innovative design packages gas and electric utility resources together with the low-income Weatherization Assistance Program (WAP), to present a fuel-blind, comprehensive package of recommended energy-saving measures to building owners where tenants qualify for WAP services. Incentives are presented in support of the comprehensive project, rather than on a prescriptive-measure basis, encouraging adoption of all cost-effective measures, rather than capturing only electric savings or only those measures with short paybacks that owners would do on their own with no incentive. This comprehensive approach also encourages owners to install measures in which the low-income residents gain most of the savings. The program has been uniquely successful in leveraging energy efficiency investment in this market, with less than 50 percent of the overall investment in energy efficiency being provided by utility ratepayers through the program. Since 1997, the program has addressed over 1000 residential units that are served by natural gas.

The program is now known and relied upon as a valued technical resource by the vast majority of owners and developers of low-income multifamily housing in Vermont. Response to the program has been favorable. Developers and owners of low-income multifamily housing now routinely call Efficiency Vermont, Vermont Gas, and Burlington Electric Department for assistance. The program is working with virtually all new subsidized multifamily construction in the state, as well as a high percentage of privately owned new construction projects. Training programs offered through the program have been in high

demand and extremely well received. More importantly, perception of the value of energy efficiency in this market has noticeably increased, creating new norms and market demand.

PROGRAM PERFORMANCE

The Multifamily Low-Income Program has had a number of noteworthy successes.

- 519 housing units have received the combined program of Efficiency Vermont and Vermont Gas Systems, resulting in cumulative electric savings of 1,128 MWh since 1997. An additional 136 units of multi-family housing have been served by the combined services of Vermont Gas and Burlington Electric.
- From 1997–2003, the program realized 7,201 Mcf natural gas savings and 4,744 ccfs water savings.
- Efficiency Vermont has developed and implemented a *Design Guide for Energy Efficient Multifamily Housing* and a related *Comprehensive* track for new construction and major rehab projects. The company provided training to architects and engineers on the guide and many are now incorporating the guide’s extensive details and specifications in their designs. Vermont Housing Finance Agency (VHFA) and Vermont Housing and Conservation Board (VHCB) have adopted the *Checklist for Energy Efficient Multifamily Housing* as part of their energy policy. Parties applying for funding to build affordable housing must demonstrate they are meeting the checklist items.
- Following on its success with the subsidized and public housing sectors, the program initiated targeted outreach to the non-subsidized sector. As a result, over 30 privately owned rental property projects have made energy efficiency improvements.

LESSONS LEARNED

Understanding the market and building relationships with market actors that span project types or customer classes enable the program to develop better solutions to the remaining market barriers to energy efficiency in affordable multifamily housing. Efficiency Vermont has included services to multifamily facilities under the Business Energy Services division of its operations.

This market approach allows the company to address the cross-sections of the business market more holistically, recognizing that investment property owners, suppliers, designers, contractors, and other market actors involved with multifamily energy projects also participate in market segments such as small commercial and health care.

Vermont Gas Systems does not identify low-income multi-family as a distinct program within its portfolio; rather these projects are treated within the existing program parameters of its residential new construction and retrofit programs. As mentioned above, many of the same market actors are involved across a broad spectrum of projects, of which low-income multi-family is only one element. Vermont Gas Systems has a long history of building relationships with contractors and project developers, regardless of the specific niche into which a given project might fall.

The program implementers have found that simply providing a written specification is not sufficient to ensure that an efficient structure is actually designed and constructed. Careful plan reviews are provided at no charge to the developer, and potential improvements are identified and discussed. Site visits are provided during the construction process to assist with air sealing details and purchasing decision, and to ensure that insulation and efficient products are selected and installed. Despite the packaged incentive approach, some developers fail to comply with all of the terms of the incentive offer. In these situations, a partial incentive may be offered, but typically with very significant deductions for failure to meet the full terms of the agreement.

Implementing this program on a joint basis has allowed for the development of a broader, shared vision regarding these projects. Developers and multi-family building operators are receiving a consistent message from multiple companies, rather than different messages depending on service territory. There have been many opportunities for technical discussions and information exchanges between Vermont Gas Systems, Efficiency Vermont, and Burlington Electric Department staffmembers, and everyone is learning from the combined experiences.

PROGRAM AT A GLANCE

Program name: Multifamily Low-Income Program

Targeted customer segment: Multifamily low-income

Program start date: March 1997

Program participants to date

1997–1999: 2,002 cumulative participants (housing units)

2000: 987 participants

2001: 1,254 participants

2002: 1,694 participants

Total participants: 5,937, of which 655 are natural gas customers

Eligible population: Low-income multifamily buildings (both new and existing) of five units or more under a single “project structure,” which can include scattered buildings under one owner. A project is income-qualified if at least half of the units are affordable to households at or below 80% of area median income. Units can also qualify based on rent levels or funding subsidy requirements.

Participation rate: See “Estimated Market Share,” below.

Annual energy savings achieved: An estimated 7,201 annualized Mcf of natural gas are being saved as a result of projects completed between 1997 and 2003. The average estimated measure lifetime for natural gas saving measures is 23.4 years.

10,005 annualized MWh savings for investments made in 1997–2001 and an additional 2,286 annualized MWh savings for 2002, for a cumulative 12,291 MWh

Other measures of program results to date: Estimated market share for new construction/major rehab is 90%+ participation, approaching 100% statewide, and retrofit is 20–30% of existing statewide stock.

Efficiency Vermont statewide multifamily budget

2001 Budget	\$836,149
2002 Budget	\$1,134,019
2003 Budget	\$1,195,363

Vermont Gas Systems does not budget separately for the low-income multi-family program. Rather, these projects are included in VGS’ budgets for VERMONT ENERGY STAR Homes and the HomeBase Retrofit Program.

Actual 1997–2003 Investments

Combined Efficiency Vermont and Vermont Gas Systems Project Participation:

Total efficiency upgrade costs—\$794,346
 Total REEP/Efficiency Vermont incentives—\$307,782
 Total Vermont Gas incentives—\$130,959
 Weatherization investment—\$22,729
 Owner cost—\$376,836

Total Efficiency Vermont Project Participation

Total efficiency upgrade costs—\$7.4 million
 Total REEP/Efficiency Vermont incentives—\$1,645,467
 Total Vermont Gas incentive—\$130,959
 Weatherization investment—\$545,648
 Owner cost—\$5,194,926

Funding sources: All of VGS’ programs are funded through rates. Program expenses are deferred until reviewed by the Department of Public Service and Public Service Board. Upon approval, expenses are amortized in rates over a three-year period. Initial development funded through a Rebuild America grant obtained from the DOE. Operations funded by four Vermont utilities and administered by the State Weatherization Program from 1997–Feb. 2000. Since March 2000, funding has been received from an Energy Efficiency Utility (EEU) charge on all Vermont electric bills. This charge was mandated by the Vermont Public Service Board’s creation of an *Efficiency Utility* contract.

Best person to contact for information about the program

- Karl Goetze, CEM
- Efficiency Vermont, 255 South Champlain Street, Burlington, VT 05401
- Telephone: 888-921-5990 ext. 1012
- Fax: 802-658-1643
- E-mail: kgoetze@veic.org
- Web page: <http://www.encyvermont.com>

*Integrated Portfolios of Low-Income Program Services
Honorable Mention*

Portfolio of Low-Income Energy Efficiency Programs

KeySpan Energy Delivery New England

PROGRAM OVERVIEW

KeySpan Energy Delivery New England (KED) supports a broad array of energy efficiency services designed for low income customers. These include the *Low Income Weatherization Program, Energy Bucks, Leading the Way- HeatWorks, WRAP and On Track*

KED's approach to servicing its low income customers is noteworthy for the variety of programs in its portfolio. KED recognized that a "one-size-fits-all" approach was not sufficient to meet the differing needs of low income customers, and has developed and supported different programs and services to meet those needs.

Below are brief descriptions of KED's low-income programs. (Note: Because of the multiple program profiles, there is no "Program at a Glance" section in this profile.)

PROGRAM SUMMARIES

Low-Income Weatherization Program

This program is sponsored by KeySpan Energy Delivery in collaboration with the Massachusetts Low Income Affordability Network (LEAN). LEAN coordinates the delivery of all publicly funded energy efficiency programs designed for the low income population across the state of Massachusetts. LEAN works to provide seamless delivery of services to low income clients. LEAN was established as a result of legislation, which for the first time, established secure funding for low income utility efficiency programs. Prior to the legislation, electric and gas utility low income programs were negotiated, one at a time, between individual utilities and the low income agencies in each territory.

LEAN's first large-scale gas utility program was the Low Income Weatherization Program established with KED in 1997. It has served as a model for other gas utility programs, including KED's New Hampshire low income weatherization program

The program works through local Community Action Program agencies. Through rate payer supported collections, KeySpan funds the installation of weatherization measures for the income eligible. Approximately one thousand homes are weatherized each year in KeySpan's Massachusetts territory, and one hundred and fifty in the New Hampshire territory. The weatherization measures available through the program include a preliminary energy audit, insulation, heating system replacement for eligible customers, air sealing, health/safety inspections, and post installation quality control. To be eligible for the program, household

income must be at or below 60% of the state's median income level. All measures are directly installed at no charge to the low income customer

Funding is drawn from various sources. KED provides up to \$4500 per home in Massachusetts and \$3600 in New Hampshire. There can also be contributions from the customer's electric utility, the US Department of Energy, and US Department of Health and Human Services. Total program costs were \$3.4 million in 2004; for 2005, program costs are projected to be \$3.9 million. These are KED costs for both Massachusetts and New Hampshire.

From its inception in May 1997, through April 2004, this program has served 8,176 customers and saved a total of 63,601,104 therms. The average savings per participant per year is 430.5 therms; the lifetime savings per participant is 7779 therms. Evaluation of the program indicates that more than 95 percent of participants are extremely or very satisfied.

On Track

On Track is sponsored solely by KED to provide financial assistance and education to low income customers. On Track works with low income KeySpan Energy Delivery heating customers, who do not presently receive public assistance, to help them resolve financial difficulties. The program provides individualized budget counseling, arrearage management, and social services, such as referrals to financial assistance programs, support groups, and working with a licensed social worker where appropriate.

The program began on January 1, 2004. The original enrollment target was 350; through June 30, 2005 the program has received 995 applications and has enrolled 372 customers. There are 344 active accounts. 137 customers have received fuel assistance as a result of the program and 61 customers are receiving public assistance as a result of the program. On Track also refers participants to the energy efficiency programs KeySpan sponsors, and seeks applicants from participants in those same energy efficiency programs

Leading the Way—HeatWorks

Through the Leading the Way-HeatWorks program, KED is working with the City of Boston's Department of Neighborhood Development (DND) to assist the low income elderly by replacing inefficient or disabled heating systems with high efficiency gas systems. The Boston community action program, Action for Boston Community Development, Inc. coordinates the installation of the systems. KeySpan has allocated \$500,000 for the program's first four years, and the City of Boston is matching that sum for this innovative collaboration. The City provides funds to correct electrical and other structural problems that KED is prohibited by regulation from doing. Correcting these problems allows heating system replacement to go forward.

This collaborative structure allows pooling of funds and accomplishes together what could not be accomplished separately by each program.

KED and DND have installed new heating systems in the homes of 28 elderly low income customers in the first program year. The program expects to reduce installation costs by installing heating systems during the off-season. KED and DND have lowered eligibility criteria for low income seniors to maximize participation. One of the program aims is to lessen the number of “no-heat” emergencies during severe winter months, by addressing problems before the heating season

Energy Bucks

Energy Bucks is an outreach program designed to educate the public about programs available for the income eligible. Energy Bucks is a joint effort by KED and other investor-owned utility companies, community action agencies, LEAN, and Action, Inc. (Action Inc. is also the lead agency that administers KED’S Low Income Weatherization Program and a charter member of LEAN; the agency's energy director is also the current LEAN Chairman.)

Based on a recent survey, twenty percent of the low-income respondents indicated that they were not aware that programs to assist them existed. In addition, 15 percent of the respondents perceive that they are not eligible for programs when in reality they are. The Energy Bucks campaign is designed to address these misperceptions and increase awareness of available programs and services.

Energy Bucks provides information about fuel assistance, discount rates, and energy efficiency programs and services through one phone call (1-866-LESS COST). Energy Bucks is an integrated campaign combining grassroots outreach, community-based activities, and advertising to encourage qualified households to better understand their service options and apply to existing programs.

Energy Bucks is a relatively new program whose purpose is to build awareness of the variety of services available to families with limited income. The Energy Bucks program undertook an extensive advertising campaign in the fall of 2004 to raise that awareness. Since the campaign, call center activity has increased 22%, web site activity increased dramatically from a monthly average of 1600 hits to 14,000, and fuel assistance applications rose 40%. The annual program budget is \$823,000 and is provided by KED and other investor-owned utilities in Massachusetts.

Weatherization Rehab and Asset Preservation Partnership (WRAP)

WRAP was created by Action for Boston Community Development, the Massachusetts Affordable Housing Alliance, and Action Energy, Inc., and is supported in part with funds from KED and the Ford Foundation. The goal of the program is to develop the asset base of low income communities and to preserve home ownership through a combination of services and funding sources. The initial target areas are specific sections in the cities of Gloucester and Boston. The goals are to reduce household energy costs, provide for unmet health and service needs, and to increase housing values. The strategy to accomplish these goals is individual case management to maximize resources and coordinate services.

To date, nine homes have been enlisted in the program, and KeySpan has provided \$42,000 in funding. Other funding organizations and programs include the Ford Foundation, the City of Boston (through its HomeWorks, Historic HomeWorks, and Lead Safe Programs), the State of Massachusetts, Department of Housing's Get the Lead Out and Home Improvement Programs, and the Low Income Home Energy Assistance Program, Residential Energy Assistance Challenge (REACH) grant. Participants in WRAP will benefit from the pooled resources of a large number of programs now operating in relative isolation. KeySpan has lowered weatherization eligibility standards to maximize participation, in addition to outright grants. The program coordinates and attempts to expand existing utility energy efficiency programs. Energy and housing repair services are offered in the context of family case management.

Best person to contact for information about the programs:

- Harry McDonough, Program Manager, Residential Energy Efficiency Programs, KeySpan Energy Delivery
- Telephone: 781-466-5319
- Fax: 781-890-7980
- E-mail: hmcDonough@keyspanenergy.com
- Web page: http://www.keyspanenergy.com/pshome/energy/saving_ma_kedma.jsp

*Integrated Portfolios of Low-Income Program Services
Previously Selected Exemplary Program*

Massachusetts Low Income Affordability Network

***Massachusetts Department of Housing and Community Development in collaboration with
KeySpan Energy Delivery—New England***

PROGRAM OVERVIEW

The Massachusetts Low Income Affordability Network (LEAN) coordinates the delivery of all publicly funded energy efficiency programs across the state. Its purpose is to ensure that the 21 program operators deliver the highest quality, most cost-effective, and most convenient energy efficiency services possible for low income clients through the Commonwealth. LEAN also represents low income interests in utility regulatory negotiations on funding levels, program designs, and evaluations. The program works to provide seamless delivery of energy services to low income clients, which currently total about \$30 million per year.

LEAN was established as a result of legislation that, for the first time, established secure funding for low income utility efficiency programs. The statute (G.L. c. 25, sec. 19; St. 1997, c. 164, sec 37) states:

The low income residential demand-side management and education programs shall be implemented through the low income weatherization and fuel assistance program network and shall be coordinated with all gas distribution companies in the Commonwealth with the objective of standardizing implementation.

Prior to this time, electric and gas utility low income programs were negotiated, one at a time, between individual utilities and the low income agencies in each service territory. Statewide support was provided by the Association of Community Action Program Directors (MASSCAP) and the Massachusetts Energy Directors Association (MEDA), and by statewide multi-party collaboratives of interested parties from all customer sectors with respect to each utility, all of which continue. The statute established a floor for funding of electric programs and the mandate for gas programs. A negotiated agreement with KeySpan Energy Delivery—New England established the model for other gas utility programs.

The services provided by LEAN include:

- Coordination among electric and gas utilities and their collaboratives with the objective of standardizing implementation (as directed by the above statute).
- Coordination within the low income weatherization and fuel assistance program network, including among lead vendors and between lead vendors and sub-vendors.
- Coordination with potential vendors outside the low income weatherization and fuel assistance program network for certain segments of the low income residential market—for example, large multi-family buildings.

- Assistance in the development of the comprehensive low income residential demand-side management and education programs required by statute.
- Assistance in monitoring and evaluating existing programs to improve cost-effectiveness and develop new program features. This includes development of evaluation strategies, coordination with evaluators, and synthesizing statewide lessons from program evaluations.
- Support for the training of the low income weatherization and fuel assistance program network with the objectives of quality, cost-effectiveness, and consistency.
- Regulatory support in negotiations with and proceedings before the Department of Telecommunications and Energy (DTE) and the Division of Energy Resources (DOER).

LEAN is composed of representatives of each lead agency among the low income agencies; the Department of Housing and Community Development (DHCD); experts and attorneys from Action for Boston Community Development (ABCD), National Consume Law Center (NCLC), and South Middlesex Opportunity Council (SMOC); and appointed experts and attorneys. LEAN negotiates program agreements among the low income agencies in each utility service territory, each of the ten gas and electric utilities,⁸ and the two regulators. LEAN also meets periodically as a group and with utility representatives to coordinate standardization and establish best practices, to work out issues that may arise, and to oversee quality control. Ultimate responsibility for each program remains the subject of contracts between each utility and lead agency and between DHCD and each lead agency. Based on those contracts, lead agencies sub-contract implementation to other agencies in the relevant territory. Operating agencies generally hire sub-sub-contractors for measure installation.

A comprehensive set of services is provided to households served by LEAN's coordinated programs to address residential heating systems, building shell improvements, appliances, and health and safety checks. Funding is coordinated among sources, as appropriate. Funding sources include gas utilities, electric utilities, U.S. Department of Energy (DOE), U.S. Department of Health and Human Services (HHS), and a Ford Foundation pilot grant to combine energy efficiency and home renovation programs. The two federal sources (DOE and HHS) are administered by DHCD. All measures are directly installed at no charge to the low income consumer and include:

- a comprehensive energy audit, which includes customer education,
- weatherization (wall, attic, floor, and pipe and duct insulation⁹) and air sealing (caulking, weatherstripping, door and window hardware, window parting beads, and stops),
- turn-down thermostats,
- water heater blankets,
- blower door analysis,
- tune-up, repair, and replacement of faulty heating systems,

⁸ As a result of mergers, the ten utilities operate in 14 separately identified territories. In addition, a gas utility that serves one town and part of another has no low income efficiency program. To date, the full set of programs has not been adopted by municipal utilities.

⁹ About a third of Massachusetts' low income homes are heated by oil. Weatherization of these homes, as well as those heated by other non-utility fuels (chiefly propane and wood), is funded by DOE and electric utility funds. Thus the integrated program operates in a fuel-neutral manner.

- low-flow showerheads and faucet aerators,
- minor building repairs, including glass replacement and adjustment of window meeting rails,
- replacement of inefficient appliances, including refrigerators and clothes washers,
- water bed covers,
- installation of compact fluorescent lamps (CFLs),
- CFL torchieres and desk lamps,
- health and safety measures such as wire inspection, ventilation, and the DOE lead-free protocol, and
- additional multifamily-building-specific measures such as common area lighting fixtures and HVAC motors and controls, particularly in publicly funded housing.

Special efforts are made with respect to new construction and comprehensive rehabilitation projects. In addition, other services that are coordinated with efficiency measures include:

- Budget counseling where appropriate and available,
- Referral to other social services, where appropriate and available, and
- Arrearage management, including some arrearage forgiveness, where there is a utility program in place.

Starting January 1, 2004, the efficiency program will be coordinated with KeySpan's innovative OnTrack program, which provides budget counseling, arrearage management, and other social services to a small number of low income customers with the objective of increasing their ability to pay their bills. In addition, a pilot project supported by an HHS grant provides case management services (including budget counseling and, where available, utility arrearage management) in certain parts of the Commonwealth. In a small part of the KeySpan territory, a Ford Foundation grant supports pilot efforts to combine energy efficiency and home renovation programs.

In almost all cases, customers become eligible for low income efficiency services through the fuel assistance program (LIHEAP), which is administered by community action programs (CAPs) and other community-based organizations. Although eligibility levels differ slightly among the programs, in general the fuel assistance application process automatically enrolls clients for all utility-related programs for which they are eligible. These can include, in addition to LIHEAP:

- Efficiency programs,
- Gas, electric, and telephone rate discounts,
- Case management services, and
- Utility arrearage management programs.

Customers not eligible for other low income energy programs are nevertheless screened by fuel assistance agencies for eligibility for low income energy efficiency services.

PROGRAM PERFORMANCE

LEAN's first large-scale gas utility program was with KeySpan Energy Delivery—New England, begun in 1997. It has been evaluated “to be operating in a high quality and cost-effective manner,” with more than 95 percent of participants extremely or very satisfied, and the consistent “opinion of program staff, managers, and planners that the program is very successful.” Evaluation further found that, in addition to the therm savings the program produces for the system, the low income efficiency program provides significant benefits to customers in the form of comfort, improved condition of homes, bill savings, and (for 60 percent of those in arrears) an easier time paying their bills. Indeed, 30% of those in arrears found themselves able to pay their bills in full after participating in the efficiency program. These non-energy benefits translate further into such benefits as health benefits to participants and reduced utility costs of carrying and collecting debt and terminating and reconnecting service. There are also water resource savings. The value of such additional benefits has not been formally computed for this program, but they are estimated to be at least 50% of the energy benefits. Concluded one contractor quoted in the evaluation: “This Program is the best one I’ve seen out there, and I’ve seen a lot!”

Results at KeySpan include these for the six completed years of the ongoing program:

	Lifetime, May 1997–April 2003	Last full year, 2002–03
Participants	7,180	1,103
Fuel savings (therms)	20,168,800	3,098,400
Program cost	\$16,100,000	\$3,400,000
Cost/therm saved	\$0.798	\$1.09

KeySpan attributes the success of its low income program to flexibility in program design and on-going implementation, creative management, effective administration, and high implementation standards. Ongoing training by the utility and the agency, based on DHCD and utility practices, also plays a key role in the program's success. This includes the requirement that all auditors have DHCD training and certification. The particular success of KeySpan's low income efficiency program illustrates how LEAN supports and enhances individual utility efforts. LEAN has improved program services in many ways, including serving as a sounding board for program managers. Such input has guided program development and evolution, leading to more effective program administration, implementation, and delivery of services to customers.

LESSONS LEARNED

LEAN's performance of its functions in a consistent, statewide manner eliminates duplication of effort and makes the administration and coordination of utilities' low income programs both more efficient and more effective. Among the benefits achieved from the approach taken by LEAN are:

- The statutory goal of standardizing implementation is achieved, while retaining individual electric and gas distribution utility flexibility.

- Repetitive functions are more efficiently performed through elimination of duplicative services.
- Problem-solving is administratively simplified and benefits from experience elsewhere in the state.
- Lessons are synthesized for statewide application, where appropriate.
- Statewide issues need only be addressed once.
- Electric and gas utility service territories partially overlap in many places. Electric and gas territories partially overlap with low income agency territories. Thus one agency can be working in the territories of several utilities. Coordination among overlapping service territories is simplified.
- Representation in proceedings before the Department of Telecommunications and Energy and the Division of Energy Resources are simplified.

Utility efficiency programs in Massachusetts, including low income programs, grew out of the Integrated Resource Planning (IRP) process of the mid-1980s, which was itself a response to a federal law (PURPA) and to price shocks due to nuclear power cost overruns. Utility low income programs were significantly expanded as a result of an electricity restructuring statute enacted in 1997. The statute set a permanent floor under electric utility funding of low income efficiency programs and required coordination with gas utility programs. In the same year, the current KeySpan program was established on the basis of the settlement of a DTE rate case. From their beginning in the federal weatherization programs of the 1970s, low income efficiency programs had been coordinated by the Commonwealth's administering agency (DHCD), by an association of the community action programs that implemented most of them, and by an association of community-based programs delivering low income energy services. LEAN was created in 1998 to focus and expand the scope of coordination of the vastly expanded programs.

The success of LEAN in expanding and coordinating utility low income programs is a result of countless factors that mix idealism, politics, and good management. The base for development of the programs has been, as it is in many states, a federally funded weatherization program administered by the state and implemented by a network of community-based agencies, together with a core of support in the state for utility efficiency services. While all situations are unique, the organizers of LEAN believe their successful leverage of that base into comprehensive and well-funded low income energy efficiency programs can be replicated over time by developing these principal conditions:

- Adequate funding to implement and administer the programs, including support services necessary to provide operational assistance, factual information, negotiation of agreements, and advocacy for those agreements with regulators;
- Development and maintenance of a broad base of political support for all efficiency programs and especially for low income programs;
- Identification of key personnel working for success of the programs at utilities, regulators, and agencies, as well as at coalition partners, and development of constant communication and strong working relationships among those people;
- Strong support from the state agency that administers the federal weatherization programs; and

- Close attention to volume and quality control and immediate response to any problems.

PROGRAM AT A GLANCE

Program name: Massachusetts Low Income Energy Affordability Network (LEAN)

Targeted customer segment: Low income households (60% of state median income, some non-efficiency program elements have lower income limits)

Program start date: 1997

Program participants: Program information for KeySpan Energy only: 1,103 for 2002–03 (program year); 7,180 cumulative program total from beginning of program (May 1997)

Approximate eligible population: 360,254 households (estimated from 2000 U.S. Census)

Participation rate: 0.3% annual (program year 2002–03); 2.0% cumulative since program inception

Annual energy savings achieved: 3,098,400 therms (program year 2002–03); 20,168,800 therms cumulative from program inception

Cost-effectiveness: Average cost per therm saved in the utility-funded portion of the program is 79.8 cents. The benefit-to-cost ratio exceeds 1.0 on the basis of energy savings alone; with non-energy benefits factored in, this ratio is at least 50% higher (a definitive calculation has not been performed).

Budget

Year	Program Costs
2001	\$3.3 million
2002	\$3.4
2003 (preliminary)	\$2.7
2004 (projected)	\$3.2

Notes: Program costs are utility costs only and do not include other sources. There are no customer costs in this program. Years are program years (May of stated year through April of following year.)

Funding sources: Customer rates pursuant to order of DTE, utility shareholder funds, DOE, and HHS via DHCD; and also a Ford Foundation grant

Best persons to contact for information about the program

- Ken Rauseo, Deputy Director, Community Services Unit
- Department of Housing and Community Development, One Congress Street, Boston, MA 02114
- Telephone: 617-727-7004 ext. 515
- Fax: 617-727-4259
- E-mail: Ken.Rauseo@state.ma.us
- Web page: <http://www.state.ma.us/dhcd/components/dns/default.htm#Energy Programs>

- Elliott Jacobson, Chair, LEAN and Energy Director/Rita Carvalho, Assistant Energy Director/Craig Brown, Director, Conservation Services
- Action, Inc., 47 Washington Street, Gloucester, MA 01930
- Telephone: 978-283-2131
- Fax: 978-283-3567
- E-mail: elj@actioninc.org; ritac@actioninc.org; craig@actioninc.org
- Web page: <http://www.actioninc.org/energy.html>

- Susan Fitzgerald, Program Manager, Residential Energy Efficiency Programs
- KeySpan Energy Delivery, 52 Second Ave., Waltham, MA 02451
- Telephone: 781-466-5319; cell 978-479-1056
- Fax: 781-890-7935
- E-mail: sfitzgerald@keyspanenergy.com
- Web page:
http://www.keyspanenergy.com/pshome/energy/low_inc_weatherization_program_ma_kedma.jsp

- Jerrold Oppenheim, counsel
- LEAN, 57 Middle Street, Gloucester, MA. 01930
- Telephone: 978-283-0897; cell 978-335-6748
- Fax: 978-283-0957
- E-mail: JerroldOpp@DemocracyAndRegulation.com
- Web page: www.DemocracyAndRegulation.com

*Programs Serving Mobile Homes
Honorable Mention*

Energy Conservation Helping Oregonians

***Oregon Housing & Community Services
Portland General Electric
PacifiCorp***

PROGRAM OVERVIEW

Energy Conservation Helping Oregonians (ECHO) addresses the energy needs of low-income Oregonians. ECHO serves households who live in single family site built, mobile homes, multifamily buildings (5 or more units per building) and shelters. The program is available to owners and renters. Priority is given to households with persons over 60 years of age, children under 6 years of age, or persons with disabilities. The ECHO program is delivered free of charge to income qualified persons with incomes at or below 60% of Oregon state wide median income.

ECHO is a full-service weatherization program. All cost effective measures (measures with a savings to investment ratio (SIR) of 1.0 or greater are eligible. Site built home generally receive insulation in attics and floors, dense pack insulation in walls, heating system improvements such as duct tightening, furnace repair or replacement and window replacement as needed. Mobile homes generally receive membrane roof systems with insulation, belly insulation, heating system improvements such as duct tightening and furnace repair or replacement and window replacement and doors as needed. Multi-family dwellings generally receive attic, floor, exhaust fan venting, heating system improvements and windows as needed.

In addition to weatherization services, ECHO provides other services to help reduce energy costs, including energy education and replacement of inefficient devices and appliances with energy-efficient units for such applications as lighting and refrigeration. CFLs are provided as appropriate to replace incandescent light bulbs. Refrigerator replacement is also provided based on identification of need. Refrigerators are metered to determine energy usage and those that can meet the required savings to investment ratio are replaced. The old refrigerator is removed, decommissioned and recycled. Refrigerator replacement is contracted through local appliance vendors.

ECHO is available within the utility service areas of Portland General Electric and PacifiCorp. Customers in these areas pay into public benefits charge equal to 3% of the monthly bill. The low-income weatherization program ECHO is supported by 13% of the 3% received under this charge. This is a result of Oregon's restructuring legislation, SB 1149 (now state law OAR 757.612) passed in 1999. In addition to establishing the public benefits charge, the law also designates Oregon Housing & Community Services Department (OHCS) as the administrator of the low-income weatherization funds. OHCS is the historic administrator of all federal low-income weatherization programs including Department of

Energy-Weatherization Assistance Program, Low Income Home Energy Assistance Program-Weatherization Assistance Program, and the Bonneville Power Administration low-income Weatherization Assistance Program. Working with the Department's Advisory Council on Energy (ACE) a set of program guidelines was established modeled after federal regulations for DOE-WAP. The Department's existing low-income weatherization network was tagged to deliver ECHO. Oregon's low-income weatherization network consists of 16 community based organizations made up of community action agencies, housing authorities, and county governments.

ECHO funds are collected by Oregon's two largest investor owned electric utilities Portland General Electric (PGE) and PacifiCorp. The funds received and collected by PGE and PacifiCorp are earmarked and spent within the utilities respective services territory. OHCS receives monthly ECHO payments from both utilities. For the calendar year 2004 ECHO funds received from PGE totaled \$4,538,791.56. For the calendar year 2004 ECHO funds received from PacifiCorp totaled \$2,878,716.87.

PROGRAM PERFORMANCE

ECHO officially began on March 1st, 2002 it is a full service weatherization program capable of standing alone without supplemental funding. As of December 31, 2004 ECHO has weatherized 4,395 homes and saved 17,045,451 kWh at an average cost of \$0.62 per kWh (first year savings only). Each dwelling proposed for weatherization under ECHO received an individualized audit using computerized audit software. All measures with an identified savings to investment ratio (SIR) of 1.0 or greater can be installed using ECHO funds. In addition ECHO subgrantees (contractors providing services) can spend up to 10% of their ECHO program allocation for repair/health & safety (non-energy savings) measures. A unique program aspect of ECHO is that energy savings is measured on total resource cost wherein each dollar spent must achieve 1 kWh (annual) in electricity savings. During calendar year 2004 ECHO saved equal 8,581 MWh.

A relatively large segment of the low-income population eligible for ECHO reside in mobile homes. Older, single-wide mobile homes have become a growing housing type for low-income households. ECHO provides services to this segment of the population, and has been very successful in reaching these customers and improving the energy efficiency of their homes. ECHO funds have been used to weatherize mobile home parks under program provisions addressing multi-family dwelling. In this case ECHO treats mobile home parks as a multi-family dwelling where everyone pays rent for their spaces and lives in individual units.

ECHO's work with mobile homes is particularly noteworthy as these types of dwellings present unique challenges, yet typically exhibit great need due to their age, condition and generally poor thermal characteristics. They also often are heated with electricity. Below are some key indicators of ECHO's results for mobile homes receiving services through the program:

- The average cost per unit is \$5,097

- The average savings per unit is 6,933 kWh
- Approximately 60% receive EPDM (ethylene propylene diene monomer) roof systems (rubber membrane for roof)
- Approximately 78% receive window replacements
- Approximately 80% receive duct sealing
- Approximately 30% receive exterior door replacements
- Approximately 50% receive belly insulation
- Approximately 30% receive refrigerator replacements
- Approximately 100% receive air infiltration

The break-down according to housing type in 2004 for ECHO is the following:

- 529 site-built single family homes (24.5%)
- 914 mobile homes (42.3%)
- 713 multi-family units (33%)
- 4 shelter units (0.2%)

LESSONS LEARNED

The success of ECHO is the result of a willing state legislature, tireless low-income advocates, a creative energy advisory council and a dedicated weatherization network. A key feature of ECHO is that the \$1 per kWh rule allows the weatherization delivery network to measure their effectiveness and control their spending. Low-income residents of Oregon benefit because ECHO provides ready access to cost-effective weatherization and dwelling stabilization that may have only been available after years of waiting under predecessor state or federal programs.

PROGRAM AT A GLANCE

Program name: Energy Conservation Helping Oregonians

Program eligibility (guidelines): Households in Oregon with incomes at or below 60% of the Oregon state-wide median income.

Program start date: March 2002

Program participants: From program inception through December 2004, ECHO has weatherized 4,395 homes.

Approximate eligible population: NA

Participation rate: NA

Annual energy savings achieved: 17,045 MWh cumulative annual savings.

Cost effectiveness: All measures installed are screened for cost-effectiveness and must show a savings to investment ratio greater than 1.0. In terms of program costs to first year savings, the program has saved electricity at a cost of \$0.62 per kWh.

Budget and cost information

Year	Program Costs
2003	\$3,290,066
2004	\$6,211,563
2005 (preliminary)	NA
2006 (projected)	NA

Funding source and share of program budget: Oregon public benefits charge.

Best person to contact for information about the program

- Joan Cote, Energy Services Director
- Mid-Willamette Valley Community Action Agency
- Telephone: 503 585-8491 Ext. 315
- Fax: 503 585-8462
- E-mail: cotej@mwvcaa.org
- Postal address: 2585 State St. NE, Salem, Oregon 97301
- Web page: <http://www.oeca.info>

*Refrigerator Replacement Programs
Honorable Mention*

Low-Income Refrigerator Replacement Program

***State of Utah
Utah Power
Program Grantees¹⁰***

PROGRAM OVERVIEW

The State of Utah, Department of Community and Culture, Division of Housing and Community Development administers the “Low-Income Refrigerator Replacement Program” in conjunction with a full service DOE Weatherization Assistance Program, which provides weatherization services to all areas of the State of Utah. The program began as part of an electric base-load reduction program when Utah Power was sold to Scottish Power. The original three-year program was funded at \$300,000 per year with 100% shareholder funding. The State of Utah completed the \$900,000 program during the fall of 2004. The current program is an extension of that first program with the following changes:

- \$225,000 is available yearly as a 50% reimbursement program to test refrigerators and replace high KWH usage units,
- Installation of CFLs is now provided, and
- Some air-conditioning equipment upgrades are provided.

The Refrigerator Replacement Program was initiated in July 2000, and the first refrigerator was replaced in January 2001. The current reimbursement program structure was approved by the Utah Public Service Commission November 15, 2004 in association with a rate case.

The State of Utah contracts with Utah Power, which funds 50% of the present program. The other 50% of program funding comes from matching federal funding or other sources. As part of the State’s contract with Utah Power, it agrees to test and evaluate every refrigerator under consideration for replacement for a minimum of 72 hours. That testing has allowed the State of Utah to compile a comprehensive database with actual measured results. As part of contract guidelines it is mandatory for every refrigerator to be tested and the results run on the audit software. All refrigerators testing at a savings-to-investment ratio of 1.0 or greater are replaced. The State of Utah has contracted with a large furniture dealer, R.C. Willey, to supply, deliver and recycle the old refrigerators according to EPA guidelines. Initially the program only offered one model as a replacement, but soon expanded the number of models to ensure that the program was not missing a significant numbers of opportunities to replace

¹⁰ Bear River Association of Governments Weatherization Program, Davis County Aging Services Tri-County Weatherization, Salt Lake Community Action Program Weatherization Program, Housing Authority of Utah County Weatherization Program, Six County Association of Governments Weatherization Program, Five County Association of Governments Weatherization Program, Uintah Basin Association of Governments Weatherization Program, and South Eastern Association of Local Governments Weatherization Program

energy-inefficient units. The program currently offer 5 models including two side-by-side models, all of which are the most energy-efficient available.

The initial program was funded with Utah Power shareholder funds. That program concluded in the fall of 2004. The State of Utah has negotiated with Utah Power and recently signed a contract to continue the program indefinitely with some minor changes. This new program was approved by the Public Service Commission and is being funded with ratepayer funds. Under this contract Utah Power agrees to pay 50% of all costs associated with qualified Utah Power customers. That 50% reimbursement includes a \$25 testing fee, 50% of the unit costs (presently \$549 per refrigerator) and a 10% administration fee. The other 50% of the associated cost will be paid either with DOE or LIHEAP funds or in the case of renters, by the landlords.

PROGRAM PERFORMANCE

Since the first refrigerator was replaced in January 2001 the program has replaced a total of 985 units through the end of 2004. During that same period of time the weatherization assistance program served a total of 2,430 homes. Program statistics show the average tested refrigerator consumed 1944 KWH per year with an average of 1510 KWH saved per client home. The most inefficient refrigerator tested to date consumed 5,031 KWH, which at \$.07 per kWh amounted to an annual energy cost of \$352.00 per year.

In 2005 the program expects to test about 900 refrigerators and replace about 400 of them. With an expected average savings of 1,156 kWh/unit, the program will save about 458 MWh of electricity, saving the average household about \$81/year.

LESSONS LEARNED

The most effective program element has been the minimum 72 hours refrigerator testing. Because of this, program staff have been able to assure Utah Power and the Public Service Commission that the refrigerators replaced will in fact saved the KWH per years that the test and audit results predicted.

Gary Spangenberg, State of Utah Weatherization Program Specialist, offers the following additional lessons learned:

- It will take longer that you anticipate the get the program up and running.
- You will need to fight tooth and nail to get some agencies on board.
- Even when all agencies are on board, it is a constant battle. We have to change policy to make these measures mandatory for all clients we serve.
- The clients we serve absolutely love the program. Because most of our clients are considerably lower than 125% of poverty, most have never had a new refrigerator.
- Every client I speak to that has had a refrigerator replaced has mentioned they have seen a significant reduction in their monthly electric bill.

PROGRAM AT A GLANCE

Program name: Low-Income Refrigerator Replacement Program

Program eligibility: Households at 125% of federal poverty guidelines across the State of Utah. That is currently \$11,963 per year for one person and approximately \$4,075 for each additional family member.

Program start date: July 2000.

Program participants: During the most recently completed contract, which ran from June 2003 to December 2004, the program served 1007 households and 3065 clients.

Approximate eligible population: NA

Participation rate: NA

Annual energy savings achieved: For 2005 about 458 MWh.

Cost effectiveness: Each refrigerator is tested to determine eligibility for replacement, assuring a positive benefit to cost ratio. The replacement service is offered in conjunction with the state's weatherization assistance program to keep program costs low.

Budget and cost information:

Year	Program Costs
2003	\$298,951
2004	\$109,840 (program ended)
2005 (preliminary)	\$225,000
2006 (projected)	\$225,000

Funding sources and share of program budget: Under the recently renewed contract with Utah Power, the utility funds 50% of the program costs; federal and other resources fund the remaining 50%.

Best person to contact for information about the program:

- Gary Spangenberg, Weatherization Program Specialist
- Telephone: 801-538-8656 1-877-488-3233 Toll Free
- Fax: 1-801-538-8888
- E-mail: gspangen@utah.gov
- Postal address: 324 South State Street, Suite 500, Salt Lake City, UT 84111
- Web page: <http://dced.utah.gov/community/weatherization.html>

*Refrigerator Replacement Programs
Previously Selected Exemplary Program*

Indiana Low-Income Weatherization and Refrigerator Replacement Program

***Cinergy/PSI
State of Indiana Weatherization
Indiana Community Action Programs***

PROGRAM OVERVIEW

The program serves households whose annual income is at or below 125% of the federal poverty guideline. Clients receive services through weatherization, energy assistance, and energy education, thus ensuring that they lower their energy burden. In the Cinergy/PSI territory, homeowners also receive additional weatherization measures paid for by the utility, as well as refrigerator replacements if the units are tested above a certain energy usage. The program replaces inefficient, high energy user refrigerators with efficient ENERGY STAR[®]-rated refrigerators. The refrigerator replacement program went statewide in mid-2002.

The program provides comprehensive services and energy savings to low-income individuals through a partnership among partnering state, local, and private entities. This leverages funding and program resources. Cinergy/PSI established partnerships with the State of Indiana Weatherization Program, the local community action agencies, the Indiana Community Action Association, and the Whirlpool Corporation.

An exemplary feature of this program is a sliding-scale payment system for refrigerators. This was a win-win situation for all parties because shared costs allow for a greater number of clients to be served as well as larger savings to be realized. In the refrigerator program, 52 percent of the homes tested received replacements. Replacement units must save at least 400 kWh per year. Average savings per unit is 1,260 kWh per year. The payment is split between the state and the utility based on the savings. For the 400 kWh minimum savings, Cinergy/PSI will pay \$100 towards the cost of the unit, up to the total cost of the unit based on savings. The sliding scale of utility payments was based on utility avoided costs to get positive results for the utility while minimizing the state contribution required.

Another exemplary feature of this program is the partnership that Cinergy/PSI developed with the Whirlpool Corporation to supply the ENERGY STAR units. This was possible due to the high volume of refrigerators being purchased. As a result, Cinergy/PSI was able to negotiate an exceptionally good price for the new units. The negotiations included delivery and set-up of the new units, and removal of the old ones followed by permanent removal from the grid by dismantling them in an environmentally friendly manner.

PROGRAM PERFORMANCE

This program has shown itself to be very cost-effective, so much that the state of Indiana has implemented the program statewide, effective July 1, 2002. This will ensure the future of this very unique partnership, as well as serve additional customers and provide additional energy savings.

Refrigerator replacements are a common program feature since most of the homes served are very low income, and these households tend to have the older, less efficient refrigerators. To

date, the program in the Cinergy/PSI territory is replacing an average of 57 percent of the units tested. Not only is this program providing clients with saving, but is permanently removing the old units from the grid and ensuring other families will not be burdened with them.

The testing results are collected by the agencies and submitted to the Indiana Community Action Association. This data is presently entered into a database maintained by Cinergy/PSI. However, the cost-effectiveness of replacing refrigerators has already been determined through several projects completed under the U.S. Department of Energy and utility companies. Cinergy/PSI has all the collected data but a formal impact evaluation has not been conducted by PSI yet.

Since November 2001, the Cinergy/PSI program has tested 1161 refrigerators and 607 have been replaced at a cost of \$177,000 and a savings of 750,000 kWh.

LESSONS LEARNED

Some of the key lessons learned from the Indiana Low-Income Weatherization and Refrigerator Replacement Program include:

- Utility funding on sliding scale increases cost-effectiveness
- Delivery and coordination with supplier critical
- Testing needs to be two hours minimum

PROGRAM AT A GLANCE

Program name: Indiana Low-Income Weatherization and Refrigerator Replacement Program

Targeted customer segment: Low-income residential households

Program start date: Cinergy/PSI has been involved with the Low-Income Weatherization Program since 1990. In January 1997, the program as it exists today was developed. In October 2001, the Refrigerator Replacement program component was included as part of the weatherization program.

Program participants:

Low-Income Weatherization Program

2001: 1,948 participants

2002: 2,029 participants

1997 through Dec. 2002: 9,231 participation

Refrigerator Replacement component

Nov. 2001 through present: 1161 refrigerators were tested and of those, 607 were replaced.

Approximate eligible population: The program serves households whose annual income is at or below 125% the federal poverty guideline. For the Cinergy/PSI portion of the program, customers must have a Cinergy/PSI electric account. Refrigerator participants must also own their homes.

Participation rate: NA

Annual energy savings achieved:

Low-Income Weatherization Program

2001 annual savings: 835,137 kWh
 2002 annual savings: 741,205 kWh
 Cumulative annual savings from total program (beginning 1997): 3,581,513 kWh

Refrigerator Replacement Program

Inception through present: 287,340 kWh annual
 Average savings per refrigerator replaced: 1,260 kWh per year

Peak demand (summer) savings achieved: Refrigerator program—The demand impact is 0.373 kW saved per unit or 85.044 kW for the program.

Other measures of program results to date: The Total Resource Cost test (TRC), utilizing DSManager, shows a program TRC of 1.87 for the utility.

Budget

Refrigerator Component

Year	Utility Costs—PSI
Nov. '01–Oct. '02	\$63,649*
2003 (projected)	\$100,000
Year	State of IN Costs
Nov. '01–Oct. '02	\$51,349*
2003 (projected)	\$80,000
Year	Total Costs
Nov. '01–Oct. '02	\$115,000
2003 (projected)	177,000

*These numbers reflect only the cost of the new refrigerator (which includes delivery of new, and removal and disposal of the old). No PSI or state program administration expenses are included. PSI's administration expenses totaled \$15,351.

Funding sources: Cinergy/PSI and State of Indiana Weatherization

Best person to contact for information about the program

- Erica Burrin, State of Indiana, Division of Family Resources
- Telephone: 317-234-1971
- Fax: 317-232-7079
- E-mail: Erica.Burrin@fssa.in.gov
- Postal address: 402 W Washington Street, PO Box 6116, Indianapolis, IN 46206-6116

*Programs Using “Standard Offer” Approaches
Honorable Mention*

Low-Income Weatherization Standard Offer Program

TXU Electric Delivery

PROGRAM OVERVIEW

The Low Income Weatherization Standard Offer Program (LIWP) is a result of the Texas Electric Choice Act passed by the Texas Legislature in 1999. The Act calls for investor owned transmission-distribution utilities to offset ten percent of system load growth in peak demand through standard offer and market transformation programs. Funding for this program is provided through transmission-distribution rates. One of the standard offer programs approved by the Public Utility Commission of Texas (PUCT) for implementation by the utilities is the Low Income Weatherization Standard Offer Program (a.k.a. Hard-to-Reach Standard Offer Program). TXU Electric Delivery and other utilities affected by these actions collaborated with the Public Utility Commission of Texas, participants in the Energy Efficiency Implementation Project, and Electric Utility Marketing Managers of Texas to develop standard offer program designs, including programs to serve the needs of low income customers.

In response to the legislative and regulatory requirements for energy efficiency programs, TXU Electric Delivery launched the Low-Income Weatherization Standard Offer Program in 2002. The program was designed in a collaborative process at the Public Utility Commission of Texas. Significant input into this program was made by low income advocates, energy efficiency service companies, utility program administrators, and regulators. The program targets single-family and multi-family residential customers whose household income is less than or equal to 200 percent of the federal poverty level. The program targets not only those who are traditionally considered low-income, but also includes the “working poor” who may not qualify for government sponsored weatherization services. For example, a family of four with a household income of \$37,000 would be eligible for the program. The program is a market-based approach to improving the energy efficiency of low income customers’ homes. The weatherization measures are installed by energy efficiency service companies who apply to be part of the program. The program allows a wide variety of energy efficiency service companies to participate. Currently, over fifty companies are participating and include both for-profit and not-for-profit organizations.

Once approved, these participating contractors are responsible for identifying customers and installing the energy efficiency measures in the customer’s home. The program seeks to minimize the chance for lost opportunities by requiring a comprehensive approach to weatherization, while having the energy efficiency measures installed at low or no cost to the consumer. Eligible measures are divided into three categories; Control Envelope Energy Waste, Control Energy Usage, and control HVAC Efficiency. Contractors are required to take a comprehensive approach to installing the energy efficiency measures by installing one “control-envelope-energy-waste” measure before installing any other measure. After the

installations are complete, TXU Electric Delivery then conducts a series of inspections to validate that the measures were installed and that the customer is satisfied with the results. These inspections can be telephone interviews of the customer or actual on site verifications of the energy efficiency measures. Demand and energy savings for individual measures are calculated through a set of “deemed” savings approved by the PUCT. Incentive payments are then made to contractors on the basis of the verified demand and energy saved at each customer’s home. The customers are also surveyed to determine their overall satisfaction with the energy efficiency measures that were installed and their experience working with the energy efficiency service provider.

Funding for this program is provided through transmission and distribution rates. The total amount of funding for energy efficiency programs at TXU Electric Delivery is \$43 million per year and was established during the last rate case. The utility determines funding levels for individual programs prior to each program year. Beginning in the 2004 program year, TXU Electric Delivery made the commitment to fund the LIWP at a level of at least \$10 million per year for the next three years. Per PUCT rules, utility administrative costs are capped at ten percent of total program costs. Since the inception of the LIWP, utility administrative costs have averaged six percent. Historical funding for the program is shown in Table 2. The current year program budget is \$12,258,380, with an administrative budget of \$980,670.

	2002	2003	2004	Total
Incentive Budget	\$1,807,989	\$6,433,171	\$13,682,570	\$21,923,730
Utility Administration	\$181,212	\$392,711	\$550,813	\$1,124,736
Total	\$1,989,201	\$6,825,882	\$14,233,383	\$23,048,466

For a customer to be eligible to participate in the LIWP, their household income must be less than or equal to 200% of the Federal Poverty level. The exact population of eligible customers is not known as the qualifying income is based up on number of persons in the family. However, a conservative estimate is that between 25-35 percent of the households in the TXU Electric Delivery service area fall under this income designation. This translates to approximately 900,000 eligible households.¹¹

PROGRAM PERFORMANCE

Since it inception, the LIWP has grown in participation and energy savings. It is estimated that the program has impacted almost six percent of the eligible population in just three years of operation. On average, the participating customer will save 1,300 kWh annually. This translates to an annual savings of \$140. To date results are summarized in Table 1. The current program year’s goals are to save 9,029 kW and 37,036,096 kWh.

¹¹ Source: 2000 U.S. Census data from the Texas State Data Center.

	2002	2003	2004	Totals
Customers	14,918	18,453	17,565	50,936
kW Saved	1,876	6,372	10,941	19,189
kWh Saved	7,365,563	30,354,007	39,561,105	77,280,675

The Public Utility Commission of Texas has established cost effectiveness caps on incentives and program administration to ensure that the program achieves a positive benefit-cost ratio. Customer satisfaction scores with the LIWP are overwhelmingly supportive of the program. Over ninety percent are either satisfied or very satisfied with the energy efficiency measures and energy efficiency service provider.

The Texas Legislature has recently directed the Public Utility Commission of Texas to shift a portion of the funding from utility sponsored weatherization programs to those being conducted by state agencies. Funding for the Low Income Weatherization Standard Offer Program may be reduced for the 2006 and future program years.

LESSONS LEARNED

- This market based program was able to deliver energy efficiency services to the low income community by tapping into organizations based within the community. Numerous entities participating in the program are religious or neighborhood based non-profit organizations, and in most cases new jobs were created in the community. These entities are able to address the energy efficiency needs to a portion of the population that are generally suspicious of government programs. The program was also able to allow customers to receive the benefit of energy efficiency measures without have to remain on lengthy waiting lists for state sponsored weatherization services.
- Program controls are required to ensure participating companies install a comprehensive set of measures and not just install those that maximize their margins. Each year of the program, new measure installation requirements were put in place to ensure a quality installation as taking place in the customer's home that generates the maximum amount of savings for both the consumer and the utility.
- This program was started with just a few national energy service companies participating. Outreach to the local contracting community has grown the program to over 70 participating companies, most of whom are local in nature. It took TXU Electric Delivery three years to develop this current set of participating companies. While outreach is necessary to have companies participate in the program, procedures are also necessary to remove them from the program if they do not follow program requirements.

PROGRAM AT A GLANCE

Program name: Low-Income Weatherization Standard Offer Program

Program eligibility: Single and multi-family residential customers whose household income is less than or equal to 200% of the federal poverty level.

Program start date: 2002

Program participants: Program to date, 2002-2004: 50,936; program year 2004: 17,565.

Approximate eligible population: About 900,000 eligible households.

Participation rate: Program to date: about 6%.

Annual energy savings achieved: Program to date: 77,281 MWH annual savings; program year 2004: 39,561 MWH annual savings.

Cost effectiveness: The Public Utility Commission of Texas is in the process of conducting an evaluation of the utility energy efficiency programs. Through use of “deemed savings” program cost-effectiveness is implied. However, the state’s evaluation will verify this assumption.

Budget and cost information:

Year	Program Costs
2003	\$6,825,882
2004	\$14,223,383
2005 (preliminary)	\$12,258,380
2006 (projected)	NA

Funding source and share of program budget: Customer charge through transmission and distribution rates.

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*Programs Using “Expanded Income Eligibility with Co-Pay” Approaches
Honorable Mention*

Targeted Home Performance with ENERGY STAR®

***Focus on Energy
Wisconsin Energy Conservation Corporation***

PROGRAM OVERVIEW

Targeted Home Performance with ENERGY STAR is part of Wisconsin’s *Focus on Energy* Program. Focus on Energy is Wisconsin’s state public benefits program. Wisconsin Energy Conservation Corporation (WECC) is the residential programs administrator for Focus on Energy as a contractor with the State of Wisconsin. Targeted Home Performance with ENERGY STAR is part of Focus on Energy’s portfolio of residential programs administered by WECC.

Research shows that less than a quarter of the states offer weatherization or energy related programs to households that fall between 150% and 200% of the federal poverty level. Targeted Home Performance with ENERGY STAR was launched in late 2002 to address this segment of the low-income population in Wisconsin. This segment is typically underserved by energy efficiency programs as these households are at income levels above the eligibility criteria for low-income services, yet their limited incomes make it difficult to participate in other types of residential programs, which may require customers to pay significant costs to receive program services or to purchase energy-efficient technologies at full market costs.

The objective of Targeted Home Performance with ENERGY STAR is to assist qualifying limited-income Wisconsin residents in making energy efficiency improvements to their homes. The improvements are completed by program consultants at minimal costs to the homeowner; a 10% co-pay is required by the program. In developing Targeted Home Performance with ENERGY STAR, WECC sought to use the existing weatherization infrastructure and also to facilitate the development of an independent network of residential building energy efficiency specialists. Targeted Home Performance with ENERGY STAR is currently delivered mostly through the local low-income weatherization network (18 of 21 contracted providers). In areas of Wisconsin where the weatherization agency is not providing program services, Targeted Home Performance with ENERGY STAR works with “Home Performance with ENERGY STAR®” consultants. (“Home Performance with ENERGY STAR” is the broader market-based residential program providing energy efficiency services for existing homes offered through Focus on Energy.)

Eligibility for Targeted Home Performance with ENERGY STAR is based on the applicant meeting each of three criteria: (1) be served as an electricity customer by a utility participating in Focus on Energy (some municipal and cooperative utilities do not participate), (2) meet the income guidelines (see table below), and (3) reside in an eligible dwelling type (single-family homes, mobile homes, and small multi-family buildings (up to 4 units; in these cases, 50% or more of the units must be deemed income eligible).

Income guidelines are based on the Federal Poverty Guidelines and are updated annually. Applicants must provide income documentation for a minimum of three months of gross income to prove eligibility. The current guidelines (based on household size) are given in the table below:

Income Guidelines

July 1, 2005 through June 30, 2006

Household	150% of Poverty		200% of Poverty	
	Annual Income	3 Mos. Income	Annual Income	3 Mos. Income
1	\$14,355.00	\$3,588.75	\$19,140.00	\$4,785.00
2	\$19,245.00	\$4,811.25	\$25,660.00	\$6,415.00
3	\$24,135.00	\$6,033.75	\$32,180.00	\$8,045.00
4	\$29,025.00	\$7,256.25	\$38,700.00	\$9,675.00
5	\$33,915.00	\$8,478.75	\$45,220.00	\$11,305.00
Additional	\$4,890.00	\$1,222.50	\$6,520.00	\$1,630.00

Renters also may qualify for Targeted Home Performance with ENERGY STAR. In these cases, the rental owners must agree to pay an energy assessment fee of \$150 plus a 10% co-pay for the measures installed.

Participants first receive a home energy assessment, which is performed by a professional program consultant. This assessment reviews and analyzes household energy use and associated building systems for their performance, and includes a diagnostic safety testing of combustion appliances to ensure that the space heating and water heating systems are not creating carbon monoxide hazards or back drafting into the home.

The following measures may be installed pending results of the home energy assessments:

- Insulation of attics, foundations, walls and crawl spaces;
- Sealing of air leaks (guided through blower door and other diagnostic techniques);
- Update/upgrade equipment, this includes complete replacements of furnaces, boilers, water heaters and central air conditioning systems based on the condition and efficiency of existing units; improvements to the distribution systems (ductwork, piping) also can be completed to improve performance.
- Install energy-efficient (saving) devices, such as faucet aerators, low-flow shower heads, programmable thermostats, and ENERGY STAR® qualified CFLs. The home performance consultants also may analyze and suggest replacements of other devices, such as refrigerators.

Participants must allow all of the energy efficiency measures recommended by the home energy assessment to be installed in their homes. They may not pick only certain measures from the full set of recommended measures.

Participants pay 10% of the costs of the installed measures. The average participant contribution in the program year 2004-05 was \$528. For the previous two years this average was \$443—meaning that participants received over \$4,000 in benefits above their contribution amount.

PROGRAM PERFORMANCE

From the program’s inception through April 2005, Targeted Home Performance with ENERGY STAR has served a total of 641 households. The program’s annual budget has been about \$2 million in its first 3 years; for 2005-2005 the budget is estimated to be about \$1.2 million, reflecting overall budget reductions experienced by Focus on Energy. The table below summarizes the frequency of installations based on the 2003-04 program year and current year information to date:

Major Measures	Percentage of Homes Receiving Measure
Blower door guided infiltration and air sealing	88%
Sidewall insulation	37
Attic insulation	78
Crawlspace insulation	15
Heating system replacement	66
Water heater replacement	55
Central A/C replacement	5
Refrigerator replacement	28
Compact fluorescent bulbs	97

Evaluation of the program shows high participant satisfaction; on a five point scale with 5 being the highest rating—described as “very satisfied,” overall program rating was a 4.6 for the most recent year’s evaluation available (2003–04). Program staff were also rated highly—4.7 out of 5 points. Other features of the program that were rated highly (4.3 out of 5 or better) include (1) types of improvements made, (2) quality of work performed, (3) application process and (4) amount of time to receive services. A majority of program participants report increased control over both household energy use and the size of their energy bills as a result of participating in Targeted Home Performance with ENERGY STAR.

The co-pay feature is a key element of the program. Program evaluations show that very few participants that have been referred to the program provider have dropped out due to lack of ability to pay the 10% contribution amount. The total number of drop outs for the program to date is only about 10-15 eligible customers.

Households are required to pay the contribution prior to installation of the measures. In most cases the contribution is not a barrier to participation. In some cases, the Targeted Home Performance with ENERGY STAR program providers have also worked with participants to tap into other funding sources to assist with the required contribution, such as home rehabilitation funds, city development block grants, churches, and special utility funds.

LESSONS LEARNED

Suzanne Harmelink, Targeted Home Performance with ENERGY STAR Program Manager with WECC, offers the following lessons learned:

- Keep the program measures and requirements as close to the weatherization program as possible. The program needs to be easy to implement in the field.
- Provide as much administrative support to the program providers as possible (for example, application processing and approval).
- Determine the weatherization infrastructure's capacity to take on additional work. In areas that the weatherization provider does not have adequate capacity to meet the program needs, work with other energy efficiency professionals.
- If working with non-weatherization energy efficiency professionals, plan for training and time for some of these businesses to gain the technical competency necessary to perform the diagnostics and related services.
- Make sure the local energy assistance providers are aware and supportive of the program. Provide them with an easy way to refer customers to your program.
- Marketing efforts may need to be expanded in some areas to increase participation where capacity and need exists.
- Allow for adequate ramp-up timeframe.
- Flexibility is critical; if something is not working, take a serious look at why not and determine if it can or should be corrected or modified.

PROGRAM AT A GLANCE

Program name: Targeted Home Performance with ENERGY STAR

Program eligibility (guidelines): Customers within eligible service territories that have household incomes from 150-200% of the federal poverty guidelines.

Program start date: 2003

Program participants: 641 for the period 2002 through April 2005. Annual target is about 300.

Approximate eligible population: Census data suggest that about 287,000 Wisconsin households fall within the income eligibility guidelines for Targeted Home Performance with ENERGY STAR; of these an estimated 193,000 are homeowners.

Participation rate: 0.3% cumulative program total to date.

Annual energy savings achieved: On average participants have achieved savings of 806 kWh/year and 262 therms/year for electric and natural gas use, respectively. These values represent about 11% of pre-participation electricity use and 28% of pre-participation natural gas use.

Cost effectiveness: Evaluation results for the first half of FY05 estimate the benefit to cost ratio of Targeted Home Performance with ENERGY STAR to be 1.11.

Budget and cost information

Year	Program Costs
2002-03	\$2,113,834
2003-04	\$2,025,167
2004-05	\$1,944,612
2005-06 (projected)	\$1,200,000

Funding source and share of program budget: Public benefits charge on customer utility bills, 100% of program funding.

Best person to contact for information about the program:

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*Residential Low-Income Single Family New Construction
Previously Selected Exemplary Program*

Non-Profit Affordable Housing Project

***CenterPoint Energy Minnegasco in collaboration with Habitat for Humanity,
Project for Pride in Living, and the Greater Metropolitan Housing Corporation***

PROGRAM OVERVIEW

The Non-Profit Affordable Housing Project is a partnership between CenterPoint Energy Minnegasco and three non-profit organizations, Habitat for Humanity, Project for Pride in Living, and the Greater Metropolitan Housing Corporation. The program’s objective is to develop energy-efficient affordable housing for the low-income community. The project addresses multiple home construction issues, including energy efficiency, home maintenance, and indoor air quality while meeting or exceeding the requirements of the Minnesota Energy Code.

The Non-Profit Affordable Housing Project has the following components:

- Financial incentives
- Training and education

Non-profit organizations involved with housing development typically install the lowest cost mechanical equipment to meet their goal of creating affordable housing (“low cost” in this case referring to procurement, purchase, or first cost; it doesn’t include operating and other ongoing costs, such as maintenance and repair). To overcome this inherent bias to procure the lowest cost mechanical equipment, the Non-Profit Affordable Housing Project provides the incremental cost difference between standard and high-efficiency equipment. The rebate levels and types of qualifying equipment are given below.

- High-efficiency natural gas water heater (>.62 EF): \$230 rebate
- High-efficiency natural gas furnace (>92 % AFUE): \$380 rebate
- Heat-recovery ventilation (HRV): \$650 rebate
- Low-flow showerhead: \$10 rebate
- Shade trees:¹² up to \$200

Each house is eligible to receive up to \$1,470 in rebates for energy-efficient equipment, which is then deducted from the mortgage agreement.

All three collaborating non-profit organizations have educational programs for their participants on topics associated with new homeownership. As part of the training, CenterPoint Energy Minnegasco works with each of the non-profits to ensure that energy

¹² These are provided by Twin Cities Tree Trust, a non-profit whose mission is to reforest low-income neighborhoods throughout the Twin Cities area.

usage and proper maintenance of the appliances installed within their homes are addressed. The Non-Profit Affordable Housing Project also provides a comprehensive *Homeowners Manual* to program participants. This *Homeowners Manual* provides information to the participant on maintenance and upkeep of their new energy-efficient equipment as well as information on the maintenance of their tree plantings. In an effort to reach those homeowners that are not native English speakers, the *Homeowners Manual* includes a significant number of illustrations and photographs to attempt to overcome the language barriers, but still provide the information to the customer.

For the past decade, CenterPoint Energy Minnegasco has focused all of its conservation resources for the low-income community in existing housing stock through its low-income weatherization program. In an effort to provide a more cost-effective program for low-income customers, CenterPoint Energy Minnegasco developed the Non-Profit Affordable Housing Project for low-income new construction for its 2001–2002 conservation plan.

In the development of the Non-Profit Affordable Housing Project, CenterPoint Energy Minnegasco established the following criteria to determine participating non-profits for the program:

- Established working relationship with CenterPoint Energy Minnegasco;
- Mission of organization to provide affordable housing to low-income customers within CenterPoint Energy Minnegasco's service territory; and
- Program will influence decision-making on installation of high-efficiency equipment.

At that time, two organizations, Habitat for Humanity and the Greater Metropolitan Housing Corporation, met this criterion amply. CenterPoint Energy Minnegasco then started working with each organization to ensure it met their needs, and would not create an administratively burdensome process for implementation. After the success of the pilot program in 2001–2002, CenterPoint Energy Minnegasco decided to expand the program for 2003–2004 to a third non-profit that also met the program criterion—Project for Pride in Living. And, in 2005, the program expanded to include three additional non-profit agencies, including Central Community Housing Trust, Twin Cities Neighborhood Housing Services and Commonbond Communities.

CenterPoint Energy Minnegasco, as an investor-owned, rate-regulated natural gas utility in Minnesota, is required by Minnesota Statute to spend 0.05% of its gross operating revenue on conservation programs. The programs are reviewed and approved through a regulatory process by the Minnesota Department of Commerce. All expenditures associated with the conservation program are reviewed annually by the Minnesota Department of Commerce and the Minnesota Public Utilities Commission and awarded cost recovery, provided the expenditures were approved and prudent to ratepayers. CenterPoint Energy Minnegasco's conservation program may qualify for a financial incentive if the program significantly exceeds the statutory spending requirements and energy savings goals in a cost-effective manner.

PROGRAM PERFORMANCE

Since 2001, this project has served 320 homes throughout CenterPoint Energy Minnegasco's service territory. The utility estimates that the average homeowner is saving 37% on the average natural gas bill, which equates to a savings of approximately \$300 annually for the homeowner.

The program goals for 2001–2002 were 100 homes annually, with an annual energy savings goal of 29,300 therms. In 2001, the program generated 14,940 therms of energy savings serving 51 homes, and the 2002 program generated 24,910 therms of energy savings serving 85 homes. The reason for the program goals not being met is that many of the homes that were built in 2001 were designed before the implementation of the program; therefore, they did not specify qualifying high-efficiency equipment. As the program progressed, the building specifications for these homes were modified to specify high-efficiency equipment, and therefore a significant number of homes built by these organizations qualified for the program. At this time, all homes built by the partnering organizations are specifying equipment that qualifies for the program.

The energy savings estimates are based on standard engineering calculations for each of the specific technologies installed in the new construction home. The typical home built by these partnering non-profits includes a 78% AFUE forced-air furnace, a 0.54 EF (energy factor) forty-gallon natural water heater, balanced mechanical ventilation, a standard flow showerhead, and no landscaping. The qualifying homes include a 92% AFUE power-vented forced air furnace, a 0.62 EF power-vented forty-gallon natural gas water heater, a 60% efficient heat recovery ventilator, a low-flow showerhead, and landscaping planted at a minimum on the western side of the home.

The program partners value the program because it reinforces their mission to make housing for low-income families affordable. The typical families that these organizations provide services to are not able to qualify for a conventional mortgage because of their income level. These organizations deduct the rebates from CenterPoint Energy Minnegasco directly from homeowners' mortgages and therefore their mortgage payments are reduced as a result of the program. Since these new homeowners are already under pressure to afford the mortgage payment, any reduction is beneficial to them. Additionally, as a new homeowner, there are many expenses associated with the home beyond the mortgage payment, including utilities, garbage removal, homeowners insurance, and taxes. A one-third reduction in a natural gas bill, especially with rising natural gas prices, contributes to maintaining affordability for the new homeowner.

LESSONS LEARNED

Over the last decade of offering conservation programs to low-income customers, the primary vehicle for meeting that goal was to provide low-income weatherization. In an effort to deliver a more cost-effective, creative program for its low-income customers, CenterPoint Energy Minnegasco partnered with two respected non-profit agencies in its service territory to create this new program for low-income homeowners. Since the approval of CenterPoint

Energy Minnegasco's program, the Minnesota Department of Commerce has required two additional natural gas utilities to replicate this program for their new low-income homeowners.

With the expansion of this program to a third non-profit organization in 2003, this program will work with approximately 75% of all single-family low-income homes built in CenterPoint Energy Minnegasco's service territory each year.

Furthermore, this program has influenced the construction practices of the non-profit agencies beyond the homes built within CenterPoint Energy Minnegasco's service territory by heightening the awareness of energy usage and the importance of the installation of high-efficiency equipment in new homes in an effort to make the homes affordable for the duration. Specifically, Twin Cities Habitat for Humanity, one of the larger builders of single-family homes in Minnesota, now specifies high-efficiency equipment for all of its residential new construction homes, regardless of whether the home is within CenterPoint Energy Minnegasco's service territory or not.

Some of the key program features that have been most effective have been the inclusion of the Training and Education Component as part of the program. Feedbacks from the partnering organizations have cited the *Homeowners Manual* as particularly helpful for these new homeowners as they transition into their homes. Additionally, the Minnesota Energy and Mechanical Codes were modified in 2001 to address indoor air quality, mold, and durability of new construction, and one solution to comply with these code changes has been the installation of heat recovery ventilators. This equipment is expensive, and by having the program pay a portion of the equipment cost, it ensures compliance with the code in a less costly manner for these homes.

The Non-Profit Affordable Housing Project can easily be replicated with other partnering non-profit organizations that build single-family homes throughout the country. Non-profits recognize the value of the program to their new homeowners, and so "selling" the concept to them is relatively simple. The key to implementing the program is to influence the equipment specifications for the home before it is constructed. The process for providing the rebate for the homes is identical to any other incentive-based conservation program.

PROGRAM AT A GLANCE

Program name: Non-Profit Affordable Housing Project

Targeted customer segment: Low-income households, new housing construction

Program start date: 2001

Program participants:

2001: 43 homes
2002: 85 homes
2003: 107 homes
2004: 79 homes
2005: 6 homes (through 8/1/05)

Total: 320 homes

Approximate eligible population: Approximately 200 low-income single-family homes are constructed each year in CenterPoint Energy Minnegasco’s service territory.

Participation rate: The program expects to work with approximately 75% of all single-family low-income homes built in the company’s service territory each year.

Annual energy savings achieved:

2002 energy savings: 24,910 therms of natural gas; 2003 energy savings: 29,420 therms of natural gas; 2004 energy savings: 21,720 therms of natural gas

Total program energy savings since 2001: 90,990 therms of natural gas

CenterPoint Energy Minnegasco estimates that the average homeowner is saving 37% on the average natural gas bill—a savings of approximately \$300 annually for the household.

Cost effectiveness: The program costs approximately \$6.66/therm saved; the societal benefits/cost ratio is 4.17.

Budget

Year	Program Costs
2001	\$85,286
2002	\$130,530
2003	\$117,816
2004	\$84,995
2005 (projected)	\$275,000

Funding source: CenterPoint Energy Minnegasco’s conservation programs are funded through its customer rates.

Best person to contact for information about the program:

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