

**UTILITY INVESTMENTS IN LOW-INCOME
ENERGY-EFFICIENCY PROGRAMS**
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Abstract

In the increasingly competitive utility industry, it is imperative that equity programs be as cost-effective as possible. In some cases, this is accomplished by working in partnership with government programs such as the U.S. Department of Energy's low-income Weatherization Assistance Program. This paper provides an overview of the DSM and conservation programs being operated by utilities for low-income customers and describes the types of utility-government partnerships that exist.

Background

This study is part of an evaluation of the U.S. Department of Energy (DOE)'s Weatherization Assistance Program, the largest residential energy conservation program in the nation. The Program's mission is to reduce heating and cooling costs for low-income households, particularly for the elderly, people with disabilities, and children, by improving the energy efficiency of their homes and ensuring their health and safety. DOE provides financial grants to State agencies, which in turn administer the program and fund local agencies to perform the actual weatherization work.

DOE's Weatherization Program is faced with a need that far exceeds its budget. To stretch the effectiveness of its limited funding the DOE Program seeks to coordinate with related public- and private-sector programs. The significant growth of demand-side management (DSM) programs operated by electric and gas utilities has created promising opportunities for such partnerships in the low-income arena.

The primary objective of this study is to describe the DSM and conservation programs operated in 1992 by utilities for low-income customers. In particular, the focus is on programs that install major residential weatherization measures free-of-charge to low-income households. The goal is to provide a foundation for closer coordination between utility and DOE low-income conservation activities.

Data on utility low-income energy-efficiency programs were collected from a mail and telephone survey of utility program managers. Targeted follow-up phone calls were made to nonresponding utilities that were identified by key sources as possibly operating low-income energy-efficiency programs in 1992. These key sources included: a survey of State public utility commissions, issues of *Demand-Side Report*, a survey of 917 local weatherization agencies, and a survey of utility low-income programs operating in 1989. Survey forms were mailed to approximately 600 utilities, and responses were obtained from 180 of them, including the vast

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majority of the targeted utilities. See Brown et al. (1994) for a more complete description of the research design and findings.

Major Findings

Program Expenditures

Our survey identified 95 utility companies located in 33 states that operated 132 low-income energy-efficiency programs in 1992. Altogether these utilities spent \$140.6 million on the operation of their programs. This represents a 29% increase over the level of utility investments in 1989, as illustrated in Table 1. This increase is primarily a result of the implementation of new programs between 1989 and 1992.

Table 1. Comparison of Characteristics of Utility Low-Income Energy-Efficiency Programs in 1989 and 1992*

Indicators	Programs in 1989	Programs in 1992
Number of Programs	102	132
Total Expenditures (in 1992 dollars)	\$109.3 million	\$140.6 million
Expenditures Per Program (in 1992 dollars)	\$1,071,000	\$1,065,000
Expenditures Per Participant (in 1992 dollars)	\$440	\$454

*The 1989 statistics are from Power et al. (1992).

The average expenditure per program in 1992 was just over one million dollars, and the average expenditure per participant was approximately \$450. The diverse nature of utility low-income programs is reflected by the fact that expenditure levels varied widely around these mean values. For instance, average expenditures per program ranged from less than \$3,765 to \$27 million with a median budget of \$216,500. Similarly, programs serving more than half of the participants in 1992 had average expenditures of less than \$300 per participant, while programs serving a small fraction of the overall participants had average expenditures of more than \$3,000 per participant.

In general, utility expenditures per participating household are considerably lower than in DOE's Weatherization Program, which spent more than \$1,550 per participant in 1992. Utility expenditures per participant were especially low in programs that were implemented by electric utilities (\$307 per participant), that operated in the hot climate region (\$333), that were not mandated by regulatory commissions (\$300), and that were not coordinated with DOE's network of local agencies (\$255).

Figure 1 illustrates the pattern of increasing utility funding relative to the three primary government programs supporting low-income weatherization: (1) DOE's Weatherization Program, (2) U.S. Department of Health and Human Services' Low-

Income Home Energy Assistance Program (LIHEAP), and (3) Petroleum Violation Escrow (PVE) funds.

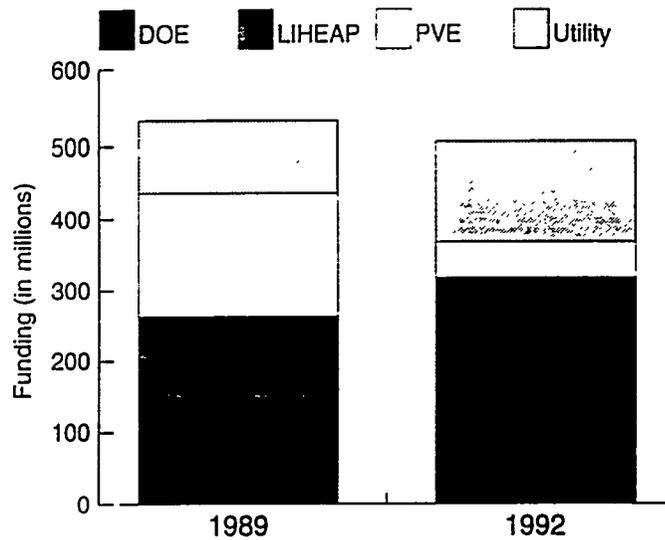


Figure 1. Four Major Sources of Weatherization Program Funds: 1989 vs. 1992

In 1989, utilities accounted for 19% of the total expenditures of these four types of programs. By 1992, the utility share had increased to 27%. This significant increase reflects the rise of utility funding and the decline in government funding (especially from PVE funds) in 1992 relative to 1989.

Program Goals and Regulatory Mandates

The most common primary goal of low-income energy-efficiency programs operating in 1992 was "to make energy services more affordable to low-income customers." Only 44% of the programs were operated primarily to provide a cost-effective energy resource, although this was a secondary goal for many programs. This "equity" emphasis is underscored by the fact that customer vulnerability was the most common type of household selection criteria employed by the utilities surveyed. In particular, 32% of the utility programs (serving 49% of the program participants) gave priority to elderly customers, persons with disabilities, and/or households with children. Further, checklists of measures were the most common criteria for determining the investment level of participating households. Savings-to-investment ratios were used by only 22% of the utilities (serving only 12% of the participants) as an investment criterion. Again, equity and not the efficiency of resource acquisition appears to dominate the design of these programs.

Orders by public utility commissions in ten states were examined to explore further the motivations behind utility investments in low-income DSM programs. These states accounted for 72% (\$101 million) of the total utility low-income program expenditures. Their commission mandates suggest that three types of rules exist.

- **Flexible DSM rules** are those in which utility investments in low-income energy-efficiency, while under the general umbrella of the utility integrated resource planning (IRP)-DSM process, are not required to meet as rigorous a cost-effectiveness hurdle as are other utility DSM investments. Examples of such orders are those in California, Georgia, Kansas, and Minnesota.
- **Strict DSM rules** are those in which low-income efficiency programs are required to meet the same cost-effectiveness standard as other DSM investments. The level of stringency of those standards varies from state to state depending on the particular Commission's inclination to encourage more or less DSM investment. Examples of such states include New York and Colorado.
- **Stand-alone low-income rules** are those that are not themselves integrated into the utility's IRP process and are specifically targeted to the low-income customers for reasons that stand apart from rationales underlying DSM and IRP. These may include the need to reduce arrearages and bad debt, the objective of making energy services more affordable to low-income households, or the desire to reduce the need for energy assistance or other subsidies. Examples of such programs are those in Pennsylvania, Wisconsin, Massachusetts, and Michigan.

The orders reviewed here indicate that a majority of the mandated low-income energy-efficiency investments are not subjected to strict resource cost tests, but are generally justified on the grounds of fairness and the equity of utility rate impacts.

Geographic Patterns

The regional distribution of utility low-income energy-efficiency programs, expenditures, and participants in 1992 deviated substantially from the regional distribution of the low-income population. Utility low-income energy-efficiency programs were concentrated in four areas of the country: California, the Pacific Northwest, the Upper Midwest, and the Northeast. California utilities account for \$60 million (or 43%) of the \$140.6 million spent in 1992 by the utilities that responded to our survey. In addition, they operated the three largest programs—Pacific Gas and Electric Company's Energy Partners Program, Southern California Gas Company's Direct Assistance Program, and Southern California Edison Company's Expanded Weatherization Program.

The uneven geographic distribution of utility low-income energy-efficiency investments means that opportunities for DOE-utility coordination are not readily available to every state and local weatherization agency. In many states and localities (particularly in the Southeast), government-funded weatherization

programs provide the only outside support available for low-income households to improve the energy efficiency of their homes.

Characteristics of Weatherized Dwellings

The 132 utility programs represented in our survey served an estimated 313,000 participants in 1992. However, this total does not represent an unduplicated count. Twenty-two utilities operated more than one program and in some of these cases households could qualify for help from multiple programs. In addition, it is possible for some participants to qualify for assistance through programs operated by both their gas and electric utility companies.

Table 2 indicates that slightly over half of the 313,000 dwellings served in 1992 were single-family homes, 5% were mobile homes, 33% were small multifamily dwellings, and 9% were units in large multifamily buildings. As is also true of DOE's Weatherization Program, utility low-income DSM programs underserve the needs of low-income households living in large multifamily buildings, relative to other subgroups.

Table 2. Types of Dwellings Served

Type of Dwelling	Utility Low-Income DSM Programs (1992)	DOE Weatherization Program (1989)	Low-Income Population (1990)
Single-Family	53%	61%	59%
Mobile Home	5%	18%	8%
Small Multifamily	33%	12%	14%
Large Multifamily	9%	9%	19%

Types of Measures Installed

The types of conservation measures emphasized by utility low-income energy-efficiency programs differ from the measures emphasized by DOE's Weatherization Program. (Comparative statistics for the DOE Program are provided by Brown, et al., 1993.) Some key similarities and differences are noted below.

- Almost every utility low-income program had a client education or information component. This is also true of DOE's Weatherization Program.
- Unlike the DOE Weatherization Program, lighting retrofits were a common ingredient of utility low-income DSM programs: 61% of the participants in 1992 received one or more compact fluorescent light bulbs. This measure became an approved DOE program measure in 1994.

- Water-heating system measures were the third most common type of measure: at least one water-heating measure was a part of 59% of the utility low-income programs. The counterpart statistics for DOE's Weatherization Program is 56%. The most frequent measure in utility programs is the low-flow showerhead, while in the DOE program it is the more expensive water heater tank wrap.
- Only 24% of the utility program participants received any type of insulation. This is significantly less than in the DOE program, where 62% of participants received insulation in 1989.
- Window and door measures were installed in 20% of the dwellings that participated in the 132 utility programs in 1992. The most common measures in this category involved either replacing window glazings or replacing entire window units—measures which are installed twice as frequently in DOE's program. Storm windows were installed in only 1% of the utilities' participating dwellings. In contrast, storm windows were installed in 36% of the homes weatherized by the DOE program in 1989.
- Structural repairs were offered by many utility programs in 1992, but only 17% of participants benefited from them. The rate of structural repairs is roughly twice as high in DOE's program.

Gas utility programs in 1992 tended to involve more space-heating measures and health and safety measures. Electric utility programs, on the other hand, involved more lighting and appliance measures. Overall, the 1992 utility investments (particularly those of electric utilities) were overwhelmingly dedicated to low-cost measures, in contrast to DOE's Weatherization Program. These programmatic differences represent both a challenge and an opportunity for utilities and DOE's network of state and local agencies to find mutually beneficial ways of coordinating their efforts.

Types of Funded Coordination

Sixty-nine percent of the utility low-income energy-efficiency Programs in 1992 (i.e., 79 programs) used the DOE local agency network to deliver some or all of their weatherization services. In 66 of these programs, local agencies received utility funding to deliver DSM services. Thus, half of the 132 utility programs that operated in 1992 involved contracting with local agencies. In total, the DOE network of local agencies received \$53.7 million from 61 utility programs, which represents slightly more than one-third (38%) of the \$140.6 million expended by utilities in 1992.

Many different arrangements existed in 1992 whereby utilities contracted with local agencies to deliver weatherization services. This resulted in a classification of three types of coordinated programs.

- In **parallel programs**, the community action agency operates two independent weatherization programs—one entirely funded by the utility and a second funded by government agencies including DOE. The nature of the utility DSM program is defined by the utility and may be quite distinct from the DOE-funded program. Households generally participate in one or the other of the programs, but not both. Utilities that fund parallel programs may in fact have many contractors—community action agencies as well as for-profit energy services companies.
- In **supplemental programs**, utility funds are used to supplement a community action agency's DOE Weatherization Program, with no changes to the operation of the DOE program. The result may be a greater production of weatherized homes by the agency, the installation of a greater number of measures, or both.
- In **coupled programs**, utility and DOE funds are used to deliver an integrated program that is distinct from the DOE Weatherization Program. This type of program has the potential to outperform parallel and supplemental programs, by taking advantage of the unique capabilities of each partner.

These three types of programs are not distinguished by whether the utility funds community action agencies directly or if they channel funds through state agencies. The most common arrangement is for the utility to contract directly with the local agency. However, sometimes the state weatherization program receives utility funding to subcontract with community action agencies. This is the case, for instance, for several utilities in both Iowa and New York. A variation on this operated in Indiana in 1992, where a utility contracted with the state's association of local agencies rather than the state weatherization program, which then subcontracted with local agencies to provide the services.

Types of Unfunded Coordination

Coordinated programs that involve no financial transactions employ various types of referrals and information exchanges between utilities and local agencies. Sometimes the referrals are primarily to the utility DSM program. This is the case, for instance, when state or local agencies provide utilities with lists of income-eligible households or when households who received DOE-funded weatherization services are referred to the utility for additional energy services. Local agencies in Michigan, for instance, refer their clients to the Michigan Consolidated Gas Company's Conservation Assistance Program for additional weatherization measures, and in Vermont households are referred to the City of Burlington's Heat Exchange Program for assistance in switching to electric heating systems. Some state and local agencies also distribute utility brochures and pamphlets of energy information to participants in DOE's Weatherization Program.

In other instances, referrals are made to the DOE network. For instance, several utilities refer their low-income clients at the time of the utility audit or after participation in the utility's DSM program to the DOE Weatherization Program for additional services. The East Ohio Gas Company, for instance, referred approximately 300 of the participants in its Housewarming Program to local community action agencies for possible furnace replacements. The Ohio Power Company provides another example of this. Its Targeted Energy Efficiency Program weatherizes eligible all-electric homes and refers households with non-electric space heating systems to the DOE Program.

The Atlantic City Electric Company's Low-income Comfort Master Program provides an example of a coordinated effort that involves multiple steps in the referral process. Local community action agencies recruit and verify the income eligibility of clients, and then refer them to the utility's DSM program. After the Comfort Master Program installs basic blower-door-guided air sealing measures, Atlantic Electric's air sealing contractors provide the community action agencies information about further work that is needed such as storm windows and heating system replacements. The same households then may become participants in DOE's Weatherization Program. Similarly, Jersey Central Power and Light provides home energy audits free of charge to households that are scheduled to be weatherized by local community action agencies.

In some utility service areas, low-income households have been known to participate in multiple weatherization programs, leading to the possible replication of efforts (e.g., when duplicate home energy audits are conducted or when furnaces are tuned up by one program and then replaced by a second). To maximize the combined impacts of both utility and DOE efforts, systems of job coordination have been initiated. Such systems were operated in 1992 by the Wisconsin Natural Gas Company the Elizabethtown Gas Company.

Conclusions

Utility low-income energy-efficiency investments have increased substantially over the past several years and have become an important resource for reducing the energy burden of the poor and improving the energy integrity of their housing. Unlike DOE's Weatherization Program, these utility programs provide mainly low-cost measures, they are relatively modest in terms of expenditures per participant, and they are geographically concentrated.

A wide array of utility-government weatherization partnerships existed in 1992. These partnerships illustrate the broad potential of coordinated programs to benefit low-income households as well as utility ratepayers and investors.

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