The Reach of Low-Income Weatherization Assistance

by Meg Power and Marilyn Brown

The most comprehensive review to date of the sources and uses of funding for low-income energy conservation shows we've come a long way, but the job is far from over.

Since 1976, the U.S. Department of Energy (DOE) has operated the nation's largest energy conservation program—the Weatherization Assistance Program (WAP). The program aims to increase energy efficiency and conservation in low-income households in order to reduce their energy consumption, lower their fuel bills, increase the comfort of their homes, and safeguard their health. It targets vulnerable groups including the elderly, people with disabilities, and families with children. The program was established in response to the 1973 oil embargo, when the escalating price of energy put an undue burden on low-income households. This burden remains significant. According to the U.S. Department of Health and Human Services, the average low-income family spends 12% of its income on residential energy compared to 3% for the average U.S. family. Low-income dwellings have a greater need for energy-efficiency improvements, but limited financial resources to undertake them.

In 1990, DOE initiated a nationwide evaluation of its Weatherization Assistance Program, with assistance from Oak Ridge National Laboratory, (see "The Scope of the Studies"). The study summarized here is part of that evaluation. It sheds light on the sources and uses of funding for low-income energy conservation programs during the 12-year period from 1978 to 1989. Data collection included a review of federal reports, a survey of program managers in 47 states, and a survey of utilities serving 75% of the nation's residential customers. Informal follow-up interviews with utility program managers and two subsequent surveys of state program managers provided an update of current levels and types of investment in low-income weatherization.

DOE

Blower doors are likely to be used more often with passage of new Department of Energy weatherization rules. Bob Winters, an envelope crew supervisor at CAP services in Stevens Point, Wisconsin, is conducting this infiltration test.

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The Scope of Weatherization Programs

Between 1978 and 1989, government, nonprofit and utility weatherization programs spent $4.3 billion on

"full scale" programs, reaching nearly 3.9 million low-income dwellings. Full-scale programs were defined as those offered at no charge that included:

- An evaluation of the unit's requirements according to a formal, written energy audit or evaluation procedure
- The availability of a comprehensive package of major and minor energy efficiency measures from which to choose
- Installation of at least one of the following: attic/ceiling, wall, or floor insulation; space or water heating system tune-up, repair, or replacement; and window replacements or storm windows

While weatherization programs have been successful in reaching a substantial number of households, there are still at least 24 million eligible households that have not been served. According to the Energy Information Administration, 27.9 million dwellings are occupied by households with incomes below 150% of the poverty level. This does not mean that 14% of currently eligible households (3.9 million of 27.9 million) have received weatherization services. The percentage is unquestionably lower because households pass in and out of poverty and roughly one-quarter of them move each year. Nevertheless, weatherization programs have improved a significant proportion of the housing that is likely to be occupied by low and moderate income households.

Sources of Funds

The type and extent of weatherization measures carried out evolved over the 12-year period, and varied by region and funding source. There was more investment in low-income weatherization in the late 1980s than in earlier years, but public funding levels later tapered off (see Figure 1). More homes were weatherized and more money was spent in the North than in the South. This partly reflects the formula used to allocate DOE's weatherization funds, which weights heating degree-days more heavily than cooling degree-days. All together, **DOE funds** account for 45% of the resources dedicated to low-income weatherization between 1978 and 1989.

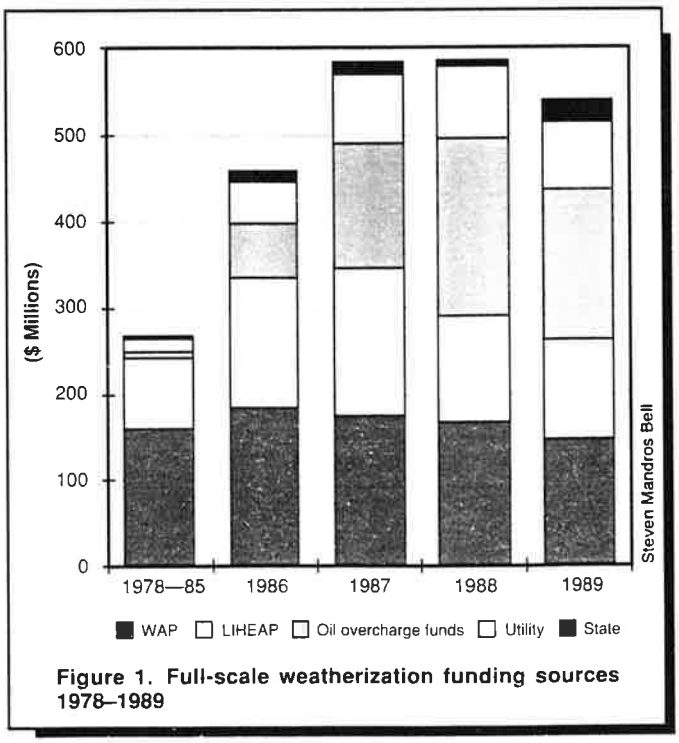


Figure 1. Full-scale weatherization funding sources 1978–1989

The Scope of the Studies

DOE is conducting a five-part review of the Weatherization Assistance Program which involves two "policy" studies; One of which is the subject of this article. The other study characterizes the capabilities, innovations and leveraging ability of the WAP network. The evaluation also includes three "impact" studies covering the major market segments served by the program:

- Mobile homes, single family homes, and dwellings in small multifamily buildings heated primarily with natural gas or electricity
- Single-family homes and dwellings in small multifamily buildings heated primarily with fuel oil
- High-density multifamily dwellings heated primarily with natural gas, electricity, and fuel oil

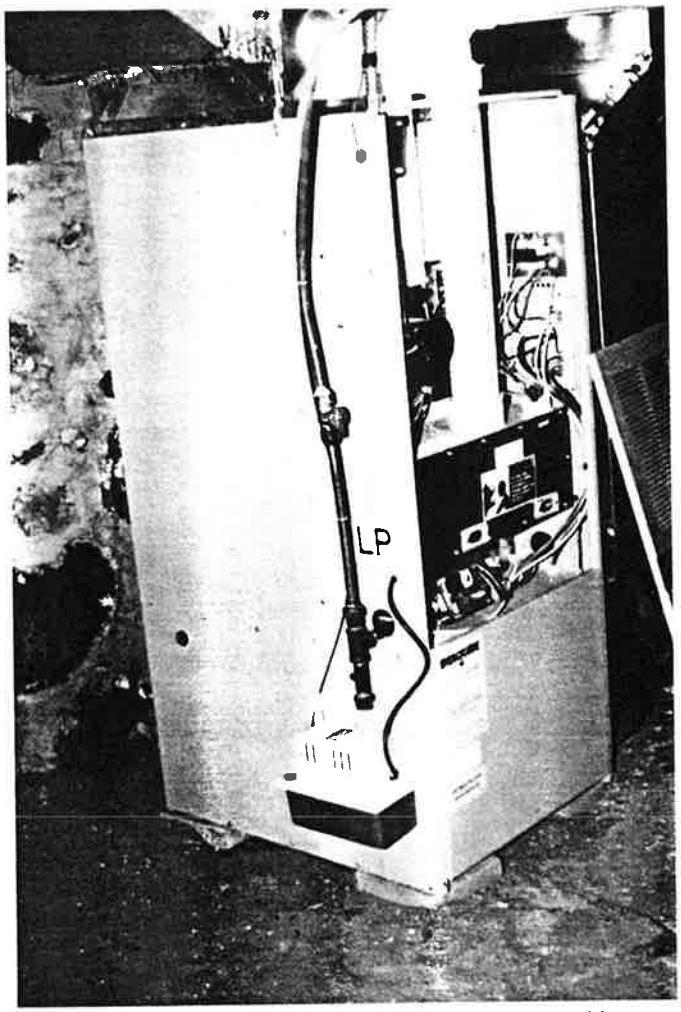
Another significant source of federal funding is the **Low-Income Home Energy Assistance Program (LIHEAP)**, administered by the Department of Health and Human Services (HHS). Since 1982, states have had flexibility to allocate up to 15% of LIHEAP funds (now up to 25% after receiving a waiver) to energy conservation measures. After reaching a peak in 1987, LIHEAP weatherization funds have been steadily cut back.

Petroleum Violation Escrow (PVE, or "oil overcharge") monies, another major funding source, have also declined. These funds come from court penalties assessed to oil companies who were convicted of violating price controls. The exhaustion of PVE funds devoted to state low-income programs on a one-time basis is the most dramatic cause of the decline in funding from 1978 to 1989. The surveys of state program managers indicate that funds available to many of them for low-income weatherization programs have dipped 30-40% since 1990, based primarily on the exhaustion of their PVE funding.

Utilities provided 9.6% of funds available nationally in the 12-year period and were responsible for 22% of all units weatherized. In particular, 49 utilities spent $418 million on energy measures reaching just over one million low-income units. On average, they invested only one-third as much as WAP per unit.

Types of Measures

In the early years of WAP, emergency and temporary measures were emphasized, including caulking, weatherstripping, and low-cost or no-cost measures such as plastic window sheets. By the early 1980s, the emphasis had turned to more permanent and effective building envelope measures such as storm windows and doors and attic insulation. In 1984 regulations were passed to allow WAP funds to be spent on space and water heating system



DOE

Collaborative weatherization and utility programs enable more capital investments such as this high-efficiency gas furnace that was installed by CAP services in Stevens Point, Wisconsin. This agency delivers weatherization services for three utilities: Wisconsin Gas, Wisconsin Power and Light, and Wisconsin Public Service Corp.

efficiency modifications, and in 1985 replacement furnaces and boilers were approved.

In response to these regulatory changes, which reflected changing weatherization technologies and opportunities, the types of measures installed in DOE's Weatherization Assistance Program shifted dramatically during the 1980s. In particular, there was an increase in the use of space heating system measures and advanced diagnostics such as blower doors, and a decline in the installation of storm windows—changes which are consistent with the findings of several studies documenting the cost-effectiveness of blower doors and furnace retrofits and questioning the cost-effectiveness of storm windows.

New regulations for the 1993 program implement changes Congress authorized in 1990 to encourage the use of the most cost-effective techniques for both energy savings and health and safety enhancements. These rules permit use of cooling efficiency measures, including air conditioner replacements, ventilation equipment, screening and shading devices and, in addition remove barriers to performing work on heating systems and mechanical equipment. The old requirement that 40% of program funds be spent on materials will be waived in states that adopt approved advanced audits, thus ensuring audit-driven cost-effectiveness tests of investments. These and other minor changes enable the flexibility needed to select measures that are appropriate to particular regions and dwellings. Such region-specfic programs are more likely to meet criteria set in utility demand-side management initiatives as well. (As *Home Energy* goes to press, many states are prepared to change their DOE program delivery systems—just in time for a one-shot, 26% funding increase proposed as part of the President's economic stimulus legislation.)

Uses of Funds: WAP Sets the Pace

Most funding for low-income weatherization, regardless of source, was spent according to WAP rules (see Figure 2). Weatherization expenditures can be classified by *source* of funding (the type of agency or organization that provided it) and by *type* of funding (the type of agency or organizational rules and procedures that govern how funds are spent). By law, all funds appropriated to WAP are governed by DOE rules and regulations. In contrast, funds appropriated by LIHEAP may be spent according to either WAP or LIHEAP's much broader guidelines which have allowed, for instance, greater expenditures on furnace and boiler retrofits and replacements. Utility and PVE programs are not required to follow WAP guidelines. Similarly, state funding for full-scale weatherization is spent as the funder deems appropriate.

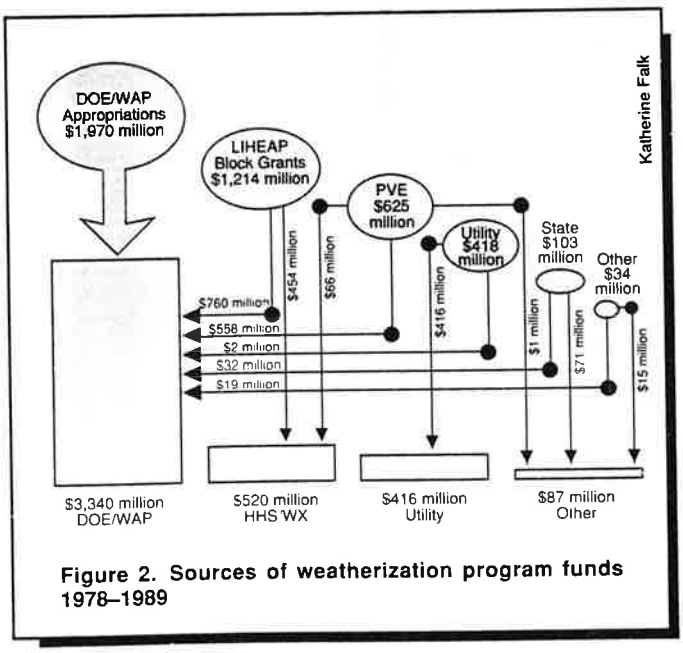


Figure 2. Sources of weatherization program funds 1978–1989

After 1982, states had the opportunity to spend $1.84 billion of LIHEAP (and later PVE) funding in programs of their own devising, but instead they chose to spend only a third of these funds on measures not strictly governed by WAP. In fact, 77% of all low-income weatherization resources spent in the 12-year study period were guided by DOE rules and procedures, while 12% was spent in

programs run under LIHEAP regulations (see Figure 2). Apparently state program managers have opted for the simplicity of a single program structure and the clarity of a comprehensive set of rules and guidelines. The fact that the vast majority of non-DOE funds have been channeled through WAP underscores DOE's central role in directing weatherization activities nationwide and indicates the importance that the new WAP rules will have in guiding future weatherization investments.

Utility Programs

Another key finding is that utility low-income weatherization programs were significantly limited in number and geographic coverage. The vast majority of utility low-income weatherization investments in the 12-year period came from programs mandated by state regulatory commissions (73%) and Bonneville Power Administration and Tennessee Valley Authority (6% combined). Forty-nine utilities in 27 states reported some form of "full scale" low-income program during part or all of the 12 years under study. Funding and unit completions were dramatically higher in the last three years of the study. Criteria used by utilities to select weatherization measures (for instance, reducing demand) and to target clients (such as minimizing unpaid utility bills) often result in investments of high value to the utility systems, which may differ from investments selected by WAP. The result has been investment by utilities in fewer high-cost measures and lower expenditures per dwelling relative to DOE's program.

The measures most commonly available as part of a utility full-scale program were:

- Attic insulation (33 out of 49 programs)
- Water heater and/or duct wrap (30 programs)
- Weatherstripping and caulking (30 programs)
- Storm doors (21 programs)
- Wall insulation (20 programs)
- Heating system work (15 programs)

During 1986–89, the number of utilities reporting full-scale weatherization programs rose from 28 to 36. However, of 36 programs reported in 1989, 23 had budgets under $100,000. Sixty-eight percent of all 1989 utility funds came from California and Wisconsin—states with mandated programs. Not all utilities in these states provided data, so 68% may understate their contributions to the national total. One California utility, Pacific Gas & Electric Co., accounted for 38% of all U. S. utility funding for

Table 1. Summary of Regulatory Changes Governing DOE'S Weatherization Program

	OLD	NEW
Eligibility and targeting	• Up to 125% of poverty, or the state may elect to use LIHEAP eligibility criteria • Special consideration given to the elderly and persons with disabilities	• Special consideration also given to families with young children
Expenditure limit per dwelling	• $1,600 statewide average	• $1,600 statewide average, adjusted annually • Separate average for dwellings with major heating or cooling system modifications
Weatherization materials and measures	• Services provided include: - air sealing - caulking and weatherstripping - furnace and boiler tune-up, repair, and replacement - cooling system tune-up and repair - replacing windows and doors and adding storm windows and doors - insulating attics, walls, and foundations - client education	• Added the following: - replacement air conditioners - ceiling, attic, and whole-house fans - evaporative coolers - screening - window films
Materials requirement	• 40% of funds must be spent on materials	• Waiver of 40% requirement may be granted if an advanced audit procedure is used
Rental unit requirements and protections	• Owner permission • 66% eligibility required for large multifamily units and 50% eligibility required for duplexes and four-unit buildings • Weatherization benefits to accrue primarily to low-income tenants	• Expanded renters protection - benefits and no rent increase even for renters paying for energy through rent - States may require financial participation from landlords
Reweatherization	• Allowed reweatherization of units partially weatherized from September 30,1975 to September 30,1979	• Cut-off date for reweatherization extended to September 30,1985

Blue Mountain CAA

This dilapidated home which received an impressive retrofit is one example of the non-standard or sub-standard shelter cases the community action agencies often take on.

full-scale low-income programs in 1989. Investor-owned utilities accounted for 88% of full-scale programs funded by utilities in 1989—reflecting the influence of state regulatory mandates.

To correct for any underrepresentation of low-income demand-side management (DSM) activities among utilities, we asked utilities to report *any* other programs they offered to low-income households at no cost. Their responses confirmed a pattern of geographic concentration among utility programs. Of the 16 utilities which offered the largest of these "other" programs to low-income households, 9 also had been counted as offering large, full-scale programs during the same year. Utilities said they spent $76.6 million on such activities from 1986-89: 54% of this total was spent by one California utility.

The measures most commonly offered by utilities in these additional low-income DSM programs during 1989 were:

- Client education at home (24 utilities)
- Weatherstripping/caulking (20 utilities)
- Client education by mail (18 utilities)
- Water heater wrap (16 utilities
- Low cost/no cost kits (14 utilities)
- Heating system work (12 utilities)

Utilities with "full scale" programs were asked if the measures were delivered in whole or in part by one or more community action agencies or other local WAP subgrantees. Utilities that together provided 89% of 1989 utility full-scale weatherization funds and 94% of 1989 utility weatherized units, used local agencies for at least some of their work. In addition, at least 160,000 of the units had more than one weatherization program contributing measures. This indicates that 16% of all units utilities completed involved work administered in combination with DOE or other programs. Many other units likely received WAP services after partial weatherization by utilities.

These findings are significant because they indicate that many low-income utility conservation programs are new and untested. There's a lack of experience, in part, due to the concentrated nature of prior utility initiatives. At the same time, some efforts *have* included the participation of community action agencies, which can be examined and tapped to benefit both utilities and publicly supported programs in the future.

The Potential For Partnerships

Utilities are increasingly turning to profit making energy services companies for assistance but they should also consider community action agencies as a resource. Over 1,000 of these agencies are now distributed across the country. With over a decade of experience in low-income weatherization, they can expand their services to include program features that interest utilities. Community action agencies have the necessary experience that commercial contractors often lack with the problems associated with substandard shelter (see "Moving Weatherization Agencies into the Utility Age," *HE*, Nov/Dec '91 p.12).

By pooling utility and DOE resources, programs can afford to invest in more capital intensive measures such as high-efficiency heating and cooling system equipment. The largest utility weatherization programs surveyed for the study historically used local weatherization providers to deliver at least some of their services. These arrangements could, but did not in all cases, include combining public and private program resources.

Recently, formal collaborative partnerships involving mixed programs have flourished. By marrying DOE and utility resources, they have achieved more in combination than two independent programs could have accomplished by themselves . The models pioneered in a few utility initiatives in partnership with the DOE weatherization network may, in fact, be rapidly and effectively disseminated and adapted to other locales. There is much to do, and with limited resources, weatherization measures must strive to be effective and efficient. ■

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Reference

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