

# A Status Report on the National Weatherization Evaluation

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## Introduction

In 1990, the U.S. Department of Energy (DOE) initiated a national evaluation of its low-income Weatherization Assistance Program (WAP). The evaluation plan calls for three "impact" studies and two "policy" studies to be carried out over a 3 1/2-year period (Beschen and Brown, 1990). The three impact studies focus on the energy savings and cost-effectiveness of the program in key WAP markets:

- single-family and small multifamily dwellings using gas or electricity for heating--the Single-Family Study (Berry, Brown, Wright, and White, 1991);
- high-density multifamily buildings using gas, electricity, or fuel-oil for heating--the Multifamily Study (MacDonald, Brown, Ternes, and Sharp, 1992); and
- fuel-oil heated single-family homes in nine north-eastern States--the Fuel-Oil Study (Ternes, Levins, and Brown, 1992).

The two policy studies address additional aspects of the program, but are not designed to provide estimates of energy savings or cost-effectiveness. They include:

- a characterization of the WAP network, describing the weatherization practices of state and local WAP agencies, the nature of agency staff and resources, public-private partnerships, obstacles to progress, and opportunities for the future (Mihlmester, Koehler, Beyer, Brown, and Beschen, 1992); and
- a profile of the scope of the WAP, describing low-income weatherization resources, the weatherized population, and the WAP-eligible population that remains to be served (Power, Eisenberg, Michels, Witherspoon, and Brown, 1992).

## Research Approach

Each of the five studies has its own research methodology. Altogether, information is being collected from 49 States, 920 local WAP agencies, 800 utilities, and 15,000 homes. Some of the many innovations incorporated into these studies include:

- close involvement of stakeholder representatives in the evaluation;
- retention of homes where occupants have changed, in the analysis of savings;
- split-winter design with metering to quantify energy savings in fuel-oil homes;
- experimentation with a heating and cooling model for weather normalizing electrically heated and cooled homes;
- assessment of weatherization impacts on the comfort, health, and safety of occupants; and
- estimation of indirect economic impacts and environmental externalities.

## Selected Findings

Results are now available for the two policy studies, and preliminary findings are available for each of the three impact studies. A selection of these findings are summarized below.

## Weatherization Practices

WAP weatherization practices are diverse and have become increasingly sophisticated. Between 1981 and 1989, installation rates decreased for storm windows and increased for space-heating system measures (see Figure 1). Both of these trends are consistent with a growing body of research emphasizing the cost effectiveness of furnace tune-ups and retrofits and questioning the cost effectiveness of storm windows. Advanced diagnostics and weatherization technologies are also taking hold: for instance, local WAP agencies blower-door tested 20% to 30% of the dwellings they weatherized in 1989, and they installed high-density wall insulation in 5% to 10% of the homes weatherized in 1989.

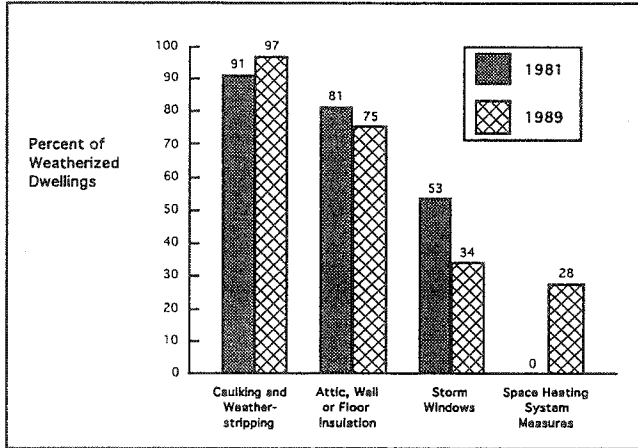


Figure 1. Installation Rates for Selected Weatherization Measures: 1981 and 1989 (in single-family and small multifamily homes weatherized by the DOE/WAP)

## Meeting the Demand for Low-Income Weatherization Services

Local WAP agencies weatherize approximately a quarter of a million dwellings annually. Between 1978 and 1989, 3.9 million low-income homes were fully or partially weatherized, by all sources (Figure 2). Two-thirds of these were completed under DOE/WAP rules, underscoring the importance of DOE/WAP regulations in shaping nationwide weatherization practices. Approximately 22% of low-income weatherizations to date have been completed primarily by utilities, at about one-third the average DOE/WAP investment per dwelling. In total, approximately 21 million households live below 150% of poverty. Thus, while a significant number of dwellings have been weatherized, some of these weatherizations have been incomplete and many more homes remain to be served.

## Serving the Multifamily and Rental Markets

Only 36% of the units weatherized by local WAP agencies in 1989 were renter-occupied, while approximately half of the WAP-eligible population are renters. Similarly, between 6 and 10% of the units weatherized by local WAP agencies in 1989 were in buildings with five or more units, while 15% of the WAP eligible units live in high-density multifamily buildings. Further, almost half of the HDMF units weatherized in 1989 were in partially weatherized buildings. Thus, initiatives are needed to enable the WAP to more fully serve the low-income population residing in rental units, particularly in larger multifamily buildings.

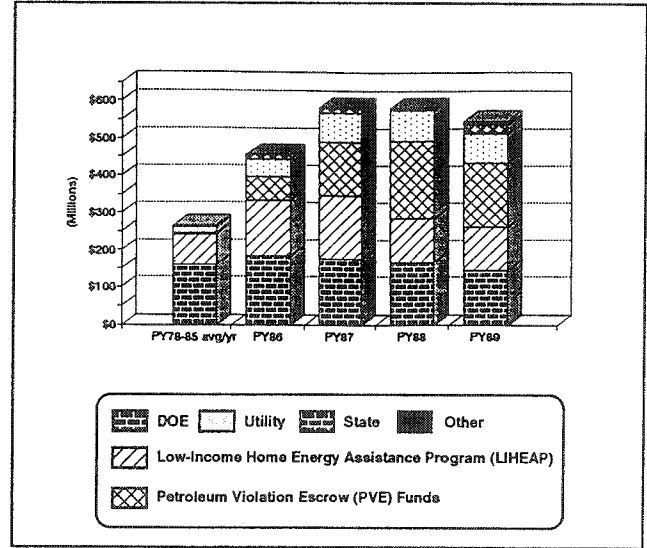


Figure 2. Funding for Full-Scale Weatherization, by Source (1978-1989)

## Discussion

Once the National Weatherization Evaluation has finalized its estimates of energy-savings and cost effectiveness, it will be possible to identify those factors that correspond with high performance weatherization, thereby identifying key opportunities for the future.

## Acknowledgements

This paper was prepared with the support of the Office of Conservation and Renewable Energy, U.S. Department of Energy. Oak Ridge National Laboratory (ORNL) is operated by Martin Marietta Energy Systems, Inc., for the U.S. Department of Energy under contract DE-AC05-84OR21400.

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