MARTIN MARIETTA ENERGY SYSTEMS LIBRARIES
3 4456 0069918 0

ORNL/CON-206

ornl

OAK RIDGE
NATIONAL
LABORATORY

MARTIN MARIETTA

A Review of Financial Incentive, Low-Income, Elderly and Multifamily Residential Conservation Programs

Linda Berry
Marjie Hubbard
Dennis White

OAK RIDGE NATIONAL LABORATORY
CENTRAL RESEARCH LIBRARY
CIRCULATION SECTION
4500N ROOM 175
LIBRARY LOAN COPY
DO NOT TRANSFER TO ANOTHER PERSON
If you wish someone else to see this report, send in name with report and the library will arrange a loan.

OPERATED BY
MARTIN MARIETTA ENERGY SYSTEMS, INC.
FOR THE UNITED STATES
DEPARTMENT OF ENERGY

Printed in the United States of America. Available from
National Technical Information Service
U.S. Department of Commerce
5285 Port Royal Road, Springfield, Virginia 22161
NTIS price codes—Printed Copy: A06 Microfiche A01

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

ORNL/CON-206

ENERGY DIVISION

A REVIEW OF FINANCIAL INCENTIVE, LOW-INCOME, ELDERLY AND MULTIFAMILY RESIDENTIAL CONSERVATION PROGRAMS

Linda Berry
Marjie Hubbard
Dennis White

Date Published - September 1986

Research sponsored by the Office of Conservation
and Renewable Energy, United States Department of Energy

OAK RIDGE NATIONAL LABORATORY
Oak Ridge, Tennessee 37831
Operated by
MARTIN MARIETTA ENERGY SYSTEMS, INC.
for the
U.S. DEPARTMENT OF ENERGY
Under Contract No. DE-AC05-84OR21400

MARTIN MARIETTA ENERGY SYSTEMS LIBRARIES
3 4456 0069918 0

CONTENTS

Page

ABSTRACT v

SUMMARY vii

INTRODUCTION 1

TYPES OF ALTERNATIVE PROGRAMS 2

DEFINING SUCCESSFUL PROGRAMS 4

SAMPLE SELECTION 6

FINANCIAL INCENTIVE PROGRAMS 9

LOW-INCOME PROGRAMS 15

ELDERLY AND HANDICAPPED PROGRAMS 15

MULTIFAMILY PROGRAMS 18

ORGANIZATION OF PROGRAM DESCRIPTIONS 18

ACKNOWLEDGMENTS 21

REFERENCES 23

APPENDIX A
BIBLIOGRAPHY OF SOURCES OF INFORMATION ON RESIDENTIAL CONSERVATION PROGRAMS. 25

APPENDIX B
DESCRIPTIONS OF UTILITY PROGRAMS 27

Financial Incentives 27
Bonneville Power Administration 27
City of Austin 29
Eugene Water and Electric Board 31
City of Santa Monica 33
Florida Power and Light Co. 35
General Public Utilities 39
New York State Electric and Gas Corporation 41
Pacific Gas and Electric Co. 43
Portland General Electric Co. 45
Public Service Electric and Gas Co. 47
Puget Sound Power and Light Co. 48
Seattle City Light 50
Southern California Edison Co. 52
Southern California Gas Co. 54
Tennessee Valley Authority 56

Page

Low Income 59
Alabama Gas Corporation 59
Bonneville Power Administration 61
Boston Edison Co. 63
Central Illinois Light Co. 64
Intercity Gas Co. 65
Massachusetts Electric Co. 66
Minnegasco, Inc. 68
Minnegasco and Minneapolis Energy Office 70
National Fuel Gas Distribution Corporation 72
Puget Sound Power and Light Co. 74
Seattle City Light 75
Southern California Edison Co. 76
Southern California Gas Co. 78
Tennessee Valley Authority 80
Wisconsin Gas Co. 82

Elderly 83
Georgia Power Co. 83
Nashville Electric Service 84
Puget Sound Power and Light Co. 85
Southwest Gas Co. 87

Rental and Multifamily 89
Citizens Conservation Corporation 89
City of Palo Alto 90
Minnegasco, Inc. and Minneapolis Energy Office 92
Northern States Power Co. and the Energy Resource Center 93
Seattle City Light 95

ABSTRACT

This report describes thirty-nine utility-sponsored residential conservation programs for four types of markets. The program types considered are: (1) financial incentive programs for the general residential market, (2) programs for low-income households, (3) programs for the elderly, and (4) programs for the multifamily market. Each program description contains information on incentive terms, eligibility, conservation measures, program history, design and marketing, and the utility/agency motivation for operating the program. The names, addresses and phone numbers of contact persons also are included.

Two methods were used to select the programs to be described. First, nominations of successful programs of each type were solicited from experts on residential energy conservation. Second, managers of the programs on this initial list were asked to describe their programs and to suggest other successful programs that should be included in the sample. Because of the selection process used, this report covers mainly the best known and most frequently studied programs that are aimed at the four market types.

SUMMARY

PURPOSE

The purpose of this report is to describe certain types of residential conservation programs that are currently implemented by utilities. The programs of interest are four types of utility-sponsored alternatives to Residential Conservation Service (RCS) programs. The four program types considered are: (1) financial incentive programs for general residential markets which sometimes (particularly in California) include provisions for low-income and multifamily services, (2) programs for low-income households which often include services to the elderly and the handicapped, (3) programs for the elderly, and (4) programs for occupants of multifamily and rental dwellings. Thirty-nine programs are described in this report. Each program description contains information on incentive terms, eligibility, conservation measures, program history, design and marketing, and the utility/agency motivation for sponsoring the program. The names, addresses and phone numbers of contact persons also are included.

SAMPLE SELECTION

Because there are hundreds of programs of the types described above, a procedure had to be developed for selecting which programs to include. We wished to select the most successful programs of each type to serve as examples of effective program design. Since we were unable to gather enough information to systematically rank utility programs by any quantitative criteria of success (such as participation rates or cost effectiveness), we used an approach based on nominations by experts on residential energy conservation. Researchers known for their work on conservation issues were contacted at Oak Ridge National Laboratory, Lawrence Berkeley Laboratory, the American Council for an Energy-Efficient Economy, the Energy Conservation Coalition, the National Research Council and the Alliance to Save Energy and asked to name particularly successful programs. Representatives of trade associations such as the Electric Power Research Institute, Edison Electric Institute, the American Gas Association, and the American Public Power Association also were asked to list the programs that they believed were especially successful. Representatives of the National Association of Regulatory Utility Commissioners and of the California Energy Commission were asked to give their recommendations, too. Managers of the programs recommended by the experts were then contacted, asked to describe their programs, and to suggest other successful programs that should be included in our sample. Because of our selection process, our sample does not provide complete coverage of all successful, or innovative, programs. It is mainly the best known and most frequently studied programs that are represented.

CHARACTERISTICS OF PROGRAMS

There was a high degree of overlap in the programs recommended by the various sources. Programs sponsored by California and Pacific Northwest utilities were nominated most frequently. Utilities in these

areas have been operating aggressive financial incentive programs for six to ten years. The California utilities, as well as some others, are now beginning to expand their efforts for low-income and multifamily/rental markets. Some key findings about the history and design of each of the four program types are summarized below.

FINANCIAL INCENTIVE PROGRAMS

- Several of the California utilities have penetrated over 90% of the single-family market and expect to discontinue their programs soon.

- Most of the incentive programs in locations other than California have achieved penetration rates in the 20-50% range and are expected to continue for five to fifteen more years.

- Most programs began by offering loans as a financial incentive and, then, after several years of operation added, or changed to, a direct cash payment of 70-85% of total weatherization costs.

- The addition of, or change to, direct payments was typically done for two reasons: 1) direct payments are more attractive than loans to many customers, 2) utility difficulties with record keeping and administrative costs are often reduced by a direct one-time system of payments.

- Most of the utilities with aggressive financial incentive programs are electric utilities which, at least when the programs began, expected conservation to delay or eliminate the need for the construction of costly new generating facilities. Purchasing large amounts of conservation was seen as a least-cost strategy for meeting future needs.

- Because many utilities now have excess capacity, a least-cost justification for conservation presently tends to require a long-term planning horizon. Utilities in rapidly growing areas, such as the City of Austin, Texas and parts of Florida, find, however, that conservation is a short-term least-cost option.

- Considering conservation as an important option in a least-cost strategy for meeting future demand has received increasing attention from state Public Service Commissions and Public Utility Commissions in recent years.

- The California Public Utility Commission has taken a particularly aggressive role in promoting conservation. It plays a key role in producing the outstanding results achieved by California's programs.

LOW INCOME PROGRAMS

- Most low-income programs were initiated in the 1980's by the same utilities that pioneered general market financial incentive programs in the late 1970's.

- Program implementation was usually motivated by: 1) a recognition that low-income households had very low participation in the general market programs and 2) PUC actions in states such as Wisconsin, Minnesota, New York and California.

- Almost all of the programs pay 100% of the costs for home weatherization.

- In nearly all of the programs community groups or social service agencies determine income eligibility, market the program, and/or deliver services.

- Cooperation with federal fuel assistance and weatherization assistance programs is common.

ELDERLY AND HANDICAPPED PROGRAMS

- Most utilities offer services for the elderly and the handicapped through their low-income programs. No examples of a program designed to serve only the handicapped and only four examples of programs designed to serve only the elderly were found.

- Three of the four programs for the elderly have income eligibility requirements for participation.

- All provide free services.

- All work closely with community groups to identify eligible customers, market the program, and recruit workers.

MULTIFAMILY/RENTAL PROGRAMS

- All of the multifamily/rental programs use marketing targeted to building owners.

- Typical marketing techniques are direct mailings, seminars and meetings with trade associations, and heavy reliance on word-of-mouth advertising.

- Two of the five multifamily programs in our sample are self-supporting through the use of some type of shared savings concept.

- None of the programs require expenditures by tenants and two are offered at no expense to the landlord.

INTRODUCTION

After the energy shortages of 1973-74, many utilities developed programs to encourage the conservation of residential energy. Residential Conservation Service (RCS) audit programs are probably the most common of these because the National Energy Conservation Policy Act of 1978 (Public Law 95-619) required all major gas and electric utilities to offer on-site home energy audits to residential customers. The RCS audit programs now have been operating long enough to evaluate their impacts. Unfortunately, the consensus is that RCS programs as currently operated produce small reductions in energy consumption. A review of evaluations conducted in the Pacific Northwest, California, Wisconsin, Minnesota, Michigan and Connecticut concludes that the typical RCS program produced only 3-5% reductions in annual consumption. When program costs are taken into account, the programs are barely cost-effective (Hirst, 1984).

At the same time, many utilities operate programs which can be viewed as alternatives to RCS audit programs that, according to utility statements, are quite effective (Brown and Reeves, 1985). The Office of Conservation and Renewable Energy of the U.S. Department of Energy (DOE) is interested in understanding the range of successful residential conservation programs that are currently being implemented by utilities. The DOE is particularly interested in programs that are potential alternatives to the RCS because the federal role in energy conservation is shifting away from such regulatory approaches to the use of mechanisms that will facilitate the adoption of voluntary conservation programs for the residential and commercial sectors. Future DOE activities will emphasize offering assistance to non-federal program efforts in these sectors.

The purpose of this report is to describe alternatives to RCS programs that are currently implemented by utilities. Thirty-nine such alternative programs are described in detail in Appendix B. The information contained in the program descriptions was collected in February and March of 1986. These program descriptions should be useful not only to DOE, but also to program managers who are working to set up new programs or to improve existing ones. In addition, researchers and policy analysts interested in understanding the range of effective conservation program delivery systems will find the descriptions helpful.

In the sections below, the types of alternative programs included are described, and sample selection procedures are explained. Brief overviews and summaries of the characteristics of the programs (detailed in Appendix B) also are presented.

TYPES OF ALTERNATIVE PROGRAMS

A common alternative to RCS audit programs is a utility-sponsored financial incentive program that offers zero- or low-interest loans, grants or rebates to help pay for the installation of conservation measures. Financial incentive programs, although more costly than audit programs, are a more effective means of encouraging customers to install measures. Evaluations of incentive programs suggest that they also save two to three times more energy than RCS audit programs (Hirst, 1984; Stern, 1985). The cost-effectiveness of incentive programs depends on utility-specific factors such as current capacity, projected demand, costs of alternate supply sources, and expected fuel cost increases.

Another alternative to RCS programs are programs targeted to special markets. Typical RCS participants have higher incomes and more education

than the average utility customer (Berry, Soderstrom, Hirst, Newman and Weaver, 1981; Wirtshafter, 1985). Low-income and elderly customers usually participate in both audit and financial incentive programs at much lower rates than would be expected from their representation in the general population. Renters and occupants of multifamily dwellings also are unlikely to participate and are, in fact, ineligible for some utility-sponsored programs (Wirtshafter, 1985). The public service commissions in some states including Minnesota, New York, and Wisconsin have, however, directed their utilities to develop programs for these target groups. The California utilities also have a variety of programs for these special markets because the single-family market is becoming saturated.

Development of programs for the low-income, elderly, and multifamily markets is important for several reasons. First, the proportions of households in these categories are large. Ten to twenty percent of households are poor depending upon which definition of poverty is used. Rental housing accounts for one third of all residential units in the United States (Office of Technology Assessment, 1982). The elderly represent about 12% of the population and their relative proportion will increase in the future (American Association of Retired Persons, 1984).

Second, rental properties and low-income dwellings (there is considerable overlap in these categories as renters have about half the median income of homeowners) are, on average, older, less well-insulated, and in poorer condition than owner-occupied dwellings. The elderly are more likely than the general population to own their homes; but their homes are older, and have less insulation, fewer storm windows, and older heating and cooling equipment than average (Smiley, 1979; Jackson, 1980;

Brown and Rollinson, 1984). Thus, the potential for cost-effective investments in energy conservation is higher for each of these groups than for the general population (Office of Technology Assessment, 1982).

Third, each of these groups is unlikely to invest in conservation without assistance. Lack of capital and information are barriers for low-income households. Tenants do not want to invest because they do not own the buildings, while landlords do not invest because they do not pay energy bills or because they simply pass their costs through to the tenants. Barriers for the elderly include diminished physical abilities, lack of awareness about effective energy conservation actions, and shorter than average planning horizons.

DEFINING SUCCESSFUL PROGRAMS

The purpose of this report is to describe successful financial incentive programs for the general residential market and successful programs for the low-income, elderly and multifamily markets. Defining successful programs and obtaining a list of such programs were the first tasks to be accomplished.

A successful program may be defined in a variety of ways. Cost effectiveness to the sponsoring utility, to participant ratepayers, to nonparticipant ratepayers, and to society as a whole form one set of criteria for success. Cost effectiveness will, of course, vary according to the perspective chosen and according to utility-specific variables such as capacity factors, expected increases in demand and fuel prices, and fixed vs. variable cost ratios. Generally, a program is considered cost effective if the ratio of program benefits to program costs is greater than one.

Cost effectiveness may be the best measure of program success, but it was not possible to use such a measure to select the most successful utility programs. There are three reasons for this. First, most utilities have not evaluated the cost effectiveness of their programs. Second, even those utilities that have evaluated cost effectiveness do not use the same assumptions and methods so their results are not comparable. Third, there are so many utility programs in operation we did not have the resources to systematically identify and rank the programs by cost effectiveness, participation rates, energy savings or any other quantitative criteria. Although there are over 3,000 electric utilities and over 1,350 natural gas distributors in the United States (Electrical World, 1984; National Research Council, 1985), most conservation activity is concentrated in a few hundred of the larger utilities.

The number of residential conservation programs among these most active utilities is substantial. A recent survey of state regulatory commissions, for example, indicates that utilities in 34 of the 50 states had financial incentive programs (Markowitz, 1985). Another indicator of the volume of utility activity can be found in the 1983 Electric Power Research Institute Survey of Utility End-Use Projects which identified 351 energy efficiency programs being operated by the 298 electric utilities that responded to their survey. Our goal was to select and describe in some detail 30-40 successful programs that were distributed among the four program types: financial incentive, low-income, elderly, and multifamily. Our approach to selecting these programs is explained below.

SAMPLE SELECTION

Because of the difficulties involved in systematically ranking utility programs by any quantitative criteria of success, we used an approach based on nominations by experts on residential energy conservation. Researchers known for their work on conservation issues were contacted at Oak Ridge National Laboratory, Lawrence Berkeley Laboratory, the American Council for an Energy-Efficient Economy, the Energy Conservation Coalition, the National Research Council, and the Alliance to Save Energy and asked to name particularly successful programs. Representatives of trade associations such as the Electric Power Research Institute, Edison Electric Institute, the American Gas Association, and the American Public Power Association also were asked to list the programs that they believed were especially successful. Representatives of the National Association of Regulatory Utility Commissioners and of the California Energy Commission were asked to give their recommendations, too.

There was a high degree of overlap in the programs recommended by the various sources. Utilities in California and the Pacific Northwest were nominated most frequently (Table 1). Utilities in these areas have been operating aggressive financial incentive programs for six to ten years. Several of the California utilities have penetrated over 90% of the single-family market. They are now beginning to expand their efforts in low-income and multifamily markets.

Table 1 also includes four nonprofit and local government agencies (the Energy Resource Center, St. Paul, Minnesota; the Minneapolis Energy Office; the Citizens Conservation Corporation, Boston; and the City of Santa Monica). These agencies are included because, even though they

Table 1. Programs nominated most frequently by trade associations and researchers, by type

Financial Incentive and Low Income

California
- City of Santa Monica
- Pacific Gas and Electric
- Southern California Gas*
- Southern California Edison*

Pacific Northwest
- Bonneville Power Administration*
- Puget Sound Power and Light*
- Seattle City Light*

Other locations
- City of Austin, Texas
- Tennessee Valley Authority*

Elderly

- Georgia Power
- Puget Sound Power and Light

Multifamily

All major investor-owned California utilities have multifamily programs.

Pacific Gas and Electric was named as one of the most successful.

City of Palo Alto, California

Northern States Power and the Energy Resource Center, St. Paul

Minnegasco and the Minneapolis Energy Office

Citizens Conservation Corporation, Boston.

*General market financial incentive and low-income program descriptions are presented separately in these cases (Appendix B). In the other cases, information on low-income provisions is included in the description of the general market financial incentive program.

are not utilities, they were repeatedly cited as the founders of particularly innovative and successful programs. Except for the Citizens Conservation Corporation (CCC), each of the agencies works very closely with utilities and has a good deal of utility funding and involvement in their programs. In CCC programs the utility role is limited to the identification of potential clients. Many of the elements of the CCC program could be used, however, by utilities that wish to penetrate multifamily markets.

Several elements of Table 1 require some explanation. First, notice that the categories of general market and low-income financial incentive weatherization programs are combined in Table 1. Initially, separate lists of utilities with successful general market programs and with successful low-income programs were compiled. It soon became apparent, however, that all of the utilities on the general market list also were on the low-income list. In addition, we began by listing loan, grant, and rebate programs separately; but found that because many of the financial incentive programs offered their customers more than one incentive option, classification by incentive type was not appropriate. Notice also that appliance rebate programs are not included among our program categories. We did gather some information on appliance rebate programs. A decision not to cover these programs in this report was made because an excellent review of such programs is already available (Geller, 1983) and because the same utilities identified by Geller, mainly California, Florida and Texas utilities, are still the leaders in the implementation of appliance programs.

We began our effort to describe successful programs by contacting the utilities and agencies listed in Table 1. As we talked with program

managers at these locations, we asked them if they knew of other successful programs that should be included in our study. Our selection process became, then, a "snowball" sampling technique. Additional utilities to be contacted were identified by contacting Public Utility Commission staff in selected states, and by reviewing descriptions of programs found in conference proceedings, government reports, books and journal articles (a bibliography of sources of program descriptions is given in Appendix A). Table 2 lists the additional programs identified with the "snowball" techniques. A few of these programs had rather low market penetration rates and were not particularly successful. The program descriptions of these few programs were left in Appendix B which contains descriptions of all the programs for which we gathered information. Figure 1 shows the location and type of each program described.

The program descriptions in Appendix B were constructed from three types of sources: telephone conversations with program managers; program documents available from the program sponsors; and information published in conference proceedings, books, journal articles, etc. Published sources of information that we used are cited at the end of each program description. After we completed a program description we mailed it to the contact person and asked for their review. When we received their comments or corrections, we then revised the descriptions.

FINANCIAL INCENTIVE PROGRAMS

The typical financial incentive program for general markets in our sample began in the late 1970's and focused on the weatherization of single-family dwellings. The California utilities with programs of this type are approaching market saturation, with penetration rates above 90%

Table 2. Additional utilities contacted*

Financial Incentives

Eugene Water and Electric Board
Florida Power and Light
General Public Utilities
New York State Electric and Gas Corporation
Portland General Electric
Public Service Electric of New Jersey

Low Income

Alabama Gas Co., Birmingham
Boston Edison Co.
Central Illinois Light Co.
Intercity Gas Co., Minnesota
Massachusetts Electric Co.
Minnegasco and Minneapolis Energy Office**
National Fuel Gas Distribution Corp.
New York State Electric and Gas Co.
Wisconsin Gas Co.

Elderly

Nashville Electric Service (a Tennessee Valley Authority distributor)
Southwest Gas Corp., Las Vegas, Nevada

Multifamily

Seattle City Light

*These utility programs were selected by the snowball sampling technique described on page 9.

**Two low-income programs are described for these sponsors.

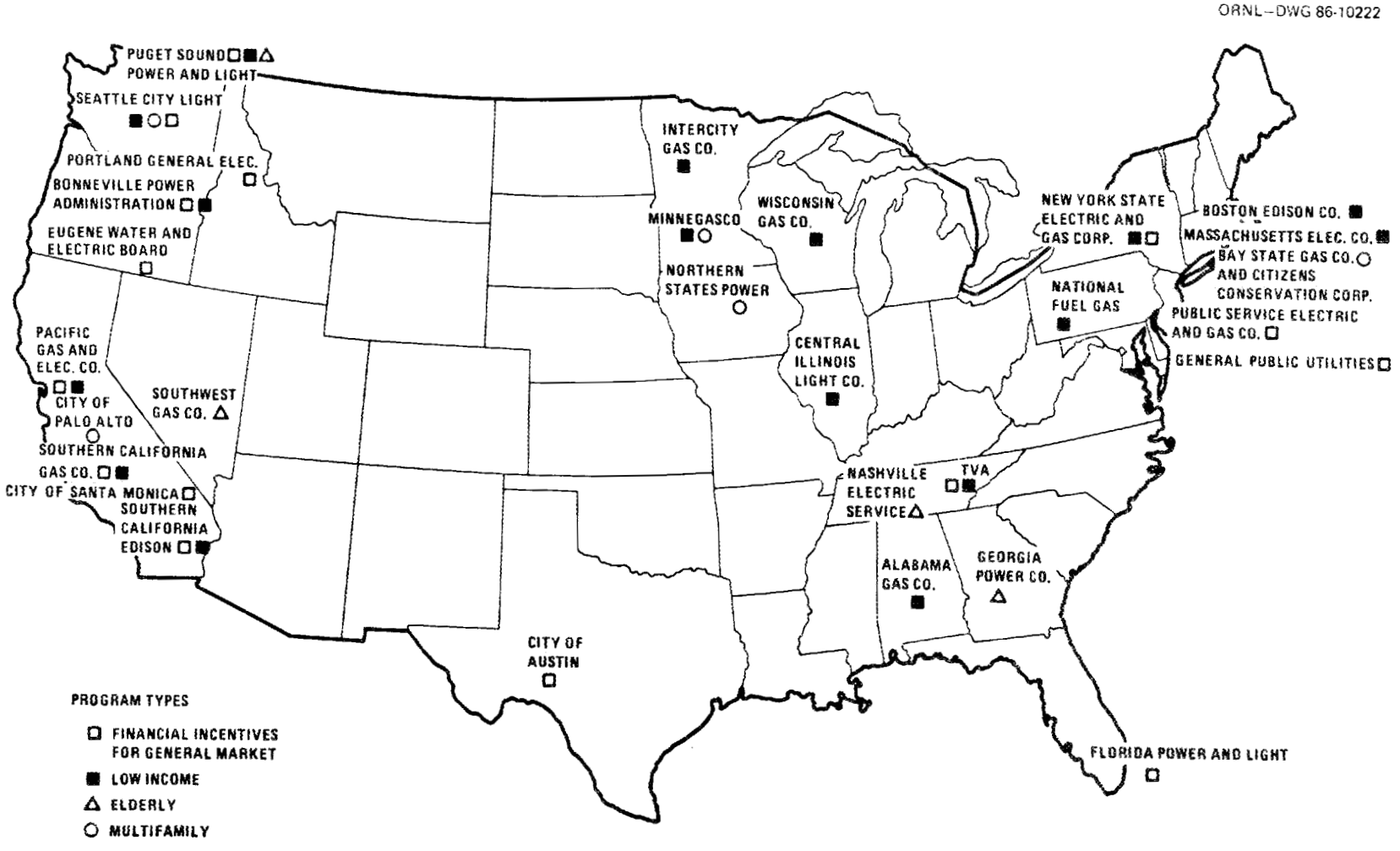

Figure 1. Location of programs described.

for some weatherization measures, and expect to discontinue their programs soon. The City of Santa Monica program has already been discontinued. Most of the other programs have achieved penetration rates in the 10-50% range and are expected to continue for 5-15 more years.

Many of the general market programs began by offering loans as a financial incentive and then, after several years of operation, added or changed to a direct cash payment of 70-85% of total weatherization costs (Table 3). The decision to add a direct payment option, or to change from a loan to a direct payment system, was typically made for two reasons. First, direct payments are more attractive than loans to many customers. Second, utility difficulties with record keeping and administrative costs are often reduced by a direct one-time system of payments.

Most of the utilities with aggressive financial incentive programs are electric utilities which, at least when the programs began, expected conservation to delay or eliminate the need to construct costly new generating facilities. Purchasing large amounts of conservation was, thus, seen as a least-cost strategy for meeting future needs.

Considering conservation as an important option in a least-cost strategy for meeting demand has received increasing attention from state Public Utility Commissions (PUCs) in recent years (Markowitz and Kriesberg, 1985). The PUCs vary in the seriousness and sophistication with which they require utilities to use least-cost planning models that include conservation options. Markowitz and Kriesberg (1985) developed a rating system for the comprehensiveness and sophistication of PUC planning processes. In general, their rating of the planning process is

Table 3. Characteristics of Financial Incentive Programs for General Markets

	Only electrically-heated or air conditioned homes eligible	Program began by offering loans, then added or changed to rebates	Contractor marketing	Penetration of market (%)
Bonneville Power Administration	Yes	Yes	No	30
City of Austin	Yes	Loan only	No	<10
City of Santa Monica	No	No, some free measures are installed	Yes	35
Eugene Water and Electric Board	Yes	Yes	No	50
Florida Power and Light	Yes	Rebates only	Yes	<10
General Public Utilities	Yes	Contractor paid for savings; free to customer	Yes	N/A*
Pacific Gas and Electric	No	Yes	Yes	90
Portland General Electric	Yes	Yes	No	40
Public Service Electric and Gas Co.	No	Loans only, interest rate varies by income	No	<1
Puget Sound Power and Light	Yes	Yes	No	55
Seattle City Light	Yes	No	No	
Southern California Gas Co.	No	Yes	Yes	90
Southern California Edison	Yes	Yes	Yes	90
Tennessee Valley Authority	Yes	Loans only	No	30

*Program is only offered to selected households in selected locations.

not associated with the amount of conservation activity in a state. Of the eight states they classified as having the most comprehensive least-cost planning strategies, only two (California and Wisconsin) also have large-scale conservation program activity. Other states in this group, such as Illinois and Nevada, are in the early phases of program development because their sophisticated least-cost planning requirements have been in place for two years or less. On the other hand, some states, which Markowitz and Kreisberg classify at a lower level of planning sophistication, such as Minnesota, New York, North Carolina, and Arizona, have a good deal of program activity (Hemphill and Myers, 1986; Markowitz and Kriesberg, 1985).

Because the sophistication of the planning process as rated by Markowitz and Kriesberg is not closely associated with the amount of conservation activity in a state, other factors must be operating. It is possible that complicated planning procedures are sometimes used to delay action. In addition, strong environmentally-oriented pressure groups in states such as California may be an important influence. In any case, regardless of the planning process used, PUC mandates for conservation can produce impressive results.

The California PUC, for example, has taken a very aggressive role in promoting conservation. It also has pushed hard on load management, small power production, cogeneration and rate reform. Programs have been proposed or initiated for almost every type of customer and energy end-use: residential, commercial, agricultural, and industrial (Hemphill and Myers, 1986). PUC action played a key role in producing the outstanding results achieved by the residential financial incentive programs implemented by the California utilities.

LOW INCOME PROGRAMS

The same utilities (Table 1) that pioneered general market financial incentive programs in the late 1970's typically began to develop low-income programs in the early 1980's. Implementation of low-income programs was usually motivated by a recognition that low-income households have very low participation in the general market programs. PUC actions in states such as Wisconsin, Minnesota, New York and California also motivated many low-income efforts.

Almost all of the low-income programs pay 100% of the costs for home weatherization (Table 4). Only the Tennessee Valley Authority (TVA) offers the same incentive, zero-interest loans, to both low-income and middle or higher income households. In nearly all of the programs, community groups or social service agencies determine income eligibility, market the program, and/or deliver services. Cooperation with federal fuel assistance and weatherization assistance programs also is common.

ELDERLY AND HANDICAPPED PROGRAMS

Most utilities offer services for the elderly and the handicapped through their low-income programs. We found no examples of a program designed to serve only the handicapped. We found four examples of programs designed specifically to reach the elderly (Table 5). These programs for the elderly are offered by Georgia Power; Puget Sound Power and Light; Southwest Gas Corporation of Las Vegas, Nevada; and Nashville Electric Service, which is a TVA distributor. Georgia Power and Puget Sound Power and Light hire and train retirees to install free weatherization measures in the homes of elderly customers. Southwest Gas Corporation's program also uses teams of retirees to install free

Table 4. Characteristics of low-income programs

	Free installation	Involvement of community groups and/or social service agencies	PUC mandate	Special features
Alabama Gas Corp.	Yes	Yes	No	Door-to-door canvassing. Hires disadvantaged youth
Bonneville Power Administration	Yes	Yes	N/A	Part of general market program with special marketing and incentives
Boston Edison Co.	Free low-cost measures; loans for higher cost measures	Yes	No	Loan terms are on a sliding scale by income
Central Illinois Light Co.	Free low-cost measures; loans for higher cost measures	Yes	Yes	Door-to-door canvassing
Intercity Gas Co.	Yes	Yes	Yes	Community Action Agencies deliver the program
Massachusetts Electric Co.	Free low-cost measures; loans for higher cost measures	No	No	Targets communities with high unemployment
Minnegasco	Yes	Yes	Yes	Contracts with municipalities to deliver services
National Fuel Gas Corp.	Yes	Yes	Yes	Funded from excess profits penalties
New York State Electric and Gas Corp.	No	Yes	Yes	Coordinates with federally funded programs
Puget Sound Power and Light	Yes	Yes	No	Combines utility and federal funding

Table 4. Characteristics of low-income programs (continued)

Seattle City Light	Free low-cost measures & insulation; loans for storm windows	Yes	N/A	Households are eligible at 90% below median income
Southern California Edison	Yes	Yes	Yes	Leveraging of federal matching funds, contracts with community groups to deliver services
Southern California Gas Co.	Yes	Yes	Yes	Contracts with community groups to deliver services; hires disadvantaged
Tennessee Valley Authority	Loans only	Yes, in marketing	N/A	Special marketing of same program offered to general population
Wisconsin Gas Co.	Yes	Yes	Yes	Priority given to highest gas consumers with lowest incomes

Table 5. Characteristics of elderly programs

Utility	PUC mandate	Community group involvement	Income eligibility requirement	free installation	Special features
Georgia Power	No	Yes	No	Yes	hires elderly to deliver services, recruitment through community groups
Nashville Electric	No	Yes	Yes	Yes	young summer employees and elderly volunteers deliver services
Puget Sound	No	Yes	Yes	Yes	hires the elderly to install measures
Southwest Gas	No	Yes	Yes	Yes	elderly volunteers install measures

measures, but the workers are volunteers. The Nashville Electric program hires and trains young workers in the summer and also uses volunteers from community groups. All of these programs work closely with community groups to identify eligible customers, market the program, and recruit workers. All provide free services, and three of the four have income eligibility requirements for participation.

MULTIFAMILY

All of the multifamily programs studied use marketing targeted to building owners. Direct mail, seminars and meetings with trade associations, and heavy reliance on word-of-mouth advertising are typical. None of the programs require expenditures by tenants and two are offered at no expense to the landlord. Two of the five multifamily programs in our sample are self-supporting through the use of some type of shared savings concept (Table 6). All of the major California utilities offer services to the multifamily sector. Information on their multifamily services is included in the descriptions of the California utilities' financial incentive programs (Appendix B).

ORGANIZATION OF PROGRAM DESCRIPTIONS

Appendix B contains descriptions of 39 programs. The descriptions are organized into four categories: (1) financial incentive programs for general markets, which sometimes (particularly in California) include provisions for low-income and multifamily services; (2) low-income programs, which often include the elderly and the handicapped, (3) elderly programs; and (4) multifamily/rental programs. Within each category the descriptions are arranged in alphabetical order according to the name of the sponsoring utility or agency. When a general market program includes

Table 6. Characteristics of multifamily programs*

	Shared savings	Self support-ing	Landlord expenses	Low-income only	Special features
Citizens Conservation Corp.	Yes	Yes	None	Yes	A private not-for-profit corporation; utility assists only in identification of property owners
Minnegasco and Minnesota Energy Office	No	No	Yes, assumes a loan	Yes	Financing consists of a 20% reduction of loan principal
Northern States Power and Energy Resource Center	Yes	Yes	None	No	Includes a wide range of funding sources
City of Palo Alto	No	No	Yes, but only low-cost measures are installed	No	Focus is on water conservation measures
Seattle City Light	No	No	Yes, unless building is occupied by 2/3 low-income households	No, but it is free for buildings occupied by 2/3 low-income households	Different financing arrangements by tenant income level

*All of the programs are marketed directly to building owners and require no expenditures from tenants.

low-income provisions, these provisions are sometimes described separately in the low-income section and sometimes included in the financial incentive description. If information on low-income or multifamily provisions is included in a financial incentive program description, the terms are underlined so that the interested reader can pick out the general programs with special provisions for these groups. Similarly, low-income programs sometimes include special provisions for the elderly. In these cases, the term "elderly" is underlined.

Each program description contains information on incentive terms, eligibility, conservation measures, program history, design and marketing, and the utility/agency motivation for sponsoring the program. The names, addresses and phone numbers of contact persons also are included.

ACKNOWLEDGEMENTS

This report was funded by the U.S. Department of Energy's Office of State and Local Assistance Programs. It is part of a series of reports initiated by DOE which analyzes utility energy efficiency programs. The series was initiated by DOE in an effort to evaluate selected conservation and load management activities of utilities in terms of their effectiveness as alternatives to the Residential Conservation Service audit program.

The assistance of several people has contributed significantly to the successful completion of this project. Sarah Kirchen, our DOE project manager, was particularly helpful in reviewing the progress of our research throughout its various stages. We also appreciate the comments of those who reviewed drafts of this report including Marilyn Brown, Eric Hirst, and Bob Honea of ORNL; Mary Fowler of DOE; Virginia Kreitler of Synergic Resources Corporation; Karen Anderson of the American Public Power Association; and Robert Wirtshafter of the University of Pennsylvania. We are especially grateful to all of the utility and agency personnel we contacted for contributing their time and their understanding of the programs.

REFERENCES

American Association of Retired Persons, 1984, Profile of Older Americans: 1984, Washington, DC.

Berry, Linda, Jon Soderstrom, Eric Hirst, Bobbie Newman, and Rose Weaver, 1981, Review of Evaluations of Utility Home Energy Audit Programs, ORNL/CON-58, Oak Ridge National Laboratory: Oak Ridge, TN.

Brown, M. A. and G. Reeves, 1985, The Implementation of a Residential Energy Conservation Shared Savings Program: The General Public Utilities Experience, ORNL/CON-187, Oak Ridge National Laboratory: Oak Ridge, TN.

Brown, M. A. and P. A. Rollinson, 1985, "The Residential Energy Consumption of Low-Income and Elderly Households: How 'Non-Discretionary' Is It?" Energy Systems and Policy, 9(3):271-301.

Electric Power Research Institute, 1984, 1983 Survey of Utility End-Use Projects, prepared by Synergic Resources Corporation, Palo Alto, CA.

Electrical World, 1985, Directory of Electric Utilities. 1984-1985. 93rd Edition, McGraw Hill: New York.

Geller, Howard S., 1983, Energy Efficient Appliances, American Council for an Energy-Efficient Economy and the Energy Conservation Coalition: Washington, DC.

Hemphill, Robert and Edward Myers, 1986, "Electric Utility Conservation Programs: Progress and Problems," pp. 137-162 in John C. Sawhill and Richard Cotton (eds.), Energy Conservation: Successes and Failures, The Brookings Institution, Washington, DC.

Hirst, Eric, 1984, "Household Energy Conservation: A Review of the Federal Residential Conservation Service," Public Administration Review, 44(5), September/October.

Jackson, E.L., 1980, Perceptions of Energy Problems and the Adoption of Conservation Practices in Edmonton and Calgary, Canadian Geographer, 24: 114-130.

Markowitz, Paul (survey coordinator), 1985, Survey Results of Regulatory Utility Commissions' Electrical Resource Planning and Conservation Activities, prepared for Congresswoman Claudine Schneider's Office, Washington, DC.

Markowitz, Paul and Joseph Kriesberg, 1985, Least-Cost Electrical Planning: Is There Really a State Movement? An Examination of State Efforts to Promote Utility Investments in Least-Cost Electrical Resources, Public Citizen's Critical Mass Energy Project, Washington, DC.

National Research Council. Committee on National Statistics, 1985, Natural Gas Data Needs in a Changing Regulatory Environment, National Academy Press: Washington, DC.

Office of Technology Assessment, 1982, Energy Efficiency of Buildings in Cities, U.S. Government Printing Office, Washington, DC.

Smiley, R., 1979, "The Levels and Determinants of Household Insulation Activity," Energy, 4: 1087-1098.

Stern, Paul C. (ed.), 1985, Energy Efficiency in Buildings: Behavioral Issues, Committee on Behavioral and Social Aspects of Energy Consumption and Production, Commission on Behavioral and Social Sciences and Education, National Research Council, National Academy Press: Washington, DC.

Wirtshafter, Robert M., 1985, "Non-participants in utility energy conservation programs," Energy Policy, 13(2), April.

APPENDIX A

BIBLIOGRAPHY OF SOURCES OF INFORMATION ON RESIDENTIAL CONSERVATION PROGRAMS

Air Conditioning and Refrigeration Institute, 1984, A Guide for Utilities Considering a Utility Incentive Program for Central Air Conditioners and Heat Pumps, Arlington, VA.

American Council for an Energy Efficient Economy, 1984, ACEEE 1984 Summer Study on Energy Efficiency in Buildings, Vol. A-K, Panel Proceedings, ACEEE, Washington, DC.

American Gas Association, 1983, The AGA Gas Industry Manual on Fuel Subsidies and Innovative Energy Efficiency Programs, Washington, DC.

AGA Monthly, published by the American Gas Association, Washington, DC.

Cooke, Alan and Ruth Tricola, 1985, "Inventory of Northwest Conservation Programs," Pacific Northwest Utilities Conference Committee, Portland, OR.

Electric Power Research Institute, 1984, 1983 Survey of Utility End-Use Projects, prepared by Synergic Resources Corporation, Palo Alto, CA.

Geller, Howard S., 1983, Energy Efficient Appliances, American Council for an Energy-Efficient Economy and the Energy Conservation Coalition: Washington, DC.

Harris, Patricia H., "Tennessee Valley Authority (TVA) The Energy Package: A Comprehensive Consumer Assistance Program," pp.299-305 in Craig B. Smith, Todd Davis and Peter Turnbull (eds.), Proceedings of the Second Great PG&E Energy Expo-1985, Vol.II, Pergamon Press, Oakland, CA, May 21-23, 1985.

Hemphill, Robert F. and Edward A. Myers, 1986, "Electric Utility Conservation Programs: Progress and Problems," pp. 137-162 in John Sawhill and Richard Cotton (eds.) Energy Conservation: Successes and Failures, The Brookings Institution: Washington, DC.

Kier, P.H., G.A. Ettinger, R.A. Hrabak, N.F. Kron, Jr., K.W. Suchy, J.F. Tschanz, and I.M. Von Zuckerstein, 1984, Assessment of Residential Energy Conservation Programs, ANL/CNSV-TM-145, Argonne National Laboratory, Argonne, IL.

Kreitler, Virginia, 1986, Alternative Utility Conservation Program Designs: An Evaluation Based on Case Study Program Experience, prepared by Synergic Resources Corporation for the Office of Conservation and Renewable Energy of the U.S. Department of Energy, SRC Report No. 7224A-R1, Bala Cynwyd, PA.

Kushler, Martin G. and John A. Saul, 1984, "Energy Conservation and the Low-Income Sector: Assessing Needs, Examining Alternative Programs," pp. 209-221 in Bonnie Maas Morrison and Willett Kempton (eds.) Families and Energy: Coping with Uncertainty, conference proceedings, Michigan State University, Lansing, MI.

Lee, Henry, 1984, "Local Energy Conservation Programs: Past and Future," Discussion Paper Series, E-84-06, John F. Kennedy School of Government, Harvard University, Cambridge, MA.

Office of Technology Assessment, 1982, Energy Efficiency of Buildings in Cities, Washington, DC.

Smith, Craig B., Todd Davis and Peter Turnbull (eds.), Proceedings of the Second Great PG&E Energy Expo-1985, Vols. I and II, Pergamon Press, Oakland, CA, May 21-23, 1985.

APPENDIX B

DESCRIPTIONS OF RESIDENTIAL CONSERVATION PROGRAMS

FINANCIAL INCENTIVES

Residential Weatherization Program

UTILITY Bonneville Power Administration

CONTACT John Elizalde
Bonneville Power Administration
P.O. Box 3621
Portland, Oregon 97208
(503) 230-7520

PROGRAM TYPE Buyback payments based on estimated savings from weatherization measures for the general market.

INCENTIVE TERMS Homeowners are paid for the estimated energy savings to be obtained from the installation of weatherization measures. The payment is the lesser of: (1) 85 percent of the actual cost of the weatherization or (2) 32 cents times the projected first year kilowatt-hour savings.

ELIGIBILITY All residences served by a participating utility that use electric space heat permanently installed prior to April 15, 1983 are eligible. Single family, multifamily, rental and owner-occupied dwellings may participate.

CONSERVATION MEASURES The following measures may be installed: ceiling insulation, floor insulation, wall insulation, duct insulation, storm windows or thermal pane glass replacement, water heater wraps and pipe insulation. If a residence has one of the above measures installed, the following measures may be installed: caulking, weatherstripping, and clock thermostats. Dehumidifiers may be installed in homes with moisture problems. To accommodate indoor air quality concerns, households may receive air quality information, radon monitoring, and where warranted, subsidy for the purchase of an air-to-air heat exchanger.

PROGRAM HISTORY Bonneville Power Administration's (BPA) residential weatherization efforts began in 1980. The pilot program, which ran for 2½ years, operated through 11 small public utilities throughout the four-state (Washington, Oregon, Idaho, and western Montana) Pacific Northwest region. In the Fall of 1982, all Pacific Northwest utilities were eligible to participate in the weatherization program. By the end of 1982, when the pilot program had been replaced by the interim region-wide program, 7200 homes had been audited and zero-interest loans had been made to weatherize 4100 of these audited homes. By 1983, 104 thousand homes, about 20% of eligible dwellings, had been weatherized at a total cost to BPA of $157 million. By the end of 1985 over 145 thousand homes had been weatherized.

Use of zero-interest loans complicated administration of the program for both BPA and the participating utilities. BPA's interest in purchasing conservation (i.e., considering conservation as an energy resource comparable to traditional supply resources) led them to develop the "buyback"

concept. In this approach, which is used in the current program, BPA purchases the saved energy from participating households. An engineering heat loss methodology is used to estimate the electricity savings that will result from the installation of retrofit measures and the amount of the incentive is tied to this estimate.

MARKETING Most participating BPA utilities obtain sufficient audit requests to keep their staff productive with only limited marketing.

PROGRAM DESIGN After a customer requests an audit, a utility auditor inspects the home. The auditor collects information on the dwelling and estimates potential energy savings for various measures. The customer is informed as to which measures are cost-effective and eligible for financing. The household decides which measures to install. Bids from contractors, selected from a list of approved contractors, are obtained. After the installations are completed, utility staff inspect the work. If BPA specifications are met, the contractor is paid by the utility.

SPECIAL FEATURES Goals for the number of homes to be weatherized each year are reviewed and updated periodically as part of BPA's overall resource planning effort. Program staffing, funding and marketing are adjusted to bring the number of homes treated annually in line with these goals.

UTILITY MOTIVATION In late 1980 Congress passed the Pacific Northwest Electric Power Planning and Conservation Act. The Act required BPA to acquire conservation resources that are cost effective, available, reliable, and compatible with the existing power supply system. Evaluations of cost effectiveness are based on comparisons among available resources necessary to meet load projections. The energy savings and costs of conservation programs are compared with the benefits and costs of various supply options to determine the least-cost mix of options for the BPA region. Currently, BPA conservation programs are operating at a lower level than in previous years because the system has excess capacity. The programs continue at this reduced level mainly to maintain a conservation implementation capability to meet future needs.

Residential Audit and Loan Program

UTILITY City of Austin

CONTACT Ira Birnbaum
P.O. Box 1088
Austin, Texas 78767
(512) 440-5532

PROGRAM TYPE Zero-interest loans for the general market.

INCENTIVE TERMS The complete cost of improvements can be financed at zero-interest up to a $4,000 limit with 7 years to repay.

ELIGIBILITY Customers with an air conditioning unit or system and a high level of electricity consumption.

CONSERVATION MEASURES Over twenty measures are offered including insulation, caulking and weatherstripping, heat pumps, high-efficiency air conditioning systems, and solar screens.

PROGRAM HISTORY The loan program began in October 1982. Because of restrictions on eligibility and the requirement that customers had to pay 50% of the costs themselves, participation in the first two years was low (4.7%). In May 1984 the program began offering complete financing with zero-interest loans and made the qualifying criteria easier to meet. About 84% of those audited are now eligible for a zero-interest loan. The addition of a choice between loans and rebates has been proposed as a future program modification because major California utilities found that this increased participation rates. Energy savings from this program are expected to increase over the next several years. The savings from the loan program have been above engineering predictions on a per household basis, but rather low on a program basis because of low participation rates. The majority of quantifiable savings achieved to date by the six programs offered by the City of Austin have come from the Appliance Efficiency Program which is described in Kreitler (1986). The other programs now offered include commercial audits, a residential energy rating system, time-of-day rates for large commercial users, and a low-income, elderly, and community development assistance program. New programs being developed include air conditioner and water heater load control, time-of-day rates, rebate payments for commercial retrofits, rebate payments for energy efficient multifamily housing, commercial thermal storage demonstrations, energy efficiency and solar installations in City facilities.

MARKETING Direct mail, advertising, press releases, bill stuffers

PROGRAM DESIGN Upon request customers receive a free Energy Check of their home. The check analyzes five major areas of energy efficiency: solar gain, air infiltration, water conservation, insulation levels, and mechanical system. Retrofit strategies are recommended and financing is offered for each of these areas.

SPECIAL FEATURES The zero-interest loan program is a small part of the City of Austin's Conservation Power Plant effort. In 1982 the City of Austin Electric Utility established the goal of reducing projected peak demand by 553 megawatts over the next fifteen years. This goal is to be achieved through a variety of conservation, load management and renewable energy programs implemented in Austin. The Conservation Power Plant effort is notable for several reasons: (1) it represents the most ambitious savings target set by any utility of Austin's size, and rivals targets set by much larger utility systems, (2) it is integrated into the Utility's long-term-planning forecasts, and consequently, represents the actual deferral of future needed capacity, (3) it represents a unique comprehensive approach to energy management planning by a public utility, (4) it has won awards for energy innovation from the American Public Power Association, the U.S. Department of Energy and the State of Texas.

UTILITY MOTIVATION least-cost strategy for meeting future demand.

Eugene Water and Electric Board Energy Buyback Weatherization Program

UTILITY Eugene Water and Electric Board (EWEB)

CONTACT Mike Logan
Eugene Water and Electric Board
399E - 10th Avenue
Eugene, Oregon 97401
(503) 484-1125

PROGRAM TYPE Buyback payments for the general market.

INCENTIVE TERMS The average customer is reimbursed for approximately 75% of weatherization costs.

ELIGIBILITY Residential customers in the EWEB service area

CONSERVATION MEASURES Caulking, weatherstripping, ceiling insulation, attic ventilation, clock thermostats, water heater wrap, storm windows, double glazing for sliding glass doors and/or windows, insulation of heating system ducts, and, as a package: foundation insulation, floor insulation, hot and cold water pipe wrap, and plastic ground wrap.

PROGRAM HISTORY The program was started in January 1982. EWEB has over 40,000 customers using electric space heating. Over 23,000 customers have requested an audit. EWEB has completed 20,000 audits and weatherized over 11,000 homes. Approximately 3,000 households are currently waiting for an audit. The residential weatherization program has 31 full-time staff members and an annual budget of $5,000,000 for administration costs and payments to weatherization participants.

EWEB has found that participating homes are using 20-25% less energy after weatherization than nonparticipants.

MARKETING There is no need for pre-audit marketing as there is a 9-month waiting list for audits, due to the free product offers and word of mouth from participants. Some post-audit followups are done to encourage participants to complete recommended weatherization.

PROGRAM DESIGN Customers request an audit and may then choose from any of the recommended measures. The participant pays an approved contractor to do the weatherization and then receives the buyback amount from EWEB. The buyback is based on the estimated first year energy savings for the weatherized house. The participant receives the lesser amount of: 85% of the weatherization cost or the first year estimated savings multiplied by 32¢/kWh.

SPECIAL FEATURES First program in the U.S. to sell conservation bonds. BPA has agreed to pay principal and interest on the bonds, thereby avoiding borrowing from the national treasury and adding to the national debt. Bond financing has given EWEB more local control and flexibility in their programs (BPA administers on a regionwide, as opposed to a local, basis.)

UTILITY MOTIVATION The program began in response to Federal legislation and state law requiring energy audits. In addition, EWEB considers weatherization programs to be a part of its resource strategy.

The Santa Monica Energy Fitness Program

UTILITY City of Santa Monica contract with Southern California Gas Co. and Southern California Edison Co.

CONTACT Program is no longer operating.

PROGRAM TYPE Direct installation of conservation measures for the general market. The program was designed to increase the participation of target groups such as senior citizens, low-income and renters of multifamily housing.

INCENTIVE TERMS Free low-cost measures installed by the auditor; free audit.

ELIGIBILITY All residents of the City of Santa Monica.

CONSERVATION MEASURES Up to three of the following measures were installed free of charge at the time of the audit: water heater insulation jackets, low-flow showerheads, faucet aerators, water heater pipe insulation, and doorsweep weatherstripping. Recommendations also were made for other cost-effective measures.

PROGRAM HISTORY At the end of 1982, the City of Santa Monica completed a unique set of arrangements with the Southern California Edison and the Southern California Gas Companies, the two companies serving the Santa Monica area, under which the city would (1) assume the primary responsibility for the operation of the RCS program within the city limits, and (2) test a variety of innovative program delivery techniques designed to increase participation rates and energy savings for both average and target group customers. The agreement between the City and the utility companies was approved by the California Energy Commission and the California Public Utilities Commission during 1983. The program began operating in May 1984 and ended in May 1985. During this period services were offered to every household at least twice and about 35% of the households in the city participated. Rates of participation among multifamily, renter, low-income, elderly and minority households were close to their representation in the city's population.

MARKETING Door-to-door canvass with residents receiving at least two notifications prior to the auditor's arrival.

PROGRAM DESIGN Door-to-door canvass of all households to encourage participation; free installation of measures at the time of the audit.

SPECIAL FEATURES All households were eligible; door-to-door marketing; free installation of measures at the time of the audit; creation of public/private partnerships among the City, the utilities, and the three private firms that contracted with the City to provide audit/installation services, publicity, and program evaluation.

UTILITY MOTIVATION To test innovative delivery techniques.

Source: Ken Egel, 1985, "Evaluation of an RCS Program Alternative: The Santa Monica Energy Fitness Program, pp.191-200 in the proceedings of Energy Conservation Program Evaluation: Practical Methods, Useful Results, Vol.I, The Second National Conference held in Chicago, August 19-21, sponsored by Argonne National Laboratory, Bonneville Power Administration, Illinois Department of Energy and Natural Resources, U.S. Department of Energy.

Five Postaudit Residential Conservation Incentive Programs: Conservation Cooling and Heating, Conservation Water Heating, Residential Ceiling Insulation, Residential Window Treatment, and Home Energy Loss Prevention

UTILITY Florida Power and Light Co. (FPL)

CONTACT Peter Zeidler
P.O. Box 029100
Miami, Florida 33102
(305) 552-2126

PROGRAM TYPE Five postaudit cost-sharing incentive programs for the general market: Conservation Cooling and Heating, Conservation Water Heating, Residential Ceiling Insulation, Residential Window Treatment, and Home Energy Loss Prevention.

INCENTIVE TERMS Incentive levels vary by program and other household specific factors. Details are given below under the conservation measures heading.

ELIGIBILITY Eligibility for all five incentive programs is limited to occupied residences in which all energy used is residential in nature. Additional eligibility requirements vary by program and are presented below along with details on the types of equipment and materials installed as part of each program.

CONSERVATION MEASURES

Conservation Cooling and Heating (CCHP) This program promotes purchases of high efficiency air conditioning and heating equipment, including heat recovery systems which operate in conjunction with a central air conditioner or heat pump cooling/heating system to heat water. Florida Power and Light pays up to $600 toward replacement of whole house cooling or cooling/heating equipment, with efficient central air conditioning or heat pump systems, and $177 toward the installation of heat recovery systems. Qualified air conditioning systems must have a minimum seasonal energy-efficiency rating (SEER) of 8.5; qualified central heat pump systems must have a minimum SEER/EER of 8.0 and a minimum Coefficient of Performance (COP) of 2.5. Incentive payments for central air conditioners and heat pumps depend on system size and energy-efficiency rating. The energy conservation incentives apply only to a residential dwelling that has been served by FPL for at least one year and to equipment installed after January 1982, when the program began.

Conservation Water Heating (CWHP) This program began in January 1982. It seeks to stimulate installations of three alternatives to conventional electric resistance water heating -- solar water heaters, water heating heat pumps, and heat recovery units. FPL helps customers install these high-efficiency alternatives by contributing up to $400 for a solar system, up to $186 for a heat pump water heater, and up to $177 for a heat recovery unit.

Residential Ceiling Insulation (RCIP) Florida Power and Light pays up to $300 toward the installation of ceiling insulation to a minimum value of R-19. The amount paid depends on the size of the attic space and the quality of any existing insulation. To be eligible, homes must have been built prior to 1982, they must have whole house electric air conditioning or heating, and the insulation must have been completed after October 1981, the month the program began.

Residential Window Treatment (RWTP) Florida Power and Light's Window Treatments program began in October 1981. It covers three energy-savers: solar reflective film, solar screens, and awnings and shutters. Florida Power and Light pays up to $150; the amount paid depends on the square footage of sun-exposed glass. To be eligible, the entire residence must be cooled electrically by either a central air conditioning system or individual room air conditioners. Also, the household must have unshaded, single-pane, clear glass with eastern, western or southern exposure. Window areas with due north exposure, or which are permanently shaded by trees or other forms of window treatments are not eligible. Further, the solar film and solar screens installed must have shading coefficients of .45 or less. Eligible solar film must have been installed since October 1981, and eligible solar screen, awnings, and shutters since July 1983.

Home Energy Loss Prevention (HELP) This is FPL's most recent cash incentive program. It began on a test basis in January 1984 and on a permanent basis four months later. It encourages the installation of up to 15 inexpensive measures by qualified contractors. Florida Power and Light pays half the installation cost, to a maximum FPL contribution of $75, for a set of measures which may include any of the following:

Caulk doors
Caulk windows
Weatherstrip doors
Weatherstrip windows
Door sweep
Door threshold
Water heater insulation wrap
Pipe insulation
Low flow showerhead
Faucet restrictor
Showerhead adaptors
Duct system maintenance
Reflective window film (for areas <20 sq. ft.)
Electrical outlet gaskets
Storm inserts for jalousie windows

Measures to weatherize the building envelope are only installed in houses with whole house electric cooling and/or heating. Measures geared toward water heating are restricted to homes with electric water heating.

PROGRAM HISTORY In the early 1980's FPL realized that RCS audits alone would not achieve its Public Service Commission mandated reductions in demand growth. A 1982 FPL study, for instance, indicated that class A audits generate only a small reduction in energy use. As a result, FPL developed a less expensive walk-through (class B) audit designed to meet state audit quotas and at the same time act as a gateway to a set of incentive programs designed to increase the penetration of energy conservation measures.

By 1983, FPL had developed a strategic conservation program relying on walk-through audits and a slate of incentive conservation programs offering utility cost-sharing to households who make energy-efficiency investments. Initially incentives were offered in the areas of whole house cooling and heating equipment, solar film window treatments, water heaters, and ceiling insulation. During the spring of 1984 FPL added a fifth incentive program called Home Energy Loss Prevention, to encourage installation of low cost conservation measures.

Recent levels of participation in the five incentive programs vary from 14,000 installations a year for the window treatment program to almost 40,000 for HELP. These rates have increased substantially over time.

MARKETING Bill inserts, brochures, mass media, contractor marketing of HELP and CCHP.

PROGRAM DESIGN Procedures by which households request participation in programs, contractors are assigned to jobs, and incentive payments are made vary across the five programs. For the water heating, ceiling insulation, and window treatment programs, the steps are similar. An FPL home energy survey must be conducted prior to installation of eligible energy-saving measures. At the time of the survey, Marketing Service Representatives (MSR) give the customer any appropriate certificates specifying eligible installations and maximum incentive payments and directories of participating contractors who meet FPL's work specifications. The household selects a participating contractor and arranges for installation. Upon completion of the work, the customer gives the contractor the certificate and pays the contractor any additional amount owed. The contractor then submits the certificate and an invoice to FPL for payment. An MSR then determines whether or not the installation meets program standards.

The procedures for HELP depend upon whether or not the customer requests the program in advance of a home survey. If the program is "pre-sold"--that is, a contractor convinces a household to sign up for HELP in advance of a survey--then the contractor who solicited the HELP participation is awarded the job. This option creates an incentive for contractors to promote the program. If the program is not pre-sold, households either sign up for HELP at the time of the energy survey or contact FPL subsequently either through the Watt-Wise toll-free hotline or by contacting their local FPL office. Florida Power and Light then awards jobs to contractors on a rotating basis. In either event, a home survey must occur before the HELP installation. During the survey, the

MSR designates applicable measures and completes a cost estimate sheet specifying locations for the work, listing the cost of each measure, and indicating an estimated total cost. In order to request a HELP installation the customer signs the cost estimate sheet and returns it to FPL. The contractor makes the appointment with the customer and completes the installation as directed. Partial payment is collected from the customer at the time of the installation. The contractor applies to FPL for the incentive payment, at which point an MSR determines whether or not the installation meets program standards through an inspection or a review of paperwork.

The Conservation Cooling and Heating Program is the only FPL incentive program which does not require a home survey. Customers contact participating cooling and heating contractors, with the assistance of a directory of contractors which is sent to customers upon request. The contractor visits the customer's home, suggests appropriate heating and cooling equipment, and calculates the incentive payment. After the system is installed, the customer pays a portion of the costs; the contractor applies directly to FPL for the incentive payment. An MSR determines whether or not the installation meets program standards.

SPECIAL FEATURES Separate eligibility requirements and incentive calculation guidelines for different sets of measures. Some contractor marketing.

UTILITY MOTIVATION Within the context of the 1980 Florida Energy Efficiency and Conservation Act (FEECA), FPL is mandated to reverse the historical relationship in which growth rates of peak power demand and energy consumption have exceeded the rates of increase in numbers of residential customers. In particular, the Florida Public Service Commission (FPSC) has required that FPSC-regulated utilities (including FPL) meet demand and energy reduction targets. These utilities are to (1) bring the rate of growth in peak demand to 72.25% of the rate of growth in residential customers by 1989 and (2) reduce the growth rate of kilowatt hour consumption to an average of 75% of the annual growth in the number of residential customers for the 1980-89 period.

Source: Marilyn A. Brown, Linda G. Berry, and Dennis L. White, 1986, The Role of Auditor Salesmanship in Residential Conservation Incentive Programs: A Case Study at Florida Power and Light, ORNL/CON-201, Oak Ridge National Laboratory, Oak Ridge, TN.

Residential Energy Conservation Action Program (RECAP)

UTILITY General Public Utilities (GPU)

CONTACT George Reeves
General Public Utilities
100 Interpace Parkway
Parsippany, New Jersey 07054
(201) 263-6240

PROGRAM TYPE Shared-savings; free weatherization for residential customers; energy conservation company contractors are reimbursed by the utility for the value of the marginal avoided cost for each kWh saved.

INCENTIVE TERMS Free to customer.

ELIGIBILITY Electrically heated homes with electric water heaters. Renters may participate if they live in an individually metered dwelling unit and obtain permission from the owner. Other eligibility criteria may be added by the energy conservation company contractors in an effort to select households with the greatest potential for savings.

CONSERVATION MEASURES Two measures must be installed in every participating household: a timer control on electric water heaters and a time-of-day meter connected to a relay that turns off water heaters during a peak period. Participants also must stay on a conventional residential billing rate for a prescibed period of time before being placed on a time-of-day rate. The delay in adoption of a time-of-day rate has the effect of shifting some of the retrofit cost to the customer. Other measures that may be installed include: water heater wraps, low-flow showerheads and faucet aerators, electric switch and outlet insulators and plugs, caulking and weatherstripping, door sweeps, attic insulation, crawl space insulation, window insulation, chimney insulation plugs, heating system filters and adjustments, thermostat adjustments.

PROGRAM HISTORY The implementation of the RECAP concept began with the passage of Public Law 96-274 which authorized the U.S. Department of Energy (DOE) to sponsor demonstrations of a shared savings concept. DOE had previously sponsored research on technical aspects, such as the house doctor audit, at Princeton University. A pilot project, the Residential Energy Efficiency Program (REEP), was implemented in 1982 in Lakewood, New Jersey. After completion and evaluation of REEP, General Public Utilities decided to modify the program and offer it in each of its three operating companies (Metropolitan Edison Company, Jersey Central Power and Light, and Pennsylvania Electric Company). Negotiations with energy conservation companies (ECCOs) differed in each of the operating companies. Contracts between Jersey Central Power and Light and three ECCOs became effective in October of 1983. At that point, the process of selecting communites to participate in the program began. Metropolitan Edison also signed contracts and selected participating communities in 1983.

MARKETING Different ECCOs adopted varying marketing strategies. Some used mailings, phone calls and mass media advertising. Intensive marketing to retirement communties through condominium associations was sometimes used. Several ECCOs used a market skimming approach by limiting participation to households with the highest electricity use and the greatest potential for electricity savings.

PROGRAM DESIGN In most residential conservation programs the homeowner and utility company absorb the risks for less than anticipated savings. Under RECAP, the ECCO suffers losses for less than anticipated savings and benefits from greater than anticipated results. This different method of risk allocation provides a strong incentive to the ECCOs to install measures which are clearly cost effective in residences which have a high potential for savings. It also provides a strong incentive for quality workmanship. Further, the ECCO has a continuing interest in the retrofits and the conservation efforts of each participating household, since payments are made over a period of several years, based on a monitoring of actual household electricity consumption. The steps involved in RECAP are as follows: 1) the utility enters into a contract with one or more ECCO to provide retrofits to a specified number of the utility's customers, 2) a community is selected for treatment, typically by the ECCO in consultation with the utility, 3) criteria for household eligibility are determined by the ECCO in consultation with the utility, 4) the utility and the ECCO market the program, 5) the ECCO performs a free home energy audit for some portion of the households that respond to initial marketing efforts, 6) after customer acceptance of the program terms, the ECCO carries out the retrofit and supplies the customer with a warranty on workmanship and materials, 7) the utility pays the ECCO for measured reductions in electricity use. The payments are made and the savings monitored over a period of several years.

SPECIAL FEATURES Shared savings concept; risks absorbed by energy conservation contractors; payment to contractors is based on actual measured savings.

UTILITY MOTIVATION GPU has a keen interest in demand reduction and load management especially in light of the loss of capacity resulting from the Three Mile Island accident and the subsequent increases in power purchases from other utilities.

Source: Marilyn A. Brown and George Reeves, 1985, The Implementation Phase of a Residential Energy Conservation Shared Savings Program: The General Public Utilities Experience, ORNL/CON-187, Oak Ridge National Laboratory, Oak Ridge, TN.

Savingpower Program (1) and Energy Conservation Bank Program (2)*

UTILITY The New York State Electric and Gas Corporation (NYSEG)

CONTACT Roxie Naylon
NYSEG
4500 Vestal Parkway East
Binghampton, NY 13903
(607) 729-2551 (ext. 2562)

PROGRAM TYPE (1) Savingpower: audit and low interest loans for the general market; (2) Energy Conservation Bank (ECB): special provisions for low income and elderly.

INCENTIVE TERMS (1) Low interest loans (10% maximum interest) for up to $2500 for a 7-year term are available to single-family customers regardless of income level. Multifamily units may receive loans of up to $4500. (2) Customers with lower than average incomes receive a 20-50% reduction of the loan principal through federal Energy Conservation Bank funds (the size of the reduction depends on income level). A 50% matching grant of up to $1,250 also may be available to certain low-income households (instead of the loan principal reduction) through the New York State Energy Conservation Bank.

ELIGIBILITY (1) General market: 1-4 family housing built before January, 1980; (2) low income: income less than 80% of median county income or age 62 or over and 1-4 family housing

CONSERVATION MEASURES Twenty-four measures including: attic, floor, and wall insulation; furnace/boiler modifications, storm windows and doors, weatherstripping, caulking, water heater wraps, clock thermostat, etc.

PROGRAM HISTORY NYSEG's program is the result of a deliberate effort to integrate utility conservation services with federally funded residential assistance programs. For instance, program monies are distributed by the state's Energy Conservation Bank (ECB) which provides funding for low income and elderly programs.

Since mid-1984 to the end of 1985, 965 loans have been approved. During the same time period, NYSEG has completed weatherization on 468 houses and 353 houses occupied by elderly customers. Job costs typically amount to $1000 to $1200 per unit.

---

*Two programs are described here: (1) is the Savingpower program, (2) is the Energy Conservation Bank Program. There is considerable overlap in the operation of the two programs, although incentive terms and eligibility differ by customer income level.

MARKETING NYSEG distributes brochures and information through community groups. The State Energy Office also advertises under the broad energy conservation program, Energy Conservation Bank (ECB).

PROGRAM DESIGN NYSEG provides a home energy analysis upon request. The customer selects a contractor from a list of approved contractors provided by NYSEG. NYSEG coordinates the loan, if any. The customer repays the loan to the bank directly; NYSEG pays the difference in finance charges between the market interest rate and the reduced rate for weatherization.

SPECIAL FEATURES Customer may choose to install only ECB program-approved measures, thereby maximizing the grant as a percent of total cost and minimizing customer costs. ECB measures are included in Savingpower as well.

UTILITY MOTIVATION PSC required.

Residential Conservation Financing Program

UTILITY Pacific Gas and Electric Co. (PG&E)

CONTACT Norm Wada
77 Beale St.
San Francisco, CA 94106
(415) 972-2638

PROGRAM TYPE General market with special emphasis given to attracting the following target groups: low income, elderly, non-English speaking and renters. Three options for weatherizing homes are available: zero-interest loans (ZIP), rebates (cashback program), and free direct weatherization (DW) for low-income households.

INCENTIVE TERMS The ZIP option offers interest-free loans of up to $3,500 per dwelling unit; loan repayment term is 50 months for most customers but low-income renters and landlords may have up to 100 months to pay. The cashback option offers rebates of varying amounts for each measure installed. The rebates range from $10.00 for a water heater blanket to $600.00 for thermal windows and may average up to 40% of the purchase price. Free direct installation of weatherization measures is available to low-income households. PG&E also pays up to $200 for minor structural repairs, such as window or door replacements.

ELIGIBILITY All residential customers including homeowners, single-family renters, multifamily renters and building owners, and mobile homes are eligible. Households with incomes at or below 150% of federal poverty guidelines or elderly households with incomes at 200% or below are eligible for DW services.

CONSERVATION MEASURES For ZIP and DW, the "Big Six" measures (ceiling insulation, caulking, weatherstripping, water heater blankets, low flow showerheads, duct wrap) must be installed first and are available without an audit. To receive a loan for additional measures recommended by the auditor the customer must install or already have the Big Six measures. Cashback requires the installation of ceiling insulation and at least two of the following five measures: duct wrap, water heater blanket, low-flow showerhead, caulking and weatherstripping.

PROGRAM HISTORY The ZIP pilot program began in 1981. By 1984 over 302,000 single and multifamily dwellings had been weatherized. About 42,000 of these received free direct weatherization services. The loan volume for this time period was over $168,000,000. ZIP will be discontinued by December, 1986. The cashback option was introduced in 1984. This option continued for only half the time originally proposed because of a response rate greater than 200% of what was anticipated. Over $25,000,000 was given out in rebates in 1984. The DW program began in 1982. PG&E has a continuing contract with the California/Nevada Community Action Association, an association of the executive directors and board chairpersons of 45 community action agencies throughout the two states, to manage the DW component of the program. In 1986, PG&E

proposes to expand DW to include low income occupants of multifamily dwellings owned by nonprofit landlords.

In 1984 a new concept was developed for the weatherization of low-income households in isolated areas--the Stirling City Weatherization Project. Stirling City is a remote foothill community in the Sacramento Valley. In June of 1984 only 37 of the 177 households in the community had been weatherized to Big Six weatherization standards. The residents also had high energy costs because of a severe winter climate and the predominance of electric heating. In addition, over 70% of the households met DW income guidelines. In the Stirling City project every unweatherized home was insulated to Big Six standards at no cost to the resident. Community Outreach Program funds were used for this pilot effort.

MARKETING PG&E has discontinued their own marketing of the loan program. Independent contractors market the program and produce about 90 percent of the sales. Media coverage and direct mail advertising also have been used. Community organizations deliver the direct weatherization services to the low-income, elderly, non-English speaking and renter target groups. Marketing to target groups includes (1) joint PG&E and community group sponsorship of workshops and seminars, and (2) Outreach Contracting arrangements in which fees are paid to community groups for each customer name submitted as a potential participant and for each such customer who actually becomes a participant.

PROGRAM DESIGN General customers can buy the "Big Six" measures directly from contractors. PG&E organized a Contractor Advisory Committee (CAC) composed of contractors and PG&E personnel. The CAC has four functions: (1) to disseminate PG&E program changes and requirements to the field, (2) to allow contractors to communicate their concerns about the program, (3) to develop joint PG&E and contractor marketing efforts, (4) to protect the customer through a bid monitoring procedure, an on-site inspection of weatherization work, warranty requirements, and a Letter of Agreement in which contractors agree to comply with all applicable standards for their work.

Implementation of the program component which provides direct weatherization for target groups is subcontracted to community-based low-income assistance groups. The community groups select eligible participants and arrange for the installation of the basic weatherization measures.

SPECIAL FEATURES No audit for "Big Six" measures; contractor marketing; community group marketing.

UTILITY MOTIVATION When the program began PG&E considered conservation an important component of its energy supply strategy. Now the company has excess capacity and continues to offer the program for public relations purposes and to meet Public Utility Commission requirements.

Source: Andrews, Earl A., "Residential Weatherization through Zero Interest Financing: The PGandE Experience," pp.5-16 in Doing Better: Setting an Agenda for the Second Decade, Vol. I, ACEEE 1984 Summer Study on Energy Efficiency in Buildings; Pacific Gas and Electric Company Testimony to the California Public Utility Commission.

Weatherization Financing

UTILITY Portland General Electric Co.

CONTACT Mike Porter
121 S.W. Salmon St.
Portland, Oregon 97204
(503) 226-8464

PROGRAM TYPE Financial incentives for home weatherization for the general market.

INCENTIVE TERMS Customers may choose from the following three financing options: (1) loans with a principal of up to $5,000 and interest rates of 6.5 percent for measures that the company defines as cost-effective and 13.25 percent for measures in excess of the cost-effective amounts. These loans are payable in minimum monthly payments of $15 over a period of 10 years. Portland General Electric defines a measure as cost-effective if the installed cost of the measure divided by the audit estimate of its annual kWh savings is less than 14.19 cents, 40.65 cents, and 53.45 cents for measures with 7, 20 and 30 year lifetimes, respectively; (2) cash payment of 25 percent of the installed cost of the measures up to a total payment of $350; (3) zero-interest loan covering cost-effective measures with a minimum principal of $200 and a maximum of $5,000. The loan is to be paid in equal monthly payments of at least $15 for a period of not more than ten years. To qualify for the zero-interest loan the dwelling owner must have approved credit, hold legal title, and allow the company to take a security interest or a mortgage in the real or personal property of the dwelling owner. PGE inspects 100% of the homes that have been weatherized under any of the three incentive programs. This is done prior to giving the loan or rebate.

ELIGIBILITY Households which use electricity as the primary space heating fuel are eligible for financing. Either homeowners or rental property owners may qualify.

CONSERVATION MEASURES Ceiling, floor and wall insulation; heating duct insulation, thermal doors, storm doors and windows, heating duct and water pipe insulation, weatherstripping and caulking, attic ventilation, ground cover or vapor barriers when installed in conjunction with wall, ceiling or underfloor insulation.

PROGRAM HISTORY From 1978 to 1981 households could receive deferred zero-interest loans that did not have to be repaid until the weatherized property changed ownership. During this phase of the program over 30% of the eligible homes participated. In 1981 the new financing arrangements described above went into effect. With the reduction in the amount of subsidy, and the requirement that loan payments begin immediately, customer response rates dropped.

MARKETING Bill stuffers, newspaper ads, brochures, workshops.

PROGRAM DESIGN The first step is an audit request from a residential customer. The audit determines which measures are cost-effective and subsequent installations made by the homeowner or a contractor can then be financed. Portland General Electric inspects 100% of the installations.

UTILITY MOTIVATION In 1977, PGE determined that weatherization of existing electrically heated homes was vital for the conservation of utility-produced energy and vital to their customers in order that they might feel comfortable in their homes without having high bills to pay. Even though at the present time PGE has excess capacity and will for some years to come, they still encourage the customer to weatherize their homes to be more comfortable with lower utility bills.

Public Service Electric Energy Conservation Loan Program

UTILITY Public Service Electric and Gas Co. (PSE&G)

CONTACT Richard B. Comerford
Public Service Electric and Gas Co.
80 Park Plaza
Newark, New Jersey 17101
(201) 430-6620

PROGRAM TYPE Loans and rebates for average and above average income groups; zero-interest for lower income groups.

INCENTIVE TERMS Zero-interest loans to households with incomes less than $30,000; 1/2 current consumer interest rate (or approximately 7%) to households with incomes over $30,000 but less than $50,000.

ELIGIBILITY Residential customers with incomes less than $30,000 for zero interest and between $30,000 and $50,000 for 7% loans.

CONSERVATION MEASURES All RCS audit weatherization measures

PROGRAM HISTORY The program began in 1982. The PSE&G Energy Conservation Loan Program has had over 5,000 participants, with the number of participants increasing as the program moves into 1986. There are three program staff members at the utility, and annual program cost is approximately $1.5 million.

Program evaluations are not complete. However, the program seems to be cost effective for the participant. PSE&G is currently analyzing the overall cost to consumers and the total impact of the program on the system.

MARKETING Newspapers, TV, radio, bill inserts, and direct mail. PSE&G has found that the contractors are their best salesmen.

PROGRAM DESIGN Interested customers contact the utility and an audit is done. The customer may choose the contracter he or she wishes to perform the installation work from an approved list of 250 contractors. The customer also may select a contractor not on the list and ask PSE&G for approval. To ensure quality work and more satisfied participants, contractors are paid only after an inspection of the installed measures.

SPECIAL FEATURES The utility has 27 conservation programs. Programs are available offering rebates for the purchase of high efficiency heat pumps, air conditioners, gas furnaces, or gas water heaters.

UTILITY MOTIVATION The program was begun because of regulatory requirements, as a public service obligation, and as a least-cost strategy for the utility system.

Home Energy Checkup and Weatherization Financing

UTILITY Puget Sound Power and Light

CONTACT Reidun Crowley, Administrator Customer Programs
Puget Sound Power, OBC-08N
P.O. Box 97034
Bellevue, Washington 98009-9734
(206) 462-3235

PROGRAM TYPE: Weatherization program offfering cash grants or zero interest loans for customers with homes where electric heat was installed before January 6, 1982.

INCENTIVE TERMS: Customers may finance weatherization by choosing a cash grant of up to 71.8 percent of the recommended cost-effective weatherization work up to 30 mills or a ten-year payment payment deferred no-interest loan for up to 100 percent of the cost-effective work. Loan customers who repay their loans early receive a prepayment discount.

ELIGIBILITY: Single-family, multifamily, and mobile homeowners and tenants are eligible if the home had electric heat installed before January 6, 1986. Tenants, however, must obtain the homeowner's approval before weatherization is installed.

CONSERVATION MEASURES: Recommended measures may include ceiling insulation (R38), wall insulation (R11), floor insulation (R19), double or triple glazing or storm windows, duct insulation (R11). Conversion to a heat pump system is also allowed after all other cost-effective measures have been installed.

PROGRAM HISTORY: In 1978 the company decided to launch an aggressive conservation program. At that time the conservation program offered free home energy checkups and no-interest, ten-year, payment-deferred loans to finance cost-effective weatherization work. The cost-effective criterion was based on the company purchasing energy saved through conservation at a cost less than the cost of energy from new generation. Since then, the program has been broadened and expanded to include a greater number of customers, subsidize a wider variety of conservation measure, and offer a cash grant financing option.

By the end of 1985, over 56% of the eligible single family and about 10% of the eligible multifamily customers had home energy checkups. About 60% of the checkups have resulted in financed weatherization work. Currently, the average loan amount is about $2,700. The average grant amount is around $1,600 with 70 percent of those participating choosing the cash grant option.

MARKETING: A multi-media approach is used which includes advertising campaigns and video presentations. They also staff exhibits at home shows and fairs, sponsor workshops and provide pamphlets and a speaker's bureau.

PROGRAM DESIGN: At the customer's request, a Puget Power representative conducts a free home energy checkup by gathering information about the home's existing insulatin, windows, structure and heating system. A solar access survey is also conducted if the customer would like one. Next, the information is analyzed using a computer porgram. Then, weatherization measures are recommended on the basis of their cost-effectiveness, which is determined by calculating the expected energy savings, and the effective life of each measure, along with installation and program administration costs.

Representatives also provide customers with free energy savers, such as water heater insulation kits, infiltration gaskets, and do-it-yourself information on caulking and weatherstripping.

UTILITY MOTIVATION: More than a decade ago the company realized that in addition to providing new generating resources to meet future growth, it would be necessary to stretch existing resources as far as possible through conservation. The primary goal, then and now, has been to help achieve and maintain a long-term balance between loads and resources.

Home Energy Loan Program

UTILITY Seattle City Light

CONTACT Tim Newcomb, Research and Evaluation
Seattle City Light
1015 Third Avenue, Room 804
Seattle, Washington 98104
(206) 625-3768

PROGRAM TYPE Zero-interest weatherization loans for the general market.

INCENTIVE TERMS Zero-interest loans are provided for ten-years. Payments are deferred for the first five years. The loan is paid during the next five years (or at the time of the sale of the home). A lien is placed against the customer's home as collateral. Discounts are offered to customers who pay back their loans during the first five years.

ELIGIBILITY Residential customers who occupy one- to four-unit electrically-heated homes.

CONSERVATION MEASURES Ceiling, wall, floor, and heating duct insulation; pipe wrap; storm windows and thermal patio door glass; caulking and weatherstripping.

PROGRAM HISTORY Seattle City Light (SCL) is a municipal utility that generates two-thirds of its own electrical power. In 1977 the City of Seattle made a commitment to pursue energy conservation as a supplement to existing and proposed generation resources. The city's goal is to reduce consumption by 45 megawatts by 1990. To this end, a broad range of conservation programs is implemented by SCL. Several versions of a home weatherization loan program have been offered by SCL beginning in 1977. In early 1981, the City of Seattle initiated the Comprehensive Residential Weatherization Program (CRWP) which offers financing to residential customers for the installation of conservation measures in their homes. The Home Energy Loan Program (HELP) is part of this larger, city-wide conservation effort designed to reduce electricity usage in residential structures. Several component programs comprise the CRWP, each targeting different groups of residential customers according to the type of fuel used for heating and the income level of the household. HELP is the component of CRWP which provides weatherization loans without any income restrictions.

MARKETING Bill inserts, mass media.

PROGRAM DESIGN There are several steps in the HELP financing process. Interested customers first receive an in-home audit (the Home Energy Check) which details the cost-effective measures that may be financed through HELP. SCL provides a list of approved contractors. Customers then arrange for and submit contractor bids for installation work to SCL. After reviewing the bids, SCL sends contract and disclosure forms

to the customer. When the customer returns the forms to SCL, SCL sends work authorization and certificate of completion forms to the contractor. Completed weatherization is inspected by SCL and must be satisfactory before the contractor is paid.

SPECIAL FEATURES Part of overall mandated City of Seattle energy policy.

UTILITY MOTIVATION City mandate and least-cost strategy.

Conservation Financing Program

UTILITY: Southern California Edison Co.

CONTACT: Gail Adams
2244 Walnut Grove
Rosemead, California 91170
(213) 491-2265

PROGRAM TYPE: Financial incentives for single-family and multifamily markets. There are four program components: (1) Basic Loan and Cash Rebate Program (BLCR) which is designed to finance improvements in single-family homes (1-4 units), mobile homes, and the dwelling areas of multifamily complexes (5 or more units), (2) Common Area Rebate Program (CAR) which applies to multifamily building areas such as laundries, walkways, recreation areas, etc., (3) an energy-efficient refrigerator (EER) program to stimulate the early replacement of primary refrigerator units with energy-efficient models, and (4) a low-income program. The low-income program is described separately in the low-income section of this appendix. The other three components are described below.

INCENTIVE TERMS: BLCR loans have an 8% annual interest rate and the size of the cash rebates varies by the measure installed and by whether the dwelling is single-family or multifamily. The rebate amounts are based on a percentage of the estimated installed cost of each measure. For CAR the rebase is 30% of the installed cost up to a maximum of $50,000 per complex. All measures financed through the CAR program must first be recommended as cost-effective in a multifamily energy survey. For EER two incentive options of $50 and $75 are offered. Fifty dollar rebates are issued models 12 cubic feet or larger which are 25% more efficient than the applicable State Appliance Efficiency Standard. Models whcih are 20 cubic feet or larger, and are 30% more efficient than the State standard qualify for the $75 rebate.

ELIGIBILITY: Residential customers with electric water heating, space heating or central air conditioning are eligible for BLCR. To receive BLCR financing customers must have in existence, or must install the "Big Four" weatherization measures (attic insulation, caulking, weatherstripping, and duct wrap). Other measures are eligible for financing if they are recommended as cost-effective in a home energy survey. All multifamily building owners are eligible for CAR. EER is offered to all residential customers regardless of their source of heating or cooling and is available to both owners and renters of single and multifamily residences.

CONSERVATION MEASURES: BLCR includes attic insulation, caulking and weatherstripping, duct insulation, wall and floor insulation, storm doors and windows, clock thermostats, heat pumps and replacement central air conditioners, pre-coolers for air conditioners, evaporative coolers, whole house fans, heat pump water heaters. Edison actively promotes heat pumps, replacement central air conditioners, and pre-coolers for air conditioners. These items are cost-effective because they reduce on-peak demand.

PROGRAM HISTORY: Edison has aggressively promoted conservation and load management since the early 1970's. In response to a California Public Utilities Commission mandate, Edison implemented a pilot Zero Interest loan program in 1981. This program ended in 1983 and was replaced by the Conservation Financing Program (CFP), which is scheduled to end in 1986. From 1983-1985 BLCR loans or rebates were provided to nearly 45,000 customers for conservation improvements. The CAR program was first implemented in the summer of 1983. During 1984, 1,466 measure were installed in common areas for an estimated demand reduction of 0.2 megawatts. EER began in 1983 and operated from June 1 through September 30. Rebates were issued for 49,429 energy-efficient refrigerators.

MARKETING: BLCR is marketed primarily by the insulation industry. State-licensed contractors market the program directly to customers. CFP mails a promotional brochure to all owners of multifamily buildings and makes presentations to trade associations. EER focused on an industry-oriented promotional campaign. Dealers, manufacturers, and chain stores were the main forces driving a campaign that included newspaper, radio, television, and in-store publicity as well as special sales of qualifying models.

PROGRAM DESIGN: Contractors market BLCR, install measures, and provide customers with financing information. Edison inspects work to maintain quality control. CFP measures are installed by contractors and inspected by Edison. EER rebate information is given to customers by dealers.

SPECIAL FEATURES: Contractor, trade association, and dealer marketing.

UTILITY MOTIVATION: Edison became involved in conservation to reduce demand and peak loads, and to comply with PUC mandates.

Weatherization Financing and Credits Program

UTILITY Southern California Gas Co.

CONTACT Art O'Daly, Edwin Patterson, and Linda Wilkinson
Box 3249
Terminal Annex
Mail Location 754A
Los Angeles, California 90051
(213) 689-4120

PROGRAM TYPE Low-interest loans and cash rebates for general residential market. The single family portion of the porgram ended in November 1985.

INCENTIVE TERMS Loans had an 8% interest rate, 100 month repayment period and a maximum amount of $2,000 (a security agreement could be made to finance larger amounts). Customers with a good credit history of utility bill payments were eligible for the loans. To receive a loan a household had to install all of the six Basic Weatherization Improvements (defined below), if feasible. The amount of the cash rebates varied by the package of measures installed and by whether the dwelling was single family or multifamily. The amount of the rebate was based on calculations of the estimated energy savings that would be realized during the lifetime of the measure. Examples of maximum rebate amounts for single-family and multifamily dwellings, respectively, are as follows: attic insulation, $302 and $136; caulking and weatherstripping, $19 and $9; water heater blanket, $8 and $5; and duct wrap $106 and $85. The average total rebate amount paid to customers was $356. To qualify for a rebate the customer had to install at least three of the six Basic Weatherization Improvements. The most commonly installed measures were attic insulation, hot water saving showerheads, and water heater blankets.

ELIGIBILITY Single-family and multifamily residential customers

CONSERVATION MEASURES Basic Weatherization Improvements were attic insulation, weatherstripping, caulking, water heater blankets, hot water saving showerheads, and duct wrap. After the basic improvements were installed Supplemental Improvements (wall, pipe and floor insulation, set-back thermostats, and electronic ignition devices for gas forced air furnaces) could be installed and financed with either incentive option.

PROGRAM HISTORY Throughout the 1970's, Southern California Gas encouraged its customers to use energy efficiently through a number of innovative programs. One of these programs marketed attic insulation that was installed by subcontractors. In 1981, the California Public Utilities Commission ordered the company to expand the insulation program to include a number of other conservation measures. The final result of the PUC order was the Weatherization Financing and Credits Program (WFCP) which was implemented in phases beginning in 1982. Over 596,300 customers participated in the rebate and loan phases of WFCP between 1982 and 1984. The single-family component of the WFCP ended in November of 1985. When this

part of the program ended, about 90% of the dwellings that could install the measures had been weatherized. The multifamily component of the program will end as of March 31, 1986. Program costs were $45 million in 1982, $50 million in 1983, $68 million in 1984, and $100 million in 1985.

MARKETING Radio, TV, bill stuffers, and direct solicitation of participants by independent contractors.

PROGRAM DESIGN Contractors who installed the weatherization measures made the first contact with customers. If the customer decided to participate the contractor installed the measures and the customer sent proof of purchase and a rebate or loan application to Southern California Gas. Southern California Gas inspected 100% of a contractor's work when they first entered the program. If a contractor maintained a failure rate of less than 10%, then only 20% of their jobs would be inspected.

SPECIAL FEATURES Contractor marketing.

UTILITY MOTIVATION PUC mandate.

Source: Edwin J. Patterson, Jr., "Weatherization Programs-The Lessons of Experience," pp. 305-312 in Meeting Energy Challenges: The Great PG&E Energy Expo Proceedings, Vol. II, 1985.

The Energy Package

UTILITY Tennessee Valley Authority (TVA)

CONTACT W. C. Whisenant
Tennessee Valley Authority
3S 65E Missionary Ridge Place
Chattanooga, TN 37402-2801
(615) 751-5197

PROGRAM TYPE zero-interest and low-interest loan for single-family and multifamily homeowners or renters.

INCENTIVE TERMS Financing may include interest-free loans of up to $1,200 repayable over a period of seven years, low-interest loans of up to $3,800 repayable over a period of 10 years, or both options may be combined for a maximum loan of $5000 per living unit. The 160 local power distributors in the TVA system have the flexibility of choosing the financing package they wish to offer their customers.

ELIGIBILITY Loans are available to all residential customers including tenants, homeowners, and owners of rental property who heat or cool with electricity.

CONSERVATION MEASURES Both high and low cost weatherization measures are included. Other items that can be financed include solar water heaters, heat pumps, air-conditioning cycling, and water heater cycling.

PROGRAM HISTORY TVA's weatherization program began in 1977 and was one of the first major weatherization programs offered on a widespread basis. It initially offered zero-interest loans for attic insulation in electrically heated homes. It was later expanded to cover other weatherization measures and to permit financing of measures in electrically-cooled homes. By December of 1985 more than 950,000 audits had been performed representing over 30% of eligible households. About 55% (over 525,000) of the households receiving audits took out loans to install conservation measures.

MARKETING Bill inserts, brochures, booths at fairs and exhibitions, radio and television public service announcements.

PROGRAM DESIGN The basic design of this program has remained the same since 1977. Onsite energy conservation audits by energy advisors provide information on which energy savings products are available. The advisors make recommendations for energy improvements and provide the consumers with lists of participating contractors. Loan payments are added to the consumer's electric bill. Inspections of all installations are provided and contractors do not receive payment until standards are met.

UTILITY MOTIVATION The TVA system currently has excess capacity. It has, however, traditionally considered consumer education and assistance

related to electricity use a corporate and public responsibility. Because of very low rates in TVA's early years, its ratepayers have one of the highest levels of electrical consumption per household in the country. As rates began to increase in the 1970's, the TVA initiated conservation activities to help reduce the inefficient use of electricity.

LOW INCOME

Operation Assist

UTILITY Alabama Gas Co.

CONTACT Jim Eason
Alabama Gas Co.
20 S. 20th Street
Birmingham, Alabama 35295
205-326-8270

PROGRAM TYPE Low-income weatherization

INCENTIVE TERMS Free to eligible customers.

ELIGIBILITY All customers who had all or part of their gas bills paid by the Low Income Home Energy Assistance Program, or who were recommended by social service agencies, or who signed up for Alabama Gas Co.'s Service Continuation Program which equalizes monthly billings and offers special payment arrangements to prevent service cutoffs are eligible. Households that requested weatherization services while the crews were working in targeted neighborhoods also received them.

CONSERVATION MEASURES Caulking, weatherstripping, door sweeps, foam sealant to fill cracks in walls, switch plates and outlets, hot water flow restrictors, plastic storm sheets on windows.

PROGRAM HISTORY The program began after a series of Consumer Roundtable discussions focused on improving services to low-income customers. The company realized that the low energy efficiency of low-income households was a major problem. During a two-month period in the summer of 1985 14,571 low-income homes were weatherized. With the cooperation of the Alabama State Employment Service, the Alabama Gas Co. (Alagasco) hired 332 unemployed young people from low-income families to do the weatherization. The young workers were paid minimum wage. Under the federal Targeted Jobs Tax Credit program, Alagasco received an 85 percent federal tax credit for the first $3,000 paid each worker. Supervisors who were from 18 to 24 years old also qualified for a 50 percent tax credit on their wages. Thirty-five foremen, who were either retired Alagasco employees or mature people who had previous experience, also were hired with no tax credits involved. Once the staff was assembled, two intensive all-day training sessions were held. By June 14, 143 crews of weatherizers had spread out across Alagasco's service area in central Alabama. Total costs for the program were about $1.5 million, less about $300,000 for the tax credits.

MARKETING Each day crews went to targeted neighborhoods, knocked on doors, and explained the service. Then, with the resident's permission they set to work. If no one was home, the crew would leave a door hanger explaining Operation Assist, with a phone number to call to request service. Television news programs and newspapers provided publicity for the program.

PROGRAM DESIGN Free, direct weatherization services were provided to low-income households by crews of young disadvantaged workers who did door-to-door program promotion.

SPECIAL FEATURES Hired young disadvantaged workers; used federal tax credits available for providing jobs; door-to-door canvassing of targeted neighborhoods.

UTILITY MOTIVATION Provide a public service to the communities it serves by reducing the fuel bills of low-income families and by providing employment for disadvantaged youth.

Source: Stewart, Julie, "Enterprising Weatherizing," pp.12-15 in AGA Monthly, Vol. 68, No.1, January, 1986.

Low-Income Residential Weatherization Program

UTILITY Bonneville Power Administration (BPA)

CONTACT John Elizalde
P.O. Box 3621
Portland, Oregon 97208
(503) 230-7520

PROGRAM TYPE Low income; pays up to 100% of the cost of weatherization.

INCENTIVE TERMS Homeowners are paid for the estimated energy savings to be obtained from the installation of weatherization measures. The payment is the lesser of: (1) 100 percent of the actual cost of the weatherization or (2) 37.8 cents times the projected first year kilowatt-hour savings. Where necessary to protect the weatherization measures, BPA authorizes up to $150 worth of repair work in each eligible home.

ELIGIBILITY The program is available through participating utilities, the State of Washington Department of Community Development, and the HUD-funded Public Housing Authority to residences that use electric space heat permanently installed prior to April 15, 1983. Single-family, multifamily, rental and owner-occupied dwellings may participate. Low-income is defined as combined household income that is at, or below, 125 percent of the U.S. Office of Management and Budget's poverty level that corresponds with household size.

CONSERVATION MEASURES The following measures may be installed: ceiling insulation, floor insulation, wall insulation, duct insulation, storm windows or thermal pane glass replacements, water heater wraps and pipe insulation. If a residence has one of the above measures installed, the following measures may be installed: caulking, weatherstripping, and clock thermostats. Dehumidifiers may be installed in homes with moisture problems. To accommodate air quality concerns households may receive air quality information, radon monitoring, and, where warranted, subsidy for the purchase of an air-to-air heat exchanger.

PROGRAM HISTORY The low-income weatherization program began in 1983. The objective of the program is to ensure that the portion of low-income residences weatherized by BPA is proportional to the percentage of low-income customers in the population. The program had difficulty attracting participants in the first few years. In 1983, for example, only 2 percent of BPA-weatherized residences were assisted by the low-income program, although 13 percent of the region's families fit BPA's definition of low-income. In 1985 new marketing approaches were used to increase participation and BPA nearly met its goal, on a regionwide basis, of weatherizing the same proportion of low-income households (14.1 %) as there are in the general population. The program currently has 94 utilities and the State of Washington actively participating. In some locations the program now works very well; in others participation still lags behind goals.

MARKETING In the first years of the program there were several barriers to participation. One problem was that many needy people were reluctant to ask for help. Another was distrust of utility motives and fear that payment of overdue bills would be required or service cut-offs would occur. In addition, some utilities were opposed to providing special treatment for needy customers. BPA tried to overcome these barriers by having social service agencies contact eligible households. This approach successfully generated lists of households willing to participate.

PROGRAM DESIGN: Except for the involvement of social service agencies, the program operations are the same as those for the general market Residential Weatherization program. That is, after a customer agrees to participate, a utility auditor inspects the home. The auditor collects information on the dwelling and estimates potential energy savings for various measures. The customer is informed as to which measures are cost-effective and eligible for financing. The household decides which measures to install. Bids from contractors, selected from a list of approved contractors, are obtained. After the installations are completed, utility staff inspect the work. If BPA specifications are met, the contractor is paid by the utility.

SPECIAL FEATURES: Desired levels of low-income participation are achieved with nearly the same program offered to the general population. Differences between the low-income and non-low-income program include the use of social service agencies to locate low-income participants and a higher incentive level for low-income households.

UTILITY MOTIVATION: In late 1980 Congress passed the Pacific Northwest Electric Power Planning and Conservation Act. The Act required BPA to acquire conservation resources that are cost effective, available, reliable, and compatible with the existing power supply system. Weatherization of low-income households helps to achieve this goal. In addition, low-income households usually are unlikely to invest in conservation without assistance and often offer particularly cost-effective opportunities for investment in conservation. Other motives include a desire to reduce low-income household energy costs so that bills will be paid and a desire to help the elderly, unemployed and handicapped.

Energy and Saving for You (EASY)

UTILITY Boston Edison Co.

CONTACT Larry Palmer
Boston Edison Co., P302
800 Boylston Street
Boston, MA 02199
(617) 424-3799

PROGRAM TYPE Low income, presently coordinated with the state Energy Conservation Bank program. Will be starting zero-interest loan program soon.

INCENTIVE TERMS Boston Edison will install up to $25 worth of conservation measures at the time of the audit. Loan terms for more expensive measures are determined on a sliding scale depending on income.

ELIGIBILITY Low-income households; no income limit for solar features.

CONSERVATION MEASURES Low-cost measures at time of audit, but mainly concerned with larger, high-cost items such as attic and wall insulation.

PROGRAM HISTORY Boston Edison's current program, begun in September 1985, is derived from the former MASS SAVE program, which was started in 1980. "Energy and Saving for You" (EASY) is an outgrowth of the RCS program, and is conducted in conjunction with local community programs. The company serves over 500,000 residential customers, and has had 2,500 participants in the EASY program to date.

There are three staff persons at the utility who work on the EASY program. The auditing and installation work is contracted out, for a total of approximately 15 persons for the project.

Monitoring of the program indicates that the EASY program seems to be meeting its goals of activity levels. However, no formal evaluation of energy savings or cost-effectiveness has been done at this time.

MARKETING The program is marketed through telemarketing and bill inserts.

PROGRAM DESIGN At the time of the audit, up to $25 worth of conservation measures may be installed; larger measures are installed on a follow-up visit.

SPECIAL FEATURES Eligibility, interest rates and loan terms are determined on a sliding scale depending upon income level.

UTILITY MOTIVATION To meet RCS mandate. Also, Boston Edison is trying to offer good service to customers and is encouraging conservation.

Neighborhood Energy Weatherization Program

UTILITY Central Illinois Light Co.

CONTACT Sue Hagel
Central Illinois Light Co.
300 Liberty
Peoria, Illinois 61602
(309) 672-5487

PROGRAM TYPE Low-income households; elderly; zero interest loans. The program ended in 1985.

INCENTIVE TERMS Free weatherization kit

ELIGIBILITY 125% of poverty level; plus anyone over age 65, regardless of income

CONSERVATION MEASURES Low-cost measures: water heater blanket, weatherstripping tape, plastic interior door covers, vinyl door sweeps, duct tape, outlet cover gaskets, 4 tubes of acrylic latex caulk.

PROGRAM HISTORY The program began in 1983 and had 904 participating households in that year. The number of participants increased over time, but did not reach projected levels because it was sometimes difficult to find volunteers to solicit and install the conservation measures, and because it was often difficult to convince customers that the installation was free with "no catches involved". Central Illinois Light had approximately ten staff persons working on the project. The program was discontinued at the end of 1985.

An evaluation of the program should be completed by early summer. There are no conclusions as yet concerning cost-effectiveness or energy savings. However, participating customers have reported higher comfort levels.

MARKETING Information about the program was included in a "CILCOGRAM," which was mailed out every two months. Community groups and door-to-door solitation were also used. Targeted areas were those shown by the 1980 Census Tracts to have high concentrations of low-income, elderly, and/or Black populations.

PROGRAM DESIGN No audits. Central Illinois Light provides a weatherization kit containing low-cost measures. The kit is mainly installed by door-to-door solicitors, but it is sometimes requested by customers.

SPECIAL FEATURES Volunteer help was used to install the measures.

UTILITY MOTIVATION Regulatory requirements mandated a program of this type.

Intercity Gas Company Low-Income Weatherization Program

UTILITY Intercity Gas Company (IGC)

CONTACT Curt Leno
Intercity Gas Company
910 Cloquet Avenue
Cloquet, MN 55720
(218) 879-1571

PROGRAM TYPE Low-income, single-family housing

INCENTIVE TERMS 100% grant up to maximum $1000/house

ELIGIBILITY Single-family housing; customers must also be eligible for federal fuel assistance

CONSERVATON MEASURES Low- and high-cost measures as recommended during audit

PROGRAM HISTORY The program started in the Fall of 1985. It is jointly operated by Intercity and the seven Community Action Program (CAP) agencies in Intercity's distribution area. The CAPs may arrange for their own crews to do the work or the work may be contracted out. Intercity pays a maximum $1000 for the weatherization of each house. Intercity also reimburses the CAP for administrative and other weatherization-related costs.

During the five-year planning horizon, Intercity expects to weatherize 62 houses each year. Intercity has assigned one manager and one clerical person to this conservation program. Intercity's annual budget includes $50,000 in program monies for the low-income program.

MARKETING Intercity only recently began enclosing information inserts with customer bills. Previously, Intercity relied on the CAPs to deliver information. There are no other active marketing strategies.

PROGRAM DESIGN The customer receives formal information about Intercity's low-income weatherization program from one of two sources: CAP outreach or bill inserts. In either case, the CAP determines eligibility, and arranges the audit and installation of recommended measures. Intercity inspects the completed installation and approves the award of grant monies to the CAP or contractor.

SPECIAL FEATURES The CAP agencies administer the program; Intercity is essentially a funding source.

UTILITY MOTIVATION PUC required.

Enterprise Plan Program

UTILITY Massachusetts Electric Co. (New England Electric)

CONTACT Ilde Toth, Residential Sector
Massachusetts Electric Co.
25 Research Drive
Westboro, MA 01581
(503) 484-1125

PROGRAM TYPE One option available to all customers, another for low-income.

INCENTIVE TERMS All-customer phase: 10% financing; low-income phase: free materials for electricity-saving measures, 10% financing on oil or gas measures.

ELIGIBILITY All residential customers in a 20-community area are eligible for free audits and 10% financing; low-income determined by fuel assistance guidelines (usually 175% of poverty guideline) and are residents of 20 communities with high unemployment.

CONSERVATION MEASURES Water heater wrap, low-flow showerhead, faucet aerators, caulking and/or weatherstripping of doors and/or windows, window pulley seals, insulating basement windows, door sweeps, electric outlet and switchplate gaskets, insulating hot water pipes and heating ducts, attic and attic access insulation, storm windows. Low-income participants are also given four energy-saving light bulbs. Other participants may purchase the bulbs.

PROGRAM HISTORY The program began in late 1985 in 20 towns in northwestern Massachusetts. Towns were selected by the state government as having a slower economic recovery rate than the rest of the state. Massachusetts Electric Co. uses outside companies to do the audits and contractors to install the measures. RCS (MASS-SAVE) does the audits and also does computer tracking of the installations.

Massachusetts Electric Co. has two staff persons for the residential program. As of early 1986, 3,000 audits had been completed.

The low-income part of the program is a pilot effort. If the program is successful, it will be implemented throughout the state.

MARKETING Telemarketing is most effective, but they also use mass media, bill inserts, and outside consulting groups.

PROGRAM DESIGN An energy audit is done at no cost to the customer (some households have already had an audit under the MASS SAVE program). The customer may select which measures he or she would like to have done. Contractors to install the measures are provided by the utility.

Massachusetts Electric inspects the completed work and pays the total installation cost to the contractor. Financed costs are repaid by the customer to the utility.

SPECIAL FEATURES Implemented in towns with slow economic recovery; includes financing for nonelectric (oil and gas) measures for low income people; financing is provided for electric measures as well for the general market.

UTILITY MOTIVATION Massachusetts Electric Co. would like to find out whether customers will purchase energy-saving measures if the "hassle" is taken out of conservation. The utility provides the audit, suggests beneficial measures, and sends in a contractor, thereby reducing the number of decisions which the customer must make. Because 50% of new residential construction uses electric space heating, the utility predicts insulation measures will help lower electricity demand.

Home Energy Check-Up Program

UTILITY Minnegasco, Inc.

CONTACT Sue Nathan
Minnegasco
201 South Seventh St.
Minneapolis, MN 55402
(612) 342-4939

PROGRAM TYPE Free audit and weatherization for low-income, single-family households.

INCENTIVE TERMS Free audit and weatherization.

ELIGIBILITY Gas space heating; single-family housing; home owner; customer must be low-income as determined by the municipality that administers the program.

CONSERVATION MEASURES Low cost measures such as caulking, weatherstripping, attic doors and hatches.

PROGRAM HISTORY Minnegasco provides audit and weatherization programs for low-income customers through contractual arrangements with municipalities in its distribution area. Municipalities are encouraged to participate with state assistance in the form of a $15,000 one-time grant to the city for the staffing of an energy coordinator (Government's Community Energy Council Program).

Recognizing that energy use is a function of behavior as well as a building's thermal integrity, Minnegasco integrated the House-Doctor concept with the four-phase Home Energy Check-Up Program in 1985. The phases consist of a common-sense audit designed for household decision makers, the House-Doctor concept, community workshops, and information about other non-Minnegasco programs. Minnegasco follows up about three months later to determine what actions were taken.

Costs average $90 per house. Minnegasco absorbs all of these per-house expenses although the municipality is generally managing the program.

MARKETING Minnegasco usually makes direct contact with a municipality when the municipality is preparing a proposal for the award of a state grant to begin a Community Energy Council.

PROGRAM DESIGN Each municipality ultimately determines low-income eligibility and identifies houses for participation. Local fuel assistance records include all eligible low-income households. Customers receive a free audit, demonstration and installation of recommended measures, and conservation information.

SPECIAL FEATURES Investor-owned, gas distributor program administered by local governments.

UTILITY MOTIVATION PUC required; excellent public relations; contributes to timely bill payment.

Coordinated Energy Services

UTILITY: Minnegasco, Inc. and Minneapolis Energy Office

CONTACT: Sheldon Strom, Director
Minneapolis Energy Office
Room 330, City Hall
Minneapolis, MN 55415
(612) 348-4834

PROGRAM TYPE: Low income.

INCENTIVE TERMS: Low cost measures are free and installed during House Doctor visit; high cost measures usually are installed through federal Weatherization Assistance Program (WAP). If WAP does not cover the client's needs, some zero-interest deferred loans are granted. Half of the funds for these loans are supplied by Minnegasco and half by the city.

ELIGIBILITY: Household must meet eligibility requirements for federal Low Income Home Energy Assistance Program and have a high level of consumption (i.e., more than 2,000 CCF annual or bills in excess of $1,200).

CONSERVATION MEASURES: Both low and high cost measures such as caulking, weatherstripping, attic and wall insulation, storm doors and windows. Any measure with a payback of ten years or less may qualify. Funds also are available for energy-related repairs such as improvements to leaky roofs, windows or doors.

PROGRAM HISTORY: Program is in a pilot phase and had processed about 100 homes as of January 1986. It is designed to coordinate the efforts of a number of agencies that offer services to low-income households. Implementation has been somewhat difficult administratively because of the different agency interests involved. Response from single-family, owner-occupied households has been good, but response from renters has been limited.

MARKETING: After eligible households are identified from agency records they are contacted directly by telephone.

PROGRAM DESIGN: There are four general stages a client household moves through in the Coordinated Energy Services program. First, Community Action Agencies nominate eligible households that meet federal low-income guidelines. From this group program staff select households with particularly high consumption levels. Second, members of the households selected are invited to attend an energy conservation workshop. At the workshop they learn some basics about the determinants of energy consumption and fuel bills and about energy conservation options. They learn how to read a gas meter, how to install rope caulk, how to set back water heater temperatures, and how to do other hands-on conservation

activities. They also learn about the components of consumption which determine the average bill. The concept that consumer choices about energy use determine bill levels is stressed in the workshop. For many low-income users bill amounts seem erratic and uncontrollable because variability in the amount of subsidy payments and weather changes can cause a very wide range of bill levels. Required payments may be reduced suddenly when fuel assistance program funds are available and go up suddenly when they are not. The workshop focuses on the idea of consumer accountability for bill levels and on practical means of reducing bills. A major goal of the program is to develop a budget plan that consists of level payments all through the year. If households agree to go through the program process, a levelized payment plan is worked out with the utility. When payments are smaller, more predictable and more affordable, households are more likely to pay their bills.

After the workshop is completed, a house doctor visit is scheduled for each household. This visit includes an energy audit and the installation of a number of weatherization measures. A three person crew works on the house for a day. The crew tries to involve the homeowner in the process especially in routine maintenance activities such as changing furnace filters.

SPECIAL FEATURES: Coordination of effort between utility, city energy office and a number of agencies that serve low-income households; levelized budget billing plan; emphasis on customer education.

UTILITY MOTIVATION: Public Utility Commission mandate; reduce uncollectable bills.

Low Income Residential Conservation Assistance Program (LIRCAP)

UTILITY: National Fuel Gas Distribution Corporation

CONTACT: Zeke Nowicki
National Fuel Gas Distribution Corporation
P.O. Box 2081
Erie, PA 16512
(814) 871-8223

PROGRAM TYPE Grant; audit and weatherization; low-income, elderly and/or disabled.

National Fuel Gas operates two weatherization programs. The essential difference between the two is the grant source: (1) LIRCAP is funded by profits from off-system sales; (2) the second program, only administered by National Fuel Gas, is funded by the Solar Energy and Energy Conservation Bank. Other differences are noted below, where "(1)" refers to LIRCAP and "(2)" refers to conservation bank weatherization.

INCENTIVE TERMS (1) 100% grant up to a discretionary average $750/house; (2) lesser of 50% grant and $1250/house.

ELIGIBILITY Owner-occupied house or renter-occupied with utility bill in tenant's name; and (1) eligible for fuel assistance (LIHEAP) and/or over 62 or permanently disabled, and income less than 150% of federal poverty level (2) income less than 80% of median county income.

CONSERVATION MEASURES (1) attic insulation, vent dampers, setback thermostats, hot water tank jackets, caulking and weatherstripping; (2) measures in (1) plus wall and floor insulation, storm windows.

PROGRAM HISTORY LIRCAP is the result of a PUC ruling imposed on National Fuel Gas for the distribution of excess profits from off-system sales in 1984. National Fuel Gas developed LIRCAP from the original weatherization program which featured only attic insulation. National Fuel Gas, in 1985, expanded the original program in order to reach additional customers.

In 1985, National Fuel Gas weatherized 655 homes under LIRCAP. Program costs totaled nearly $280,000. The average cost per house was approximately $450. Three auditors and one clerk are assigned to LIRCAP on a full time basis. LIRCAP will be continued through 1986 until funds are depleted.

The conservation bank program completed 96 weatherizations in 1985. Program costs totaled $134,000. The average cost per house of $835 does not include the customer contribution. This program has a present balance of $65,000 for further weatherization.

MARKETING National Fuel Gas introduced the programs by enclosing information inserts with customers' bills. Presently, National Fuel Gas relies on their business offices and community groups to spread information about conservation programs.

PROGRAM DESIGN Customers call for audits or, through an unofficial network to reach households in energy crises, National Fuel Gas initiates conservation activities. With two programs having similar eligibility criteria, National Fuel Gas imposes no hard rules for program participation. For instance, the maximum grant for LIRCAP is primarily a guide. Additionally, National Fuel Gas will combine the two programs for a "best fit" weatherization. Although all work is done by contractors, National Fuel Gas performs 100% post-inspections.

SPECIAL FEATURES National Fuel Gas frequently combines provisions of LIRCAP and the SEECB-funded program when weatherizing an eligible house. National Fuel Gas also calculates "site-specific" paybacks for weatherization measures.

UTILITY MOTIVATION Conservation program plan approved by PUC to assist low income residential customers.

Low Income Co-op Program

UTILITY: Puget Sound Power and Light

CONTACT: Reidun Crowley, Administrator Customer Programs
Puget Sound Power OBC-08N
P.O. Box 97034
Bellevue, Washington 98009-9734
(206) 462-3839

PROGRAM TYPE Provides 100% financing for cost-effective weatherization measures through a cooperative agreement with the State of Washington for eligible low-income homes with electric heat.

INCENTIVE TERMS The company provides a cash grant up to 71.8% of the cost of the recommended weatherization with the balance coming from federal funds distributed by community action agencies or housing authorities.

ELIGIBILITY The customer must utilize electric space heat that was installed before January 6, 1986, and have an income of no more than 125% of the federal poverty level.

CONSERVATION MEASURES Recommended measures may include ceiling insulation (R38), wall insulation (R11), floor insulation (R19), double or triple glazing or storm windows, duct insulation (R11).

PROGRAM HISTORY This program began in 1982 as an informal partnership between Puget Power and the State of Washington. Constracts were also negotiated wtih the Community Action Agencies.

MARKETING There is no formal marketing program; however, the Community Action Agencies locate and identify eligible participants.

PROGRAM DESIGN The Community Action Agencies determine if both the applicant and the home meet the guidelines. Then the request is referred to Puget Power where it is given a priority status. A free home energy checkup is performed and any cost-effective measures are identified and installed. Puget provides up to 71.8% of the financing and the Community Action Agencies fund the balance from federal energy assistance funds.

UTILITY MOTIVATION Puget Power implemented this approach as a way to increase the participation of low income customers in the weatherization program.

Low Income Electric Program

UTILITY: Seattle City Light

CONTACT: Tim Newcomb, Research and Evaluation
Jean Shaffer, Evaluation Unit
Seattle City Light
1015 Third Avenue, Room 804
Seattle, Washington 98104
(206) 625-3768

PROGRAM TYPE Free weatherization for low income households.

INCENTIVE TERMS Free weatherization except zero-interest 5-year deferred loan for storm windows.

ELIGIBILITY At the beginning of the program, households with incomes below 90% of median income were eligible. This has now been changed to 125% of the median.

CONSERVATION MEASURES Insulation, storm windows, caulking, weatherstripping, water heater wrap.

PROGRAM HISTORY The program is operated by Seattle City Light and the Department of Human Resources, and was started in 1981 with a few hundred participants. The number of participants increased to 2000 during 1983-84, then tapered off to approximately 1000 in 1985.

MARKETING Bill inserts are the most effective; mass media, direct mail, and community groups are also used.

PROGRAM DESIGN Eligible participants receive free insulation, caulking, weatherstripping and water heater wrap. Storm window installation is offered at $6.00/sq.ft. on a 5-year deferred loan with no interest.

UTILITY MOTIVATION There is a high interest in the conservation ethic in the area; also some political pressure. In 1977 the City of Seattle made a commitment to pursue energy conservation as a supplement to existing and proposed generation resources. The city's goal is to reduce consumption by 45 megawatts by 1990. Seattle City Light has implemented a broad range of conservation programs in pursuit of this goal.

Conservation Assistance Program

UTILITY Southern California Edison Co.

CONTACT Dina Hunter
2244 Walnut Grove
Rosemead, California 91170
(818) 302-3196

PROGRAM TYPE Low-income; elderly; handicapped.

INCENTIVE TERMS Free to qualified customers.

ELIGIBILITY Annual income at or below 150% (200% for elderly or disabled) of the poverty level as defined by Department of Health and Human Services' Poverty Income Guidelines. Customers receiving Aid for Families with Dependent Children (AFDC) or Supplemental Social Security Income (SSI) may also qualify. Owners or renters of single-family or multifamily dwellings may also participate.

CONSERVATION MEASURES Attic insulation, caulking and weatherstripping, duct insulation, wall and floor insulation, storm doors and windows, clock thermostat, heat pumps and replacement central air conditioners, evaporative coolers, heaters, portable electric heaters (to use in one room instead of heating the whole house), and energy-efficient refrigerators (to replace existing inefficient units). In addition to the free measures, customers may also qualify for substantial rebates for installing air conditioner pre-coolers, whole-house fans, and heat pump water heaters.

PROGRAM HISTORY Although Edison's low-income customer services compare to those of other California utilities, Energy Assistance Programs' activities exceed other utilities' services because they include free measures, installations and deliveries as well as increased incentives. A unique aspect is the leveraging of over $1.5 million in matching federal funding to supplement budgeted resources. Many of the low-income efforts were funded by combining Edison conservation dollars with a grant from the Solar and Energy Conservation Bank through the California Energy Commission. Because of its aggressive Energy Assistance Program campaign, Edison was able to assist 58,000 low-income customers with their energy conservation needs during the past year.

MARKETING Edison contracts with community groups to market and install the conservation measures. Several programs were designed to target non-English-speaking customers, senior citizens, the handicapped, and renters. Mass media advertising, newsletters, and direct mailings are some of the marketing techniques.

PROGRAM DESIGN Edison contracts with community groups and licensed contractors to deliver and/or install the various measures.

SPECIAL FEATURES Leveraging of federal funds; contracts with community groups to deliver program services.

UTILITY MOTIVATION To increase.the rate of low-income customer participation in traditional utility conservation programs, and to satisfy a CPUC mandate.

Community Involvement Energy Programs

UTILITY Southern California Gas Co.

CONTACT Art O'Daly
Southern California Gas Company
Mail Location 754-A
P.O. Box 3249, Terminal Annex
Los Angeles, California 90051
(213) 689-4120

PROGRAM TYPE Low-income weatherization; also targets elderly, handicapped and non-English-speaking households; provides employment and job training for disadvantaged workers.

INCENTIVE TERMS Free weatherization for qualified customers.

ELIGIBILITY Annual income at or below 150% (200% for elderly or disabled) of the poverty level as defined by Department of Health and Human Services' Poverty Income Guidelines. Customers receiving Aid for Families with Dependent Children (AFDC) or Supplemental Social Security Income (SSI) automatically qualify. Owners or renters of single-family or multifamily dwellings may participate.

CONSERVATION MEASURES Six basic measures may be installed: attic insulation, weatherstripping, caulking, hot-water saving showerheads, water heater insulation blankets, heating duct insulation. An allowance of up to $200 per unit is provided for minor home repairs that affect energy use such as door or window repair or replacement, minor roof repair, and patching holes in the structure.

PROGRAM HISTORY Program implementation began in 1983. Before 1983 weatherization of low-income households in the Southern California Gas service territory was performed by federally and state-funded local community groups and administered by the California State Office of Economic Opportunity. About 23 community agencies provided weatherization services and had extensive community outreach capabilities.

Because Southern California Gas wished to draw on the strengths and experience of these community agencies, they were asked to form an advisory group to help develop the program. Utilizing input from the advisory group, a multiphase, two-component program was developed. The first component consisted of three phases: (1) contracting with Community Action Agencies and community-based organizations for the installation of measures and minor home repairs, (2) adding the participation of independent contractors and local government housing authorities, and (3) employing and mobilizing non-profit organizations to assist in the identification of low-income, disabled, elderly, and non-English-speaking households.

The second component is the community involvement inspection program. This element of the program provides vocational training and direct

employment for formerly unskilled and unemployed members of low-income communities. Disadvantaged workers are hired and trained to inspect the weatherization improvements installed through any Southern California Gas program, not just the low-income program. Currently, 20 community agencies are under contract as weatherization installers and four as inspection agencies. Southern California Gas provides each agency with all necessary administrative, clerical and technical assistance. This utility/community group partnership has created over 400 jobs and provided technical skill training for disadvantaged workers. By October 1985 almost 53,000 homes had been weatherized. About half of these homes were single-family and about half multifamily dwellings.

MARKETING A slide-presentation and video tape program are presented to appropriate audiences. Utility personnel make regular presentations to organizations that provide services to low-income households. Brochures are distributed at these presentations and at county fairs, United Way sites, exhibits, etc. Brochures also are distributed by all program installers. A direct mailer was sent to each customer receiving AFDC or SSI benefits. Television coverage of the program also has been provided. A telephone hotline, which is mentioned in all the outreach efforts, is maintained to receive requests for services.

PROGRAM DESIGN Participating community agencies are responsible for conducting outreach activities, determining eligibility, assessing the dwelling's condition, and installing needed improvements. Southern California Gas pays the agencies for completed installations. It also maintains close contact with existing agencies by monitoring performance in various ways. Quality assurance checks are performed on more than 20% of the assessments of the dwelling's needs for improvements. All weatherization jobs are inspected to see that they meet proper installation standards. Regular in-service training activities are conducted.

SPECIAL FEATURES Extensive coordination with community agencies produces a highly effective utility/community partnership. The program also includes agressive marketing, and direct employment and vocational training for formerly unskilled and unemployed members of low-income communities.

UTILITY MOTIVATION Public Utility Commission mandate to provide a low-income program and a desire to provide effective weatherization services to those most in need.

The Energy Package for Low-Income Customers

UTILITY Tennessee Valley Authority (TVA)

CONTACT Glenn Roberts
Tennessee Valley Authority
MR3S144G
Chattanooga, Tennessee 37402-0028
(615) 858-5132 or 751-5132

PROGRAM TYPE: Standard general market zero-interest and low-interest loan program with intensive marketing to low-income customers.

INCENTIVE TERMS: Financing may include interest-free loans of up to $1,200 repayable over a period of seven years, low-interest loans of up to $3,800 repayable over a period of 10 years, or both options may be combined for a maximum loan of $5000 per living unit.

ELIGIBILITY: Households with annual incomes below $10,000 are considered low income. Either homeowners or tenants are eligible.

CONSERVATION MEASURES: Both high and low cost weatherization measures are included. Other items that can be financed include solar water heaters, heat pumps, air-conditioning cycling, and water heater cycling.

PROGRAM HISTORY: Approximately one-third of the 2.5 million households in the TVA service area have an annual income of less than $10,000. Through energy conservation services provided under The Energy Package, TVA is working with power distributors and other Federal, State and local agencies to find ways to help the elderly, the poor, and those on fixed incomes. By 1985 over 240,000 low income units had been surveyed with over 100,000 units weatherized.

As a result of special outreach, marketing and communication efforts, low income participation in the weatherization option of The Energy Package has increased dramatically. In fiscal year 1985, over 43% of the units weatherized under the program were low-income units. This high 1985 level of participation, which is a higher percentage than the representation of low-income households in the population, is in contrast to the below representative levels of earlier years. In 1979, 1980, 1981, and 1982, the percentages of low-income households participating were 7, 8, 21.6, and 22.6 respectively. Obtaining low-income participation above their representation in the eligible population is a significant achievement. Most home weatherization loan programs have much lower low-income participation than their proportions in eligible populations.

MARKETING: Some of the TVA's low-income outreach efforts include recruiting participants through local community groups, developing promotional material specifically for low-income clients and distributing the material through doorknob hangers, posters, and displays at community gathering points. For example, TVA has advertised an offer of

three free loaves of bread in return for requesting an energy survey at grocery store displays in low-income neighborhoods. Other techniques have included door-to-door canvassing, community meetings, soliciting at food distribution centers, and mall exhibits.

PROGRAM DESIGN: The basic design of this program has remained the same since 1977. Onsite energy conservation audits by energy advisors provide information on which energy savings products are available. The advisors make recommendations for energy improvements and provide the consumers with lists of participating contractors. Loan payments are added to the consumer's electric bill. Inspections of all installations are provided and contractors do not receive payment until standards are met.

SPECIAL FEATURES: High levels of participation by low-income households have been achieved by intensive marketing of the standard program for the general population.

UTILITY MOTIVATION: The TVA system currently has excess capacity. It has, however, traditionally considered consumer education and assistance related to electricity use a corporate and public responsibility. Because of very low rates in TVA's early years, its ratepayers have one of the highest levels of electrical consumption per household in the country. As rates began to increase in the 1970's, the TVA initiated conservation activities to help reduce the inefficient use of electricity.

Utility Low-Income Weatherization Program

UTILITY Wisconsin Gas Co.

CONTACT Wally Zeddun
Wisconsin Gas Company
626 East Wisconsin Avenue
Milwaukee, WI 53202
(414) 291-7022

PROGRAM TYPE Grant; audit and weatherization for low-income households.

INCENTIVE TERMS 100% grant for installation of eligible measures.

ELIGIBILITY Income less than 150% of federal Office of Management and Budget poverty level; gas space heating; 1-4 family housing.

CONSERVATION MEASURES Infiltration measures, furnace replacement and other measures with paybacks of 5 years or less.

PROGRAM HISTORY Wisconsin Gas Company started its low-income weatherization program in 1982. Since then, the company has weatherized 2259 residential buildings (1-4 dwelling units) at a cost of nearly $6 million, including administration and installation labor and materials. In 1985 alone, Wisconsin Gas Company weatherized 926 buildings in the City of Milwaukee and 120 buildings in other company districts. (Operating costs for 1985 totaled approximately $2.3 million.)

Ten staff, including three supervisors, seven conservation specialists, and two secretaries, are assigned to the low-income program on a full time basis. Wisconsin Gas Company will intensify its efforts in 1986 with goals to weatherize 100 buildings each month in the city and 20 in the districts.

MARKETING Wisconsin Gas Company uses the Company's list of customers on the "guaranteed service plan," or low-income payment plan. Previously, Wisconsin Gas Company has paid local community groups for outreach, and has advertised through radio and local newspapers.

PROGRAM DESIGN Priority is given to households with the highest gas consumption and the lowest incomes. Wisconsin Gas Company conducts an audit, arranges installation of conservation measures, and conducts a post-weatherization inspection.

SPECIAL FEATURES As a consequence of the original outreach marketing scheme, the low income weatherization program benefitted from the inputs of several community groups. These groups continue to be active in the identification of eligible customers.

UTILITY MOTIVATION PUC required.

ELDERLY

Seniors Lending A Helping Hand

UTILITY: Georgia Power Co.

CONTACT: David Kee
Georgia Power Company
333 Piedmont Avenue
Atlanta, Georgia 30308
(404) 526-7323

PROGRAM TYPE Elderly/Handicapped.

INCENTIVE TERMS All services are free to the homeowner. The cost of labor and materials for an average home is about $150-200.

ELIGIBILITY All homeowners, 60 years of age or older, and all handicapped homeowners regardless of age who are served by Georgia Power Company are eligible for program services.

CONSERVATION MEASURES The focus is on infiltration measures such as caulking/weatherstripping, door sweeps, etc. Necessary repair work also may be done. Insulating jackets are installed on electric water heaters. As an added feature to the program, to ensure safety of customers, smoke alarms are installed.

PROGRAM HISTORY This program began in March, 1982. Between 1982 and 1985 over 30,000 homes were weatherized. Beginning in 1985 efforts were made to coordinate efforts with the State Energy Office, the Weatherization Assistance Program and 26 local Community Action Program (CAP) Agencies. With this coordination Georgia Power does its standard program weatherization work and the CAP's install insulation and other measures for eligible households.

MARKETING Local community groups and sales representatives.

PROGRAM DESIGN To deliver program services, Georgia Power, through Enercom, Inc., involves about 155 senior citizens who are able to do the weatherization work. They work in teams of two. Local mayors, county commissioners, churches and civic clubs were contacted initially to explain the program and to obtain recommendations about workers.

SPECIAL FEATURES Involves the elderly to do weatherization jobs and works closely with local community groups and State Office of Energy Resources.

UTILITY MOTIVATION Development of the program was motivated by a recognition that existing programs were not reaching senior citizens particularly those living in rural areas or small towns. Offering relief from rate increases to customers living on fixed incomes was another motivation for Georgia Power's involvement. Basically, a decision was made at the Chief Executive Officer level to take on a social responsibility toward the elderly and handicapped.

Senior Citizens Peer Counseling Program

UTILITY Nashville Electric Service (NES)

CONTACT Jim Perkins
Nashville Electric Service
1214 Church Street
Nashville, Tennessee 37203
(615) 474-3665

PROGRAM TYPE Elderly. There are three types of weatherization programs available to the elderly: (1) a TVA Loan Program, conducted through the Tennessee Department of Human Services, which provides interest-free loans up to $1200 for weatherstripping and attic and floor insulation; (2) Project 2000 (providing summer employment for approximately 30 youths by teaching them weatherization skills) which has weatherized over 1500 homes; and (3) the Basin County Volunteer Weatherization program, which provides help to low-income elderly (through the assistance of volunteers from community services and religious organizations) with the cost of materials being paid by the business community, TVA, and NES.

INCENTIVE TERMS Free information, audits, materials, and installation.

ELIGIBILITY Elderly and low-income.

CONSERVATION MEASURES Low cost (such as caulking and weatherstripping) and high cost (such as storm windows and attic insulation) but do not include high efficiency appliances or heating equipment.

PROGRAM HISTORY The program began in January 1980 with approximately 1000 participants. It was the first peer-counseling weatherization program in the United States. NES has assisted with over 3000 audits through 1984. At the end of 1985 they had contacted 19,000 households and conducted 3716 energy surveys.

Nashville Electric Service has nine elderly counselors and one supervisor who work five hours a day on the project. The budget for the program is $100,000 per year.

MARKETING Direct mail, neighborhood symposiums, and neighborhood workshops. NES discovered that the elderly low-income group had low participation in weatherization projects, so they concentrated on a "one-on-one" strategy, in which an elderly program representative discusses options with the elderly customer.

PROGRAM DESIGN Information, audits and installation are offered.

SPECIAL FEATURES Innovative peer counseling approach.

UTILITY MOTIVATION NES decided to offer these programs due to the escalation of energy costs in 1979 and 1980. They began a demonstration project with TVA which worked well, and so was continued.

Housewarming Program

UTILITY Puget Sound Power

CONTACT Reidun Crowley, Administrator Customer Programs
Puget Sound Power OBC-08N
P.O. Box 97034
Bellevue, Washington 98009-9734
(206) 462-3839

PROGRAM TYPE Provides full funding for cost-effective weatherization of the electrically heated homes of the low income elderly.

INCENTIVE TERMS Utilizing the cash grant option, Puget provides 100% financing for cost-effective weatherization work.

ELIGIBILITY To qualify, owners and tenants of single family, multifamily, and mobile homes must be 65 or older, utilize electric space heat, and have an income of no more than 125% of the federal poverty level. In multifamily dwellings, two-thirds of the occupants must meet the guidelines in order to be eligible for the program.

CONSERVATION MEASURES Recommended measures may include ceiling insulation (R38), wall insulation (R11), floor insulation (R19), double or triple glazing or storm windows, duct insulation (R11). Water heater insulation kits and infiltration measures are also available if needed.

PROGRAM HISTORY Both the Housewarming and SWAT (senior weatherization assistance team) programs were created in 1984. While Housewarmng provides full funding for homes where major insulation measures can be installed, SWAT assists those customers who have homes where less extensive weatherization work can be done. The unique feature of the SWAT program is that Puget Power retirees are hired on a contract basis to install infiltration measures and make minor household repairs.

MARKETING An extensive outreach program has been implemented to reach senior customers. This consists of mass media, bill inserts, flyers at Food Banks, advertisements in senior publications, and seminars held by the senior assistance agencies and Community Action Agencies. Newspaper advertising, senior publications and word-of-mouth through senior focus groups have been the most effective promotional tools.

PROGRAM DESIGN After the customer's request is received and eligibility is determined, a free home energy checkup is performed on a priority basis. If major weatherization measures are feasible and cost-effective, with the customer's approval, installation proceeds. The company provides 100% financing for cost-effective work.

Where less extensive measures are appropriate, SWAT members are called upon to install infiltration measures, make minor household repairs, and install water heater blankets.

UTILITY MOTIVATION The needs of the low income customer, especially the elderly, have been a primary concern of the Company in the last few years. In addition to providing a much needed service to the low income elderly, Puget also benefits by saving energy through conservation in homes where weatherization might not have been possible except through full funding.

Central Arizona Seniors Weatherization Program
Southern Arizona Seniors Weatherization Program
Southern Nevada Seniors Weatherization Program

UTILITY Southwest Gas Co. (SWG)

CONTACT Al O'Neal (send correspondence to Marilyn Bolinger)
Marilyn Bolinger, Manager of Consumer Affairs
Southwest Gas Co.
P.O. Box 15015
Las Vegas, Nevada 89114
(702)876-7286

PROGRAM TYPE Elderly, strong emphasis on awareness.

INCENTIVE TERMS Free materials (paid for by the utility) worth up to $25.

ELIGIBILITY Customers of SWG, in owner-occupied homes, must be at least 55 years of age, and must meet certain income levels.

CONSERVATION MEASURES Low cost measures, such as caulking and weatherstripping, door sweeps, water heater blankets.

PROGRAM HISTORY The program has been in operation for over three years. There have been over 5,000 participants for all three area programs. There is one full-time staff person from each of the three Consumer Affairs departments and other employees who work part time. The annual budget is approximately $200,000 for all three programs.

A written evaluation for the company is done for each participating home. The program is cost effective.

MARKETING Bill inserts, word of mouth, door-to-door solicitation, and an extensive outreach program that includes presentations at senior centers, retirement clubs, social service agencies and nutrition sites.

PROGRAM DESIGN There is a strong emphasis on educating customers. Volunteer teams of two retirees from the community visit homes, taking time to discuss conservation measures with the residents, educating them about poor energy habits and showing them how improvements can be made. The volunteers also provide an audit, free installation of low-cost measures and a homeowner's do-it-yourself booklet. A referral service for seniors in need of either social service agencies and/or home repair programs is provided, too. In approximately 20% of the homes visited, a referral for some additional service is made.

SPECIAL FEATURES Seniors helping seniors; integration with other community groups and service agencies.

RENTAL AND MULTIFAMILY

Low-Income Multifamily Residential Weatherization

ENTITY Citizens Conservation Corporation (CCC)

CONTACT Robert Sydney
Citizens Conservation Corp.
530 Atlantic Avenue
Boston, MA 02210
(617) 4231-7900

PROGRAM TYPE Multifamily; low-income.

INCENTIVE TERMS Low-interest loan (5 to 9%); "one stop weatherization service."

ELIGIBILITY 50% of the dwelling units under some rent subsidy.

CONSERVATION MEASURES Total energy improvement including air infiltration measures, heating, ventilation, air conditioning, and water heating systems.

PROGRAM HISTORY Citizens Conservation Corporation (CCC) was established as a private, not-for-profit energy service company in 1981. CCC provides a multifaceted conservation program for low-income apartment owners and residents. CCC conducts building-specific audits, coordinates tenant education and participation, arranges low-cost financing, supervises construction, and monitors energy use.

Through 1984, CCC improved nearly 2500 units at an average cost of $1050 per unit. In 1985, CCC improved almost 1500 units at an average cost of $1500 per unit.

MARKETING CCC relies on word-of-mouth as the primary marketing and sales tool. Utility cooperation is very important in identifying building owners.

PROGRAM DESIGN CCC focuses on poverty communities. Bay State Gas Company, the Massachusetts Housing Finance Agency, and Northeast Utilities Company assist CCC in the identification of property owners. CCC negotiates an audit and loan with the owner. CCC drafts construction specifications, solicits bids, and supervises work.

The program is designed so that total annual loan costs during the five to seven year payback of the loan are equal to or less than the annual fuel savings. When energy savings exceed the amount required to repay the loan, CCC distributes the excess in the form of "rebates" to tenants and landlords. The largest amount given to a single tenant approaches $200 for six months of savings. There are no tenant expenses. Property owners are guaranteed constant fuel costs for the duration of the loan and an improved property.

SPECIAL FEATURES One stop/full service approach.

CCC MOTIVATION Social need existed.

SUMMER SAVERS

UTILITY City of Palo Alto Utilities

CONTACT Cara Lee (Sam) Mahany-Braithwait
Conservation Program Coordinator
P.O. Box 10250
Palo Alto, CA 94303
(415) 329-2268

PROGRAM TYPE Audit and low- and no-cost weatherization; multifamily housing.

INCENTIVE TERMS Free audit; no-cost weatherization/low interest loans; 40% state income tax credit for owners.

ELIGIBILITY Renter, multifamily unit; owner, multifamily residential property.

CONSERVATION MEASURES Low- and no-cost: e.g., low-flow showerheads, caulking, weatherstripping, faucet aerators.

PROGRAM HISTORY Since 1981, Palo Alto has operated a multifamily conservation program which focuses almost exclusively on water-related items. Shortages in public water supplies in addition to contamination of private well water sources necessitate this focus. Furthermore, Palo Alto can demonstrate a greater savings related to water-packaged items than to typical space conditioning programs, because of the short payback period (8 - 9 months) of water-related items. High tenant turnover and the predominance of individual heating systems for dwelling units in multifamily structures also preclude typical space-conditioning programs.

There are 798 multifamily buildings (5 units or more) in Palo Alto's service area. To date, 9% of the buildings (41% of the 6638 dwelling units) have been audited. Conservation measures have been installed in 698 of the 2730 audited dwelling units (26% penetration), at a present average cost of $45 per unit.

Program costs are currently budgeted at $10,000 annually for marketing, audits, and installation of measures. The work force consists of 18 students who are trained and supervised by Palo Alto staff. With a drought situation approaching, Palo Alto will become more aggressive and concentrate its efforts on high water users in the multifamily program.

MARKETING Palo Alto has applied several marketing strategies in varying intensities. The original outreach strategy of 1981 included a multi-target approach. Aspects of the program were designed to appeal to tenants, property managers, maintenance personnel, and owners. Recently, Palo Alto has relied on direct contact with property owners. Hidden ownership, on-site manager's defense of owner interests, and the absence of significant owner incentives have contributed to Palo Alto's change in marketing strategy.

PROGRAM DESIGN Palo Alto staff contact apartment property managers directly, offering free energy audits. The audits concentrate on the low-cost and no cost measures. Tax credits and energy savings are discussed and the installation service is proposed.

SPECIAL FEATURES Palo Alto employs high school students during the summer. These students install all conservation measures in the multi-family program. Since Palo Alto will be modifying this "Summer SAVERs" program to include measures which require the use of power equipment for installation, college students will replace the high school students.

UTILITY MOTIVATION 45% renter population; necessity to conserve water.

Rental Energy Bank

UTILITY Minnegasco, Inc. and Minneapolis Energy Office

CONTACT Sheldon Strom, Director
Minneapolis Energy Office
Room 330, City Hall
Minneapolis, MN 55415
(612) 348-483

PROGRAM TYPE Rental units.

INCENTIVE TERMS Financing consists of a 20% reduction of the loan principal assumed by the landlord.

ELIGIBILITY Any rental building.

CONSERVATION MEASURES Any measure with a payback of ten years or less may qualify.

PROGRAM HISTORY This program, which began in October, 1985, provides financial incentives to rental property owners for participation in the Operation Insulation Program. Although Minnesota has an energy-efficiency code for rental housing, many landlords are not in compliance. Capital to provide financing is obtained by combining funds from taxable city bonds and from federal Solar Bank money. Approximately 15 building owners per week have participated since the program began. One meeting attracted over 250 building owners.

MARKETING Direct mailings to rental property owners.

PROGRAM DESIGN The first step in this program is to send mailings to all building owners in a given area of the city. The letter explains code compliance requirements and that funding to help owners meet code requirements will be available for a limited time. Meeting times are arranged for interested owners. At the meeting further details of the program are explained and those who wish to participate can sign up. Minnegasco services the loans and includes loan payments in the participants' bills.

SPECIAL FEATURES Coordination of utility and city efforts. Use of city and federal funds.

UTILITY MOTIVATION Public Utilities Commission mandate. Also a concern with reducing uncollectable bills among low-income renters. Seventy percent of households receiving federal fuel assistance in Minneapolis are renters.

Energy Management Services for Multifamily Rental Property

UTILITY Northern States Power and the Energy Resource Center, St Paul

CONTACT Joyce Kerwin
Energy Resource Center
427 St. Clair
St. Paul, Minnesota 55102
(612) 227-7847

PROGRAM TYPE Multifamily rental properties.

INCENTIVE TERMS The program is based on a shared savings concept. Once gross savings have been determined, weatherization costs are deducted. The balance from the gross savings is then shared equally between the property owner and the Energy Resource Center. Program costs to be recovered amount to an annual expenditure for administration of $40,000 and average job costs of $10,000 per property. All customers receive a 20% Solar Bank principal reduction grant on energy retrofit cost.

ELIGIBILITY Rental properties with five or more dwelling units, established creditworthiness, and potential for the cost-effective installation of measures.

CONSERVATION MEASURES Improvements are directed toward saving Btu's of natural gas. Electricity savings are not a concern. The focus is on reducing gas use for space heating and water heating. Infiltration measures and insulation are included.

PROGRAM HISTORY In 1980, Minnesota passed a law directing the state Public Utilities Commission to order utility company energy conservation pilot projects. In response to the legislation, the state's major utility company, Northern States Power Company (NSP), and the City of St. Paul formed a private, non-profit corporation, the Energy Resource Center (ERC), in September, 1981, to develop energy conservation projects.

The original mission of the ERC was to provide a "one-step conservation service" for single-family residences. In March 1983, after two and one half years experience in the single family conservation financing business, the pilot phase for the Energy Management Service for rental properties began. The St. Paul area has 13,000 rental properties; 1200 of these have five or more units. To date, the Energy Management Services program has completed work on 30 properties (approximately 500 dwelling units).

MARKETING Potential customers can learn about the program in several ways: word-of-mouth, printed literature, local contractors, and seminars sponsored by local multifamily housing associations and apartment management companies.

PROGRAM DESIGN The program provides a walk-through audit, scheduling and supervising of all work to be done, shared savings financing (which incorporates a guarantee on the savings predicted by the audit), and a final inspection.

The audits have been quite accurate in predicting fuel savings. In 18 buildings of 5 or more dwelling units, predicted savings exceeded actual savings by only 4.2% (29.6% to 28.4% of pre-retrofit energy use).

SPECIAL FEATURES A wide range of funding sources is used including public grants, loans from foundations, utility funds, and city capital and capital reserves. By obtaining a variety of funding the stake in success is widened and the risk is shared.

The ERC has determined that the shared savings concept is a profitable mechanism only in large buildings with more than $6000 annual heating bills.

Multifamily Residential Conservation Program

UTILITY Seattle City Light

CONTACT Ed Holt
Seattle City Light
1015 Third Avenue, Room 804
Seattle, WA 98104
(206) 625-3703

PROGRAM TYPE Audit and weatherization; multifamily housing (with provisions for low income).

INCENTIVE TERMS Zero-interest, 5-year deferred payment, 10-year term loan; 50% discount for payment of loan in first year; 100% grant if at least 2/3 of tenants are "low income."

ELIGIBILITY Electric space-heat, multifamily residences in SCL service territory.

CONSERVATION MEASURES Low- and high-cost measures are available; due to the predominance of baseboard heating systems, installations involve mainly shell measures. Lighting measures and low-flow showerheads are also included.

PROGRAM HISTORY In response to customer demand, Seattle City Light has developed a multifamily program for properties with five or more dwelling units. Publicity from the forerunner, single-family program has generated a waiting list of 100 owners, representing approximately 300 buildings, for the new multifamily program.

Seattle City Light has just completed weatherization of 15 buildings in a 1985 demonstration project (evaluation of the demonstration project is currently in progress). With 3700 multifamily properties in its service area, Seattle City Light has established a 20-year horizon for the program with immediate goals of 48 and 70 building weatherizations for 1986 and 1987. Seattle City Light has projected approximately $1,000,000 for first-year program costs.

Eligibility is limited to electric space-heat buildings. The multifamily program has both low-income and nonlow-income provisions. If at least 2/3 of the units are occupied by low-income tenants, then the entire property is eligible for a 100% grant to finance installations.

Otherwise, the owner may choose between a zero-interest, 10-year loan with no payments required for the first five years, or make a cash payment with 50% discount. Loans paid off in the first year are also discounted 50%.

Maximum expenditures for each property and dwelling unit have not yet been established pending bid receipts from contractors. During the first year of the multifamily program, three utility staff will be directly assigned to the program. As the single-family program winds down (i.e., as the market becomes saturated), additional utility staff will be assigned to the multifamily program.

MARKETING Except for print advertising, the waiting list for participation makes advertising unnecessary.

PROGRAM DESIGN Seattle City Light provides an audit and conservation information on demand. Income verification is done by outreach staff on site. Property owners may choose loan terms.

SPECIAL FEATURES Long-term strategy and commitment to conservation as a resource; general market and low-income provisions.

UTILITY MOTIVATION Conservation is an integral part of Seattle City Light's long-range planning first established in 1976.

ORNL/CON-206

INTERNAL DISTRIBUTION

1. L. G. Berry
2. R. B. Braid
3. M. A. Brown
4. R. S. Carlsmith
5. J. E. Christian
6. W. Fulkerson
7 R. T. Goeltz
8. D. Hamblin
9. E. Hirst
10. R. B. Honea
11. L. Jung
12. M. A. Karnitz
13. M. P. Kertesz
14. M. Kuliasha
15. J. M. MacDonald
16. L. McCold
17. R. W. Mixon
18. D. C. Parzyck
19. J. H. Reed
20. M. Schweitzer
21. R. B. Shelton
22. T. K. Stovall
23. B. E. Tonn
24. T. A. Vineyard
25. T. J. Wilbanks
26. Central Research Library
27. Document Reference Section
28. Laboratory Records (RC)
29-31. Laboratory Records Dept.
32. ORNL Patent Section

EXTERNAL DISTRIBUTION

33. Institute for Energy Analysis, ORAU-Library
34. Office of Assistant Manager for Energy Research and Development, DOE-ORO.
35-61. Technical Information Center, DOE, P. O. Box 62, Oak Ridge, Tennessee 37831.
62-600. External Decision Systems Research Section Distribution Mailing List and Extra Copies to M. S. Hubbard, 4500N, H-32.

☆U.S. GOVERNMENT PRINTING OFFICE 1986—631-056/40042