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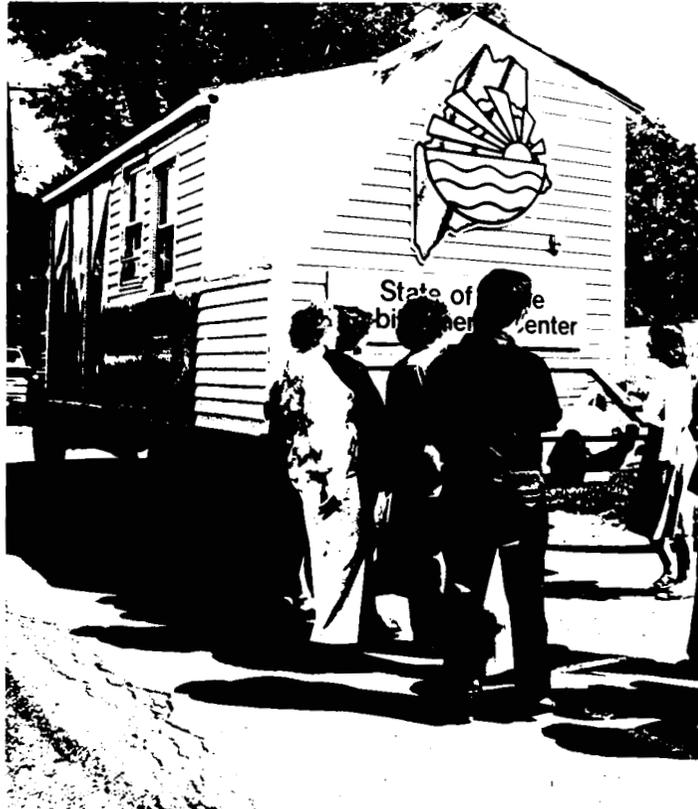
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# Reaching People With Energy Conservation Information:



## Four Statewide Residential Case Studies

Elizabeth Peelle  
Robert B. Braid  
Donald W. Jones  
John H. Reed

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**ORNL-5984**

**REACHING PEOPLE WITH ENERGY CONSERVATION INFORMATION:  
FOUR STATEWIDE RESIDENTIAL CASE STUDIES**

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## LIST OF RELATED REPORTS

S. A. Carnes, M. Schweitzer, B. H. Bronfman, *Community-Based Assessment and Planning of Energy Futures: Final Report of the Decentralized Solar Energy Technology Assessment Program*, ORNL-58, 1982.

N. E. Collins, L. N. McCold, and P. Zuschneid, *Thermal Efficiency Standards and Codes, Volume 1: State-of-the-Art Literature Review and Analysis of Secondary Data*, ORNL/CON-101/V1, 1982.

L. N. McCold and N. E. Collins, *Thermal Efficiency Standards and Codes, Volume 2: Relationship of ASHRAE Equivalent Standards and External Factors to Energy Efficient Building Practices in New Homes*, ORNL/CON-101, V2, 1982.

M. Schweitzer and S. A. Carnes, *Local Government Programs to Save Energy: Case Studies of Four Selected Communities*, ORNL-5982, 1983.

Price Waterhouse and Co., *State Energy Conservation Program Evaluation Guidance and Reporting Requirements*, for the U.S. Department of Energy, Washington, D.C., 1981.

Price Waterhouse and Co., *Study of State Energy Conservation Programs: 1981 Energy Savings Indicators*, for the U.S. Department of Energy, Washington, D.C. 1982.

E. J. Soderstrom, et. al., *Evaluation of Conservation Programs: A Primer*, ORNL/CON-76, 1981.

U.S. Department of Energy, *State Energy Conservation Plan Handbook*, Vol. 2, Washington, D.C., 1978.

## ABSTRACT

Four state residential energy conservation programs are reviewed in terms of their origins, evolutions, purposes and goals, administration, organization, and outcomes. The four programs chosen were selected from among 30 nominated by state energy offices and regional Department of Energy personnel as being illustrative in terms of organization and/or outcomes. While intended primarily for state-level program managers and staff, the profiles of programs, conclusions, and recommendations should be useful to anyone interested in developing viable, action-oriented conservation programs.

The four case studies included Oregon's Master Conserver program, Oklahoma's energy education project for low-income and elderly families, Virginia's workshops for heating dealers service and contractors, and Maine's three energy education projects—the Energy Bus, Energy Conservation Month, and the Home Energy Check-up. All four programs utilized Energy Extension Service (EES) funds from the federal government, and three were directly managed through the state EES organization.

The findings of the study indicate that these programs (1) had flexibility to experiment, iterate, and reorganize as a result of their initial experiences, (2) made extensive use of networking to involve local groups in program delivery, (3) employed a large variety of delivery methods, and (4) made substantial efforts to tailor literature and handouts to the target audiences. All but one program had unresolved problems with evaluating their efforts, including difficulties with interpreting qualitative results, conducting evaluations with limited resources, and knowing how to build evaluation into program design. Federal financial support has been a vital factor in initiating and supporting these programs. The case studies further revealed that all four programs had competent, committed personnel, stability that permits cumulating experience through a lengthy evolutionary period, strong leadership, a receptive local climate, political support at the state level, and a strong, credible organizational framework.



## **ACKNOWLEDGMENTS**

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# 1. INTRODUCTION

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The four state residential energy conservation programs described in this report were chosen from nominations by state energy officials and Department of Energy (DOE) support office managers. The programs were deemed to be illustrative of DOE-sponsored efforts in which explicit programmatic actions have been demonstrated and, as a result, should be able to provide other program managers with useful information for their own activities. Following an introduction and overview of the report with brief summaries of the case studies, the major findings are summarized. Four detailed case studies are presented: Oregon's Master Conserver program, Oklahoma's energy education project for low-income and elderly persons, Virginia's workshop for heating dealers and contractors, and Maine's three energy education projects: the Energy Bus, Energy Conservation Month, and the Home Energy Check-up. All of these programs were initiated with and are still partially funded through federal conservation funds, mostly through the Energy Extension Service (EES) and some through the State Energy Conservation Program (SECP). The remainder of this section discusses the purpose and scope of the study, the selection process for choosing these four case studies, their relationship to prior EES case studies, and brief summaries of all four cases.

## PURPOSE

The purpose of the case studies is to disseminate information useful to other state-level energy program managers and staff. With an average of three years' experience among these programs in delivering energy conservation information to the residential target audience, there is much information to be shared about what has worked and what has not. Sharing experiences about lessons learned may shorten the trial-and-error path through which most programs have gone and avoid much future reinventing of the wheel. Hopefully the experiences of these four states will assist other states in making program decisions and suggest ideas for application in other contexts.

While the case studies look closely at results and lessons learned, they are not formal evaluations. We were not charged with determining program success or with collecting in-depth data required for an evaluation. Rather, as part of this information-gathering effort, information was collected about the

nature and role of program evaluation *within* the program itself. The primary focus of this study therefore was on information relevant to organization, administration, and outcomes which might be useful to other program directors and staff in making their own program decisions.

## SCOPE OF THE REPORT

Each of the four studies reviews the origins, evolution, purposes and goals, administration, organization, and outcomes of the particular program. Notable features of each program, its results, and lessons learned are highlighted.

The programs studied range from a focused set of one-time workshops for a limited audience (Virginia) to a broad, continuing program of multipronged efforts aimed at the general public (Maine). The cases vary from one with elaborate data collection designed to permit in-house testing and validation of program objectives (Oklahoma) to others with minimal reporting arrangements and no formal internal evaluation.

## SELECTION OF CASE STUDIES

Choosing the case studies involved a three-step procedure: (1) nominations by state and regional DOE officials, (2) review and evaluation of state program information by ORNL staff, and (3) selection of the four cases by DOE after reviewing the nomination information compiled by ORNL.

The selection criteria used by ORNL included both limiting and ranking criteria. It was decided that candidate programs should (1) have been in operation since October 1981 (18 months), (2) *not* have been the subject of a previously published case study, (3) *not* have been an RCS (Residential Conservation Service) or Class A audit program, (4) have received federal assistance, either EES or SECP, through the state energy office, (5) have carried out significant programmatic actions, and (6) have a demographically well-defined target audience. These criteria were designed to reduce the large number of possible candidates and provide focus for the study.

This list of criteria was circulated in November 1982 by DOE via its support offices to the state energy offices with a request for nomination of suitable candidates from their states. From these nominations and additional follow-up by ORNL staff, a list of 35 projects was developed from the 25 states responding. Additional ranking criteria applied to the 35 projects included whether the program displayed (1) significant integration of efforts and techniques and (2) significant leverage in goals, organization, or results.

ORNL staff presented a list of 15 prospective projects selected by applying these criteria, and final selection of the four cases chosen was made at a January 1983 meeting at DOE's headquarters.

This tailored and interactive selection process worked well, in our opinion, to select four very different programs that are well developed, are noteworthy, and have interesting results.

## **RELATIONSHIP TO PRIOR EES CASE STUDIES**

Though the informed reader may notice similarities to the findings of early Energy Extension Service reports and evaluations (see, for example, *The Evaluation of the Energy Extension Service Pilot Program: The First Year*, August 1979), the current study was not planned either as a follow-up or as an extension of these earlier studies. The 1979 document was a formal program evaluation whereas this report transmits information to appropriate officials about programs they may wish to duplicate in some fashion. When viewed in the context of the earlier EES work these four case studies are a useful supplement to the growing body of information and findings which exist after as much as six years of energy conservation service delivery experience.

EES funds channeled to the states are intended to support the development and testing of new approaches in the delivery of energy conservation information. Some findings of the pilot studies have been further supported by the findings of this set of case studies. Others of the findings have not been supported, including those suggesting that residential conservation efforts are not cost-effective. These studies which follow develop more information about the value of certain qualitative results and some firm evidence bearing upon the cost effectiveness argument. Further discussion of this point is in the findings of this study.

## **BRIEF SUMMARIES OF FOUR CASE STUDIES**

### **Oklahoma's Energy Education Program for Limited-Resource Families**

This program consists of a series of residential energy conservation education pilot projects designed to instruct limited-resource (low-income, elderly,

isolated, and/or handicapped) families in methods of increasing their physical comfort and controlling fuel bills. The Conservation Division of the Oklahoma Corporation Commission funds these projects through Oklahoma State University's Cooperative Extension Service, using SECP initially and EES money at present.

The program is delivered to limited-resource families via individual visits from paid aides and trained volunteers. Aides or volunteers offer information and instruction in simple behavioral and structural modifications which could be adopted to improve comfort and reduce or control energy bills. Follow-up visits are made to reinforce the information, evaluate adoption efforts by clients, and collect information on behavioral and structural changes in order to evaluate project effectiveness. Evaluations were built into each project, permitting both in-project and future project modifications of techniques and practices.

Begun in 1977 in Tulsa, this program moved to rural settings in Choctaw and Pushmataha Counties in 1980-1983 and has recently been expanded to five projects in other counties.

### **Oregon's Master Conserver Program**

Modeled after Oregon's Master Gardener program, the Master Conserver program was originally designed to extend limited program resources through involvement of trained volunteers who would offer equivalent public service time in exchange for their training by sharing this information with other Oregonians.

Two pilot programs were begun in the Portland and Eugene areas in 1980, and expansion to all areas of the state became a program objective in 1982. Under decentralized management and in the absence of program implementation plans, agent autonomy resulted in highly divergent outcomes. (1) By focusing upon utilization of volunteers to extend program resources, one agent devised and delivered a multilevel 16-month program of weatherization information and services via the Master Conservers. (2) In an alternate approach focused upon training of Master Conservers, the two Portland agents spent two years developing a highly regarded series of alternative energy training courses, now opened to the general public and serving broader program integration needs. Programs to utilize the trained volunteers were delayed until 1983.

In this extended development period, the Master Conserver program has undergone major modifications and shifts in emphasis. Extension of the MC training model to agents in more isolated sections of the state is now in progress. These agents now teach some MC classes while continuing to concentrate upon other aspects of their multiple responsibilities wherein a primary tool is the proven cooperative extension individual contact mode.

### **Three Maine Residential Energy Conservation Programs: The Energy Bus, Energy Conservation Month, and the Home Energy Check-up**

Operated by the Maine Energy Office in cooperation with Cooperative Extension agents and funded by federal EES monies, the three programs have evolved through several iterations to their present state.

Energy Conservation Month is a multimedia, multiorganizational promotional event designed to deliver energy conservation information and service to homeowners. Staged annually during the month of October, it achieves great response during the prewinter season, when residents are most receptive.

The Energy Bus is a mobile demonstration for energy conservation displays and informative brochures. The driver arranges for scheduled stops at schools, fairs, and shopping malls and facilitates publicity.

Maine residents can receive a computer analysis of home energy use by filling out a form describing their home and returning it to the State Energy Office. Several changes in access to and processing of information have increased requests for but decreased utilization of the Home Energy Check-up, a Class B audit program (formerly the REAP program). The three programs are integrated to facilitate maximum exposure to and adoption of energy conservation.

### **Virginia's Heating Contractor Workshops**

Four one-day workshops for 118 heating service personnel were conducted by the state Office of Emergency and Energy Services (OEEES) in late 1982. The \$13,000 effort was funded by DOE's Energy Extension Service.

The purpose was to provide objective information about the latest proven techniques and equipment for achieving residential energy conservation to an industry not known for its interest in innovative developments. The businesses and utilities were competitors who provided fuel, maintenance, or installation services to residents. The program evolved from an earlier set of workshops designed for heating dealers only.

The program emphasis at the workshops was upon increased efficiency through use of heat pumps and ancillary technologies, retrofits, furnaces, and hardware. Two instructors with the requisite technical expertise were selected by requests for proposals to develop detailed tailored literature and to conduct workshops.

Participants responded positively to a brief evaluation questionnaire at the end of the workshop but frequently had difficulty identifying any particular information learned in the workshop and used in their business as a result when queried after six months. The workshops apparently reinforced information and encouraged adoption of new technologies in an industry undergoing rapid reorganization.

Because of the program's limited scope, prior experience, short duration, and experienced personnel, the program encountered few organizational, networking, or administrative problems.



## 2. FINDINGS

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The four residential energy conservation case studies reveal some unique features, many commonalities, and some unexpected effects. They have in common certain unresolved problems and many structural, organizational, and evolutionary similarities. These programs demonstrate many accomplishments, though the qualitative nature of some results may prevent adequate recognition and/or appropriate evaluation. The efforts described in detail in the case studies illustrate how four active and viable programs went about establishing legitimacy and credibility in dealing with the general public or more specific target groups. The unexpected effects include certain responses by target audiences and volunteers as well as some unanticipated audiences. It should be reiterated that these case studies were not formal evaluations and were not intended to be a representative sample of SECP programs. Rather they are reports detailing how each program has run, what its results were, and the lessons learned from each effort. As a result of the absence of firm evidence in many cases, some findings are essentially speculative in nature and are indicated by qualifying terms.

### SUMMARY

#### Unique Features

Certain features or characteristics of some programs proved to be unique or generated unique results. The differences among programs included:

- Two were self-contained and aimed at particular target groups (Oklahoma and Virginia).
- Two were part of a broader statewide effort aimed at the general public (Oregon and Maine). Both made special efforts to integrate delivery of all their energy conservation programs.
- Relationships with the media for transfer of program information and publicity about specific program events were most highly developed in Maine. Maine's annual Energy Conservation Month, for instance, depends in large measure upon extensive media publicity.
- Three are continuing, year-to-year efforts, while one (Virginia) was essentially a one-time occurrence.
- Alternative technologies were the focus of program efforts in Oregon and Maine.
- Only one program had comprehensive evaluation built into its efforts in an organic way (Oklahoma). In-house staff expertise for program delivery was strongly preferred by three of four programs. Virginia successfully used consultants obtained through an RFP bidding process for its workshop leaders.
- Only one program (Virginia) dealt with a target group which contained business competitors.
- Technology adoption was a major goal in two programs. In Virginia the flame retention burner was emphasized, while in Oregon, solar water heating was a principal focus.
- Agent autonomy and freedom to determine program implementation can be major factors in high levels of staff commitment, qualification, and resourcefulness (Oregon).
- The Virginia workshops' positive reception may be due to their likely function: the workshops elaborated and reinforced information about new technologies, enabling faster adoption at a time when the heating services industry is undergoing major reorganization.

Specific conclusions unique to one or two programs included these findings:

- Individual contact is more expensive but produces larger benefits than do group methods for low-income and elderly target groups (Oklahoma).
- Reduction of volunteer training and work requirements occurred in both programs utilizing volunteers (Oregon and Oklahoma). These changes resulted from better understanding of volunteer needs and involved adapting program demands to fit this experience.
- Maine's Energy Conservation Month is an *intensification* of regular year-round activities into a special annual event. This effort focuses public attention via a media spotlight upon conservation at a time of maximum receptiveness in the general public. Significant resource leverage also occurs through substantial contributions of media time and resources.
- Built-in evaluation is useful to project managers for internal planning purposes. It reduces the cost of learning lessons about the effectiveness of various program delivery methods (Oklahoma).
- Improving comfort appears to be more influential as a goal for encouraging actions among limited-resource clients than are potential fuel bill savings (Oklahoma).

## Commonalities

All four programs showed many similarities and tended to share significant common goals, methods, and emphasis. Some of the more obvious commonalities include:

- Putting large efforts into tailoring literature and information handouts to specific publics and geographic areas. Outside brochures have been rewritten or used as supplementary material. Examples are Oklahoma's easy-to-read large-type weatherization pamphlets for elderly clients and Virginia's specially designed "Tricks of the Trade" booklets for heating contractors.
- The principal target group in all cases was the public, explicitly or implicitly, though a subset of the public may have been the focus. Virginia was the only case in which another *instrumental* target group was chosen (heating oil dealers, contractors, and installers). In this case the general public, served by the explicit target group, was still the implicit target.
- Flexibility to experiment, test, discard, iterate, and reorganize the program in the light of experience.
- Use of a large variety of methods. Classes were a principal focus in Oregon, workshops in Virginia; displays were featured on the Maine Energy bus; Maine's Energy Conservation Month was a special event, whereas its Home Energy Check-up was a Class B audit. Personal consultation was used in Oregon and Oklahoma.
- Extensive use of networking to involve local groups in program delivery. Virginia, for instance, was able to sponsor its heating dealer workshop despite the withdrawal of assistance by a relevant trade association because of development of Virginia's own contact network. Locally based agents were a key to the networking effort in Oregon, Maine, and Oklahoma.
- Emphasis on technical detail and technical expertise. It was considered extremely important for program credibility in Virginia, and very important to agents in Oregon and Maine and aides in Oklahoma.
- Soliciting questionnaire feedback from some or all participants in specific programs or events.
- Use of innovation diffusion principles and techniques in the design and delivery of programs. The use of local agents, tailored literature, community networking, local sponsors, and individual contacts tailored to specific groups are representative examples.

## UNRESOLVED PROBLEMS

Also held in common were a series of unresolved problems centering around evaluation, the use and training of volunteers, pressures to produce quantifiable results, and the continuing resource shortage.

With the notable exception of Oklahoma, all programs lacked formal comprehensive evaluation measures. Oregon's EES utilized some *ex post* evaluation of program components such as one type of class and one pamphlet but had no evaluation of the overall Master Conserver program. While all programs used questionnaires to solicit feedback from participants, none except Oklahoma used these data in a fully systematic way to evaluate results or to determine program delivery directions. In most cases, the data collected were inadequate to permit evaluation (e.g., see detailed discussion of this situation in Virginia case study). The development of meaningful targets and specific actions expected was often missing or problematic. In all instances, only limited time and resources were available to conduct any evaluation activities, as staff struggled to devise and deliver programs under conditions of resource shortage. With very low cost programs as in Virginia, costs of evaluation could easily exceed the entire original program cost. In addition, some programs presented difficult evaluation problems because of their inherent natures. For example, the users of the Maine Energy Bus are all anonymous persons whose eventual use of the information gained through their perusal of the bus displays and exhibits would be very difficult to estimate, let alone track and convert to actual energy savings. Judgments on the effectiveness of this method of delivery have relied upon counting the (large) number of visits to the bus and upon the amount of literature distributed.

Considerable internal and informal evaluation occurred in all programs, regardless of whether or not they employed formal evaluation. The significant and continuing evolution and change in these projects occur as a direct result of informal evaluation and review among program staff.

How to evaluate qualitative results remains a serious problem for all programs. All were conscious of the large amount of time and effort spent in producing important qualitative results such as creating and maintaining networks, developing staff expertise, or cultivating a receptive local climate. But as with all such qualitative measures, none has devised a methodology for properly inserting such results into a quantitative program evaluation.

The need for quantitative program results creates significant pressure to adopt mass-contact methods and neglect important qualitative results, as above. To an ever greater extent, quantitative results are required by sponsors and state-level managers. In Oregon, this pressure was in part responsible for the major shift in direction which occurred when Master Conserver training classes were opened without restriction to the general public. To paraphrase the agents involved, "Why should we go to all that work for a group of 15 or 20 when we could have 50 to 400 attendees per session?" Other people who had no desire to become trained volunteers wanted to attend. Since a principal measure of the success of any of these programs for many policy makers is the total class attendance, this move greatly increased these numbers in Oregon by an order of magnitude, from a few hundred to several thousand. This move also altered the nature of the pro-

gram significantly since Master Conservers no longer studied together in small classes or even knew one another in the large classes. This move, plus the need to integrate multiple energy conservation projects, has resulted in the submerging of the MC program in broader program delivery efforts, at least temporarily. Mass contact and instruction methods have come to be favored in much of Oregon and Maine as a result of these pressures for quantitative results. The difficulty of estimating energy savings attributable to qualitative process changes is a continuing problem for each of these programs.

The training and use of volunteers remains problematic in the three programs where their use has been tried or considered (all except Virginia). Confusion over the needs for and use of volunteers has existed in Oregon, where the original objective of volunteers as extensions of paid staff was implemented in one county for 16 months and in another area only recently. Better use of volunteers could have been achieved through volunteer recognition and support activities, had this been a clear objective for the program. The principal lesson learned here is that major investments of staff time and resources are required for proper recruiting, training, and management of volunteers. In Maine, agents were reluctant to use volunteers in view of their own time shortages. Oklahoma confronted these problems when budget constraints necessitated the substitution of volunteers for paid aides to deliver programs to elderly and low-income citizens. Careful definition of volunteer tasks and recognition was required to minimize problems of volunteer burnout, dropout, and lesser incentive for completing long and difficult tasks.

Finally, all programs confront the problem of perennial resource shortages. Agents and staff regularly report "being spread too thin" for the tasks for which they are responsible. Five to seven field staff were given responsibility for the entire state in Maine and Oregon. Since program delivery typically depends upon the quality of *local* networking, staff are typically overworked with the multiple responsibilities for finding sponsors, arranging meeting places, and publicity as well as delivering programs. The decline in federal conservation funding requires staff efforts to develop new sources of support at both state and federal levels and to facilitate this shift. In Oklahoma, state political considerations have required the extension of the program to additional counties but with little or no increase in resources and a shorter time frame (two months per county) in which to accomplish all service delivery objectives. Doing more with less has its limits, but all these programs are trying.

## UNANTICIPATED EFFECTS

Unexpected results or effects from the four programs included volunteer staff focusing on use of information for personal development, rather than program goals, unanticipated responses from certain audience segments, and

structural shifts occurring in EES organization under the pressure of budgetary and quantification requirements. One of the principal results of the Oregon Master Conserver training program was the widespread use by the volunteers of the training program for job training and career enhancement purposes. In Oklahoma, high volunteer interest in learning *more* than was required to fulfill their job functions led to a redirection in the training program.

In Virginia, the unexpected preponderance of utility personnel at the heating contractor workshop resulted from the utility perception of the workshops as a valuable practical opportunity for staff training. When an unexpectedly large number of skeptical builders began showing up at Maine programs about home insulation to challenge the data used by agents, the ensuing discussions led to convincing the skeptics about the merits of the case. A noticeable number of Maine citizens sought information or services about other state programs when they identified the Energy Bus as a state government function.

Another unanticipated result has been the shift in basic Energy Extension organizational structure which is occurring in Oregon and Maine. The basic agricultural extension philosophy of encouraging a few selective adopters of new ideas or techniques by spending a large amount of agent time with these few selected individuals is generally being reversed or modified in these two EES programs. In order to reach more people in less time and to operate in urban areas, Maine agents and some in Oregon are devoting more of their time to larger audiences and spending considerably less time per person. Thus the effective but time-consuming one-to-one relationship formerly utilized in other Cooperative Extension activities are being superseded in these two cases by various mass contact methods in which agents teach large classes or seminars, organize exhibits seen by many, or speak on radio or TV. Volunteers may perform various functions for the agent, acting in his/her stead. In all these instances, individual contact with the public by agents is greatly reduced. In Oregon the effect is most pronounced in the Portland and Willamette Valley districts, while the agents in more isolated areas rely more heavily on the standard extension technique of individualized contact. Group contact methods were tried and then discarded in favor of individual contact in the Oklahoma program when evaluation showed the new methods to be less effective on their target group.

Among the factors encouraging the shift in Maine and Oregon are (1) shortage of resources, which limits the number of energy agents to a half dozen or so per state, (2) the goal of reaching urban as well as traditional rural audiences, and (3) emphasis upon quantification, which encourages making larger numbers of contacts.

Despite these changes in two programs, other extension emphases have been retained and utilized in all programs. These include agent competence, high level of technical expertise, development of community contacts, and networking to broaden program influence.

Finally, the staff of most programs were somewhat surprised at what they perceived to be their own accomplishments in implementing program objectives. They were prepared *not* to have things go as well as they did and were gratified to achieve the results they did.

## COMPONENTS OF SELECTED PROGRAMS

What are the distinguishing characteristics of the four programs analyzed in this report? Are there certain minimum requirements for organization, personnel, or institutional climate that must be met before a viable program can develop? These questions are of high interest to program managers, staff, and funders alike. Keeping in mind the limitations of the selection process, we now review characteristics of these programs which bear on these questions.

First, all of these programs were developed with the impetus provided by federal resources. EES (and SECP in one case) funds and program goals provided both the framework and the means to develop these particular energy conservation programs. In one case (Oklahoma) the first efforts were SECP-funded pilot programs in 1977–1979, followed by EES money which allowed the continuation and further development of the program ideas and knowledge developed in the initial efforts. While the programs are all heavily dependent upon other resources such as the preexisting Cooperative Extension framework in addition to the federal money, it was the *availability* of federal funds which actually resulted in the initiation of these efforts at this time. The question of whether these programs would have developed *without* the prospect of federal support is difficult to answer. When asked if their state would have authorized and funded the project by itself without this initial support, program managers' answers are "no." In one case (Oregon), the Cooperative Extension Service had already begun energy education efforts using agents in other extension programs (home economics, agriculture), but the focusing of these scattered efforts did not occur (and probably would not have) until they were drawn together in the Oregon EES proposed by Owen Osborne using federal

support. A comparison of these programs with other comparable programs initiated and functioning *without* federal support would be desirable and is necessary to answer the question of the role of federal support.

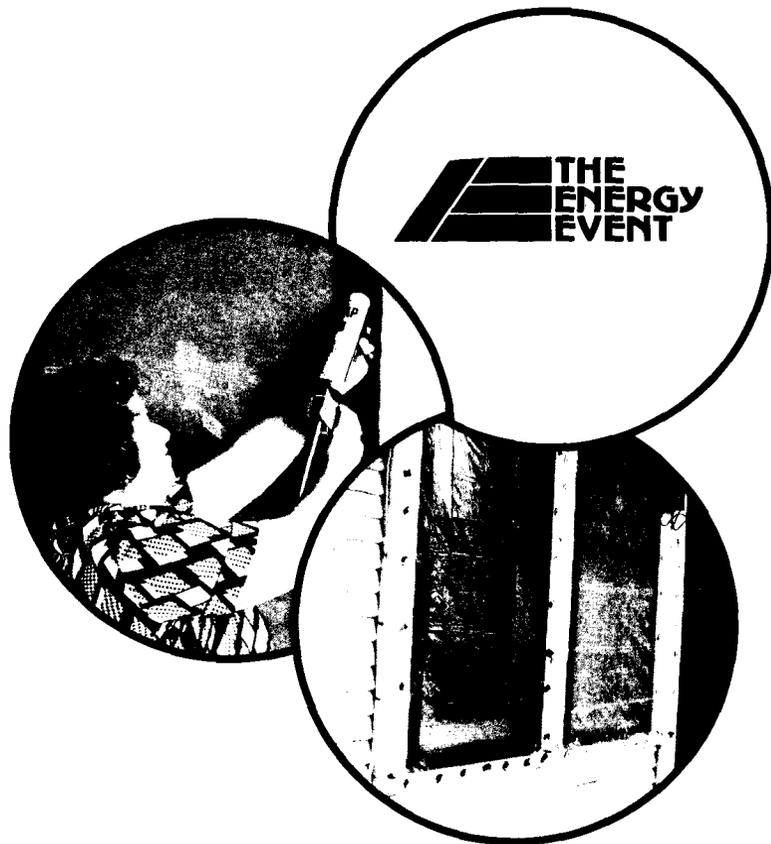
Thus, federal support appears to have served a necessary but not sufficient role in the creation of viable residential energy conservation programs at the state level. Federal support enabled these efforts by providing financial support vital to their initiation. Their continuation after the reduction or possible withdrawal of federal support is intended at the state level but by no means assured.

The greatest common strength of these programs is their ability to create and implement an effective local delivery system for residential energy conservation information. The expertise they display in using standard techniques of networking, for instance, is reflected in the legitimacy and acceptance with which they are regarded in their state and communities. This is their principal contribution to the federal-state partnership, and has enabled the development of these energy conservation information delivery efforts.

Those components held in common which distinguish this group of state programs include:

- committed, competent personnel who make major time and skill investments in program development and implementation,
- stability that permits cumulation of experience through a lengthy evolution,
- articulate, dedicated leaders through program start-up,
- receptive local climate, with supportive attitudes and values among the public, educators, and/or media; these programs have often created their own local and state climates by attentive cultivation of contacts and networking,
- state and local political support,
- strong, respected organizational framework,
- pragmatic approach to problem solving,
- explicit or implicit use of the principles and techniques of diffusion of innovation.

# 3. OVERVIEW OF OKLAHOMA'S ENERGY EDUCATION PROGRAM



## Energy Education For Oklahoma Families

*Oklahoma State University*

Oklahoma Extension Service and Oklahoma Corporation Commission

## INTRODUCTION

This program has consisted of a series of residential energy conservation/education pilot projects designed to instruct limited-resource (low-income, elderly, isolated, and/or handicapped) families in methods of increasing their physical comfort and controlling fuel bills. The Conservation Division of the Oklahoma Corporation Commission has funded these projects through Oklahoma State University's Cooperative Agricultural Extension Service, using SECP and EES money.

The program began in Tulsa in fall 1977 and was followed with a second Tulsa project in 1978-79. In 1980 it was taken to the rural setting of Choctaw County in southeastern Oklahoma. The program was expanded to Pushmataha County, adjacent to Choctaw County, in 1981 and matured considerably in joint Choctaw-Pushmataha County efforts in 1981, 1982, and 1983. In early 1983, the program was expanded to five other projects in six other counties across the state.

The codirectors of the program, Bonnie Braun and Sue Williams, operated the projects through the Oklahoma State University's Cooperative Extension Service. They directed the training of paid extension aides in energy use/conservation, and the aides worked under direct supervision of County Extension Service personnel. In addition to conducting group meetings early in the program, individual aides contacted individual members of the eligible population of each county in their homes, offering information and instruction in simple behavioral and structural modifications which could be adopted to improve comfort and reduce/control energy bills.

Follow-up visits were made to offer further instruction, evaluate adoption efforts by clients, and collect information on behavioral and structural changes in order to evaluate project effectiveness. Evaluations were built into each project, permitting modifications of techniques and practices in ongoing and subsequent projects. Serendipitously, the results of these evaluations were also useful in obtaining political support for continued funding.

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This case study was prepared by Donald W. Jones, utilizing information from a variety of sources including a site visit conducted May 9-12, 1983.

## PHILOSOPHY OF THE PROGRAM

Although the subject matter of this program is residential energy conservation, it is, in fact, a human capital-investment welfare program, as is recognized at all levels of the program's administration. However, all parties involved in the program have consciously eschewed an income supplementation approach, such as subsidizing lower-income fuel bills, in the belief that longer term benefits will derive from investment in educating the target groups to adjust their energy consumption behavior.

The program's combination of a conservative approach to economics and a liberal conception of the state's responsibility to its citizenry has been very effective in an economic and political climate in which it must continually compete for the funds assigned to it. In a net energy production state, conservation naturally has a relatively low priority, but the relatively high incidence of lower incomes in the state enhances the political acceptability of some marginal income redistribution. At the same time, the small budget and the self-help character of the program appeal to both political and economic pragmatism. Finally, the articulation of long-term goals for the program and the continual attention devoted to demonstration of the program results have enabled its supporters to sustain its fiscal life.

## ADMINISTRATIVE AND FUNDING STRUCTURE

The source of funding for the program has been predominantly, but not exclusively, the U.S. Department of Energy. USDOE funds went to the Oklahoma Department of Energy until that agency was dismantled in 1981 and have since been channeled through the Oklahoma Corporation Commission, the state's public utility regulatory agency. The Conservation Division of that commission has directed funds for this energy education program to the College of Home Economics of Oklahoma State University. [Summarily, the flow of funds is: USDOE—ODOE/OCC (Conservation Division)—Oklahoma State University—College of Home Economics—Oklahoma Cooperative Extension Service, the County Extension Office—energy extension aides and suppliers of related services.]

The intellectual and technical direction of the program originated and has remained with the codirectors, Braun and Williams, and the execution of the individual projects in Choctaw and Pushmataha Counties has been accomplished through the County Extension Office.

Funding levels have varied considerably between 1978 and 1983. The figures are presented in Table 1. The initial allocation for 1983 was \$62,000, but that amount was augmented on a one-time basis later in the year by an additional \$136,000. Despite the general upward trend in funding, anticipation of maintaining recent funding levels was generally uncertain, and timing of their release caused occasional planning and coordination problems in project implementation.

Table 1. Oklahoma project funding, by fiscal year

1978	1979	1980	1981	1982	1983
\$10,000	\$16,000	\$84,600	\$50,000	\$55,000	\$62,000
					\$198,000 <sup>a</sup>

<sup>a</sup>Note explanation in text.

## DESIGN AND EXECUTION OF THE PROGRAM

### Articulation of Short- and Long-Term Goals

Oklahoma's energy education for limited income families program was begun in Tulsa in fall 1977 with the long-term objective of teaching low-income individuals how to better manage their energy consumption to control their fuel bills, increase their comfort, or both, on a continuing basis. The short-term objectives of the 1977-1978 project and its fall 1978 companion project were to deliver information to accomplish the long-term project goals and to test the relative effectiveness of individual and group contact methods in accomplishing the long-term objectives. This long-term objective has remained intact throughout all subsequent projects, while parallel short-term goals have involved experimenting with modified communication, education, and evaluation techniques appropriate to different audiences, setting, and circumstances. To articulate their short- and long-term objectives to the Oklahoma Corporation Commission, the program directors published a ten-year plan for the program, with annual objectives, in 1981. The plan was retroactive to 1977 and cited evidence of results in hand. Publication of the plan was instrumental in assisting the program's supporters in the Conservation Division of the Oklahoma Corporation commission in competing for funds for the program.

### The Subject Matter—Weatherization Practices

Before recounting the implementation of the program, staffing structure, etc., it is useful to tell what it attempted to teach and how. Most of the specific projects, described in the next section, taught much the same weatherization practices, so minor interproject variations in curriculum will be ignored in the summary. The weatherization practices can be divided into behavioral and structural practices, depending on whether a practice involved individuals altering their daily actions or performing a one-time modification (or at least a relatively longer-lived modification) on the dwelling itself. The practices were designed to reduce energy consumption while maintaining or enhancing physical comfort or, viewed alternatively, to improve comfort without incurring a larger energy bill.

A major money saver among the behavioral practices was encouraging people to lower the thermostats on their water heaters and physically showing them how to do so. Clients were taught a number of lessons about choosing clothing for both summer and winter comfort—thermal qualities of different fabrics and colors; layering of clothing; how to recycle old sweaters into leggings for winter, a particularly useful practice for the elderly poor. Construction and use of various types of window shades and windbreakers for use at bottoms of drafty windows and doors were also taught. The projects identified materials for making these items which could be found around the house and used at no out-of-pocket cost or could be purchased at low cost from local stores. Timing during the day of shading windows on east or west, north or south, depending on the season, was also in the behavioral curriculum.

Structural modifications spanned a wider cost range than did the behavioral weatherization practices. Some could be implemented quite cheaply, e.g., caulking and weatherstripping, while other modifications, such as the construction of awnings over strategically (sunwise) facing windows, were more expensive and required some saving up of resources by clients or assistance from another program such as DOE's weatherization program. Aides showed clients how to load a caulking gun, how to apply the caulking, and what a proper caulking bead looks like, as contrasted with what a bad one looks like. Aides also taught clients how to install plastic storm windows and how to use sun screens over windows and apply solar film to glass. Some instruction in insulation was offered, as well. The use of climbing plants on strategically placed trellises was also shown, but again, this was a more costly (in both labor and cash) structural modification, and installation often would have required some assistance, particularly for the elderly.

The teaching was conducted in the clients' homes, with aides using prepared materials to both demonstrate and give clients the opportunity to learn by doing. More detail on aide activities and training is offered in the sections on Personnel and Materials.

## **Program History**

### **The Tulsa projects**

Using EES funds in 1977, the Oklahoma Department of Energy contracted with the Oklahoma Cooperative Extension Service to develop programs to reduce Oklahoma's energy consumption by 5% by 1980. One of the components was a pilot project aimed at low-income families in Tulsa, directed by both Braun and Williams and coordinated by an extension home economist. Seven paid aides were trained, and the energy education project was conducted over a seven-week period in winter 1977-78. Contact was made with some clients on an individual basis and with other clients in group meetings. Aides collected personal information on clients who opted to enroll

formally in the program and offered instruction in weatherization of structures. The coordinator conducted follow-up visits to determine the extent of adoption of recommended practices. Six of the seven aides worked with clients on an individual basis and the seventh conducted group information delivery. The six aides reached 364 families and worked with 156 of those intensively. Twenty-nine percent of the 156 families (45 families) adopted some of the weatherization practices by the end of the project period. By the following year, fully 78% of these 156 families had done some weatherizing. Fifty-seven families were contacted via the group method, and only 4% (two families) adopted weatherization practices.

A second Tulsa project was conducted in fall 1978, to continue the energy education efforts and further examine the tentative first-year conclusion that individual contact was far more effective than group contact for low-income individuals. Again, weatherization practices were the subject of the education. Five paid aides were trained and worked intensively with families on an individual basis and a larger, but unspecified, number in group meetings. Meetings were held twice with each group in the latter approach, rather than once as before, in an effort to obtain a higher adoption level from that delivery method. They nevertheless met with little success. The adoption rate for weatherization practices (at least one of the three taught) was 31% for the individually contacted families by the end of the nine-week delivery period, jumping to 90% by the end of one year; the families contacted only in groups were more difficult to reach in follow-up interviews, but obtainable evidence indicated another low adoption rate. A major conclusion reached from this pair of projects was that group meetings are distinctly inferior to individual contacts for lower-income families *if the goal is to change behavior rather than simply to maximize contacts*. Subsequent projects in rural/small town settings used the individual delivery system.

The project reports indicated no investigation of self-selection biases in the composition of meeting attendees and individually contacted clients. To the extent that any selection bias was present among meeting attendees, it was attributable to the selection of particular groups rather than to individuals' predilections to sign up. (Of course, given membership in any particular group, attendees at an announced energy education meeting of the group may represent self-selection bias.) More room for self-selection bias exists among the individually contacted clients, since they had the opportunity to enroll or not to enroll in the program independently of any group affiliations. *Ex post*, this possibility seems to be little cause for concern for evaluation of the program, however. Such self-selection bias would be of some concern if the project showed little effect on behavior, say, because participants were all energy conservers in the first place and had already done everything they could, but just the reverse was the case: individually contacted clients took more measures recommended by the project than did group meeting attendees.

### **The Choctaw and Choctaw-Pushmataha County projects**

A rural/small-town setting was selected for the next education project. In fall 1980, seven paid, trained aides were put in the field for ten weeks through the Choctaw County Cooperative Extension Service. The aides contacted 788 low-income rural families individually, paying multiple visits and offering instruction in behavioral changes which could increase comfort/decrease energy consumption as well as in structural weatherization practices. Aides collected detailed information on 656 of the 788 families, and 99% of those 656 families adopted some of the recommended practices within one year following the contacts. As in the Tulsa projects, the program directors investigated the correlations between individual and family characteristics and adoption rates.

The following year, the program was extended geographically to Pushmataha County, directly north of Choctaw County, and was focused on elderly residents, defined as age 55 and older. Because energy consumption behavior differs substantially between seasons, both a summer and a winter phase, of ten weeks each, were conducted in this project. Six paid, trained aides worked individually with 442 families in the summer phase (1981) and with 228 in the winter phase. There was substantial overlap in the seasonal coverage of families, with the total number of different families contacted over both phases being 473. The adoption rate of either kind of practice by elderly families was judged to be relatively low at 42%, but the aides collected information in follow-up visits on reasons for nonadoption as well as for adoption. Physical limitations associated with aging were the primary reasons for non-adoption of structural changes, and the project directors recommended that consideration be given to finding additional assistance to help the elderly make structural changes. Volunteer labor consequently was solicited from local civic groups for this purpose.

In 1982, the energy education program was conducted again in Choctaw and Pushmataha counties, with a focus on rural limited-resource families. Eight paid aides were trained and fielded in both summer and winter phases. Two hundred ninety farm families were contacted in the 20-week summer phase, 231 of whom adopted at least one weatherization practice. These families were new contacts and not repeats from previous projects. In this project, information collected by aides was put on minicomputer disk and quickly transferred to the mainframe computer at Oklahoma State University, facilitating more rapid analysis of interim progress by the project directors. Aides collected beginning-of-period information on families and collected end-of-period data during the last two weeks of the project so the project could be evaluated.

### **Continuation and expansion of the program**

By 1982, the political imperative to extend the program to a larger number of counties arose because state facilities were being used. Since the

program's immediate funding decisions were made at the state level, its use of state facilities was a potential political lever to press for widening the geographical coverage of the program. Since such an expansion was already part of the ten-year plan, this posed little problem. The documented successes of the program permitted it to be expanded in early 1983 to five other projects in six counties as well as continuing for a final cycle in Choctaw and Pushmataha Counties. Forty-seven of Oklahoma's seventy-seven counties were identified by the program directors, Braun and Williams, as "high-need" counties on the basis of percent of population in various limited-resource categories and housing stock characteristics. Six counties were selected using these criteria and two others: reputation of the County Extension Office and geographical distribution considerations (western Oklahoma should be included as well as eastern). Paid, trained aides (again, local residents) are currently being used in Delaware County (eastern Oklahoma) in a project of the Choctaw-Pushmataha prototype; they will be delivering energy education to limited-resource households through summer 1983. Paid, trained aides will be fielded in Jackson County (south-western Oklahoma) in mid-June and operate through August. A combination of paid aides and volunteers will be fielded in Comanche County (southern Oklahoma) in a project similar to the Jackson County project. The final project planned for the 1983 cycle is in Creek and Osage Counties (north-eastern Oklahoma) and will use Green Thumb volunteers (retrained retired workers). In 1983, a variety of types of aide will be employed, requiring modification of the mix of training, delivery, and evaluation methods but offering a wider range of lessons upon which future programs can draw. Lessons learned from these organizational and operational differences will be incorporated in subsequent cycles of the program.

### **Personnel**

A more detailed description of how the projects were executed is necessary, beginning with a review of the personnel, their organization, activities, and training.

### **Directors**

Two individuals in particular have been principally involved with the development and administration of the program since its Tulsa beginnings: Bonnie Braun and Sue Williams. Braun's and Williams's time devoted to the projects has ranged from 10% each in the Tulsa projects to 40% each in the Choctaw-Pushmataha projects. Braun and Williams have shared closely in the intellectual development of the program, have developed training materials for aides with technical assistance from agricultural engineers and the Agricultural Information Service, have supervised the training of aides and aide supervisors, and have conducted evaluation research on the projects.

## County Extension personnel

Individual projects of the program have been implemented using the County Extension Offices. The County Extension directors and/or Extension home economists have overseen these energy education projects as special programs assigned to their offices, together with other Extension programs. Following the mission of the program as conceived by its directors, the County Extension directors and home economists have seen that the varied resources of their offices are used to support the execution of the energy education program. This includes supervision of aide supervisors and aide recruitment and training, utilization of expertise of other agents in the office when appropriate, and coordination with other programs and activities of the county office. The reputations of the County Cooperative Extension Offices among the program's clientele have been particularly instrumental in gaining acceptance of aides' presences in homes and in all likelihood have enhanced the effectiveness of the program.

## Aides

The activities of the aides have been the *sine qua non* of the program, and despite their relative anonymity in this report, their recruitment and training warrant particular attention.

**Recruitment.** In the Tulsa projects, the aides were former aides from the Expanded Funds and Nutrition Education Program (EFNEP), who were available for other work because of funding cutbacks in their programs. They thus had previously worked for Extension in teaching roles and were familiar with the clientele they were to reach. Their pay was \$3.00 per hour, for six hours a day, five days a week for eight and nine weeks.

In the projects in Choctaw and Pushmataha Counties, media advertisements were made for aide applications. In the neighborhood of 30 applicants applied for the seven aide positions available. Selection was made on the basis of prior teaching experience (often with Extension although most of the 1980 Choctaw County aides finally chosen had no teaching experience) educational attainment and trainability, familiarity with the targeted clientele, ability to work with people, and related criteria. Pay was \$3.35 per hour, for six hours a day, five days per week for the duration of the project. Aides were also required to have a car, driver's license, and liability insurance and were compensated for mileage. Each project completed so far has employed from five to eight aides, each of whom was encouraged to enroll 50 families in the program.

One problem faced was aide retention across projects. For example, only two aides out of seven continued from the 1980 Choctaw Limited Resource Project to the 1981 Choctaw-Pushmataha Elderly Project. The aide work was sufficiently close to being full-time to be competitively attractive as an income source, but instability of funding put experienced aides back into the long-term job market at the end of projects. Consequently, when funding

was secured for the next cycle, most of the former aides had already taken other employment and were unavailable. Much, but not all, of their experience was then lost to subsequent programs (but see section on Training for more on this point).

**Training.** Aides in the Tulsa 1 project were already familiar with Extension and required only training in weatherization and energy information, in which they received an initial eight hours training. They were given an energy quiz before and after the project. During the field portion of the project, the aides received an additional two hours of training per week, during which time they were also able to exchange information on their experience. This function served essentially as a during-project feedback and control mechanism. In the Tulsa 2 project, aides received only six hours prefield training but spent three hours per week in supplemental training during the field phase.

The same format (a period of intensive training before going into the field and several hours weekly supplemental training during the field phase) was continued in the Choctaw and Choctaw-Pushmataha projects. Initial training was much more intensive, totaling 60 hours, and an additional 4 hours per week were spent in field period supplemental training. The subjects covered in the initial training included an introduction to the Cooperative Extension system, project objectives, collection and use of data from clients, energy concepts, low-cost/no-cost conservation techniques, and record keeping. Subjects covered in the weekly meetings included problems and successes experienced in the field, procedural questions, time management, additional training in low-cost/no-cost conservation techniques, an additional subject area each week, and a review. The continued training incorporated some of the aides into each current project as well as into future projects, thus mitigating experience losses if aides were unavailable to work in subsequent projects.

In the projects in the 1983 cycle, some modifications were made in training. Volunteer training was reduced to 18 prefield hours and to 2 hours of subsequent training every three weeks. The segment of paid aide training on the Cooperative Extension system was dropped; some program objectives were also scaled down (although the objectives remained the same as in other projects), reducing time required in that section of training; and client data collection and record keeping were also reduced. The sections on energy concepts and conservation techniques were kept intact, however. The reason for reduction of demands on volunteer aides is simply that pay brings forth more effort; volunteer aides simply have less incentive to complete more tedious parts of the program.

**On-the-job-feedback.** As would be expected, various problems and issues surfaced during program implementation. In the case of paid aides, "burnout" occasionally surfaced, resulting from frustration built into the energy education program. It was often difficult to observe responses in clients, particularly because many of the weatherization practices take time to adopt—people often would have to save money to implement them—and

their seasonal character often made a year's wait not unreasonable. This is in contrast to the "seasonality" of the Expanded Foods and Nutrition Education Program: meals are prepared three times daily, so there is plenty of opportunity for low-cost experimentation by clients and attendant personal satisfaction for aides. Appearances of these burnout symptoms were occasions for counseling by the County Extension home economist or project coordinator.

Volunteers also faced occasional burnout problems, and resultant drop-outs were more of a problem for this group than for paid aides. Efforts to sustain volunteer motivation involved awarding peer and community recognition for service: awarding of certificates for a certain number of hours service, selection of a volunteer of the year, and provision of badges in the shape of the state, denoting them as energy education aides working with the County Extension Office. The badges were useful conversation pieces which helped aides make contacts with potential clients. See Fig. 1 for selected pages from the volunteer notebook on rights and responsibilities of volunteers.

## Materials

### Handbooks for aides

Each aide was issued a handbook containing basic information on the project, aide responsibilities, data collection forms, and energy conservation reference materials. The handbooks were designed as reference sources for the aides rather than as a repository of materials to hand out to clients. The printed reference material warrants special mention in this regard. These were relatively expensively printed brochures (prepared by Extension for other purposes) on particular weatherization practices—e.g., the construction of awnings or trellises—and were quite detailed. The amount of detail was anticipated to be overwhelming to a client if the brochure was simply distributed; also, the high cost per brochure—in the neighborhood of one dollar apiece—would have made their direct dissemination to clients very expensive to a small-budget project. Instead, essentials of these brochures were distilled into one- or two-page mimeographed guides to particular practices, which were written with the target clientele in mind. For the project targeted at the elderly, large type was used on yellow paper to provide easier reading. The more detailed brochures were held in reserve for use by the aide in offering supplementary advice, although if a client asked for a copy, it was given.

Handbooks for paid aides and volunteer aides differed, inasmuch as the data collection requirements for them and the depth of their prefield training differed.

## Demonstration kits

Each aide was also issued a demonstration kit which contained items to illustrate both behavioral and structural modifications. The kits included various items:

### I. Structural Weatherization Practices

- A. Sample "Hole in the wall"—3 X 5 in. opening shows the air leakage around an average window.
- B. Caulking gun and tube of caulk—gives aides and clientele the opportunity to actually use a caulking gun.
- C. Caulking sample board—sample butyl rubber caulking and latex caulking with proper bead and poor bead.
- D. Weatherstripping sample board samples of weatherstripping to familiarize clientele with various kinds available and best uses.
- E. Threshold sample board—shows sample of weatherstripping to use around doors and how to install threshold.
- F. Storm window—how to install a plastic storm window.
- G. Plastic storm window sample board—shows several weights of plastic and tells best uses of each.
- H. Window treatments—how awnings can attach to windows, samples of sun screens, and solar film applied to glass.
  - I. Landscape—sample of trellis to use with climbing plants.
  - J. Insulation samples—samples of commonly available types of insulation.

### II. Behavioral Weatherization Practices

- A. Fabric sample boards—several types of fabrics with different thermal qualities for winter and summer.
- B. Layers of clothing—examples of wearing several layers of lightweight clothing for winter, lightweight loose clothing for summer.
- C. Sleeveless vests and leggings—example of how a long-sleeved sweater can be recycled.
- D. Color sample board—shows warm and cool colors in a color chart.
- E. Roman shades—one window treatment that can be very effective in making windows more energy efficient.

# Volunteers Rights

- ◀ THE RIGHT OF BEING OFFERED THE OPPORTUNITY TO BECOME A VOLUNTEER REGARDLESS OF RACE, FINANCIAL STATUS, SEX OR AGE;
- ◀ THE RIGHT TO BE CAREFULLY INTERVIEWED AND APPROPRIATELY ASSIGNED TO A MEANINGFUL JOB;
- ◀ THE RIGHT TO EXPECT TRAINING AND SUPERVISION TO ENABLE THEM TO PERFORM THE JOB WELL;
- ◀ THE RIGHT TO BE INVOLVED IN PLANNING AND EVALUATING THE PROGRAM THEY PARTICIPATE IN;
- ◀ THE RIGHT TO RECEIVE RECOGNITION THAT IS MEANINGFUL TO THEM; AND
- ◀ THE RIGHT TO BE REGARDED AS PERSONS WITH INDIVIDUALITY, UNIQUENESS AND VALUE.

Taken from: The Effective Management Programs By Marlene

# VOLUNTEERS RESPONSIBILITIES

- ★ Be honest and open with the Director of Volunteers and other staff, beginning with the interview, regarding intent, goals, needs and skills so that a good placement is possible;
- ★ Understand the requirements of time and duties of assignments before accepting them and once accepting, fulfill the commitment to the best of your ability;
- ★ Work to deserve being treated as a recognized and respected member of the team (no room for temperamental prima donnas, off-and-on again types or "no shows");
- ★ Take the commitment seriously enough to participate in planning and evaluating the volunteer program and in whatever training or learning opportunities are available;
- ★ Share ideas with staff, for the volunteer frequently has a fresh, new perspective that is valuable. However, do not be hurt or resentful if the ideas are not always implemented, for staff's ideas aren't always either;
- ★ View staff as allies and mentors for much can be learned from them;
- ★ Respect the confidentiality of the agency and its clients;
- ★ Seek and accept honest feedback on performance. Remember, negative feedback is valuable too, when viewed as opportunities for growth;

(Continued on next page)

# VOLUNTEER ENERGY EDUCATOR CHARTER MEMBERS

★ ALTA BURTON  
6904 N. W. 36th Street  
Bethany, OK 73008  
789-6701

★ VICKIE CAMP  
7100 N. W. 21st Street  
Bethany, OK 73008  
789-5418

★ MARY JUNELL FIFE  
Rt. 1, Box 159  
Oklahoma City, OK 73111  
478-0285

★ PATSY L. FOUTZ  
1528 N. W. 24th Street  
Oklahoma City, OK 73106  
525-5721

★ THELMA GRACE  
3004 N. W. 15th Street  
Oklahoma City, OK 73107  
942-6003

★ MARY E. JONES  
2201 Brixton Road  
Edmond, OK 73034  
232-6357

★ RUTH KINNEY  
Rt. 2, Box 338A  
Guthrie, OK 73044  
282-7116

Fig. 1. Workbook pages for Oklahoma volunteers

- F. Window inserts—two samples of window treatments that are effective and inexpensive; shows several kinds of finishes that can be used.
  - G. Windbreaker—sample made to show how to stop drafts under doors and windows.
  - H. Shades—two samples of roll-up indoor and roll-up outdoor shades.
- III. *Miscellaneous*—equipment for auditing included: flashlight, 50-foot tape measure, stiff tape measure, and thermometer.

Materials for each demonstration kit fit in a small suitcase. Cost of assembly of a single kit, including materials and labor (using an average labor cost of \$5.00 per hour), was estimated to be in the range of \$220 to \$250. The cost per kit decreases when multiple kits are assembled at the same time and may well dip below \$200 per kit when as many as 20 are assembled simultaneously.

The materials in these kits were items that clients could find around the house or purchase locally. Care was taken to ascertain, in each location at which the program was conducted, exactly which stores sold which materials and the prices. The aim was not to favor certain stores, with comparison shopping done for the clientele by the aides, but to be able to tell the clientele exactly where they could get particular items and how much a particular practice could cost. This information was found to be particularly valuable for limited-resource clientele.

The local assembly of demonstration kits does have the possible effect of raising their assembly cost somewhat. If the program were conducted simultaneously in six counties, as is now being done, a larger run of kits could be assembled in one place for a lower per-kit cost, but such centralized mass production would run the risk of defeating a major purpose of the kit, viz, demonstration of what can be done with materials that are *known* to be available locally, from specific stores at specific prices.

## Delivery Methods

### Mass distribution method

In the Choctaw project, 3277 leaflets were mailed to eligible members of the population (limited-resource households), 15 of whom responded (0.5%) with at least a phone call to the Extension Office. This method of information delivery was judged not cost-effective.

### Group meetings

Meetings were arranged through existing groups such as church and senior citizen groups and through special neighborhood meetings. It was

found that although the cost per attendee is lower for group meetings than for individual visits, the benefits in the form of weatherization adoptions are at least correspondingly low. However, this was regarded as a good way to make initial contact with audiences.

### Individual contacts

This is the most expensive delivery method, both in aide time and transportation costs, but the far higher adoption rate associated with this approach appears to justify the higher cost. At a minimum, two visits per household were required, and ordinarily three or four were made as the aide established a rapport with the clients. First visits were generally relatively short—five minutes to half an hour—but subsequent visits were usually in the range of two to three hours each. An additional benefit of the individual contact procedure was that it permitted the identification of some clients as eligible candidates for other extension programs.

## Evaluation

Interim and post-project evaluation have been important elements of these projects. The weekly training sessions for the aides have provided interim evaluations of procedures, and the learning has been incorporated into the ongoing project. The follow-up visits to clients by aides, aide supervisors, or both, at the end of the project, as well as subsequent visits one year later, have offered valuable information on adoption of weatherization practices, from which can be generated cost-benefit assessments of the project.

Building the evaluation design and data collection into the projects has permitted the program directors to document and quantify degrees of success. Efforts at *ex post* documentation and evaluation would have been much more expensive, i.e., would have duplicated a number of efforts and denied program directors the use of the evaluation results for their own feedback and control purposes.

The evaluations conducted, to date, have been simple but effective. Measuring the effects of education and making proper attributions to education are notoriously intricate endeavors, and all problems in doing so simply cannot be avoided. Counting the number of individuals “educated” would be a useful thing to do if the term “educated” could be well defined and measured. The directors of the Oklahoma program avoided the trap of simply counting the number of people contacted and focused instead on the proportion of the people *enrolled* (smaller than the number *contacted*) *who actually undertook* some of the recommended behavioral or structural weatherization practices.

Effort is under way to use engineering information on house characteristics and on average Btu savings associated with particular weatherization practices and, possibly, fuel consumption data from utility companies to estimate the monetary value of benefits flowing from the education. The currently

collected information on practices adopted identifies the practice and can be used in conjunction with the cost estimates to calculate how many people (households) saved what percentage of preprogram energy costs. Since knowledge of these practices gets passed on to people outside the program and no attempt is made to measure consumer surplus, these would be lower-bound estimates. This savings calculation can be carried forward to a cost-benefit calculation. Estimates have been made for later projects of the private cost (to enrollees) of adopting weatherization practices—cost of materials and value of home labor time— and these, combined with cost figures on public funding, are sufficient to conduct a simple cost-benefit analysis.

It is worth noting, however, that the present level of evaluation effort—measuring the proportion of project enrollees who adopt any weatherization practice by the end of the project period and within one subsequent year—has offered sufficient evidence of program success for the program's advocates to secure continued funding. Further refinement of the evaluation can be of use to higher level (say, USDOE) budget evaluators, to social program planners, and probably to the Oklahoma Energy Education Program managers as well and should not be thought superfluous merely because one evaluation audience has had its information requirements satisfied.

## **The Role of the County Extension Office**

### **Formal**

The County Extension Office served as a formal administrative channel for the execution of these energy education projects. Aides were recruited and supervised through the County Extension Office, for which the local office received funds from the College of Home Economics at Oklahoma State University. The existence of the office permitted competent daily administration of the projects without charging full administrative set-up costs to the projects. The county director committed 5% FTE and the County Extension home economist committed 10% FTE as in-kind funding, aides were paid directly by Oklahoma State University, and OSU reimbursed the county office each month for operating expenses and mileage.

### **Informal**

Important as the formal role of the County Extension Office was to the program, its informal influences were equally important. County Extension has a long-established and wide contact network and its knowledge of the capabilities of local service providers, both public and private, was particularly helpful. Related to this, but not identical, is the existence of complementary programs which County Extension was able to draw upon for manpower and advice. For example, the agricultural extension agent was available to provide

information on the planting and maintenance of shade-providing deciduous plants in the area, and 4-H was able to provide youth labor to assist the elderly in weatherization. Extension is also able to refer clients contacted through the energy education program to other programs, both of its own and of other public and private agencies. County Extension also has long been in the business of delivering education in the home and has considerable expertise in that area. Finally, there is the matter of County Extension's reputation in the community. It is known as a trustworthy agency with which to deal, and affiliation with it helped gain more rapid acceptance for the energy aides and the energy education program.

## **ACHIEVEMENTS**

### **Adoption of Weatherization Practices**

The primary object of the program was to increase people's well-being, and this appears to have been accomplished. The projects' tasks included documentation of changes in behavior and structural modification. Since the behavioral changes are generally readily reversible, it must be presumed that the documented persistence in the new behaviors is evidence of an improvement in welfare. The structural changes are somewhat less readily reversible, but longer lag time between exposure to the idea of them and their actual construction or implementation offered time for examination of their potential effects. Consequently it is reasonable to associate the structural changes with welfare improvements as well.

It is important to address, at this point, the motivation for change. Was it the energy education project or something else? It appears safe to assume that the status quo ante would have produced none of these changes during the observed time period since a long time had elapsed already without adoption. A more reasonable alternative is that another program either directly or indirectly offered the final impetus to adopt some weatherization practice. This is an especially likely alternative when considering the structural changes. Several other agencies offer these limited-resource families help with some types of housing structural changes, and clients are sometimes uncertain, or unaware, of the different agencies; they all appear to be the same source. In the Choctaw and Pushmataha County projects, client referrals were made between the energy education project and other agencies offering assistance with structural modifications. To the extent that this reflects a complementarity among programs, little distortion seems to be produced by allowing the attribution of a structural change to the energy education project even if it were carried out by, say, Community Action, particularly since there is a reasonable chance that the clients were put in contact with the Community Action program by the energy education project.

The changes introduced by the energy education program will have continuing benefits rather than one-time supplementary effects, and this was also an aim of the program. The individuals who learned how to adjust their behavior to achieve greater comfort, often while reducing their fuel bills, should retain that knowledge for application in the future; structural changes should provide continuing benefits also. Additionally, there is evidence that original clients disseminate what they have learned to friends and relatives. Although there is some room for transmission of errors in this subsequent diffusion, sufficient control mechanisms exist to ensure that net benefits are positive. For example, a misused (improperly learned) practice is more likely to be discontinued, particularly if it generates disbenefits, and it is less likely to be disseminated.

### **Learning about Delivery of Energy Education**

In addition to the direct benefits intended to accrue to clients, the program directors and other involved staff have gained useful lessons in how to implement this kind of program. This learning will eventually offer more benefits to clients as program delivery becomes more efficient across a wider range of audiences and a wider range of programs.

Specific lessons learned are discussed in the following section, but some enumeration is appropriate at this point. Possibly the largest single lesson learned was the usefulness of making evaluation an organic part of the project. This lowered the cost of other lessons (essentially, by making those lessons available earlier), such as the greater effectiveness of individual rather than group contacts, what information is useful to collect for evaluation purposes and what is not, and what kinds of aides can reliably conduct what elements of the projects.

## **LESSONS LEARNED**

### **General Lessons**

#### **Importance of political support**

Securing the interest of an influential elected or non-elected official who influences funding decisions for energy-related projects is of major importance. This can also help obtain the cooperation of other agencies. Get a champion!

#### **Importance of careful planning**

Demonstration of well-conceived goals and methods for achievement is crucial not only for success of a project but for securing the support of political or administrative leaders. Despite their desires to look favorably upon an

idea, their public responsibilities force them to require a relatively high proportion of documentation and accountability.

### **Usefulness of beginning with small projects**

Particularly when major aspects of a project are experimental—Will energy education through extension really produce benefits?—there are better opportunities to learn from a smaller project; management alone could well take up all one's time in a larger project, leaving managers with no time to contemplate what the project has and has not accomplished. What can be accepted as a learning cost at a small scale could be called a bungle or worse if it happened on a large scale, and the distinction is legitimate, particularly during times of lean budgets and other scarce resources.

### **Usefulness of built-in evaluation**

Evaluation of a project is important for the managers, so they can get a sense of their achievements, what could have worked better, what didn't work at all, and what worked very well and should not be changed. In this sense, it is also important for clients of future projects. It is also crucial for demonstrating to an inquisitive elective body that a project is worth what it costs; it gives potential political supporters facts rather than statements of faith with which to work. Built-in evaluations are cheaper than *ex post* (and usually *ad hoc*) evaluations, particularly since "before" and "after" information is collected. Built-in evaluations can also produce information with which to make during-project modifications which will better serve the success of a project.

### **Usefulness of County Extension Offices**

Extension is an excellent vehicle for delivery of an energy education program. Extension is experienced in the business of delivering practical education in the home and has a tradition of being an innovative but non-threatening force in the community. Its directors are respected community leaders and its agents are generally accepted as trustworthy.

### **Specific Lessons**

1. Individual contact produces larger benefits than group contact. One consistent lesson through these projects was that, although group contacts may reach more people, more behavioral changes and a larger value of benefits derive from the more intensive individual contacts.
2. It appears that paid aides will solve knottier problems than volunteer aides and can also be relied on to persist with more tedious work, although the program directors are reserving final judgment on this until volunteers have been in the field longer.

3. Paid aides will collect more detailed information than will volunteers.  
4. Peer and community recognition are important motivators for volunteer aides.

5. Interim evidence from the Oklahoma City project, which began in late January 1983, indicates that volunteer aides tend to value the aide training as information for themselves and require special direction in order to maintain the balance between training time and field time planned by the program directors.

6. Regular weekly discussions among aides permit them to learn from one another's recent experience, help other aides avoid pitfalls, and can spread excitement among them and damp the depressing effects of less successful experiences.

7. It is possible to collect too much information as well as too little. The former swamps aides and is confusing.

8. Use local resources in making kits—it *ensures* that materials are available locally.

9. Telephone and printed contacts are of very limited value in affecting the behavior of limited-resource households but may get quick initial contacts.

10. More success was encountered when improving comfort was stressed as the aim of energy education than when saving on fuel bills was emphasized.

11. A full-year program would permit more thorough education of clients, reduce aide frustration, and permit education in both summer and winter weatherization practices.

12. Collecting information on personal and family characteristics of clients permitted identification of traits associated with particularly high or low rates of adoption of weatherization practices (see, e.g., pp. 12–15 of the 1978 Tulsa I report for some detailed findings). This will assist the scientific community in general in advancing its knowledge of the diffusion of innovations. Program designers and others interested particularly in delivering energy education can also identify particular groups as having specific needs which may be met in specific manners.

#### PRINCIPAL CONTACTS

Bonnie Braun, Program Co-Director  
338 Home Economics West  
Oklahoma State University  
Stillwater, Oklahoma 74078  
(405)624-6231

Sue Williams, Program Co-Director  
447 Home Economics West  
Oklahoma State University  
Stillwater, Oklahoma 74078  
(405)624-6825

Robert Springer  
Energy Conservation Services Division  
Oklahoma Corporation Commission  
4400 N. Lincoln Blvd.  
Oklahoma City, Oklahoma 73105  
(405)521-2995

#### DOCUMENTS

- 1977 Tulsa 1: Braun, Bonnie, and Linda Murray. *Energy Education for Limited Income Families*. Stillwater, Oklahoma: Oklahoma State University, Home Economics Cooperative Extension Service, summer 1978.
- 1978 Tulsa 2: Murray, Linda. *Energy Education for Limited Income Families, Phase II*. Stillwater, Oklahoma, Oklahoma State University, Home Economics Cooperative Extension Service, winter 1979.
- 1980 Choctaw: Williams, Sue, Bonnie Braun, and N. L. Lauener. *Energy Education for Limited Income Families: The Choctaw Project*. Stillwater, Oklahoma: Oklahoma State University, Home Economics Cooperative Extension Service, 1981.
- 1981 Choctaw-Pushmataha: Braun, Bonnie, Sue Williams, and N. L. Lauener. *Energy Assistance for the Aged*. Stillwater, Oklahoma: Oklahoma State University, Home Economics Co-operative Extension Service, 1982.
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# 4. OREGON MASTER CONSERVER PROGRAM:

A CASE STUDY IN DELIVERING ENERGY INFORMATION TO THE GENERAL PUBLIC

VOLUNTEER SERVICE

CLASSES

STORM WINDOWS

DISPLAYS

## INTRODUCTION, OVERVIEW, AND ORIGINS OF THE PROGRAM

### Introduction and Overview

The Oregon Master Conserver program was originally designed as one component of a four-part program to deliver energy education information to the general public. Using the "proven, existing delivery system" (Osborne 1980) of the Cooperative Extension Service, it was proposed that Oregon State University (OSU) add energy extension agents and specialists to its extensive statewide network of agriculture, 4-H, home economics, community development, forestry and marine resource agents. The program was funded by a grant from the U.S. Department of Energy in early 1980 to the Oregon Department of Energy (ODOE), which, in turn, subcontracted with OSU Extension Service (OSUES).

The Oregon Master Conserver (MC) program was originally designed to extend limited EES program resources through involvement of trained volunteers. Following training in various alternative energy technologies and residential energy-saving techniques, volunteers were expected to offer equivalent public service time to share this information with their fellow Oregonians.

The Master Conserver program is organized and delivered by regionally based energy extension agents along with other energy education efforts such as consumer response and small business programs. Using Cooperative Extension resources and modes of operation, agents develop extensive community and organizational contacts which enable sponsorship, publicity, and other support for MC training classes and activities.

Two distinct approaches to the Master Conserver program evolved in the two-year pilot phase before the program was extended statewide in 1982. One approach (Portland area) concentrated upon the training of Master Conservers and evolved into a broad-purpose vehicle fulfilling additional program objectives beyond those of the MC program. The other approach (Lane

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This case study was prepared by Elizabeth Peelle, utilizing information from a variety of sources including a site visit conducted Feb. 27-March 2, 1983.

County–Eugene) focused upon the utilization of trained Master Conservers to deliver information and services to specific target groups, including the elderly and homeowners. The evolution of the Master Conserver program continues with the extension of the program state-wide and with refinements and follow-ons to the two pilot programs.

## Origins

The architect of the Master Conserver program in Oregon, Dr. Owen Osborne of OSU Extension Service, melded together several diverse threads in the creation of the program. These included (1) experience from the successful Oregon Master Gardener volunteer program, (2) ideas from the pilot EES Washington State Master Conserver program, (3) Oregon Extension Service (OES) experience with delivering energy information through existing (nonenergy) agents, (4) desire to fill gaps in existing energy information education efforts in Portland and Oregon, and (5) knowledge of OES organizational structure and capabilities and Oregon energy politics.

Osborne served as the designer, facilitator, and first head of the Oregon Energy Extension Service until mid-1982. It was his vision, energy, and careful facilitation which laid the groundwork and led to the establishment and organization of the EES in February 1980. At Osborne's behest, a major energy needs study was conducted in 1978 (Morgan and Osborne 1978), and efforts to avoid duplication of services were made. From these efforts he developed four program emphases: (1) builders and contractors, Combined with the small business program in July 1982. (2) small businesses, (3) a Consumer Response program to react to public requests for information, and (4) a Master Conserver program to extend limited resources by involving volunteers in the presentation of information to the public. The first two emphases were designed to meet perceived gaps in the state's energy education efforts. He also developed political and organizational contacts within OSUES, Oregon energy groups, and the state legislature which enabled the passage of appropriate legislation and the establishment of EES within the Extension Service structure. For further information about the origins and early years of the program, he may be contacted directly:

Dr. Owen Osborne  
Associate Director, Engineering Extension Service  
110 Marston Hall  
Iowa State University  
Ames, Iowa 50011  
(515)294-1938

Direct antecedents and models for the Master Conserver concept were some preexisting Oregon programs, such as the Master Gardener and Master

Canner (now Master Food Preserver) programs. Oregon Master Gardeners are volunteers who agree to repay the state for their 40 hours of free OSU extension classes in horticulture by volunteering an equivalent amount of time to share their expertise with fellow citizens. In this manner, volunteers are utilized to further disseminate information and assist in its use and implementation among the general population. This idea was transferred to the energy area with the proposal that a corps of select Master Conservers (MCs) be certified after their completion of 40 hours of OSU extension classes and that these MCs be utilized to extend OSUES efforts in energy education by their contribution of equivalent public service time to assist other Oregonians.

With national EES pilot program support, Washington State was developing a Master Conserver program starting in 1977. While Osborne and Oregon EES staff had some knowledge of and contact with the Washington State efforts, Oregon's MC program was developed essentially independently to fit Oregon's particular interests and views of what was needed in energy education. See Appendix C for a brief overview of the different approach used in Washington State recruitment, training, support, utilization, and management of Master Conserver volunteers and how this program has evolved.

In the ferment that characterized energy and conservation activities in the latter part of the seventies, energy conservation and alternate energy groups and programs proliferated, and public interest in these subjects was high. Oregon developed not only an energy needs assessment (Morgan and Osborne 1978) but also goals for a proposed Energy Extension Service (see Appendix A). Several prior planning efforts pertinent to the formation of the Energy Extension service are listed in Appendix B.

All the major themes and the general structure of the Master Conserver program had been enunciated to some degree in these preliminary studies and evaluations done in Oregon before the program was begun in 1980. These included

- program themes of conservation and alternate energy resources,
- use of the preexisting Extension structures through OSUES,
- capitalizing upon the use of volunteer lay leaders to extend limited resources,
- an expanded energy education and information program to reach the whole state, beginning in the western urban centers,
- supplementing and coordinating with existing conservation or energy-related services.

## EVOLUTION OF THE MASTER CONSERVER PROGRAM

The interaction of policy needs and management approach within a particular organizational structure and resource context shaped the evolution of

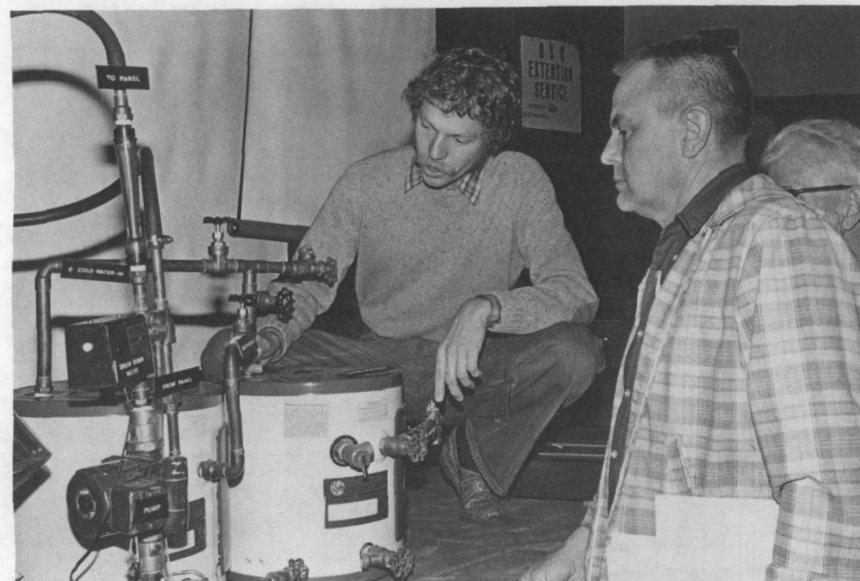
the Master Conserver program. These considerations resulted in Master Conserver program changes, phased extension of the program to other parts of the state, and some territorial reorganization of the EES in the Portland area during the Master Conserver development period.

Beginning with a pilot program in three of the more urbanized districts in the Portland-Willamette Valley area was a key policy and resource decision. Thus three of the initial six agents of the EES were given responsibility for developing a MC program for a five-county area of 1,500,000 (58% of the state's population). Seventeen percent of the initial EES budget was allocated to MC program development for roughly one quarter of the program effort.

Program development in EES occurs under a decentralized arrangement in which considerable flexibility and autonomy are given to agents to shape and implement programs within very general guidelines. Agents consult each other, other EES staff, and their advisory committees, call upon other nonenergy extension agents and community groups, and meet formally every quarter to review their progress on program development and implementation. Agents had no guidelines on either recruiting, training, or managing volunteer MCs, although a list of possible ways to use MCs was given in the 1979 state plan (see Appendix D).

The two approaches to Master Conserver programs which developed during the pilot period differ both in focus upon MC program elements and in degree of overall program integration. The collaboration of the two Portland agents focused upon development of MC training classes and supporting materials at the expense of volunteer management or utilization. To achieve their goal of a high-caliber program series, they spent the better part of two years developing, testing, and refining the content, organization, and presentation of their MC series. The classes focused upon application of theory to practical needs in a concrete manner (see photograph). Since they found it disruptive to concentrate sequentially upon four different program areas (MC plus Consumer Response, Small Business, and Builder/Contractor programs), they gradually combined and integrated their public classes and other program development efforts as much as possible. As a result, MC training classes became vehicles for providing information for broader audiences and purposes other than the training of volunteers. With major training development work completed, the Portland focus has now turned to utilization of MCs. An additional agent was hired for this purpose in early 1983.

In contrast, the Lane County agent's MC development work focused upon utilization of trained MC volunteers. Following development and presentation of two Master Conserver training class series in 1980 and 1981, the majority of a 16-month effort was devoted to utilization of trained Master Conservers in further program development and delivery efforts aimed at specific residential energy consumer groups. This intensive Lane County storm-window and weatherization program for elderly and do-it-yourself homeowners used 24 Master Conservers and a part-time paid aide to extend the resources of

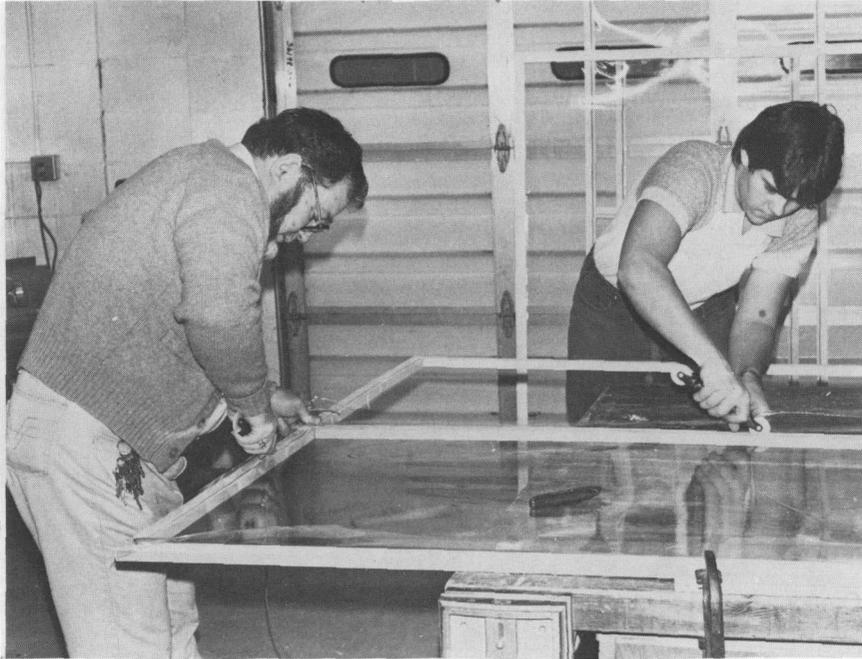


Oregon agent discussing solar water heater demonstration with Master Conserver

the single agent. The Lane County agent viewed the MC program as a stand-alone effort and did not attempt to integrate it with other program efforts. His strategy was to develop and implement one program at a time, giving undivided attention to a particular program objective.

Because of limited EES resources, it was decided initially to place six agents in existing County Extension Offices in six locations<sup>•</sup> covering most of the state and to omit Multnomah County (Portland). MC development was undertaken by three of the six agents as previously described. The original six sites and principal counties in the regions are shown in Appendix G along with the seventh location, Pendleton, added in 1982. Multnomah County was initially omitted because it was felt that energy conservation and renewable resources were being adequately addressed by the large number of existing agencies and organizations in that area and by the "aggressive" energy conservation policy of the City of Portland (Osborne 1980).

<sup>•</sup> As compared with one or more agricultural extension agents per county in the 36 Oregon counties.



Lane County Master Conservers build low-cost storm windows

In the Portland area, the two agents responsible for the adjoining territories (Clackamas and Washington Counties) developed from the start a joint approach to their work, despite having offices 40 miles apart. In 1983, they joined forces officially by opening a single office in TERA ONE, a special energy demonstration house near the Oregon Museum of Science and Industry and the Portland zoo. This action redrew the boundaries and reporting arrangements for EES agent territories in the major urban area and implicitly recognized the disappearance or changed emphasis of other energy information efforts in the greater Portland area.

Specific programwide policy changes adopted during the early years included (1) opening the MC training classes to all citizens who wished to attend (spring 1981) after three small groups of MCs had completed their training; (2) reducing the length of the training required for MC certification from 40 to 20 hours (June 1982); (3) curriculum changes, including an evolution from general to more specific and, in 1982, specification of a core curriculum plus electives; (4) expanding the MC program statewide to some addi-

tional (rural) areas in 1982; and (5) use of materials and handouts developed for the MC program to meet other program needs (Consumer Response, Small Business). The first three changes resulted in part from changing agent perceptions about the nature and purpose of the MC program. These perceptions included (1) a shift to viewing the MC program as a *delivery mechanism*, rather than as a *target group* as originally conceived, and (2) reduced expectations that all MCs would volunteer equivalent amounts of public service time.

Funding changes in the short life of the EES have meant a switch from the federal Department of Energy as chief funder to the Bonneville Power Administration (BPA). BPA will be supplying 60% of EES funds in FY 1984, with the U.S. Department of Energy supplying about 25% and Oregon the remainder. BPA goals as of 1982 were to encourage conservation of electrical energy among its customers. In EES tradition, counties provide support for local centers or offices for extension agents. Some budget cuts have occurred at the local level in 1982 and 1983 as local governments respond to rising costs and lowered income.

Policy and personnel changes within EES and OSUES have continuing impact upon the evolution of the MC program. The effect of recent changes is not fully known since new heads of EES and OSUES were just installed in mid-1983.

## DESIGN AND IMPLEMENTATION OF THE PROGRAM

How the Master Conserver program design has developed and is executed in various formats and by different agents is the subject of this section. This includes program elements in their different variations, internal relationships among MC and other EES programs, external relationships affecting program delivery, the EES decision-making and problem-solving processes, and the role of evaluation in the program.

### Description of Program Elements

Master Conserver program elements include the goals, program organization, program components, requirements, activities, and the materials and promotional/outreach methods designed to reach the intended target audience.

### Goals

Initially, Master Conserver program goals were to involve trained lay leadership to help "accomplish Extension's educational goals" and to "provide training and technical assistance to 500 volunteer participants in exchange for public service" (OSUES Program Leader's Report 1980). This goal was directly responsive to the priority (third in list of five) given to "increasing the

use of volunteers to extend Extension's energy conservation capability to reach new and traditional audiences." By 1982, the program was defined in the 1982-1985 program plan as follows:

The Master Conserver Program will provide training and technical assistance to the general public, and encourage volunteer service. A standardized course curriculum, which will encompass energy conservation and the use of renewable resources, will be offered statewide. The Master Conserver program is intended to increase energy savings by encouraging participants to save energy themselves in their home or business and to volunteer their service in ways that save energy directly or increase the effectiveness of the energy agents.

### **Recruiting Master Conservers**

Different methods for recruiting candidates for MC classes were tried and evaluated for the first set of MC-only classes in the Portland area, but specific recruiting efforts have been abandoned since classes were opened to the general public as well as MC candidates. It was found in these early efforts that personal contacts and word of mouth were by far the most effective approaches; 11 of the 15 students in the first class had been contacted by agents or by a friend.

Many other agent activities contribute to recruiting of MCs, however, though not specifically labeled as such. The steady round of agent contacts with community groups, organizations, schools, utilities, and media as they make arrangements for classes, programs, and other activities is a continuing source of class attendees. Some of these become Master Conserver enrollees. In addition, some agents may suggest the MC program to individuals seeking information either through the Consumer Response program or through materials developed specifically for the MC program.

### **Training Master Conservers**

Since the target audience was initially conceived as two levels of the general public—Master Conservers and the people who would be contacted by MCs—the programs can be viewed as having two major thrusts: one for Master Conservers and one by MCs. This section describes the former component—training for MCs to prepare them for their volunteer role.

In the Portland area pilot program, the major effort in the MC program has gone into the development and presentation of classes to train Master Conservers. While originally offered to small groups of MCs only in an intensive series of 40 hours of training and site visits, it was decided in 1981 after three such series to open the sessions to the general public as well as to potential Master Conserver volunteers. The Multnomah (formerly Clackamas and Washington) County agents have spent the greater part of two years

developing, testing, and refining the content, organization, and presentation of their jointly presented Master Conserver series. In addition they have developed detailed written and visual materials to accompany their presentations. Their solar water heating presentation is now a well-paced, intensive, substantive introduction to this technology which regularly draws 30–200 attendees for a three-hour session several times per year in their combined territories (greater Portland area, Salem, McMinnville, Astoria/Seaside, Canby, Forest Grove, Oregon City, and Tillamook). They expect and receive audience response during the break and in a question-and-answer period at the close of the session as shown in the photograph.

After some initial experimentation with course content, more general topics like "the energy crisis," "energy overview," or "home energy use" have been abandoned in favor of specific topics on energy-saving alternate energy and conservation technologies. Besides solar water heating, these commonly include energy-efficient new construction, energy-efficient retrofits for existing houses, solar greenhouses, wood space heating, or wood water heating. Others offered occasionally or in certain districts to meet particular

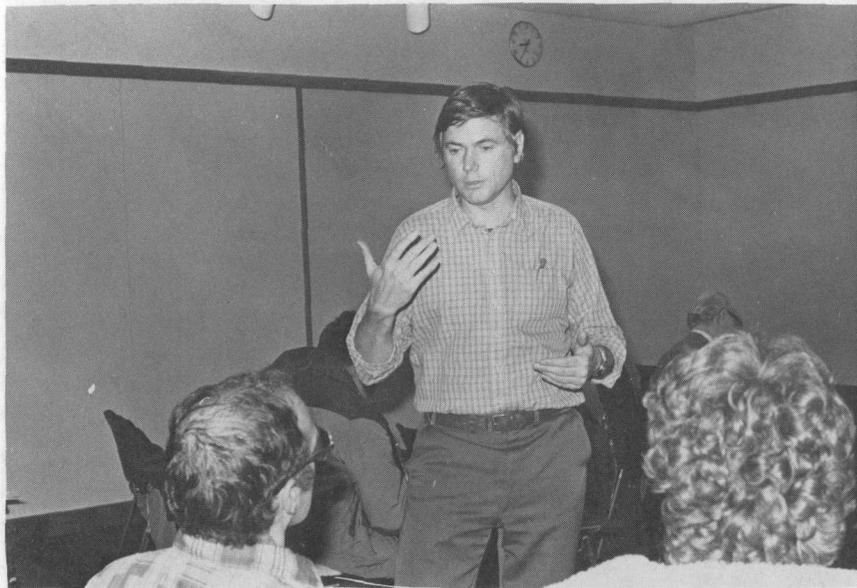


Energy Extension Agent Dave Burtner answers questions of participants in a Master Conserver workshop on solar water heating

needs include micro hydro systems, energy conservation in irrigation (of pasture land and cranberry bogs, or with center pivots), wind power development, photovoltaics, heat pumps, solar pool heating, and energy-conserving windows. The early interest in alcohol fuels and wind (in all regions) has been superseded by micro hydro and wind in specific regions where there is a significant resource. Courses cover theory, design concepts, construction details, performance, calculation of economic payback periods, and consumer protection. Local examples, "common errors of do-it-yourselfers," and question-and-answer periods are commonly used.

The MC courses are now stand-alone, two- to three-hour slide-assisted presentations by the agent or an occasional outside specialist (including another agent). Seven classes are now required including five core presentations and two electives.

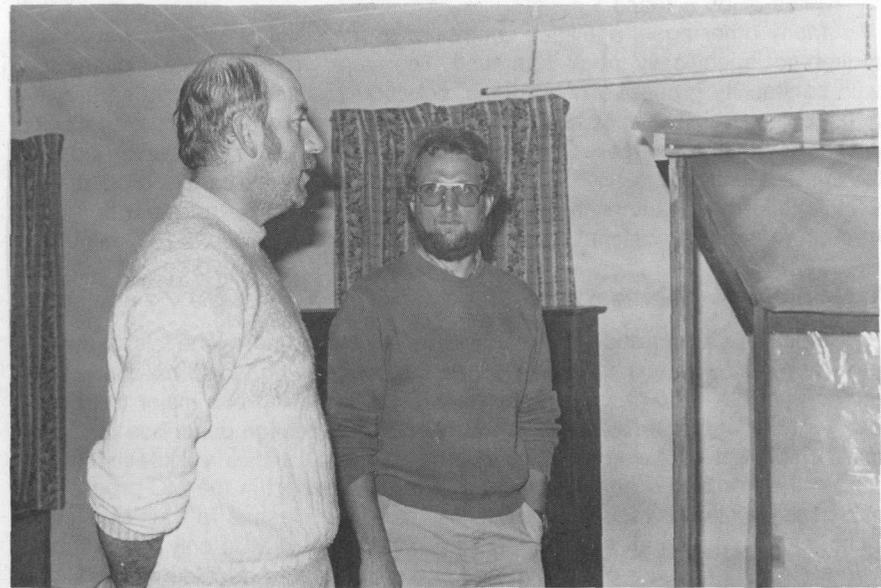
The training efforts of the Lane County pilot program were much less elaborate than those of the Portland program. The Lane County agent, in contrast, spent a few months developing and presenting his MC training efforts in 1981 and then concentrated upon utilization of the volunteers, as described in the next section. He describes his classes as being much less thorough in content and less polished in presentation than those of the Portland agents.



Gus Baker, Energy Extension Agent, explains super energy efficient homes to participants in a seminar in Corvallis

With the extension of the MC program to all areas in 1982, all agents are now involved in training Master Conservers. The Deschutes County agent is beginning his MC program (1982) and presently has 72 persons enrolled for MC training, with first graduates expected in June 1983. In Jackson County, the agent began the MC training program in 1980 and has conducted one or two rounds of classes per year, but he has de-emphasized MC training and certification in the past year. The East Oregon agent, with responsibility for eight sparsely populated arid counties, conducts some MC classes during part of the year. The new coastal agent conducts MC classes but expects it will be a few years before any MCs are certified.

While the large MC class development effort has been well received in the western urban areas, the Portland training effort has not been transferred to or duplicated by agents in other areas of the state. Each agent tends to develop and present his own programs using local illustrations and materials, calling upon other agents occasionally for their special substantive expertise (e.g., micro hydro or solar hot water heaters). All the agents outside of the Portland-Willamette Valley area are quite isolated in large expanses of predominantly rural territory and tend to give more emphasis to individual contact as a mode of operation rather than teaching classes.



Bruce Sullivan (right) explains his solar wood dryer to a participant in the wood heating Master Conserver workshop

### Utilizing Master Conserver volunteers

Once the Master Conservers have been trained, they are expected to "pay back" in community service an equivalent\* number of hours of volunteer service. With the exception of the first Lane County agent and the three early closed training class series, agents have generally chosen not to organize or oversee this portion of the MC "bargain," though several have worked informally with particular MCs. The Portland agents looked originally to other energy-related groups (e.g., Portland Energy Saving Center) to use and oversee time commitments by their trained MC volunteers. No formal arrangements were made to implement this expectation. During the first Portland MC classes, some time was devoted at the end of the series to brainstorming about the nature and type of projects which MCs could undertake in fulfillment of their volunteer commitment. Two forms were given the new graduates: (1) a suggestion matrix for those who wished to consider specializing in a given area and (2) a volunteer record with time-date-activity information to be mailed back to the Portland agents. These efforts were discontinued when classes were opened to the general public, since there is now no identifiable "end date" for conclusion of the MC classes. The Deschutes County agent explains the system to his MC candidates as an "honor system" and suggests guidelines for their use in devising their own projects: "helping your neighbor weatherize his house counts, but weatherizing your own does not." Most agents make occasional or ad hoc use of MCs to design exhibits and staff energy fairs or a speakers' bureau, but until March 1983 none had (with the Lane County exception) organized a major effort to utilize the volunteers. "We found we didn't need that many volunteers," said one of the more isolated agents. Beginning in March 1983, however, the new Multnomah County agent is specifically concentrating upon organizing volunteer activities for MCs in the combined Portland area.

Left to their own devices, many Master Conservers have invented their own projects. Others are still waiting to be called upon. The first Master Conserver newsletter, with suggestions for MC projects and activities, appeared in May 1983. Though most MC payback projects are thus unknown and unrecorded, known examples include helping to organize a neighborhood weatherization cooperative, compiling information for use in alternate energy efforts, conducting energy minicourses for interested organizations, or building a solar greenhouse for display at a local energy fair as shown in the photograph.

The Lane County 1981-82 storm-window-weatherization project specifically utilized 24 Master Conserver volunteers on a regular basis where they functioned as essential staff during the 16-month life of the project. The four-part program focused upon (1) delivering weatherization and program information to 1200 senior citizens in senior centers and Nutrition Sites in a major recruiting effort for existing utility audits, BPA financing, and low-income weatherization programs, (2) identifying those not eligible for other programs



Master Conservers in Jackson County build a solar greenhouse for display at a local energy fair

and constructing and installing storm windows and/or weatherstripping or caulking homes of 36 senior citizens who could not carry out their own work (see photograph), (3) developing materials for and conducting 34 "how to weatherize your home" class demonstrations in Eugene and Springfield, and (4) operating weekend storm-window workshops for citizens who built their own storm windows under supervision by MCs from materials provided at cost. The agent and a part-time staff person organized the effort, developed materials for the class demonstrations, coordinated staff and space assistance from the local utility, conducted an extensive publicity campaign (19 hours of TV time, plus radio and newspaper coverage), and arranged for regular purchase and delivery of storm-window materials to the workshops. The MCs and other volunteers spoke to the elderly groups and individuals at

\* Note that the number of hours of training is now reduced to 20 from the original 40 hours and that, as in Washington State's MC program, a general rather than specific payback is expected.

length, weatherized the 36 homes, conducted the 34 class demonstrations, and operated the 15 weekend storm-window workshops. The substantial results of this effort are detailed in the section on Program Outcomes. After a six-month gap between agents in 1982, the current agent arranged for a limited follow-on to this effort utilizing a single MC volunteer who organized six weekend storm-window workshops in early 1983.

### **Certification of Master Conservers**

Certification of Master Conservers has been a fairly informal procedure, with students asked to fill out and retain a short form available at classes for each session they attend. When they have completed the requisite number of classes, they turn in their minicertificates to the agent, who adds their names to the MC list. A certificate (see Appendix F) indicating their achievement of Master Conserver status is sent to them by the agent. No records of this process are maintained by either agents or EES, since the responsibility for establishing an attendance record is that of the student. Agents do maintain lists of certified Master Conservers. Somewhat greater formality has been proposed because of losses of information about MCs during agent turnover and because of certification delays for MCs who have completed all course requirements.



Oregon Master Conserver installs storm windows at home of senior citizens

### **Materials**

Agents are encouraged to upgrade their handouts for MC classes to meet OSU's "Energy Notes" format. A great deal of effort has been invested by some agents and the communication specialist at Corvallis in the production of 27 Energy Notes. This process includes the researching, writing, reviewing, editing, rewriting, and eventual publication of these materials. These publications range from one to eight single-spaced pages. Typical titles in the Energy Note series are:

- Heating Domestic Water with Wood
- Solar Space Heating for Existing Homes
- Energy Efficient Residential Construction Details
- Micro-Hydropower Reading List
- Solar Wood Dryer
- Master Conservers: Who They Are/What They Do

Several agents note that the large effort invested in the production of the Energy Notes has a double benefit in that the information collected in this form is also useful in their other efforts, especially the Consumer Response program.

### **Sponsorship and networking**

All agents develop and utilize an extensive network of formal and informal contacts with communities and groups in developing, arranging, and publicizing their programs. Local advisory committees and sponsorship are two of the more formal arrangements commonly used.

Following Extension's pattern, all agents convene and consult their local advisory committee to receive suggestions for programs and course content. These advisory committees usually include representatives from local utilities, alternate energy businesses such as solar technology companies, alternate energy volunteer groups, one or more educators from high school or community college faculty, and some members of the general public or business community. Some agents ask their committee for specific assistance or advice as well as general program review and suggestions.

Cosponsorship of EES activities by local organizations and institutions is regularly sought and is also a standard mode of Extension operation. Members of local advisory committees may also represent sponsors of MC programs. For instance, the list of cosponsors of the Portland area MC classes in 1982 included a community college, Oregon Museum of Science and Industry, two local school systems, a solar energy association, Bonneville Power Administration, Oregon Department of Energy, and eight local utility districts. The support provided by sponsors ranges from an active role of providing classroom space and publicity for MC and other classes to the passive role of allowing use of their name. With at least one sponsor, the relationship

is a two-way cooperative one: the Oregon Museum of Science and Industry shares office space with the Portland area agents in TERA ONE, a special energy demonstration building, and urges its volunteers to take MC training.

### **Publicity**

Publicity about program offerings—classes, workshops, fairs—is almost entirely the agents' responsibility. They have all experimented with different modes and have developed different styles. Some regularly contact news media in the locale where a class is to be offered, some publish a brochure listing the courses and other programs scheduled for each quarter, and three agents in rural areas publish their own newsletters, while two others contribute to County Extension newsletters. Some send individual notices to their mailing list in the appropriate area. In some cases, particular local sponsors take responsibility for local publicity when the agent travels to the community to present a program. The communication specialist in Corvallis provides support when requested, by preparing news releases and photographing the events for later publication or use. She also prepares most of the program-wide releases and material about the EES for use in Extension activities and reports.

### **Relationship to Other Programs**

Relationships to both other internal (EES) programs and external (Extension Service) programs have significantly shaped the development and delivery of the Master Conserver program. See Appendix H for a diagram showing these relationships.

The decision of the Portland agents to integrate MC programs with their Consumer Response and Small Business programs resulted in the development and use of MC training classes as the major public program of the EES in their districts. The Portland agents have developed a common calendar for all their public programs (see Appendix J) and have merged their three program efforts in other ways. For instance, they may refer inquiries for information (Consumer Response) to the next MC public program on the subject in the inquirer's area. Such inquiries, in turn, shape the content and nature of the MC programs. Small businessmen, builders, and contractors were likewise urged to attend MC classes, and special information was developed for their use.

In addition to these MC courses, most agents also give shorter, less-detailed presentations as part of their Consumer Response program at the request of local organizations or community colleges. Some also give more detailed technical sessions (solar mapping) for special interest groups such as builders, contractors, and designers as part of their Small Business program.

Most agents use the Extension network to good advantage in order to develop contacts, sponsors, and other assistance, as previously indicated. Cooperation with other extension agents is well developed among the more rural agents, most of whom have cosponsored classes with their counterparts in agriculture (irrigation), forestry (wood heat), or home economics (weatherization, energy-efficient homes). Their office space and other assistance are provided by the local county. Agents outside the Portland area have much more daily contact with other extension agents than they do with their EES counterparts.

### **The Decision-Making Process**

The decision-making process regarding program decisions varies according to whether policy making or implementation is involved. Agents were not involved in the setting of the original program objectives (see the section on Origins). However, they play a major role in setting their own goals for implementation of the program and have considerable power in reviewing or challenging program objectives at quarterly meetings of EES staff. Agents are in control of the mode, manner, and degree of implementation of programs. Hence, they determine the real nature and success of any program because they determine day-to-day priorities and the actual deployment of program resources. An ODOE sponsor described this process as "bottom-up management." This agent autonomy explains in large measure the variability in MC program implementation as well as the creativity, skills, and energy shown in program development.

### **Evaluation**

Evaluation of the MC program is conducted both internally and externally. Internal evaluation occurs on two levels—informal ongoing evaluation by agents after each program and occasional formalized use of participant comment sheets after a class. In addition, each agent may include evaluation plans in his yearly plan of work. The numerous changes in nature of the MC program, how it is administered, and the differing emphases given the program by different agents have all resulted from the internal evaluations conducted by agents and the EES staff.

Agents have also cooperated with formal OSU evaluations of portions of the MC program (e.g., a solar hot water publication) and of the Consumer Response program. Use of an independent subcontractor such as the OSU Survey Research Center is regularly scheduled to "evaluate the effectiveness of (both) specific programs, for example, solar water heating and micro-hydropower seminars...(and) delivery methods such as telephone response, on-site counseling, videotapes and newsletters" (OEES plan, 1982–1985).

## **ADMINISTRATIVE AND FUNDING STRUCTURE**

### **Personnel**

Staff to implement the program included the six energy extension agents, part-time secretarial help available to each agent at the County Extension Office, and EES central staff located at Corvallis. The latter include the EES program leader, a technical specialist,\* and a half-time communication specialist. All agents and specialists are faculty of Oregon State University, the technical university in the state system.

Agents and specialists are a versatile, highly skilled group with training and background in a minimum of three of the following areas: education, renewable energy technologies, business, engineering, environmental management, and extension activities. All have well-developed skills in personal and group communication and the ability to create and maintain networks of contacts with communities and groups in their areas. Despite variation in background and experience, agents were alike in displaying high levels of commitment, energy, and resourcefulness in pursuing their particular programs. They list the advantages of their jobs as including the freedom to make decisions and develop programs, the self-pacing nature of the work, contact with the public in a helping or teaching role, and the high quality of those with whom they work.

### **Reporting and Monitoring Procedure**

Fairly simple reporting and monitoring procedures provide the EES director with a monthly one-page report from each agent and specialist. Information is sought concerning number of classes held, class attendance, meetings of the advisory committee, and time spent in staff training or evaluation, preparing a newsletter, or writing Energy Notes. The student-managed nature of the MC certification process also simplifies reporting and record keeping for the field staff. Because of the all-purpose nature of the current MC public programs, registration cards are used to help sort out the interests and needs of attendees.

### **Budgets and Funding**

Funding for the MC program has increased steadily since its inception in 1980 from \$43,000 to \$95,000 in 1982. The MC percentage of the overall Energy Extension budget has likewise increased from 17% to 28% in that period, while the projected target for the next two years is 40%. Part of this

\* A second technical specialist was added in March 1983 with the transfer of one of the original Portland agents.

percentage increase is a result of program consolidation in 1982, when the Builder-Contractor program was eliminated as a separate category.

Budgets for the next year are drawn up by the EES director and approved by OSUES, ODOE, and federal sponsors. Once the yearly funding and budgeting decisions have been made by outside sponsors (DOE and now BPA) and by ODOE managers, there is little impact on normal program administration and operation, except for some budget flexibility which occurs whenever a staff position goes unfilled for some period. This flexibility resulted in unexpended funds which enabled the first Lane County agent to hire a three-month staff assistant for the storm-window project, for instance.

With the advent of a new principal funder—Bonneville Power Administration—specific alterations in direction and emphasis are occurring. BPA's interest in 1982 was in encouraging conservation of *electrical* energy among its customers, in accord with the Northwest Regional Power Act of 1980. Hence, its goals were less inclusive than the original charge of the EES. The current power surplus in the Northwest may bring further changes in policy or implementation directives. BPA also provides a wide variety of its own conservation and weatherization literature to EES agents and views agents as an additional major distribution channel of such information to its customers in the Oregon service area.

## **PROGRAM OUTCOMES**

The results of the three-year Master Conserver program effort are considered in this section in terms of intended and actual target audience, expected and unexpected effects, and quantifiable and nonquantifiable outcomes. Outcomes to date are viewed from the perspectives of the various participants and actors in this still-evolving and developing program, as well as of the author of this report.

### **Target Audiences**

Though the intended target audience of the MC program was the general public, the actual segment of the public reached has varied with the evolutions of the program itself. The Energy Extension Service was expected to serve Extension's traditional clients as well as attracting a new audience (OEES, 1982-1985). The proportion of women taking MC training declined from about half in the first closed classes to about 20% or less in the open classes in 1981. Early MC classes attracted a younger group of participants. For instance, 75% of the second class of MCs were age 40 or younger. By the estimate of the Portland area agents, current classes attract a large proportion of homeowners whose objectives are energy improvements in their own homes. Two-thirds of the second MC class listed their intended use of what they had learned as being directly related to home improvements. In

response to participant feedback, the course material has become increasingly oriented toward the do-it-yourself homeowner. This audience is predominantly male and well educated. The use of the lengthy class format tends to restrict attendance to more highly educated persons who are at ease with this mode of presentation (Boaz 1978).

Occupational identifications available for the 1980 MC classes and for four selected spring 1981 classes indicate that 20 to 30% of attendees were builders/contractors/real estate people, 8 to 20% had energy-related vocations, 10 to 14% were in education, 12 to 20% were in engineering/data management/technician positions, while 8 to 14% were in blue collar occupations (Burtner and Baker 1981). These results are also consistent in occupational category with those found in studies of U.S. participants in adult and continuing education; they tend to be from white collar and professional occupations (OECD 1977). Since these identifications were available for an average of only 37% of those attending the four sessions evaluated in spring 1981 and were more heavily weighted with master conservers, they may not be representative of all those who attended, however.

## Class Attendance

The number of persons contacted through the MC program can be viewed through three different types of data: total number of persons enrolled and certified as Master Conservers, class attendance since classes have been opened to the public, and persons contacted by Master Conservers through their volunteer work. Much of this information has not been collected or compiled, as previously indicated, but Table 2 shows that which is available.

Class attendance totals for all Master Conserver classes were about 2800\* and 5900 in the years 1981 and 1982, as shown in Table 2. It is estimated that about 25% of those attending were also enrolled in MC certification efforts, on the basis of three selected 1981 classes on which special data were collected.\*

\* These totals do not include several hundred attendees at other agent presentations for the Small Business or Builder/Contractor programs, general presentations, or technical forums.

Table 2. Master Conserver class attendance, certifications, and contacts, by year

	1980	1981	1982	1983
Class attendance		2767—all counties	5900—all counties	Not yet compiled
MC enrollees	75—Portland area	94—Portland area	104—Portland area	72—Deschutes Co. area 20—coastal counties 50—Lane Co. area
MCs certified	50—Portland area	32—Lane County 85—Portland area	48—Jackson Co. 31—Portland area	20—Yamhill & Clatsop Co.
MC contacts (Lane County)	NA	1200 senior citizens 311—weatherization seminar attendees 40 families—storm-window workshops	16 families—storm-window workshops	
Other counties	NA	NA	NA	

## Energy-Saving Actions

Energy-conserving actions taken and energy or economic savings have been estimated and/or compiled both for the Lane County program and for the most developed and most popular class, the solar hot water (SHW) heating presentation. These are shown in Tables 3 and 4, respectively, along with

Table 3. Results of Lane County storm-window and weatherization projects, 1981 and 1982

<u>1981 senior citizen WARM program</u>	
1200 senior citizens contacted, given information	
36 homes of senior citizens weatherized and/or storm windows installed by MCs	
2500 square feet of storm windows constructed, installed by MCs	
<u>1981 do-it-yourself WARM program</u>	
34 weatherization seminar demonstrations by MCs	
311 residents attended	
40 families attended build-your-own storm-window clinics	
6000 square feet of storm windows constructed	
Total Savings, 1981	\$38,000 avoided costs* for storm windows (76 x \$500 per home) \$5100 energy saved per season—storm windows only (\$59 per 100 square feet of storm window installed)
<u>1982 do-it-yourself HEAT program</u>	
16 families build own storm windows	
1341 square feet of storm windows constructed (98 windows)	
Total Savings, 1982	\$ 8000 avoided costs \$ 780 energy saved per season

\*avoided costs are the difference between cost of commercially available storm windows and the material costs for storm windows constructed in the workshops.

Table 4. Results of solar water heating classes inferred from follow-up sampling

	Spring 1981	Spring 1982
Percent having acquired solar water heating system	15	23 ( $\pm 10\%$ )
Percent planning to acquire SHW system	75	56
Estimated number of all attendees acquiring SHW systems		820
Estimated energy savings @ 2000 kWh per system per year, kWh		1.7 million

additional information about the results of each of these efforts. The storm-window workshops resulted in the most definable savings of money and energy for participants, with over \$46,000 in avoided costs (for storm windows and weatherization equipment) and \$6000 in energy costs saved in one season. This very conservative estimate covers a total of 76 households in Lane County (Table 3). No estimates were made for any actions or savings resulting from the 34 weatherization workshops, though some are known to have occurred.

The number of solar hot water (SHW) systems installed by persons who attended a SHW class was estimated to be 820 as of spring 1982, when a follow-up telephone survey found 23% of those sampled had installed such equipment. The energy savings estimated per season per household are 2000 kWh, for a total energy saving of 1.7 million kilowatt-hours in 1982 (Table 4), or about \$50,000 at 3¢/kWh.

## Results of Master Conserver Activities

Outside of the Lane County 1981–82 storm-window and weatherization project, there was no systematic organization of Master Conservers or directed focus to their volunteer efforts during the two-year MC training development effort, as previously described. The Portland agents worked informally with some MCs in designing MC service, but no records are available as to the accomplishments of MCs. See discussion in the section on Design and Implementation of the Program on the type of MC volunteer payback projects which are known to have occurred.

One specific outcome of this situation has been the hiring of a replacement agent in the Portland area (March 1983) to specifically organize the previously undeveloped volunteer aspects of the MC program. Another outcome has been the sharp reduction concerning MC volunteering expectations among program managers. The program's goals for 1982-85 list the following among expected impacts on behavior: "to have 30% of those completing Master Conserver program volunteer at least 20 hours in energy-related public service" (OEES 1982-85). This estimate is both lower and more precise (30% of MCs) than were earlier estimates.

Master Conservers have put their training to use in other ways besides volunteering their time to share information with their fellow citizens. Vocational and home improvement applications are the two known principal uses of their training. For instance, five of the six Master Conservers interviewed for this case study were using their training currently in their present job. Four of these had entered a new job for which they used their MC certificate and training as job experience and qualification. When asked at the end of their training how they intended to use their MC training, as many as 75% responding mentioned home improvement or do-it-yourself-type applications (Burtner and Baker 1981).

## **Publications**

The publications on alternative energy systems produced by the agents are a continuing and well-used resource within the state of Oregon. Demand for Energy Notes, for instance, is fueled by MC classes, Consumer Response requests, and republication and distribution by other sponsors. Portland agents report that they have distributed 4700 copies of Energy Notes in the last 13 months. They also distributed Energy Notes to each of the ten County Extension Offices in their districts for use by other extension agents in responding to energy-related inquiries. Another agent has advertised the entire listing of ENs in his newsletter. At least 1700 Energy Notes are estimated to have been distributed to the 850 participants in micro-hydropower seminars alone. A significant additional distribution occurs through republication and distribution by utility sponsors to their own customers. One of the 27 Energy Notes has been expanded into a more widely circulated brochure in the Extension Circular series. By April of 1983, 6245 copies of Solar Water Heating, EC1081, had been distributed.

## **Evaluation and Use of Results**

Evaluation of the MC program has included formal OSU evaluations of program components and various levels of informal review by staff, sponsors, and Master Conservers. No formal overall evaluation of the program has been conducted.

The OSUES evaluation of the Solar Water Heating circular compared a sample of users and a control group in the general public. Eighty-six percent of the user group found the material helpful. Users knew significantly more about SHW systems than did the control group. It was found that 75% of the user group were men, that 7% had installed a SHW system, and that 80% planned to install. Among the control group, 50% were women, 9% had also sent for the publication, and only 1% had installed a system, while 26% planned to do so (Berg and Bodenroeder 1982a).

Evaluations of the program by staff sponsors and participants reveal generally strongly favorable responses by participants and sponsors. All the Master Conservers interviewed were highly supportive of the MC program and its value (all of these were from the early exclusive classes). Class ratings from the 1981 participants were also highly favorable, with averages ranging from 8.0 to 9.0 on a scale where 1.0 represents poor and 10.0 indicates excellent. Review of the available comments from 1980 and 1981 classes supported the agents' statements that they had incorporated or responded directly to many participant suggestions and comments as the presentations were refined and elaborated in that period. Local utilities and other sponsors interviewed (OMSI, BPA, Salem Electric) were also highly favorable to the MC program and classes.

The interrelationship of MC with other EES programs was supported by the unsolicited, voluntary mention of MC classes by 11 citizens out of 146 contacted by OSUES in an evaluation of the Consumer Response program (Berg and Bodenroeder 1982b).

All of the specific changes made in the Master Conserver program are the result of internal feedback and review conducted by agents and EES staff throughout the development and delivery of the program.

Use of results from the various independent agent program development efforts is, however, highly dependent upon the presence of that particular agent. The lack of administrative infrastructure in EES means that few mechanisms, with the exception of quarterly staff meetings, exist for transfer of learning or integration of results into ongoing programs. For instance, the departure of the Lane County agent in 1982 meant not only the cessation of the storm window weatherization effort involving utilization of MCs but also the disappearance from view within the EES of the results and meaning of this effort. The information compiled in Table 3 for this study was generally unknown and unanalyzed within EES until it appeared in drafts of this report. In all fairness, it should be noted that the departure of Osborne, the first EES program director, and the Lane County agent occurred simultaneously and that the program has functioned for an entire year with an interim director.

Since both Portland agents have remained with the program, the results of their MC development efforts (e.g., the public program series on energy

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\* One transferred to Corvallis as an EES specialist in early 1983.

conservation and renewable energy technologies) are much better known within the EES. The format and general organization of the Master Conserver program within EES are essentially those developed by the Portland agents as they sought means to train Master Conservers. The current effort to utilize volunteers in the Portland effort is likewise being developed independently by a new agent along lines unrelated to the prior Lane County utilization effort.

## Staff Comment

Staff comments and observations, on the other hand, were more critical and detailed, dealing with the problems encountered in implementing this program among their several responsibilities. The two Portland area agents noted the lack of resources and program direction in implementing the MC program, pointing out their large investment in MC class curriculum development to the exclusion of other aspects for the first two years. "We had no idea what we were training Master Conservers for at first, and had no time or skills to devote to organizing volunteer efforts in addition." They noted that when classes were opened in 1981, "we served three to ten times more people (but)...the MCs lost that cohesive, small-group feeling." These agents believe that it is not necessary to train people for 40 hours to prepare them for most kinds of volunteer work. Therefore, program directors should have the intended purpose and use for volunteer work clearly in mind before undertaking such elaborate training efforts. They feel that high-quality training efforts have merit in themselves and that integrating their multiple program responsibilities has made their tasks workable as well as resulting in programwide benefits. This view is also that of the interim program director.

The first Lane County agent felt that his storm window weatherization project had been very successful in utilizing MCs to achieve specific objectives and energy savings but noted that the quality of his MC classes was lower and his presentations much inferior to those of the Portland agents. "You have to make trade-offs when your resources are limited." Rural agents feel the Master Conserver concept has limited application in their isolated, often sparsely populated multicounty jurisdictions. Attendance at classes in Gold Beach, Lone, The Dalles, and Grants Pass is limited to much smaller turnouts than those possible in the Portland or Eugene areas, and the two rural agents (of four) still actively pursuing MC programs say it will be three or four years before a noticeable number of MC graduates is produced. Nonetheless, 72 MC enrollees have signed up in Deschutes County, and 20 are pursuing MC certification along the coast. An ODOE manager voiced the opinion that the EES agents were still learning about the possibilities of the Master Conserver program and were "just getting their feet wet."

## Outside Awards

Outside recognition of the MC program includes two awards involving one or more Portland agents. The 1982 State Environmental Quality Recognition award (awarded by Velsicol Corporation in conjunction with the National Association of County Agriculture Agents) was given to David Burtner and Gus Baker for Master Conserver program publicity and delivery. David Burtner was honored as "Outstanding New Extension Staff of 1981." Up to five such awards are given annually to OSUES's 160 extension agents or specialists. Most of Burtner's work in the years of the award was devoted to the MC program.

## LESSONS LEARNED

Among the lessons learned from the first three years' experience with the Oregon Master Conserver program are:

A. Decentralized program management and agent autonomy produce wide variations in program development outcomes. The Master Conserver program now has two separate directions:

1. high-quality public programs for disseminating energy conservation information and
2. special volunteer support and management efforts for utilizing volunteers.

B. Overall program integration objectives can markedly affect the form and function of individual programs (such as Master Conserver) when staff has the freedom and ability to optimize resource development and program implementation goals.

C. Agent autonomy and program implementation freedom are principal reasons for the high level of staff commitment, qualification, and resourcefulness.

D. A focus on utilization of volunteers can significantly extend limited program resources when project objectives are clearly defined and resources are devoted to volunteer support and management.

E. The MC program as structured was good vocational and do-it-yourself training for its graduates and provided access to the developing energy network in Oregon.

F. Organizing and directing volunteers takes a major effort and requires significant amounts of staff time. The payback in program delivery does not happen automatically or without prior organizational investment.

G. Emphasis on technical detail and precision and specific technologies tends to attract one type of audience to the exclusion of others.

H. The resource-intensive format of multiple intensive class series is not well adapted to rural settings with sparse, widely scattered population.

I. Oregonians are not interested in "general" information on energy. Oregon EES experience indicates that people want programs which

1. "are tailored to their particular needs,
2. offer conservation actions that will save money, and
3. are run by technically qualified people" (OEES 1982-85).

J. Use of local examples and curriculum tailored to local interests and concerns is a key to a receptive local audience.

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#### PRINCIPAL CONTACTS

Dave Burtner, Energy Extension Agent  
OSU Extension Service  
3821 Canyon Road  
Portland, OR 97221  
(503)241-9172

Greg Wheeler  
Extension Energy Specialist  
Mechanical Engineering Department  
406 Rogers Hall  
Oregon State University  
Corvallis, OR 97331  
(503)754-2515

W. S. "Gus" Baker  
Extension Energy Specialist  
114 Covell Hall  
Oregon State University  
Corvallis, OR 97331  
(503)754-3004

Larry Gray  
Assistant Administrator, Conservation Division  
Oregon Department of Energy  
Labor and Industries Building  
Salem, OR 97310  
(503)378-8607



## Appendix A

### OREGON ENERGY EXTENSION SERVICE GOALS

Energy Extension Service program goals recommended by the Oregon EES

Advisory Committee include the following:

- a measurable reduction in energy consumption by target audiences in target areas,
- substitution, where possible and economically feasible, of alternate renewable energy resources by target audiences,
- behavioral changes...that will lead to reduced energy consumption, appropriate energy substitutions, or incentives to invest in energy saving techniques or technologies,
- behavioral or attitude changes that will result in removal of barriers to use of new or existing technology,
- attitudinal changes by target audiences that eventually will lead to a change in energy consumption behavior,
- knowledge changes by target audiences that will lead to subsequent attitudinal and behavioral changes. (OSUES-569, p. 4)

These goals were derived from those specified in Oregon law in 1975 (ORS 469.010), which included the encouragement of the "use and development of a diverse array of permanently sustainable energy resources, the promotion of "energy conservation and elimination of wasteful and uneconomical uses of energy...(through) effective communications" and "that state government shall provide a source of impartial and objective information to enhance this energy policy."

## Appendix B

### PRIOR OREGON EFFORTS

#### SIGNIFICANT TO FORMATION OF ENERGY EXTENSION SERVICE

1. The three-year Oregon EES State Plan developed in 1979 with the aid of a 27-member advisory committee.
2. Ten outlook statements prepared by Extension specialists (1979) on energy-related topics ranging from Oregon's energy supply and demand to solar and wind power contributions to conservation within the state. Study was initiated by Director of Extension.
3. The report and work of the Oregon Legislature's Alternative Energy Development Commission presented to the Governor in September 1980 (OAEDC-1980).
4. A survey of Oregon's existing energy and conservation efforts in 1978. Some 115 activities or efforts supported by 80 groups and organizations were identified (Morgan and Osborne 1978).

## Appendix C

### WASHINGTON STATE MASTER CONSERVER PROGRAM, 1977-1983

The Washington State Master Conserver program began as one of the ten national EES pilot programs in 1977. Master Conserver volunteers were trained to perform home energy audits. By late 1978, utilities had begun taking over this function and were offering free or largely subsidized home energy audits. New functions were then devised for the Washington Master Conservers (MCs) under highly centralized management direction. After intensive recruiting, selected volunteers were given 80 hours of training in energy topics before applying for specific volunteer jobs such as assisting EES agents at fairs, conducting small group weatherization workshops, or preparing media information. A paid volunteer coordinator provided continuing support to MCs by convening their monthly meeting and by organizing and recognizing their efforts. Some 600 MCs were certified in the first five years of this program, most in the metropolitan Seattle area. With the extension of the MC program to other areas of the state in 1982, a new director, and the shift in administrative functions from Washington State University Extension Service to Seattle University, various adjustments have been made in the MC program. MC training has been scaled back from 80 hours initially to about 50 hours at present, and MC certification occurs in the year that training is completed after "some" volunteer hours have been contributed. While the recruiting of MC class No. 7 (1983) still entailed a significant effort, MC volunteer hours are no longer tracked, and records are kept only of "who volunteered for what." MCs may now complete their volunteer commitments by working for *other* community organizations (Seattle Tilth, Solar Trades Council, Washington Solar Energy Association) with energy-oriented purposes or needs. Of the 750 total Master Conservers produced by the program, some 250-300 are currently active, including some who continue to volunteer long after their equivalent service obligation has been completed. For further information about the Washington Master Conserver programs, contact Steve Denner at (206)789-5555 (first director) or Stan Price at (202)626-6225 (present director), Seattle, Washington.

## Appendix D

### SUGGESTED WAYS TO UTILIZE MASTER CONSERVERS

Possible programs to be delivered by MCs after completion of their training and for their public service obligation include:

- answering questions at public energy conservation clinics in shopping malls or at fairs;
- organizing and conducting neighborhood workshops or clinics on wood heating, solar water heating or building solar greenhouses;
- organizing and conducting neighborhood "do-it-yourself" work parties on home energy analysis, insulation, caulking and weatherstripping, etc.;
- assisting small business owners in conducting "do-it-yourself" work parties; and
- recruiting additional volunteers for the MC program and assisting in volunteer training. (OSUES-State Plan-569)

**Appendix E**  
**MASTER CONSERVER FACT SHEET**

**Energy  
 Extension**

**Fact Sheet**

*Updated July 1982*

Since the Oregon State University Extension Service energy program began in 1980, the energy Extension Agents have provided information and direct technical assistance to more than 21,000 Oregonians. Educational programs have been directed to small energy consumers, to individuals and business operators, and to groups that influence energy consumption.

Like all other activities of the Extension Service, energy programs receive local guidance through advisory groups. These citizens represent businesses, energy suppliers, educational institutions, and consumer interests.

**PROGRAM ELEMENTS**

The Extension Service energy program has three distinct elements:

\*A *Consumer Response Program* provides counseling and a referral service for individuals with energy conservation questions or concerns. Help is provided on understanding incentive programs, deciding merits of do-it-yourself projects and feasibility, safety and other considerations of using renewable energy devices.

\*A *Small Business Program* provides seminars, workshops and on-site counseling in energy management to small business operators in cooperation with the Oregon Department of Energy Clearinghouse for Commerce and Industry and appropriate trade associations. A primary focus is on builders and contractors, who are small business operators in a unique position to influence energy conservation. Information and educational sessions are provided for many professions related to building trades such as realtors, appraisers, designers and accountants.

\*A *Master Conserver Program* provides energy training to interested volunteers. Those who complete a core curriculum of five courses plus two electives of their choice will be awarded a certificate recognizing their completion of the program. A quarterly newsletter providing energy information and a report on activities of other Master Conservers is sent to all who complete the course. Graduates are encouraged to volunteer time in community energy activities equal to the amount of their classroom time.

All Master Conserver classes are open to the general public. Anyone interested in a particular topic without pursuing the full course is encouraged to attend that session.



Extension Service, Oregon State University, Henry A. Wadsworth, director. Produced and distributed in furtherance of the Acts of Congress of May 8 and June 30, 1914. Extension work is a cooperative program of Oregon State University, the U. S. Department of Agriculture, and Oregon counties. Extension invites participation in its programs and offers them equally to all people.

**Appendix F**  
**MASTER CONSERVER CERTIFICATE**

**Certificate  
 of  
 Training**

OREGON STATE UNIVERSITY  
*Extension Service*

This certifies that

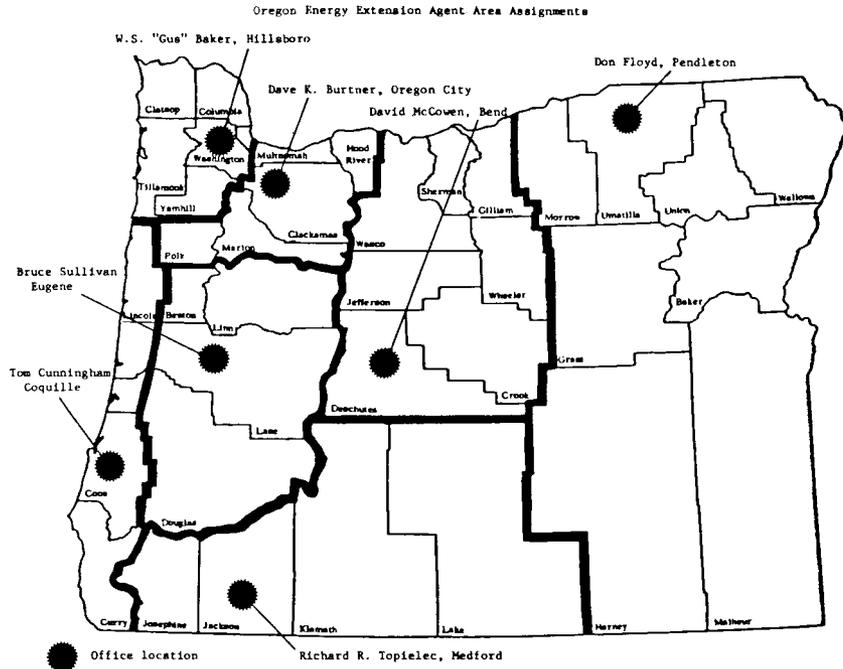
\_\_\_\_\_ has satisfactorily completed the  
 Energy Master Conserver training program.



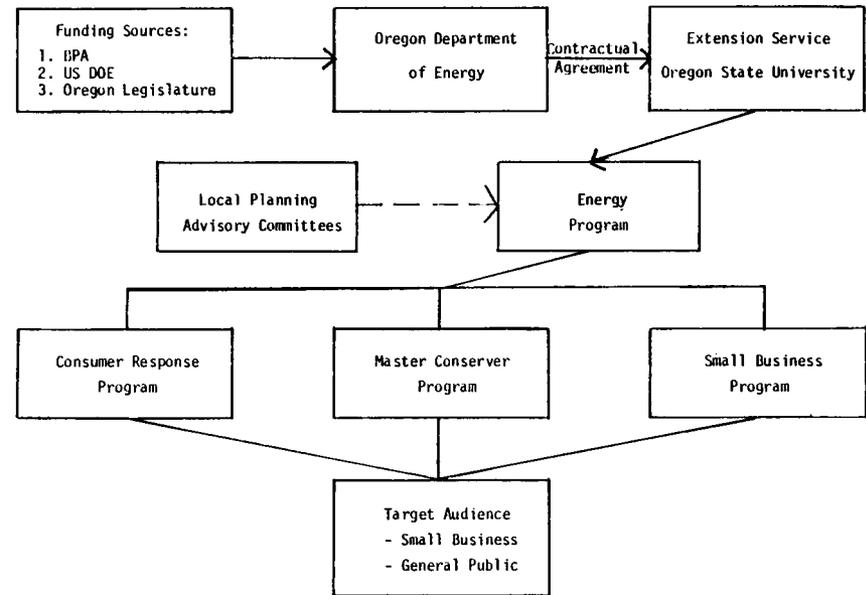
Signed and dated this \_\_\_\_\_ day of \_\_\_\_\_, 19\_\_\_\_

\_\_\_\_\_  
 Energy Extension Agent

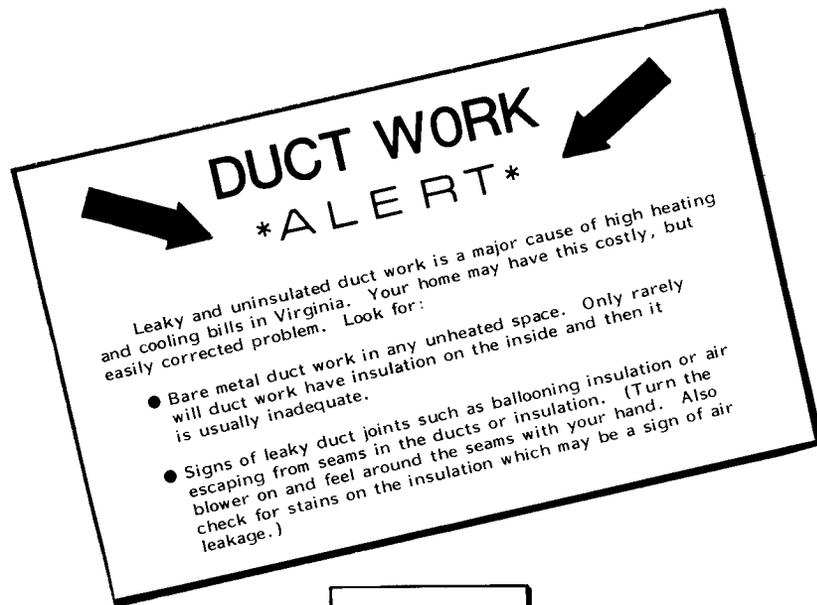
**Appendix G**  
**AGENT LOCATION MAP**



**Appendix H**  
**OREGON EES PROGRAM ORGANIZATION**



# 5. THE VIRGINIA HEATING CONTRACTOR WORKSHOPS



**TRICKS  
OF THE  
TRADE**

## INTRODUCTION

On October 26 and 28 and November 3 and 4, 1982, the Virginia Office of Emergency and Energy Services (OEEES) conducted four one-day workshops for individuals engaged in businesses providing residential heating services (fuel, maintenance, or installation). The idea for the workshops originated with the OEEES and was funded by the U.S. Department of Energy (DOE) Energy Extension Service (EES). The program is particularly interesting because it combined a frequently used method for transferring conservation information—the workshop—with aspects of a problem which is one of the most crucial in the overall energy situation—the provision of adequate residential heating at affordable prices.

## BACKGROUND

As in many states, Virginia has a large number of homes which heat with fuel oil. According to the 1970 U.S. Census, 676,000 homes (49% of total) used fuel oil, whereas in 1981 the number of homes using oil heat was estimated by the OEEES to have dropped to approximately 600,000 or only 40% of all Virginia homes. Substantial increases in usage occurred for gas heating, which increased from 423,000 to an estimated 600,000 homes in 1981, and electricity, which grew from 124,000 to 300,000 homes. While no figures are available on types of heating systems being put in new homes, it is known that the trend in Virginia is away from oil and toward gas and electricity. The impact on the oil dealers has been substantial, with many of the smaller firms either going out of business or being bought out by larger firms. Many of the survivors are expanding their businesses into installation work and are also moving to include gas furnaces and heat pumps in their line of business. While prices of competing fuels were probably an issue, other factors, such as fuel availability and aggressive marketing by competitors, also probably played a part in shifting the public's allegiance away from oil.

Thus, fuel oil's competitiveness—and future—was in serious question. Workshops to encourage oil dealers to implement conservation measures in

This case study was prepared by Robert B. Braid, Jr., utilizing information from a variety of sources including a site visit conducted April 5-7, 1983.

home heating systems not only could reduce oil consumption but might produce financial savings for the homeowner and added maintenance business for dealers as well as extend the operating life of existing oil furnaces. Fortunately, the public mandate of the OEES to increase energy efficiency seems to have been supported by the public's desire to save money and the industry's interest to secure business.

In this context, the Heating Contractor Workshops Program had its genesis in a 1981 effort of the OEES in which the office presented 11 workshops aimed primarily at heating oil dealers. This earlier effort was associated with a broader DOE program and, as described by the program coordinator, sought to "assist oil dealers in providing quality maintenance and modification to improve the operating efficiency of home heating systems."

The OEES felt there were two reasons for putting on a new series of workshops designed to encourage conservation in home heating systems. First, the energy office believed that the original workshops' focus on the oil dealers should be expanded to include heating contractors, electric and gas utilities, and others interested in home heating issues. In this manner a broader audience of people from the heating business would be hearing the conservation message. Second, the OEES felt that the heating industry, which is generally slow to innovate or change, still needed exposure to the kind of perspective provided by workshops in order to maintain the conservation efforts already under way.

It should be noted that the Virginia OEES has conducted an educational effort since 1979 aimed at providing those in the home heating business with information about the latest proven techniques and equipment for achieving increased conservation in residential heating. One method for providing this assistance has been through periodic mailings of brochures about specific problems or technologies related to home heating. These information brochures go to approximately 1200 dealers, contractors, and utilities in the state. A second method is to provide, on request, "bill stuffers" to these businesses, who, in turn, distribute them to residential customers. The bill stuffers are designed to stimulate interest in a specific energy conservation issue associated with home heating while at the same time increasing business for the dealer, contractor, or utility. A third method has been to provide consultation services with OEES staff for dealers and contractors when they have questions about conservation-related home heating issues. A hot-line service has been used, but, frequently, callers have simply telephoned particular OEES staff they knew were knowledgeable about the problem at hand. Heating Contractor Workshops were another effort within this broader program to increase the interest and knowledge about conservation of those people involved in the home heating business.

Credit for developing the Heating Contractor Workshops goes to the Virginia OEES and particularly to its director, Temple Bayliss, who had maintained a long-term professional interest in home heating technology. Bayliss

knew that various conservation-related advances in knowledge were being made at such places as DOE's Brookhaven and Oak Ridge National Laboratories and believed that the advances needed to be brought to the attention of those in the home heating business. In effect, Bayliss was serving as a technology transfer agent. His greatest interest was in the flame retention burner, and information about developments in this technology was included in the workshops.

While the Heating Contractor Workshops were the creation of OEES, others were involved in the development of the effort. The \$13,000 necessary to fund the endeavor (see Table 5) was provided by Virginia out of EES funds received from DOE. These funds primarily paid for consultants/ instructors, mailings and handouts, and OEES salaries and overhead. DOE also provided limited assistance regarding financial reporting and contracting procedures but, otherwise, played little active role in the program. One of the two consultants hired to provide instruction at the workshops also contributed significantly to developing the technical side of the workshop. He had participated in the 1981 workshops and authored several "Tricks of the Trade" pamphlets on conservation in home heating systems for the OEES. Unlike the 1981 workshops where the Virginia Fuel Oil Institute, a trade association of heating oil dealers, had helped provide some of the stimulus and support, this

Table 5. Costs of Heating Contractor Workshops

Item	Cost
Contracts for instructors	\$ 6,961
Postage, printing, Xerox costs	420
Handout materials	
Xeroxed materials—2 days part-time help	144
Folders	25
Tricks of Trade series (OEES stock)	
OEES personnel	
Program coordinator, 70% of 2.5 months	2,200
Clerical support, 1 month	1,000
Travel, 3 overnight trips, transportation, lodging, meals	300
OEES overhead	2,000
	<hr/>
	\$13,050

Source: Holly Mouer, Program Coordinator

group played no active role in the Heating Contractor Workshops in 1982. This occurred for two reasons: the director of the fuel oil institute had since retired, and the OEEES program managers sought a broader audience than just heating oil dealers. Thus, the OEEES effort in 1982 was independent of any technical support or promotional assistance from trade associations or other external groups.

## PROGRAM ELEMENTS

According to Holly Mouer, program coordinator, the Heating Contractor Workshops had a single goal, which was the conservation of residential fuels. Three objectives were established to accomplish this goal:

1. Upgrade heating technicians' skills in servicing and installing efficient equipment.
2. Provide salespeople and technicians with information to assist them in choosing the most efficient systems for their customers.
3. Introduce high-efficiency equipment and service techniques to those technicians whose companies are expanding their services to include additional types of heating system.

One instructor saw these objectives in terms of making contractors aware of some of their current practices which were not really working in a cost and energy-efficient sense. The idea was to show contractors inexpensive changes which will be energy-efficient yet present low risk to their firms in the form of mistakes which require expensive callbacks.

The objectives were all very applied and designed to help service or sales staff in the field. The focus was to transmit specific information about energy conservation and to sell conservation to workshop participants on the basis that energy efficiency would be good business over the long term.

The target audience for the workshops comprised those people engaged in providing the home heating market with fuel, maintenance, or installation. The implicit audience, however, was the homeowner who is the consumer of energy. Heating oil dealers had been the focus audience of the 1981 workshops, but the 1982 effort was directed at contractors also, who were likewise felt to have considerable influence in shaping the home-owner's heating system decisions in directions favorable to conservation. Thus, the workshops were designed as a focused program to influence the relatively small number of heating professionals who could implement conservation measures, as opposed to a broad-brush approach to persuade the public as a whole.

The promotional effort to reach heating oil dealers and heating contractors was through letters sent by the OEEES over the signature of either Temple Bayliss or another appropriate OEEES staff member. The letters went to

approximately 1200 individuals on a mailing list compiled from membership rolls of trade organizations and phone book Yellow Pages. This list was the same as that used to send out periodic OEEES energy-related brochures and sample bill stuffers.

The agenda for the one-day workshops is set forth in Table 6. Much of the presentation related to the basics of home heating, and emphasis was placed on understanding and treating home heating as a system rather than simply a variety of separate pieces of equipment. When particular heating systems or components were being discussed, any recent developments were

Table 6. Agenda for Heating Contractor Workshops

8:30	Introduction	—What is our perspective? What can you expect from this program? Buildings as systems
	Efficiency	—What does it mean, how to measure it, and how to make it better
	Sizing	—Methods and examples
9:30	Selection and Application of Heat Pumps	Air distribution Grilles and registers Duct and fittings Duct design Extended plenum Equal friction
11:30	Lunch	
12:30	Add-On Heat Pump	Design Application Operation
1:30	Retrofit Schemes and Hardware	Burners Timers Controls Zoning and other tricks New boilers/furnaces
3:30	Conclude Workshop	

included. The integrating theme throughout the day was the conservation message in the form of increased efficiency in choice of hardware and in upgraded maintenance procedures. Items which received emphasis included ductwork (particularly the importance of sizing), regular and add-on heat pumps, flame retention burners, and timing devices. While the 1981 workshops had dealt only with oil heat systems, the 1982 program included gas systems and heat pumps, thereby increasing the target audience of contractors, homeowners, and utilities but reducing the earlier imperative of conserving home heating oil, which had then just escalated rapidly in price because of the Iranian revolution in 1979.

The cost to each attendee was only \$10, which helped pay for lunch and workshop materials. Materials provided to contractors included a lengthy document discussing the technicalities of different heating systems and components, three "Tricks of the Trade" booklets on oil burner efficiency, gas heater efficiency, and heat pumps (Fig. 2), and a ductulator, a device used for calculating the correct size of ductwork needed for a particular system.



Fig. 2. Materials used in Virginia Heating Contractors Workshop

## PROGRAM ADMINISTRATION AND OPERATION

Virginia's Heating Contractor Workshops Program was a relatively modest affair and did not require substantial staff support. No organizations other than the OEES were used in implementing the workshops, although two consultants were hired to teach the seminars and prepare the associated documents. The potential audience of contractors was small and the duration of the program limited to four identical workshops spread over just ten days' time. Thus the program was very focused and could be conducted with minimal personnel and funds.

The formal OEES organizational chain of command (Fig. 3) was long for such a small agency and program, but the actual decision-making group was somewhat smaller, with Bayliss, Wheary (EES Branch Chief), and Mouer comprising the OEES staff actively involved in guiding the program. While one is tempted to use the term "triumvirate" to describe this decision-making setup, the actual process was more of a two-headed leadership (Fig. 4) with Wheary providing program guidance and Bayliss offering technical guidance and overall inspiration. Wheary's input followed the formal organizational hierarchy normally operating in such a program. Temple Bayliss's role, however, was different from what might be expected of the director of an energy office. As the creator of the overall effort to upgrade the knowledge of Virginia heating contractors and dealers, of which the 1982 workshops were but a part, and an individual with a strong personal interest in heating technology issues, Bayliss's role was essentially that of a mentor determined to see the program succeed. Bayliss's close association with the workshop was reinforced by the fact that he and Mouer rode in the same car pool, thus

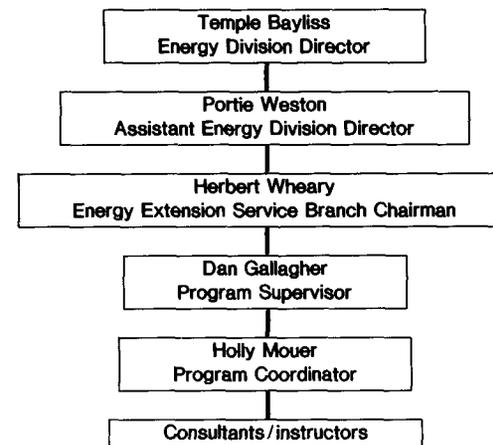


Fig. 3. Formal OEES organization of Heating Contractor Workshops

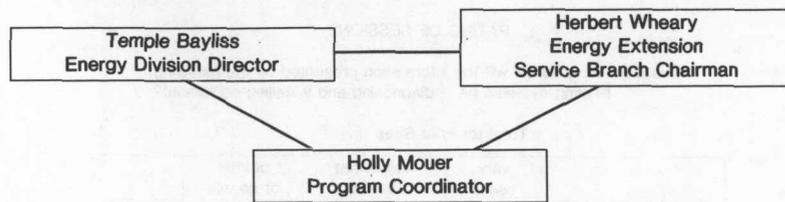


Fig. 4. Informal OEES leadership of Heating Contractor Workshops

providing him the opportunity to consult directly with Mouer while by-passing the normal top-down filtering process occurring in hierarchical institutions. The OEES is a small organization in which all staff members know and work with one another, and this situation apparently enabled the Wheary-Bayliss dual leadership structure to evolve and operate. This arrangement was not unique to the workshop program within the OEES. Bayliss and Mouer are shown in the accompanying photograph.

In its operation of the program, the OEES had little if any involvement with external organizations. The public was far enough removed from the program that it had no familiarity with or impact upon the effort. Except for a few individuals whose advice was sought, heating dealers, contractors, and utilities had no involvement in the program's inception and only rarely sought to affect its administration. The program content, however, was influenced by input from selected contractors and the instructors, and by the results of a planning workshop attended by the branch chief which dealt with energy conservation opportunities associated with HVAC systems, especially ductwork. Because of the competition among those engaged in providing different types of heating systems (oil, heat pumps, gas) there was some understandable nervousness among workshop attendees representing each heating system regarding what instructors might say about their particular part of the business or what information the OEES might be providing the public through the hot-line services or informal consultation the agency offered. These problems were negligible; indeed, the different perspectives helped stimulate good debates, and the OEES conducted the workshops with few difficulties. Even the Virginia Department of Transportation, of which the OEES is a part, took a hands-off approach toward the program, as did the governor's office and the legislature, which were apparently unaware of the workshops' existence while they were being designed and presented.

Because of the brief duration of the program, no formal reporting or monitoring procedures were established. An effort, however, was made to gauge the effectiveness of the workshop presentations in the form of brief question-



Holly Mouer, Program Coordinator, and Temple Bayliss, staff of the Virginia Heating Contractor Workshop

naires completed by attendees at the end of the day's activities (Fig. 5). The questions tended to be rather general, which limited their utility for any kind of meaningful evaluation, but the results are still of interest. Marty Farber of the OEES compiled a summary of the usefulness of the workshops, as indicated by participants representing each heating system (Fig. 6). While this compilation represents the only attempt to measure workshop effectiveness to date, the OEES may conduct follow-up interviews with attendees at a future time—a procedure it normally uses.

Because the focus of the Heating Contractor Workshops was to be a practical approach to achieving greater efficiency in home heating systems, the OEES sought experts outside the agency with the requisite knowledge about heating efficiencies plus the ability to teach that knowledge to heating dealers, contractors, and utility personnel. The OEES advertised through a "Request for Proposal" and had five responses from among 18 firms which sought information. From among these five, the agency selected two. Their fees amounted to \$3795 and \$3166, respectively, all of which was funded by the Energy Extension Service. The contractors were responsible for teaching the entire one-day workshop (see photograph), preparing the teaching materials, and providing teaching aids. One contractor had not worked with the

1. I represent: (check one)  
 \_\_\_\_\_ a contractor (type) \_\_\_\_\_  
 \_\_\_\_\_ an oil dealer \_\_\_\_\_  
 \_\_\_\_\_ equipment \_\_\_\_\_  
 \_\_\_\_\_ utility \_\_\_\_\_  
 \_\_\_\_\_ other (specify) \_\_\_\_\_

2. My position in the company is: \_\_\_\_\_

3. Number of years in this position: \_\_\_\_\_ (years)

4. The subject matter presented in the workshop was: (check one)  
 \_\_\_\_\_ too complex \_\_\_\_\_ just at the right level \_\_\_\_\_ too simple

5. How useful will the information presented on the following heating systems be in diagnosing and installing equipment? (check appropriate box)

	very useful	somewhat useful	of little or no use
a. oil			
b. gas			
c. heat pumps			
d. new equipment			

6. Did the workshop meet your expectations? \_\_\_\_\_ yes \_\_\_\_\_ no  
 If no, what you have liked more time spent on? \_\_\_\_\_

7. As a result of having attended this workshop, is there specific equipment or diagnostic and installation techniques which you will be using?  
 \_\_\_\_\_ yes (please describe): \_\_\_\_\_  
 \_\_\_\_\_ no

8. Additional comments or suggestions: \_\_\_\_\_  
 \_\_\_\_\_

Fig. 5. Evaluation form for Heating Contractor Workshops completed by each attendee

RATING OF SESSIONS

Question: How useful will the information presented on the following heating systems be in diagnosing and installing equipment?

Total for Four Sites

	very useful	somewhat useful	of little or no use	N =
a. Oil	69%	26%	5%	99
b. Gas	51%	41%	8%	92
c. Heat pumps	69%	24%	7%	90
d. New equipment	65%	31%	4%	94

Springfield

	very useful	somewhat useful	of little or no use	N =
a. Oil	67%	33%	0	18
b. Gas	33%	60%	7%	15
c. Heat pumps	60%	40%	0	15
d. New equipment	56%	44%	0	16

Richmond

	very useful	somewhat useful	of little or no use	N =
a. Oil	63%	30%	7%	30
b. Gas	45%	52%	3%	29
c. Heat pumps	68%	18%	14%	28
d. New equipment	64%	25%	11%	28

Roanoke

	very useful	somewhat useful	of little or no use	N =
a. Oil	59%	27%	14%	22
b. Gas	57%	38%	5%	21
c. Heat pumps	58%	32%	10%	19
d. New equipment	62%	33%	4%	21

Hampton

	very useful	somewhat useful	of little or no use	N =
a. Oil	83%	17%	0	29
b. Gas	65%	23%	12%	26
c. Heat pumps	82%	18%	0	28
d. New equipment	72%	28%	0	29

Fig. 6. Summary of workshop usefulness as indicated in attendee responses to questionnaire

OEES prior to the workshops. He was a retired consumer services engineer from Appalachian Power Company and had taught a short course entitled "Comfort Conditioning with Air" throughout the state. His workshop specialties were ductwork and electric heating problems. The other contractor had been an instructor at the 1981 workshops and had written the three "Tricks of the Trade" booklets the OEES had sponsored and disseminated to the trade.

## PROGRAM OUTCOMES

The Heating Contractor Workshops were a successful undertaking in the opinion of OEES staff and workshop attendees. While attempts were made to limit participants at each location to a manageable number of 25, the four workshops were actually attended by 118 participants, almost all of whom were closely associated with residential heating systems. Attendance at each workshop was the following: Roanoke (October 26, 1982), 27 attendees; Springfield (October 28, 1982), 24; Richmond (November 3, 1982), 34; and Hampton (November 4, 1982), 33. Based upon the questionnaire completed by attendees at the end of the workshop, all major components of the heating business attended, as noted in Table 7.

Table 7. Workshop attendance, by type of business

Contractors	34%
Utility reps.	25%
Oil dealers	21%
Contractor/oil dealer/equipment sales	5%
Contractor/oil dealer	4%
Propane dealer	3%
Equipment sales	2%
Oil burner service	2%
Oil dealer/equipment sales	2%
Manufacturer	1%
Wholesaler	1%
No response	1%
	101%

N = 104

As indicated in Table 8, the workshops were able to appeal to individuals representing all levels of responsibility in their firms, although the number of junior people among the technicians was relatively small.



Instructors demonstrate ductwork at Virginia Heating Contractors Workshop

Table 8. Attendees' jobs within their firms

Technicians (servicemen)	27%
Owners/general managers	20%
Service mgrs./trainers	17%
Sales mgrs. or reps.	15%
Customer service reps.	8%
Energy advisor (with utilities)	7%
Marketing reps.	5%
Government bureaucrats	1%
	100%

From these two tables it is apparent that a wide, but representative, variety of businesses and types of employment could be found in attendance at the workshops. Indeed, the workshops' focus upon the heating contractor or dealer and his practical problems understated the extent of the participants' actual interests, as demonstrated by the organizations and types of employees who chose to attend. The major variation from anticipated attendance

was in the number of utility personnel, particularly sales and customer service/advisory representatives. Utility personnel looked on the workshops as a valuable learning tool, particularly since these individuals were seldom either engineers or service people and generally had little familiarity with the technical aspects of residential heating systems.

As with workshops in general, the benefits of the Heating Contractor Workshops are difficult to establish definitively, although the modest cost of the program coupled with the large number of attendees and relative ease of obtaining energy savings through a variety of hardware and service measures make a positive benefit/cost ratio seem plausible. Considerable after-the-fact effort was made by ORNL to identify specific ways in which greater conservation of residential heating fuels was achieved as a result of the attendance of the 118 heating system professionals at the four workshops. The results can only be stated in very qualitative terms for reasons discussed below.

As mentioned earlier, a questionnaire was completed anonymously by almost all attendees at the end of the workshop (Fig. 5). While this form provides a good sense of the overall usefulness of the workshops, it does not ask the kinds of questions which would allow judgments to be made about specific benefits—in terms of energy savings or the spreading of the conservation ethic—which might be expected from the workshops. For example, a general question was asked about whether an attendee would implement any lessons from the workshop. However, a more helpful device for identifying benefits would have been a listing of specific hardware and service techniques taught at the workshop coupled with questions of whether the attendee would now implement each action and whether such implementation was a behavioral change for the attendee. Such specific targeting of potential savings beginning in the workshop would also serve to emphasize to all attendees the specific benefits of lessons taught at the workshop. This approach could have permitted a very rough estimation of energy savings produced from the workshops by multiplying an average energy saving expected from each action by the implementation rate suggested by responses to the questionnaire. It would be expected that the “good intentions” demonstrated in these responses would not always be realized, of course.

Attempting to establish workshop effectiveness through this evaluation technique would not constitute a defensible evaluation in itself because it would only record past behavior and present intent; it could say nothing about actual future behavior, and this latter point is the key to measuring program benefits. Two fairly simple additions to the evaluation process would substantially strengthen the credibility of the findings. The first addition would be to take the initial questionnaire from the workshop—with its focused, “bottom line” questions directed at key lessons in the day’s instruction—and use it in a follow-up survey of a sample of attendees between six months and a year after the workshops. The reported behavioral changes identified in this follow-up survey, as opposed to only intentions indicated in the initial survey,

would provide a sounder basis for establishing positive impacts of the workshops, although some overstating might still occur. If desired, a second addition to the evaluation would be to ask the same questions of a small sample of contractors and dealers who did not attend the workshops. The answers could be compared with those of attendees to gain additional estimates of program benefits. While this evaluation process might appear complex, the follow-up surveys of attendees and nonattendees and the focused questionnaire are the only new additions, and these surveys could be administered by telephone with only two or three days of effort.

Since neither the workshops nor the limited evaluation effort at their conclusion established specific actions to be implemented and energy savings targets, judgments about program outcomes must be qualitative. Use of qualitative measures is an acceptable way of determining program benefits, particularly when such difficult to quantify benefits such as greater awareness of conservation, more effective sales techniques, improved customer relations, and transfer of energy-efficient technologies are benefits of the program.

Conversations with OEES staff indicated an agency consensus that the program was an effective way of improving the technical knowledge of professionals in home heating systems and that increased energy conservation for the homeowner would be the ultimate result. OEES staff had several bases for this conclusion. First, it was widely believed that professionals in the heating business had much to learn from workshops which presented the latest research findings in ways that could be applied in the field. Second, the evaluation forms previously discussed as well as unsolicited verbal comments from attendees provided a strong general consensus that attendees had benefitted from the workshops. Third, sales of flame retention burners, one of the pieces of equipment demonstrated at the workshops, were known to have increased substantially, although it was recognized that any direct association of increased sales with the workshops was speculative.

In order to identify what specific outcomes could be attributed to the Heating Contractor Workshops Program, ORNL staff conducted in-depth personal interviews five months afterwards with 17 workshop attendees and telephone interviews with an additional 25 attendees, which together comprised 35% of the total program participants. The almost universal opinion of the workshops was favorable. Instructors were given high marks for accuracy of their presentation and the interest they were able to generate and maintain on the part of their audience. The “Tricks of the Trade” booklets distributed at the workshops were very well regarded. Frequent comments were that the workshops were great refresher sessions and that new people in the business, in particular, could definitely benefit from them. Numerous attendees indicated that they would want to attend future workshops; some felt that the workshops should be extended to two-day sessions, or that they should be open to the general public, or that similar workshops should be offered to commercial heating contractors. A consensus existed that the more general

*Gill Oil Company's Vice President of Sales, John Bailey, believes the public is "a lot smarter than they used to be" and that attendance at the Heating Contractor's Workshop "can keep a contractor well-informed and able to help answer customers' questions."*



*Ellington Oil Company's Sales Manager, Floyd Garrett, has found that customer acceptance of workshop advice is good in his rural area at Farmville, Virginia, where "work has to be good or everyone hears about it."*



*Natkin Service Company's Melvin Woodcock and Gene McCoy felt that the workshop instructors "did a fantastic job and managed to cover a lot of material in a short time."*



**Participating Heating Contractor establishments**

information dissemination effort of the OEES external to the workshops reflected in periodic mailings of brochures on specific energy-saving equipment or measures and bill stuffers for residential customers was an accurate and useful means of informing heating professionals and the public. Sample comments from respondents are shown in the accompanying group of photographs.

Specific benefits which attendees were able to take away from the workshops were much more elusive, however. A majority of the attendees, even when gently prodded, were unable to name specific points they learned in a workshop. Most apparently felt that the workshops simply reinforced knowledge they already had and that the workshop could not really be credited with providing them with that knowledge for the first time. A minority of attendees were able to cite specific benefits such as proper sizing and sealing of ductwork, information about heat pumps and add-on heat pumps, and improvements in energy control devices as particular contributions of the workshops. Many attendees felt their firm benefited from their workshop attendance, but almost none could indicate actual instances in which they believed their business profited directly through a sale to a customer as a result of specific lessons they learned from their workshop attendance. This lack of immediate payoff is not as surprising as it may at first appear. First of all, attendees may be unconsciously applying some of the lessons taught at the workshops. Secondly, acceptance of new technologies is frequently slow in industry, and the home heating business is no exception. Temple Bayliss himself has provided some salient insights about the sequence of events by which a technology is adopted.

Learning about a new technique by itself does not give rise to implementation. In practice a new technique is implemented by a contractor first because an unusually knowledgeable client demands it. After that has happened a couple of times the contractor may offer the technique just occasionally to people who are looking for ways to save energy and will be impressed by a new wrinkle. Then, after a while, the contractor will begin to offer the new technique as a matter of course ...

My guess is that most contractors will adopt an energy saving idea and sell it to their clients only after they have seen competitors making money by it. As a result, a change may move through the trade five years or more after the technology of it is widely understood.

The overall conclusion that one draws about the outcome of the workshops is that they were good refresher courses for professionals who have been in the business for some time and that they injected new ideas about energy efficiency which take time to diffuse throughout the industry.

Because the consensus was so strongly in favor of the program, one suspects that attendees were able to acquire more new knowledge than they could actually identify. It is also possible to surmise that the positive reinforcement so many attendees received at the workshop made attendees more confident and proficient salesmen for energy conservation as well as for their own business. (Indeed, many stated that providing accurate information to customers—a function to which the workshop contributed—was good public relations for their firms.) Another possible benefit could be that workshop attendees may be somewhat better informed than nonattendees and that they may likewise be molders of opinion among their colleagues and would help establish, over time, trends in favor of more energy-efficient hardware and measures. ORNL telephone contacts with a limited number of nonattendees provided a slight measure of support for this observation, but the distinctions between workshop attendees and non-attendees appear to be smaller than one might have suspected.

Because these generalizations about program outcomes are so qualitative, it is not feasible to establish specific program benefits in terms of energy or money saved by consumers, increased business for dealers or contractors, or new jobs created in energy retrofit firms.

It is apparent that benefits are present and that they probably exceed the small cost of putting on the program by a significant margin. Linking the lessons taught with specific energy savings targets to be sought by attendees, combined with a modest evaluation effort based on these specific targets, should be able to produce some defensible quantitative benefits for the program which would supplement the apparent qualitative benefits. That the Virginia OEES views the workshops as successful is indicated by the fact that the workshops will be repeated in spring 1984 and that many of the same techniques and procedures will be used in a series of workshops to be presented shortly in conjunction with loan audits for the U.S. Housing and Urban Development Department's solar bank program.

## LESSONS LEARNED

- Workshop attendance can be encouraged by using an accurate mailing list of people from relevant types of jobs. Workshop credibility can be strengthened if the mailing list has been used to contact these individuals for accepted functions in the past.
- Workshops are likely to be more successful if they are coordinated with ongoing projects which help provide a context for the workshops.
- Considerable responsibility for planning and running a workshop can successfully be delegated to private consultants provided that competent ones can be selected.
- Efforts could be made to capitalize on the benefits of the workshop. Procedures could be implemented with opinion leaders in attendance who can

be particularly helpful in spreading the message to others in their trade. Mechanisms could be established for following up workshop lessons with later contacts designed to measure and encourage implementation of those lessons.

- Technical accuracy of lessons presented at workshops is extremely important in establishing the credibility of those associated with workshops.
- Workshops don't have to be expensive in order to be effective.
- The Heating Contractor Workshops benefited greatly from the experience gained from a somewhat similar series of workshops presented in 1981.
- Strong support from the OEES director provided the workshops with considerable credibility with the trade and impetus within the OEES.
- The Virginia Heating Contractor Workshops are an example of viable, informative programs conceived and administered by state energy offices with little other than financial assistance from the federal government.
- The highly focused workshops, in terms of audience and content, have evolved in Virginia as an effective means of communicating conservation lessons, as contrasted to broader workshops aimed at the general public. Thus, transferability of the Virginia program to other states should be viewed within the context of this specialized approach.
- Workshops for trades-oriented people are probably more effective when presentations are based upon practical techniques rather than theoretical discussions.

- Workshops can be effectively presented to attendees who represent competing industries as long as the presentations are perceived as equitable and accurate.
- The program was able to appeal to all types of residential heating businesses and types of employees, although utilities were somewhat over-represented and junior technicians were underrepresented.
- A system for measuring the benefits of the workshops can be developed but its implementation must begin in the workshops as an integral part of the lessons being taught.

#### PRINCIPAL CONTACTS

Temple Bayliss, Director  
Virginia Office of Emergency and Energy Services  
310 Turner Road  
Richmond, Virginia 23225  
(804)323-2899

Holly Mauer, Program Coordinator

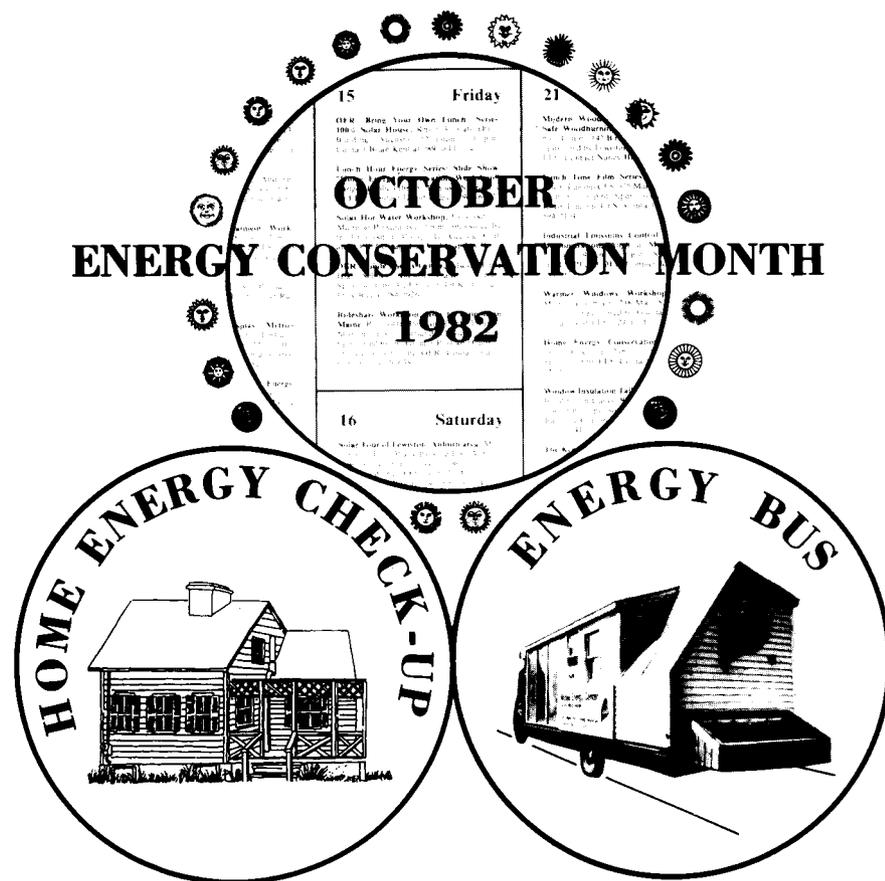
#### DOCUMENTS

Naismith, Robert, and Lew Evans, 1982, "Heating Contractor Workshop," prepared for the Office of Emergency and Energy Services, Richmond, Virginia.



# 6. REACHING PEOPLE:

EXPERIENCES FROM THREE MAINE ENERGY PROJECTS



## INTRODUCTION

A September frost is likely to encourage Maine homeowners to turn their thoughts from gardening toward keeping warm during the winter. Maine winters are harsh and long. However, long before the frost triggers the homeowner's concerns about winter, the employees of the Maine State Office of Energy Resources (OER) have begun their preparations for October and Energy Conservation Month (ECM). The staff of the OER has capitalized on the fact that people are most receptive to information when that information is most salient to them. Energy Conservation Month is a multimedia, multiorganizational blitz designed to deliver conservation information and services to homeowners. The event is of such scope that most Maine households are touched by media information or by one of the events occurring during the month.

Energy Conservation Month is one of three residential programs run by the Maine Energy Office which will be the focus of this case study. Another is the Maine Energy Center, or the "Energy Bus," as it has been dubbed here. The Energy Bus is akin to an old-fashioned traveling medicine show. It is moved from location to location throughout the state. People are encouraged to visit the bus to see the energy displays and to take home the informative brochures that are available.

The third program is the Home Energy Check-up (a Class B audit program). By filling out a form describing their house and returning it to the OER, Maine residents can receive a computer analysis of home energy use. The analysis helps pinpoint problem areas and contains a set of recommendations on how to make the home more energy efficient.

The effectiveness of Maine's energy program can be traced in part to the quantity and quality of contacts that the OER has initiated with Maine residents. Furthermore, these programs have been helped greatly by the interest, skill, and commitment of the energy extension agents. One purpose of this case study is to show how these contacts are initiated and why they are effective.

This case study was prepared by John H. Reed, utilizing information from a variety of sources including a site visit conducted April 4-7, 1983.

Another purpose of this case study is to show that the three programs described do not operate in isolation and that their interrelationships are important to each program. A good example of this is the way which both ECM and the Energy Bus introduce clients to the Home Energy Check-up.

## BACKGROUND

According to the 1980 census, Maine has more than a million persons residing in 440,000 households. The lower geographic third of the state is fairly densely populated, but the remaining two-thirds of the state—the area more than 50 miles from the coast—is thinly settled. Maine's climate is fairly harsh. It ranks among the ten coldest states in degree-days (approximately 7500 degree-days in southern Maine). Personal and family incomes are also low. Based on 1979 data, Maine ranked 48th among the states in per capita income.

These characteristics have important implications for energy consumption, especially in light of the U.S. oil problems which began in 1973. Prior to 1973, the convenience of central heating and price of oil had encouraged many Maine residents to install oil burners for home heating. Oil was chosen in preference to natural gas because of the economics of delivery to a dispersed population. This switch to oil represented a significant departure

from traditional heating methods. Oil, which accounted for roughly 44% of residential energy consumption in 1960, accounted for 58% by 1972. Approximately 85% of the increase in residential energy consumption between 1960 and 1972 was met by oil. The remainder of the increase was met almost entirely by electricity.

The heavy reliance on oil meant that relatively more residents of Maine felt the impact of the oil embargo and its aftermath than did residents in other parts of the country. Home heating oil prices escalated from 20¢ per gallon in 1972 to approximately \$1.20 in 1982. Home heating bills, which had been taken for granted, suddenly became important. In the late 1970s, it was not uncommon to find people in Maine whose winter heating bills exceeded or were even double their monthly mortgage payments. The seriousness of the problem often was aggravated by low incomes.

The need for an agency to help people with their energy problems was recognized by the governor and the legislature when it established the Maine Office of Energy Resources. Many of the programs in the Office of Energy Resources were originally funded with federal money. As federal resources have declined, Maine has recognized the continuing need for energy programs and has provided them. In the spring of 1982, the number of staff positions in the Office of Energy Resources has been stabilized at about 30 persons, and the state is now providing 40% to 50% of the OER budget.

Figure 7 is an organizational chart for the OER showing the 30 current functional positions. The programs described come under the purview of the

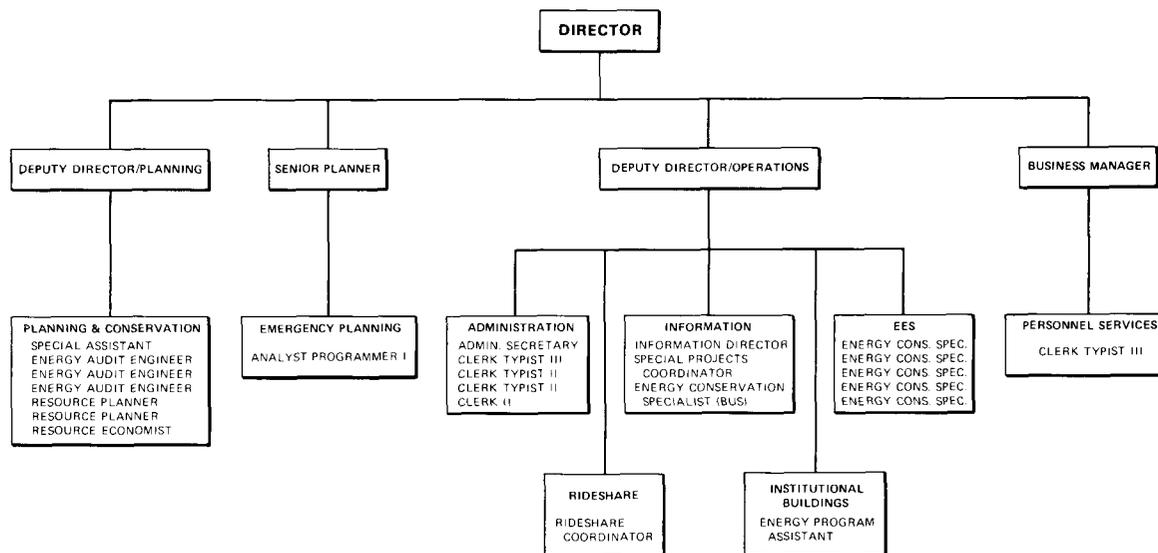


Fig. 7. Organizational chart for Maine Office of Energy Resources

# ENERGY CONSERVATION MONTH



Deputy Director/Operations. The Energy Extension Service (EES) agents, designated energy conservation specialists on the chart, are the prime movers behind Energy Conservation Month. That program is coordinated from Augusta with the help of the Information Director. The EES agents are employed by the OER and are not formally related to the Cooperative Extension Service. The Energy Bus is the responsibility of the Information Director. Finally, professional staff responsible for the Home Energy Check-up are drawn from the Planning and Conservation group under the Deputy Director for Planning.

## ENERGY CONSERVATION MONTH

Each fall the governor designates October as Energy Conservation Month. ECM is a massive campaign aimed at educating Maine residents about energy and encouraging them to take an active role in making their homes energy efficient. The choice is deliberate since October is the month in which Maine residents begin to prepare for winter.

Energy Conservation Month has two principal purposes. The first is to establish direct contact with Maine residents through workshops, tours, adult education courses, and other activities. In 1982, the OER in cooperation with other local community organizations offered about 260 opportunities reaching more than 11,000 people. The second focus for Energy Conservation Month is the dissemination of information through the media. The OER was able to obtain significant participation in ECM from nearly all of the television, radio, and newspapers in Maine. This means that most Maine households had the opportunity to be exposed to some information about energy conservation. In addition, the OER made more direct attempts to disseminate information through the use of information displays in malls and mailings.

## Initiating Energy Conservation Month

Many of the activities carried out during Energy Conservation Month are similar to activities that are carried out by the OER during the rest of the year. The difference is in the frequency and the timing of the events. In effect,

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Friday

OER "Bring Your Own Lunch" Series: 100% Solar House, Rm 113, State Office Building, Augusta. 12 noon - 1 p.m. Contact Brian Kent at 289-3811.

Lunch Hour Energy Series: Slide Show: Home Energy Conservation Workshop, Bangor Public Library. 12 noon. Sponsored by EES. Contact David Foley at 945-6732.

Hot Water Workshop, University of Maine at Presque Isle. 3 p.m. Sponsored by the University of Presque Isle Geology Club and EES. Contact Tim Vrabel at 796-3531.

Mobile Energy Center, Edward Little School, Auburn. 8 a.m. - 3 p.m. Sponsored by ELHS and OER. Contact Ray at 784-2926.

Share Workshop: How to Vanpool in Maine, Room 416, Portland Public Library, Monument Sq., Portland. 12 noon - 1 p.m. Sponsored by the Greater Portland Council Governments and OER. Contact Carol Rothers at 289-3811.

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Saturday

Solar Tour of Lewiston/Auburn area. Meet at Great Falls Plaza Parking Lot, Auburn. Transportation provided/\$1.00 fee. 9 a.m. Sponsored by EES and LJA Jaycees. Contact Dick Ray at 784-2926, ext. 24.

Retrofit Workshop, Dyer Library, Main Street, Saco. 10 a.m. Sponsored by Dyer Library and EES. Contact 861.

Energy Conservation and Auditing Training Seminar, University of Maine at Bangor. 10 a.m. - 3 p.m. Sponsored by Washington County CES and EES. Contact David Foley at 945-6732.

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Thursday

Modern Woodburning Technologies and Safe Woodburning Workshops, Multipurpose Center, 145 Birch St., Lewiston. 7 p.m. Sponsored by Lewiston/Auburn Jaycees and EES. Contact Nancy Holmes at 289-3811.

Lunch Time Film Series: "Wood Heat", Knox/Lincoln CES, 375 Main St., Rockland. 12 noon - 1 p.m. Sponsored by EES and Knox-Lincoln CES. Contact Les Hyde at 594-2104.

Industrial Emissions Control Technology Demonstration, Augusta Mental Health Institute. 9 a.m. - 3 p.m. Sponsored by OER, BPI and DEP. Contact Joel Davis at 289-3811.

Warmer Windows Workshop, Goodall Memorial Library, 238 Main St., Sanford. 7:15 p.m. Sponsored by Goodall Memorial Library and EES. 324-4714.

Home Energy Conservation Workshop, Dover-Foxcroft Public Library. 7 p.m. Sponsored by EES. Contact David Foley at 945-6732.

Window Insulation Talk and Display, CMP Building on Canco Rd., Portland. 7 p.m. - 8:30 p.m. Sponsored by CMP. Contact Ramona Carson, CMP Home Economist, at 772-7411.

The Kennebec Valley CAP Energy Van will be in shopping centers and schools in Southern Kennebec County thru the 30th. Sponsored by the Kennebec Valley CAP. 873-2122.

Window Coverings Mini-Workshop, Northwind Senior Citizens Center, Skowhegan. Sponsored by Kennebec Valley CAP. 873-2122.

Energy Audits and an Update on Window Insulation, Lithgow Library, Augusta. 9:30 a.m. Sponsored by Friends of the Handicapped and CMP. Contact Ruth McGary, CMP Home Economist, at 623-3521.

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OER "Bring Your Own Lunch" Series: The Other Building, A contact Bonnie

Warmer Windows Workshop, School, Bangor and Adult. 824-2136.

Efficient Use of Energy, Stock Elementary School, Bangor. 7:30 p.m. Sponsored by OER, BPI and DEP. Contact Cathy New

Home Energy Check-up, Dimin Bath. 1:30 p.m. Lt. Peter Ol

OER Mobile Energy Center, Portland. Contact Pat Norton

Symposium on Energy Conservation, by UMO (Registration Write to UMO, 126 College

Hypothermia Prevention, Whipple Base. 7:30 p.m. EES. Contact

WHO's "100% Solar House", on Woodstock. Sponsored by WHO, at 769-3531.

Home Energy Check-up, Hypothermia Prevention. 10:30 a.m. Sponsored by WHO, at 945-6732.

the OER creates an "event" which captures the attention of both the media and Maine residents. Such a focused "event" is more likely to be effective in gaining attention than a series of announcements about individual workshops spread throughout the year.

Planning for Energy Conservation Month usually is initiated in July and August. The five OER energy extension agents (EES), who live in different parts of Maine, are brought together to plan the activities. The purpose of this meeting is twofold. The first is to evaluate the previous year's successes and failures. The result is a list of activities that are to be dropped, kept, or modified and new ideas which are to be developed. One staff member described this as a "self-criticism" session. The second purpose of this meeting is to develop the framework within which activities for ECM can be organized and to assign tasks to individual agents.

After the organizational meeting, extension agents return home and begin to fill in the framework with the details of time, place, and personnel. Coordination among the extension agents is achieved by telephone. Telephone contacts among the agents are sufficiently extensive that they develop a real sense of comraderie. A good example of this occurred while gathering the material for this case study. We were told that our conversation with the Portland extension agent would probably be relayed to the Lewiston agent (40 minutes away) while we were driving between the two locations.

### Contact with Community Groups

Contact with community groups is essential to the success of Energy Conservation Month. Such contacts provide both organizational resources and legitimacy. Roughly 75% of the 260 workshops and activities in ECM in 1982 had local sponsors other than OER or the Cooperative Extension Service. Table 9 shows the categories of local sponsors. Local organizations typically make arrangements for or provide places to meet, and they promote the workshops. This reduces the burden of work for the extension agent, multiplies the resources at the agent's disposal, and undoubtedly enhances the credibility of the agent's message.

Heavy reliance upon community groups means that the extension agent must be skilled at making contacts. Like many people for whom "networking" is a "natural" part of the job, the agents had difficulty articulating the methods they employed. One agent pointed out that whom you approach depends on your intended target audience. For example, contacts with officers of local service clubs are not likely to lead to extensive contacts with low-income residents or senior citizens. Agents often start out knowing the intended target group but not whom they should contact. In such situations the agents begin with an educated guess and then follow leads until they get to someone who meets their needs. This process may require many phone calls.

Agents identified the types of groups and individuals they contact when they are attempting to organize workshops. The officers of service organizations such as Rotary and Lions usually are among the first to be approached.

Table 9. Types of community groups cosponsoring Energy Conservation Month activities

Type of group	Number
State agencies, Energy Extension Service, OER <sup>a</sup>	40
Radio, TV, newspaper	28
Adult education programs	24
Community service groups	23
Cooperative Extension Service	21
Fire departments	18
Libraries or museums	11
Businesses	10
Utilities <sup>b</sup>	10
Community Action programs	7
Conservation groups	4
Universities	2
Vocational/technical institutes	2
Other	25
Total	219 <sup>c</sup>

<sup>a</sup>Some of these are programs sponsored for state workers in the Augusta, Maine, area. These agencies were really sponsors rather than cosponsors.

<sup>b</sup>In several cases an organization sponsored a program offered by a utility. These were credited to the organization rather than the utility.

<sup>c</sup>This was the number of activities that could be determined from looking at the printed calendar. The OER reported 41 additional activities not listed on the calendar.

They will often support a request that their group sponsor a program or workshop, or they will identify willing groups. The agents have also found that libraries and adult education programs are likely sponsors. One agent identifies large companies in his area and tries to get them to sponsor programs

for employees. He pointed out that such companies often have established speakers series and are delighted to find a program that will have tangible benefits for their employees. Clearly, what works for one agent does not necessarily work as well for another.

## Creating the Workshops

The workshops given by the agents are not necessarily specifically created for ECM, but they are an integral part of it. Table 10 shows the distribution of workshops given during ECM in 1981 and 1982 and the attendance figures for those workshops. With some notable exceptions (for example, wood stove safety), the agents give most of the workshops. Indeed, there appears to be some reluctance on the part of agents to make use of volunteers. This reluctance stems at least in part from a very real agent concern about quality.

Table 10. Number of and attendance at workshops given during Energy Conservation Month in 1981 and 1982

Workshop type	1981		1982	
	Number	Attendance	Number	Attendance
Warmer windows	30	630	16	153
Light savers (commercial and industrial lighting)	5	37	—	—
Solar	22	441	27	673
Home energy conservation	37	592	21	415
Business and industry energy conservation	—	—	5	91
Home energy check-up (1982); REAP (1981)	5	37	9	465
Safe wood burning and modern wood-burning technologies	14	130	29	616
Ride sharing	—	—	6	55
Film series	7	91	—	—
Total	150	2528	113	2468

New workshops are initiated when the agents agree, based on feedback from community contacts and attendees at existing workshops, that there is a need for a workshop. One of the agents is selected to research the topic and to develop a packaged workshop presentation. The package usually contains a script, perhaps some slides, ideas for displays and demonstrations, news releases and public service announcements, and handouts.

The purpose of the script is to define the content of the workshop, to identify the factual material in the presentation so that it can be checked for accuracy, and to provide a learning tool for other agents who also will be doing the workshop. Scripts may include ideas for props such as mock-ups of windows or slides. Scripts are reviewed by other agents and by subject matter experts when appropriate. The agent who writes the workshop may then preview the workshop with the other agents before trial workshops are done.

After the workshop has been pretested, it is distributed to other agents. In turn, these agents "learn" the script. Agents make it a practice to present the workshop in front of other agents before doing it alone. This represents a quality check and this, as well as the extensive preparation, helps to prevent credibility problems.

Of course, agents do not follow the script verbatim. They modify the materials to suit individual styles and add their own embellishments. The scripts are not static; they evolve over time. Agents share with each other the gimmicks and insights they gain as they present the workshops. Workshops often involve demonstrations of how to make or install a conservation product.

Attempts to create new workshops are not always successful. Recently, the EES agents attempted to create a new workshop for commercial and industrial establishments. The response to the trial workshops was distinctly negative. The agents discovered that the diversity of commercial and industrial establishments made it difficult to program the workshop and that much of the material presented did not meet the needs of the participants. These workshops are being extensively revised, and the help of a person qualified to develop them is being sought.

## Warmer Windows: An Example of a Workshop

The purpose of the Warmer Windows workshop is to demonstrate to clients ways of reducing heat loss through windows. The content deals with how to reduce air infiltration and how to reduce heat loss by thermal conduction. Although some theory is presented, agents concentrate on practical applications. They discuss storm windows and proper caulking. They carry with them models of windows illustrating various types of shutters and curtains that can be installed to minimize heat loss at night. Some attempt is made to achieve a balance between more costly methods and low-cost, no-cost methods. A presentation on storm windows might be balanced with a discussion of proper methods for installing plastic over windows. Another example of a low-cost method is the use of multiple layers of cardboard to make an effective night shutter and discussion of how to integrate the shutter into the room during the day by covering it with decorative paper and using it as a wall hanging. At least one agent makes such a shutter as part of the workshop.

## **Agents as an Important Key**

The previous two sections offer clear evidence that energy extension agents are an important key to Maine's energy program and Energy Conservation Month. The extension agents have been chosen with great care. They are not straight out of college, but neither do they fit the stereotype of the state patronage worker. According to one of the OER deputy directors, agent selection criteria include the ability to communicate, a demonstrated interest in energy, and some technical background. Maine energy extension agents typically are experienced people who previously have had successful careers.

## **Workshop Attendance**

In general, workshops tend to draw 20 to 25 people. Attendance figures for the two most recent ECMs are found in Table 10. Unfortunately, there are very few data on who attends workshops. One agent described the clientele as being "heavy on 40-to-50-year-old homeowners." One group of people who frequently attend the workshops are builders. Agents have often found builders skeptical about the costs of energy-saving measures and public acceptance of the costs of energy-saving houses. Agents report that the tone of builder participation has changed as the builders have discovered that builders with work are those who are building energy-efficient homes. To help meet the needs of builders, the OER in cooperation with the City of Portland has put together a booklet titled "Enersave," containing tips on energy-saving construction techniques.

## **The Role of the Media in ECM**

The OER encouraged media participation in ECM by (1) producing a set of public service materials for radio, television, and newspapers promoting energy conservation and (2) using EES personnel to make contacts with the media to gain cooperation. This was very effective. During ECM in 1982, 83% of Maine radio stations used personalized public service announcements. Seventy percent of these stations used OER-produced "Energy Tips of the Day." Thirty-seven energy-related talk shows were presented on 18 stations, and there were two special statewide series on energy conservation.

Although there are not nearly as many television as radio stations in Maine, their responses were equally dramatic. Five stations carried evening news stories about OER, four listed ECM activities on their community calendars, and one aired three 5-minute segments on the noon news featuring energy conservation tips.

The most extensive use of television involved the production of a two-hour program entitled "Everything You Always Wanted to Know about Energy Conservation but Were Too Cold to Ask." The program was aired by the Maine Public Broadcasting network at Orono. The program was composed of segments, each of which featured a specific conservation message—caulk-

ing, attic insulation, hot water, furnaces, wood stove safety, ride sharing, and so on. Each segment featured an EES agent who explained and demonstrated how to carry out a conservation measure. The segment on caulking, for example, showed where to look for cracks and how to use the caulking gun to effectively fill and seal cracks. Between the segments in the places usually reserved for advertisements were messages featuring each of the EES agents and telling how they could be contacted. There were other messages for Home Energy Check-up and other programs. The program also contained question-and-answer segments with the OER director.

The program had some spin-offs. For instance, the segments featuring the EES agents were extracted and turned into public service announcements for more extensive use during ECM and throughout the rest of the year. Such a production is not without its problems. A segment showing the governor in the governor's mansion with an innovative heating system had to be excised because of an approaching election. In critiquing their own program, the OER staff suggested that some of the segments ran too long (almost 15 minutes) and could have been broken up for more effective presentation. Even so, the program represents a significant accomplishment and a significant resource. It is now available through the State Library for use by extension agents and community groups.

The OER also provided materials to the print media. Included in these materials were 24 articles which six newspapers carried in special supplements. Six newspapers carried additional articles about ECM and three newspapers featured question-and-answer columns responding to inquiries submitted by readers.

## **Cultivating Media Resources**

One of the lessons to be learned from Maine is that the media cannot be taken for granted. If one wants media participation for special events such as ECM, then one must cultivate the media throughout the year. The relationship with the media is an exchange relationship to which each side must contribute in order to maintain the relationship. One of the members of the Maine energy staff pointed out that the relationship between the OER and the media has improved dramatically in recent years. In the past the OER was viewed by reporters as much as a place to go muckraking as a place to get reliable and useful information or a credible story. The turnaround came when the OER hired a person with media experience for the position of information director.

The Maine energy staff has learned a number of important lessons about dealing with the media. First, the OER has found it is important to have someone on the staff who has primary responsibility for public relations. Secondly, they have recognized the importance of developing a one-to-one relationship with media people. Thirdly, they have come to realize that media personnel have needs in terms of deadlines to be met, space or airtime to fill, editors to please, and career objectives to be met.

The Maine energy staff has recognized these things and tries to help media representatives meet their needs. The OER attempts to have some new story available and ready to go each week. The OER staff also tries to be responsive when media representatives call for information. For example, during our visit the OER received a call from a reporter wanting to know what impact a court decision handed down earlier that morning would have on Maine. OER staff responded immediately by finding out what the court decision was and evaluating its importance for Maine. The reporter could give his story a state slant, and it is likely that that reporter will respond positively to the OER in the future.

### Other Outreach Methods

The OER has established a number of information centers throughout the state. An information center is a literature rack containing a selection of OER-produced literature. In 1981, 26 such centers were established in libraries and museums during ECM, and 7 new centers were established in 1982. These centers are augmented during ECM with information displays in shopping malls, fairs, and places of major employment. For example, 42,800 people were reached during 1981 at four fairs and a conference. The OER produces a large calendar poster which it uses to call attention to the many ECM activities. These are posted at the information centers and in other public places throughout the state.

Other approaches have included a poster contest in one county which attracted 2600 entrants. A walk-through home energy conservation demonstration run by the Cooperative Extension Service in Augusta attracted 7000 people in 1981. In addition, there were a number of tours of solar housing in the Portland area. The basic purpose of all of these approaches is to create an event which will catch people's attention and which will provide an opportunity to disseminate information.

### The Budget for ECM

The real costs of ECM are very difficult to calculate since much of the activity during ECM is an extension and intensification of normal EES activities. Special costs were about \$7000. These included about \$3000 for printing of the special ECM calendars which were distributed throughout the state, about \$2500 for advertising for the workshops, and about \$1500 for the solar tours. There are undoubtedly additional costs for postage, supplies, and staff time which are not easily identified because they are not specific line items for ECM.

There are substantial benefits to be weighed against these costs. For example, there is the production of the TV special which was done by public TV. More important, commercial radio and television stations ran public service announcements and provided substantial airtime, while newspapers gave

space and added supplements to their regular editions. It is not known what this airtime and newspaper space would have cost if it had been purchased, but the real value is likely to be several tens of thousands of dollars. The important point is that a relatively small investment of public funds was matched by very substantial private contributions. These contributions would not have occurred without the stimulus of ECM.

## THE ENERGY BUS

### What Is the Energy Bus?

The Energy Bus, formally called the Maine Energy Center, is a mobile energy information vehicle carrying displays, literature, and information on home energy conservation programs. The original center was a houselike structure built on a 1966 school bus chassis. Because of maintenance and reliability problems which prevented the bus from traveling very far from the Augusta area, the original bus was replaced in late 1982 with a motor home.

The bus travels to several sites each month. As one staffer put it, "We like to go where there are concentrations of people." Typical sites are schools, malls, downtown areas, and public events such as fairs and festivals. In the period from January to October 1982, the bus visited 54 different sites.



Maine's original energy bus



Maine's current energy bus

The bus (the original) undoubtedly would have visited more sites if it had not been for maintenance problems which kept the bus off the road for a sustained period. During the busiest month of this period the bus was open to the public on 20 days. Attendance ranged from an average low of about 75 persons a day in June to an average high of 525 persons in September. The latter figure is substantially inflated by attendance of 2700 people on one day at a fair. In general, average attendance ranges between 75 and 175. In all, 15,181 persons went through the bus during this ten-month period.

### What's In the Maine Energy Bus?

As can be seen in the photograph, the original Energy Bus had several unique features—a bread-box water heater, a solar collector, and a Trombe wall—which gave the bus an unusual shape. This probably contributed to its attention-getting qualities as well as serving educational functions. The current bus does not have those features, but does carry a large sign on the side identifying it as a Maine Energy Center. The interior of the motor home was designed by its driver, who is an extension agent. When parked in an appropriate location, the bus has ramps to facilitate handicapped entry. Table 11 and the three accompanying photographs give an indication of the displays contained in the Energy Bus. The content of the displays is obvious from the listing. However, two are worth describing in more detail.

Table 11. Displays in the Maine Energy Bus

- 
- Microprocessor-controlled oil burner system with setback thermostat and high-efficiency burner
  - Hot water tank with insulation wrap
  - Cutaway views of insulation techniques
  - Wood stove installation with proper insulation and clearances
  - Boiler plate for wood stove to supplement domestic hot water
  - Solar collectors
  - Caulking
  - Window treatments
  - Display on the cost and efficiency of various heating methods
  - Literature rack
- 

In the years prior to 1972, Maine residents had installed a substantial number of oil burners. The market was sufficiently competitive so that many oil distributors offered free or low-cost tune-ups and low-cost service. As a



Information center in Maine Energy Bus

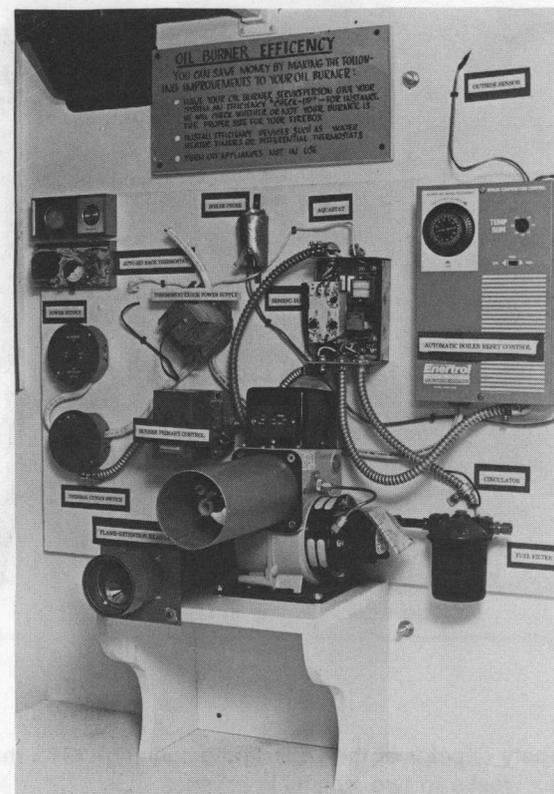
result, people paid very little attention to their oil burners, and few attempted to understand the fairly complex workings of the control systems. The purpose of the display in the bus is to educate people about the workings of oil burner systems and to illustrate several products which can be added to the oil burner system to make it more efficient.

One of these products, shown on the right side of the photograph, is designed for systems that heat domestic water in a boiler. Traditionally, boiler temperatures are set for winter operation, when, for purposes of efficiency, the boiler is started around 160°F and turned off at 210°F. For summer operation these temperatures are unnecessary, but resetting the boiler means a service call in the spring and fall. When oil was cheap, people didn't do this. The control device in this display measures outside temperature and, by the use of microprocessor control, adjusts the boiler temperature automatically.

Two other important devices in the oil burner display are the setback thermostat (upper left corner) and the flame retention burner (in the lower left) shown in contrast to the traditional burner head. In the revised Home Energy Check-up booklet, the OER estimated that the boiler setback control would save about \$200 a year, the new burner head about \$100 a year, and the setback about \$30 a year. Installed costs would be about \$300, \$800 and \$600 per year, respectively, with corresponding payback periods of 1½ years, 8 and 2 years. These are significant savings on a typical oil bill, which otherwise might run between \$800 and \$1600 annually.

A second display that deserves mention is that shown in the photograph concerning the wood stoves. When oil prices increased, Maine residents began switching to wood. Between 1972 and 1980, the number of cords of wood burned roughly doubled from 357,000 to about 654,000. This trend has continued. In Maine, a small well-insulated house with southern exposure might use two or three cords of wood per winter, while a larger less well-insulated house might use six to eight. Because many households are using wood as a supplement to other heating methods, the total number of households using at least some wood has increased dramatically.

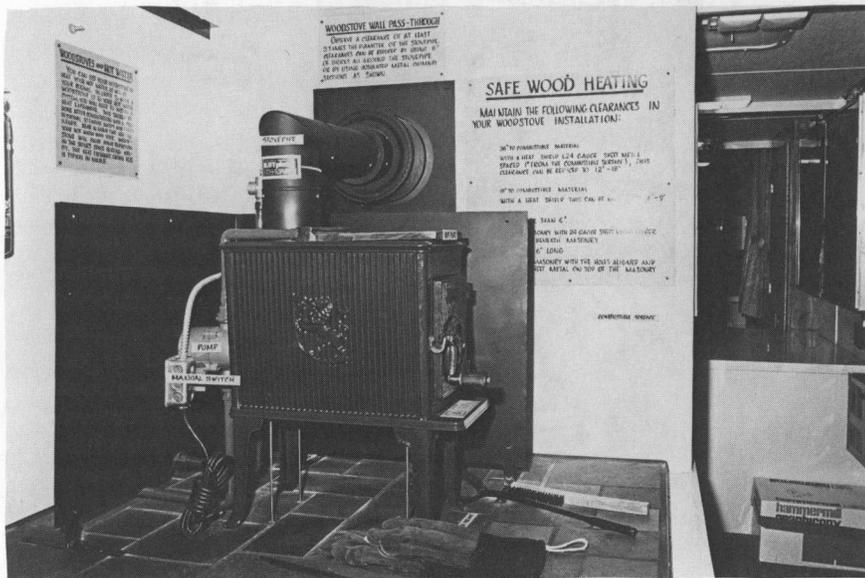
It was clear to the OER that Maine residents were switching to wood and that a program to encourage the switch was not necessary. However, one of the unintended consequences of the switch to wood was a substantial increase in fire hazards from wood stoves. Thus, instead of promoting wood stoves the OER has emphasized wood stove safety. The wood stove display demonstrates proper clearances for a wood stove from the wall and shows products which permit the reduction of these distances. It also demonstrates proper floor covering underneath the stove and acceptable methods for installing the thimble to an outside chimney. Finally, the display has a plate collector with a small pump demonstrating a wood stove assist for water heating.



Oil burner display with automatic boiler reset control (upper right), automatic setback (upper left), and flame retention burner (lower left)

## Operation of the Energy Bus

The Center is operated by an energy extension agent hired specifically for the task. The agent is responsible for maintaining the bus and for seeing that an ample supply of literature is available. The agent is also responsible for scheduling the bus and for making his own travel arrangements. This is usually done from a desk at the OER in Augusta when there are a few days between sites. The choice of sites is largely dictated by requests from organizations throughout the state. The schedule for the bus is approved by the



Wood stove display in energy bus

director or a deputy director of the OER. In the spring of 1983 the bus was booked about six weeks to two months in advance.

Many of the requests for the bus are generated by the other extension agents. An important key to generating public response to the bus is making sure the proper groundwork is laid for a visit by the bus. A recent visit to Aroostook County in Maine's far north provides a good example. This was the first visit by the bus to that area. Prior to the arrival of the bus, the local extension agent had made contact with the local media and had arranged coverage of the bus with them. In addition, the agent had arranged for the bus to visit local schools so that students could tour it. The agent also had made contact with local service clubs and community organizations.

Once on site, the extension agent manning the bus assumes the role of energy educator. He is available to discuss the various displays, to answer more specific energy questions that clients might have about their own particular situation, and to discuss and provide literature that is available on the bus. The agent can and often does refer people to other agencies that may be able to assist them with specific problems.

Obviously the extension agent manning the bus cannot do everything. Because of the schedule and the amount of time spent on the road, the OER

has had a problem of driver "burnout," which has resulted in a rapid turn-over of the driver agents. In the past the Energy Center extension agent has made use of the local extension agent to fill in and provide relief. This has the benefit of providing the local extension agent with one-on-one contact with people in his local area. But this provided only momentary relief. More recently the OER has decided to have the driver agent on the road for three months and off for one. During the off period, the regional EES agents will be responsible for the bus. The initial experiments with this have indicated problems with transferring the bus between regional agents. It remains to be seen if this problem can be effectively solved.

### The Construction and Operating Budgets for the Bus

The capital costs for the current bus include the initial outlay of about \$30,000 for the motor home and about \$3500 in construction costs. Most of the construction costs were for materials costs since much of the work was done by the driver agent. Annual operating costs include \$3000 for travel (gas, oil, motel, meals), \$600 for maintenance, and \$1000 for promotion. Finally, there are the driver's salary, benefits, and overhead and the efforts of other agents to promote the bus.

The OER did not have to purchase all of the items in the displays; many were donated by Maine firms. However, the donations raised questions as to whether the donor firms would be allowed to stock the bus with leaflets. OER policy does not permit this.

### Public Response to the Energy Bus

Evaluation of public response to the Energy Bus has largely been confined to keeping track of the number of persons visiting the bus. On several occasions visitors to the bus have been asked to fill out brief questionnaires after exiting. The responses to these questionnaires have been uniformly positive.

The difficulty of eliciting varied responses from visitors to the bus points to the special problems of evaluating the effectiveness of the bus. Many of those visiting the bus (for example, school children) are "indirect consumers" of energy conservation services. They do not make the decision to consume such services, but may initiate and/or influence the family decision process. Another difficulty in achieving a formal evaluation is that people making use of the Energy Center do so anonymously. These problems are not insurmountable, but do make measuring effectiveness difficult.

Observation of the clientele suggests three distinct groups. There are the "idle curious" who wander in, look around, and leave quickly; there are those who spend considerable time looking at the several displays; and there are some who come clearly seeking specific information. The large amount of

information carried away by visitors indicates that the center is meeting a real need.

The Energy Center serves a purpose for one unanticipated group of clients. This is a small but not inconsequential group of people who, seeing that the bus is operated by the State of Maine, stop to inquire about non-energy matters such as tax or pension problems. Such inquiries are treated with courtesy, and when the information is known, people are referred to the appropriate agencies. It is not clear how these people respond to the Energy Bus as an Energy Bus, but it is clear that other agencies in Maine might take their cue from the OER by providing opportunities for local contact.

## THE HOME ENERGY CHECK-UP

The Home Energy Check-up is an outgrowth of the Residential Energy Audit Program (REAP), which was started in Maine in 1979 to respond to the need for residential audits. At that time the Residential Conservation Service (RCS) audit program was not yet in operation. To participate in the REAP program, a homeowner filled out a four-page questionnaire (there were also four pages of instructions) describing the physical features of his or her home. The questionnaire portion was mailed to the OER, which did a computer analysis of the house and returned a set of recommendations to the homeowner. From 1979 to 1982, a total of between 14,000 and 20,000 forms were mailed to homeowners at their request. It is not known what proportion of the population was aware of the program or what proportion of those who were aware requested questionnaires. Approximately 6700 questionnaires, between a third and a half of those requested, were filled out and returned to the OER for analysis.

In 1982 the REAP program was transformed into the Home Energy Check-up. Many of the changes to the program were based on an evaluation that was done in 1982. The new program was targeted to areas that lacked an RCS program (roughly 10% of Maine households), although the program is generally advertised and residents of areas where RCS audits are available can obtain the Home Energy booklet. Fifty-nine thousand bill stuffer were mailed to customers of utilities without the RCS program. The best current estimate is that 10,000 request cards were returned to the OER (about 17% of those mailed), which then sent them the energy analysis questionnaire. Of those questionnaires, about 500 have been returned, and these have been processed and sent back to the homeowners. Thus, about 1% of those who received a bill stuffer, or 5% of those who asked for a questionnaire, followed through and asked for an audit.

# A Do-it-Yourself Home Energy Check-up



STATE OF MAINE



OFFICE OF ENERGY RESOURCES  
State House Station 53  
Augusta, Maine 04333  
Phone (207) 289-3811

## The Homeowner Questionnaire

The original REAP questionnaire was very simple. There were a set of instructions and the questionnaire. The questionnaire asked residents to provide the following information:

- House type—some basic illustrations were provided to help determine the style
- Shape and height information—illustrations were provided showing how to enter the information onto the form
- Outside dimensions
- Doors and windows—a set of boxes was provided to enter height, width, number of panes, weatherstripping, and caulking information
- Foundation—basic descriptive information about the foundation
- Fuel use—amounts of various types of fuels used annually
- Temperatures—during the heating season
- Insulation—thickness and types in various parts of the house

As a result of citizen input, the questionnaire was substantially revised in 1982. A number of individuals had suggested that some of the sections in the original eight-page bifold were difficult to comprehend and that the questionnaire could be more comprehensive. The new Home Energy Check-up became a 20-page booklet with a heavy stock cover. Roughly half the pages were printed against a gray background. These were the pages that the homeowner was to fill in and mail to the OER in the return envelope. As with the earlier questionnaire, this one opened with a message from the governor.

One basic difference between the two questionnaires is in the layout. The new Home Energy Check-up questionnaire requires that much less information be entered on each page and provides more explicit text and illustrations to guide the homeowner in providing the necessary information. The new audit asks for some additional information such as solar orientation, presence or absence of windbreaks, number of people residing in the structure, more explicit information about household temperatures, explicit information about water heating and duct and pipe insulation, and more detailed information about heating sources.

In addition to eliciting data from the householder, the Home Energy Check-up questionnaire is designed to educate the user. Even without returning the booklet, a person using it would have an excellent idea where a dwelling might be losing energy. This feature is enhanced by the fact that the booklet also contains information about projected savings from instituting specific conservation measures and about methods of stopping infiltration. A well-organized homeowner might be able to complete the questionnaire in about an hour, but most would probably take longer.

## Processing the Information

Information received from residents is edited for completeness. About half of the forms are returned with insufficient data. OER will proceed with the analysis if the missing data are not serious. Sometimes a call to the homeowner can clarify or verify the information that has been submitted. The information is entered through an interactive editing process into a computer file, which may contain data from several households, and the file is submitted for batch processing. The result is a printout for each house for which information was submitted. The computer program used by OER is an adaptation of a program originally written by Central Maine Power (CMP). OER's use of the program is by agreement with CMP.

As a quality control check, OER staff compares calculated energy consumption based on the description of the house with the reported fuel use. When there is a substantial discrepancy, OER staff tries to resolve the discrepancy either by making some changes based on their experience or by contact with the homeowner. In a few cases, an extension agent may be dispatched to check on the matter. As a last resort, the homeowner may be told that the analysis was not possible based on the information that was supplied. According to the OER it takes about two to three weeks to process a home energy audit.

## Feedback to the Homeowner

The homeowner receives a computer printout of about five pages. The first page contains information about square footage, temperature, calculated and actual fuel use, and an analysis of where the heat losses are—floor, wall, ceiling and roof, window and door, and infiltration. On subsequent pages, conservation options are presented starting with low-cost and no-cost measures followed by more costly measures. Where it is appropriate, estimates of potential savings are provided. Typical low-cost measures include temperature setback, furnace tune-up, flow-restricting shower heads, and infiltration. More costly measures include insulation, changing burners or water heaters, installing aquastat, and storm windows. A typical paragraph from such a report is quoted below.

### Temperature Setback

The information you supplied indicated that you heat your home to 71 degrees during the day and 68 degrees at night. You can save about \$45 per year for each degree you permanently reduce these temperatures. You can also save by reducing the temperature at night. If you reduced the temperature in your home to 55

degrees for 8 hours during the night you would save up to \$15 per degree per year. Remember, reducing the temperature too much can cause health problems, especially with elderly and very young family members. Check with your doctor if you have any questions.

### Home Energy Audit Budget

The costs of the Home Energy Check-up program were difficult to determine. The development of the booklet, the printing for the booklet, and the printing of the return postcards for the bill stuffer cost approximately \$10,000. OER personnel estimate that they commit about half of the time of a staff member to maintenance of the program. That includes the professional staff time to review the audits and time for someone to do the data entry. The computer charges are minimal.

### The 1982 Evaluation

In 1982 OER did a telephone survey of REAP users. The sample consisted of 263 of the roughly 7000 households which had made use of REAP services. Usable responses were obtained from 54% (that is, 143 of 263) of the households. Thirty-three percent of those in the sample could not be reached because they did not have phones or their phones had been disconnected. The remaining 13% could not be contacted or could not remember having anything to do with REAP. Of those who did respond, 79% (113) said the analysis was useful while 21% (30) did not find it useful. Table 12 displays information about actions taken and perceived usefulness of the program.

With the exception of the caulking and weatherstripping, those who found the program more useful were more likely to spend money on items requiring larger capital outlays than those who did not find it useful. However, the percentage differences are small.

Persons who indicated that they thought that the REAP analysis was useful were asked how much they estimated that they spent. Forty-three percent said that they spent less than \$250, 22% said they spent between \$250 and \$1000, and 21% said that they spent more than \$1000. Apparently, 14% did nothing. Because of the structure of the survey, comparable data are not available for those who did not find the analysis useful. Respondents in both groups were asked how much they thought they had saved. Table 13 presents those results.

One interpretation is that those who did not find the program useful did not perceive as many estimated savings as those who found the program useful. However, since no demographics and descriptive data for households are available, we can only speculate. The temptation to quantify total savings

Table 12. Perceived usefulness of REAP analysis by conservation actions taken

Action taken	Perceived usefulness of REAP <sup>a</sup>	
	Useful (%)	Not useful (%)
Caulked and weatherstripped	61	50
Insulated basements	22	20
Insulated ceilings	40	40
Insulated walls	17	17
Installed storm windows	27	20
Installed insulated windows	18	13
Installed shades and shutters	16	7
Purchased new heating system	19	10
Had heating system tune-up	20	20
Bought a water heater tank timer	12	7
Installed water heater tank insulation	26	27
N	(113)	(30)

<sup>a</sup>Percentages do not add to 100 since categories are not mutually exclusive.

Table 13. Perceived usefulness by client-estimated savings from REAP analysis

Estimated savings	Perceived usefulness	
	Useful (%)	Not useful (%)
Less than \$100	12	
\$100-\$250	22	13
Greater than \$250	39	20
Unreported	27	67
Total	100	100
N	(113)	(30)

for this program is perhaps best resisted since there is no control group of nonparticipants against which to compare the results.

The fuel bill data in Table 14 give some indication of the range of users of the program.

Table 14. Perceived usefulness of the program by annual fuel bill

Annual fuel bill	Perceived usefulness	
	Useful (%)	Not useful (%)
Less than \$500	26	10
\$500-\$1000	39	23
Greater than \$1000	26	33
Unreported	9	34
Total	100	100
N	(113)	(30)

These data suggest that users of the program were not just those with high fuel bills. Further, there are differences in the size of fuel bills for those who perceived the program to be useful and those who did not, but given the amount of missing data it is wise to avoid generalizations.

Based on these and other data, the OER made some significant alterations to REAP and renamed it the Home Energy Check-up. The result was a large increase in requests for questionnaires (10,000 in three months compared to less than 20,000 in three years) but a significant drop in the rate of return (see the previous section). It is not possible to explain with certainty why this occurred, but there are some possible explanations.

First, a bill stuffer advertising the Home Energy Check-up was sent to a specific target audience. Such an approach is more effective than the more general media approach used with REAP. The 17% response rate for the bill stuffer is about twice the response rate that most utilities have gotten from bill stuffers promoting conservation programs. Secondly, the lower return rate can probably be explained by differences in the audience reached by REAP and Home Energy Check-up and by differences in the materials which those audiences used. Given the way REAP was promoted, those who responded were likely to have a significant interest in the program. The bill stuffer probably reached a larger number of people whose interests were marginal and for whom returning the enclosed postcard required some effort. The Home Energy Check-up survey form requires more information than did the

REAP form, and this may have served to inhibit response. The physical makeup of the Home Energy booklet in terms of its size and the fact that it was a booklet that had to be disassembled may also have contributed to a lower return. The Home Energy Check-up booklet provides more conservation and cost information than did the old REAP form. Individuals using the booklet may have made conservation decisions on the basis of information in the booklet without bothering to return it. Thus, what was clearly a Class B audit program may have become either a Class B or Class C (do-it-yourself) audit program. The effectiveness of the program is likely to be greater than is indicated by the return of the booklets. Finally, it may be too early to tell the full extent of the response since many booklets may come in at a later time, although enough time (six months) has elapsed so that this is unlikely.

It is not clear to what extent the evaluation shaped the new Home Energy Check-up. Since the evaluation did not involve a control group it was not possible to estimate energy savings from the program. Many of the suggestions for changing the audit form came from sources other than the evaluation. At least one SEO staff member seemed to reflect some disappointment that more of the new forms had not been returned. This staffer seemed to agree with the suggestion from the interviewer that perhaps more time could have been spent developing and pretesting the new booklet. It will take additional evaluation to know whether the program is more or less effective (with its possible Class C character) or whether there is simply less demand for audits.

## LESSONS LEARNED

The following points represent important lessons to be learned from the study of the Maine energy programs.

- Energy Conservation Month is an event designed to capture the attention of the media and the public. It represents an intensification of activities which are carried out regularly during the rest of the year. This intensification of activity can lead to a significant leveraging of resources. Other energy agencies might benefit from considering how they might periodically intensify their regular activities to create an "event" which will call attention to their programs.
- Extensive coordination among energy personnel is essential for any event such as Energy Conservation Month.
- The use of local community groups to sponsor activities increases the resources available to the energy office and gives legitimacy to the activities.
- If community groups are to be used extensively, energy personnel must be effective at "networking." This means that agents must be able to identify potentially relevant groups and individuals; they must make contact with

these groups and individuals to gain cooperation or to identify new contacts. Effective networking requires that one not be dissuaded by rebuffs or lack of interest.

- Quality control is a necessary but not sufficient condition for workshop effectiveness. Materials should be pretested and checked for accuracy. Those giving presentations should be checked for effectiveness of delivery.
- Personnel are probably the key element in any program aimed at informing the public or enlisting public participation. The Maine SEO is careful to hire experienced personnel with an ability to communicate, personal interest in the issue, and technical background.
- Effective use of the media requires professionally prepared materials that can be distributed in advance of an event and effective personal contact with media representatives.
- The availability of media resources at special times is often dependent on the extent to which the media resource has been cultivated. Cultivating the media is done by helping media representatives meet deadlines, fill space or airtime, satisfy editors, or meet career objectives.
- The Energy Bus is most effectively used when there have been advance preparations by locally based extension agents to alert the public to the presence of the bus.
- Evaluating the effectiveness of the Energy Bus is difficult because many visitors to the bus are indirect consumers of energy conservation services who use the bus anonymously. Based on the number of visits to the bus and the amount of literature distributed from the bus, the program appears to be an effective outreach method.

- The Home Energy Check-up (Class B audit) and its predecessor program (REAP) appear to be meeting an important need. About 2% of all Maine households have received an energy analysis from one of these two programs.
- The format and content of Class B audit questionnaires is important in eliciting responses. Judicious trade-offs have to be made between the amount and type of information required to make accurate analyses of home energy use and the willingness and ability of the householder to provide such information.
- While no firm conclusions can be made about methods of publicizing important differences between methods. Direct mail solicitation may lead to higher numbers of requests for questionnaires but lower rates of return of the questionnaires for analysis, while the use of mass media and word of mouth may generate proportionately fewer requests but a higher rate of return of questionnaires for analysis. Those responding to the mass media may have to expend more effort to obtain a questionnaire than those responding to direct mail solicitations and direct mail solicitations, and this may serve to screen out those who marginally interested.

#### PRINCIPAL CONTACT

Donald Bumpus  
Maine Office of Energy Resources  
Statehouse Station 53  
Augusta, ME 04330  
(207)289-3811

### **Photo and Figure Credit**

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Fig. 3. ORNL DWG 83-17954  
Fig. 4. ORNL DWG 83-17955  
Fig. 5. ORNL DWG 83-17956  
Fig. 6. ORNL DWG 83-17957  
Fig. 7. ORNL DWG 83-17029

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