

EXPERIMENTS IN ALTERNATIVE ENERGY PROGRAM DESIGN

Final Report
Volume One

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for the

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Volume Five: *North Carolina Alternative Energy Corporation Downtown Small Business Demonstration Project* (1989). Meredith Emmett and William Stevens, North Carolina Alternative Energy Corporation, Raleigh/Durham, North Carolina.

Volume Six: *The Diffusion of Information about Energy Cost Reduction to Religious Congregations* (1989). Andrew Rudin, Interfaith Coalition on Energy, Philadelphia, Pennsylvania.

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EXPERIMENTS IN ALTERNATIVE ENERGY PROGRAM DESIGN

Introduction

The U.S. Department of Energy's Residential and Commercial Conservation Program (RCCP) funded the Experiments in Alternative Design project at the Solar Energy Research Institute (SERI) to further its goal of fostering voluntary actions to increase energy efficiency by utility companies and other program implementers, such as state energy offices, utility regulators, local governments, nonprofit organizations, private sector organizations, and trade and professional associations.

The project's purpose was to provide modest funding and technical assistance to enhance program implementation, evaluation, and reporting of already-funded innovative programs as potential nationally replicable models. RCCP had selected the following building sectors of interest: (1) single-family residential buildings occupied by owners with low to moderate incomes* and (2) small commercial buildings occupied by small businesses or nonprofit owners or renters.

The single-family owner-occupied sector was the largest of the residential building sectors nationally, comprising approximately 54 million homes using 10.53 quads of energy per year. Although several federal and nonfederal energy efficiency programs such as the Residential Conservation Service (RCS) Program, the Energy Extension Service (EES), and WAP targeted single-family homeowners, RCCP analyses showed that significant additional savings, estimated at 2.08 quads per year, could still be achieved in this sector. The WAP-ineligible lower-income and the moderate-income micromarkets had not participated extensively in energy efficiency programs or used residential energy tax credits.

About three-quarters of the existing commercial buildings in the nation are relatively small. These smaller buildings are used most frequently as retail stores and service shops, offices, restaurants, grocery stores, public or private assembly buildings, and warehouses. Small commercial buildings use about 2.47 quads of energy annually. RCCP analyses showed that 0.49 quads of energy could be saved in these buildings each year. Over two-thirds of the buildings are occupied by business tenants and the remaining third by owners. While commercial buildings have received some attention from federal programs and private sector efforts, occupants of smaller commercial buildings have not participated in energy conservation programs as extensively as have those of medium-size and larger buildings. RCCP staff judged the smaller buildings most apt to benefit from generic technology applications such as those used in residential buildings.

On December 31, 1986, the Solar Energy Research Institute issued a Notice of Program Interest (NOPI), which was advertised through the *Commerce Business Daily* and by direct mailings (using RCCP mailing lists), which solicited brief seven-page proposals. Appendix A presents the NOPI as it was provided to potential applicants. The objective was to solicit a wide range of innovative proposals from organizations with already formulated and funded projects addressing the market sectors of interest. Applicants had to indicate interest in receiving technical assistance or combined technical and monetary assistance in improving the design, delivery and/or evaluation of energy efficiency programs. The intent was to help make the selected projects as successful as possible and replicable across the nation for other small businesses, industries, nonprofit organizations, and homes.

*Income levels were (a) low = less than \$15,000 total annual income but ineligible for the Weatherization Assistance Program (WAP) and (b) moderate = \$15,000-30,000 total annual income.

The technical assistance SERI provided was intended to be responsive to the proposer's needs and took the form of an ongoing partnership between SERI and successful proposers. Due to time and resource constraints and the pressure to implement energy programs quickly, local organizations often don't have the ability to study alternative approaches to program planning, operation and evaluation, nor, frequently, the access to a wide variety of technical and programmatic expertise. The NOPI offered proposers the opportunity and resources to draw upon a wide range of diverse talent that could assist in developing improved program effectiveness.

SERI received 27 proposals in time for evaluation in response to the NOPI. These were evaluated by a project team, negotiations were conducted with the top-ranked proposers, and six monetary and technical assistance awards were made. Two awards went to each of the following three categories:

- o low- to moderate-income residential programs
- o small commercial programs
- o programs for nonprofit organizations.

The awardee organizations and their projects were as follows.

<u>Organization</u>	<u>Project Title</u>
Residential:	
Massachusetts Audubon Society Boston, Massachusetts	Home Energy Assistance Team (HEAT) Program Market Study
Boston Edison Company Boston, Massachusetts	Disaggregated Utility Usage Analysis ("EASY-Plus" Electric Usage Analysis)
Small commercial:	
ANCO Engineers, Inc. Culver City, California	Small Commercial Energy Program Study
North Carolina Alternative Energy Corporation Raleigh/Durham, North Carolina	Downtown Small Business Demonstration Project
Nonprofit:	
Interfaith Coalition on Energy Philadelphia, Pennsylvania	ICE Review and Development Project
United Way and Nonprofit Energy Conservation Project Washington, DC and New York City	Energy Service Delivery to Nonprofit Organizations

Appendix B shows the statements of work for each of these projects.

With approximately \$105,000 in funding, results from an estimated \$820,000 worth of projects have been made available to the public. Each project received a modest amount of funding to support disseminating findings at the 1988 Summer Study of the American Council for an Energy Efficient Economy at the Asilomar Conference Center, Pacific Grove, California, August 28-September 3, 1988.

The balance of this report briefly describes each of the six projects in turn, and then evaluates the NOPI process, which was in itself an experiment.

Appendix C lists the publications resulting from the NOPI project: six final reports on the six NOPI projects, and two technical reports based on some of the project's technical assistance.

RESIDENTIAL PROJECTS

RCCP wanted to leverage existing infrastructures to address under-served markets where a high potential for further energy savings existed and equity considerations were important. RCCP then wanted to focus on sectors where knowledge gaps and difficult barriers are impeding the realization of potentially large energy savings in buildings.

The single-family, owner-occupied sector is the largest of the residential buildings sectors, comprising 54 million homes using 10.53 quads of energy per year. Although several federal and nonfederal energy efficiency programs such as the Residential Conservation Service (RCS) and the Weatherization Assistance Program (WAP) have addressed single-family homeowners, significant savings can still be achieved in this sector. To discern where these savings might be obtained, micromarkets based on household income were identified and data regarding program penetration of these micromarkets analyzed. The analysis revealed that there are two significant under-served micromarkets that have not participated extensively in energy efficiency programs or have not used residential energy tax credits: (1) a lower-income (less than \$15,000/year) micromarket ineligible for WAP and (2) a middle-income (\$15,000-30,000/year) micromarket. Taken together, these micromarkets total some 20 million homes--over a third of the single-family homeowner sector. These two under-served residential micromarkets were selected for near-term attention. RCCP had determined that some six million households nationally with incomes under \$15,000 annually were still ineligible for the Weatherization Assistance Programs.

Two projects were selected to represent innovative approaches to the residential sector: (1) Massachusetts Audubon Society's evaluation of the zero-interest loan program instituted in Massachusetts and (2) Boston Edison Company's disaggregated electric usage analysis.

Massachusetts Audubon Society (MAS): Heat Energy Assistance Team (HEAT) Program Market Study

Lower- and middle-income homes are the most difficult to involve in residential energy programs. This phenomenon appears to hold true across the nation. The Massachusetts HEAT Program used local agencies to penetrate difficult lower-income markets. Any plan to involve these difficult-to-serve groups deserves special attention to see whether--and why--it worked.

The project produced a market segmentation (by income) and evaluation study on Massachusetts' new Home Energy Assistance Team (HEAT) program, a statewide program providing zero-interest loans and energy counseling to homeowners. The study's purpose was to determine the most successful marketing and counseling methods to involve WAP-ineligible lower-income and moderate income single-family homeowners in program participation and implementation of energy efficiency measures. MAS found that, in the Boston area, incomes defined as below 125 percent of poverty were higher than for the nation as a whole, and their analysis of market participation was based on estimates of market segments revised upwards accordingly.

The Massachusetts HEAT program, which is funded by oil overcharge monies, is administered by 14 regional program operators (RPOs) chosen through a competitive bid process. RPOs include community action agencies, county and city governments, community-based nonprofit organizations, and the two major deliverers of RCS audits in Massachusetts. Originally, MAS thought that each RPO employed different marketing and assistance strategies, such as contractor arranging services, group bidding, grants to subsidize the loans further, and utility financing of the loans with loan payments included in the customer's electricity bill. However, after doing the study, MAS concluded that

the RPOs were using essentially the same approach with their customers. MAS's study suggests that the use of community-based organizations is effective in reaching these difficult-to-serve micromarkets, and in gaining their participation in energy programs and in actually implementing measures.

MAS performed a market segmentation analysis to determine program participation and implementation rates in the single-family micromarkets of interest and collected data from a random sample in each income micromarket, including both participants (those completing loans) and nonparticipants (those making initial inquiries but not completing loans). Respondents were asked about the desirability of the zero-interest loan program versus other types of incentives that could be offered, program features they appreciated, sources of information about the program, and factors motivating them to implement energy-conserving measures. MAS had intended to test the different methods used by the various RPOs to determine the most successful program delivery mechanisms for the micromarkets in question; however, because the approaches were so similar, this test was not performed.

Some of the key findings were:

- o The HEAT program reached the targeted lower- to middle-income homes.
- o Newspapers and word-of-mouth were the most important sources of information in people originally hearing about the program.
- o Zero-interest financing was attractive to these lower-income groups; in fact, it was preferred over outright grants.
- o Funds tended to be spent on less cost-effective measures, such as replacement windows, which were home improvements these home owners had already decided to do prior to participating in the program.

The program design implications for reaching these micromarkets are that:

- o Zero-interest loans will be more effective in reaching them than will grants.
- o Local community-based organizations will be most effective in reaching them.
- o Improved quality control measures with contractors are needed (this was the most significant problem area identified).
- o To enhance the energy actually saved as a result of the zero-interest loan program, better mechanisms are needed to encourage participants to install the most cost-effective measures.

Boston Edison: Disaggregated Electric Usage Analysis

The Boston Edison "EASY" audit was used as a vehicle for delivering an "EASY-Plus" disaggregated electric usage analysis to low and moderate income customers. This project was interesting because the literature had suggested that information feedback could play a role in reducing energy consumption. Boston Edison, and its subcontractor Technology Development Corporation, piloted a disaggregated electricity analysis project. The project used proprietary software developed by ENERCOM, Inc. to collect data from households to be used in an existing computer algorithm that produced monthly and annual electricity usage analyses. These results were presented as bar charts of electricity costs broken down by 13 end uses in the home.

The EASY-Plus service was delivered in two different modes--(1) by an auditor in person at the end of the regular RCS audit and (2) by mail. The project tested customer behavioral response to disaggregated billing information that constituted feedback on their electricity use. Although Boston Edison originally intended to deliver the service to 500 randomly selected customers in nine different communities, these numbers were not reached because of inadequate funding.

Using an experimental design, Boston Edison was to (1) test the impact of disaggregated electric usage analysis on implementation of recommended measures, actual electricity consumption, customer understanding, and customer motivation; and (2) test the two different methods of delivering disaggregated consumption information: (a) community-based on-site delivery and (b) mailed delivery. Ordinarily, we would expect face-to-face delivery of services to result in greater participation and implementation of measures.

The project as actually carried out resulted in 500 personally delivered EASY-Plus and 1,200 mailed EASY-Plus analyses being completed. The final report explains why such a limited number of disaggregated usage analyses were completed. A total of 39 telephone interviews were completed, 16 with customers receiving personal visits and 23 with customers using the mailed service. The Boston Edison findings could not be generalized to the population as whole because of these low sample sizes. Study results must be viewed with a great deal of caution, and are limited in their applicability to program design. Another limitation of the findings is that the customers receiving the personal EASY-Plus analysis were selected by auditors on the basis of convenience of delivering the service, perceived ease of selling them some measures to implement, or high electricity bills. These customers were not a randomly selected scientific sample, and the results from the interviews cannot be generalized for that reason, as well.

Technology Development Corporation completed an analysis of the actual electricity consumed in households receiving and not receiving the analyses. They found that households receiving the analyses saved about seven percent more electricity than the average Boston Edison residential customer. Also, complaints from participating consumers about high electricity bills were resolved.

Boston Edison may, as a result of this study, use disaggregated electric usage analysis for some residential customers in the future, especially those with high bill complaints. However, the Company's management has stated that displaying electricity consumption disaggregated by end uses on the monthly utility bill would be quite expensive and they are not planning to do it in the future.

SMALL COMMERCIAL PROGRAMS

RCCP analyses showed that about three-quarters of existing commercial buildings are relatively small. These smaller buildings are used most frequently as retail stores, offices, restaurants, grocery stores, public or private assembly buildings, and warehouses. Only two federal programs have had commercial buildings as a primary focus--the Institutional Conservation Program (formerly the Schools and Hospitals Program) and the Commercial and Apartment Conservation Service (CACS) Program. CACS was repealed by Congress in 1987, leaving no federal program which addresses small commercial buildings. These smaller buildings are most apt to benefit from generic technology applications such as those used in residential buildings. However, their occupants tend to have limited resources and have received almost no attention from private energy service companies.

Although the technical energy savings potential is higher for larger commercial buildings, market forces tend to function more effectively to increase energy efficiency in these buildings. Small commercial buildings tend to be an under-served market, both by public and private programs. CACS was designed to help utilities address the smallest buildings in this sector. However, few small businesses actually received audits under the program prior to its repeal. Further, the decline in federal funding for state energy conservation programs that sponsored small business programs has led them to eliminate their efforts or to shift to less costly, but also less effective, approaches for this sector, such as general information dissemination. While some barriers exist, such as the tenant/landlord split in motivations in renter-occupied small commercial buildings, the potential for relatively quick action exists through leveraging the interest and resources of national industry associations and encouraging state and utility efforts targeted to the sector.

Two projects were selected to represent the small commercial sector: (1) ANCO Engineers, Inc.'s evaluation of Pacific Gas and Electric's Great Rebate Program and (2) North Carolina Alternative Energy Corporation's Downtown Small Business Demonstration Project.

ANCO Engineers, Inc.

This project represented an opportunity to learn what worked in a small commercial rebate program--specifically, Pacific Gas and Electric's (PG&E) "Great Rebate Program." This project was significant because 59 utility companies across the nation are currently offering rebate programs, using a variety of program designs. ANCO Engineers, Inc., performed a post-hoc evaluation of the PG&E rebate program to define program elements that were attractive to small commercial owners and tenants, to assess what made the programs successful, and to identify special program features attractive to tenants as compared with building owners. ANCO had itself been involved in the design and implementation of the rebate program.

PG&E's Great Rebate Program for small business tenants and owner-occupants was evaluated for the period 1983-86. The rebate program was marketed through a variety of mechanisms, including personal visits by utility representatives, trade allies mentioning it to customers, brochures and flyers, and media advertising. The program offered 40 percent rebates for about 36 energy conservation measures (included at various times) such as setback thermostats, energy-saving lamps, and wall insulation. ANCO Engineers, Inc. evaluated the rebate program using a mail questionnaire for program participants (N = 731 responding, a 26 percent response rate). Questionnaires were mailed to a randomly selected sample from PG&E mailing lists of program participants.

ANCO found that the rebates made the difference for two-thirds of the respondents in deciding to install measures. More than 90 percent of the respondents said they would participate in a future rebate program if one were offered. Respondents reported high levels of satisfaction with the program, including the skill and courtesy of utility representatives, the application form and process, and the speed with which their rebate check arrived. About 60 percent were satisfied with their perceived lower utility costs after installing the equipment.

ANCO personally visited a subsample of 51 businesses, interviewed the business owners, and inspected the equipment. The measures were all in place, suggesting that the energy savings from such a rebate program are relatively permanent.

Surprisingly, ANCO found no significant differences in response between building owners and building tenants on any of the study's key variables. ANCO concluded that rebates work as well for business tenants as they do for owners.

Nonparticipants typically failed to take advantage of the rebate program owing to lack of awareness of the program, assessing energy conservation as not cost-effective, lacking information about what actions to take, lacking capital to invest in measures even with the rebates, or failing to see a need for energy efficiency for their business.

PG&E estimated that the rebate program saved more than 2,000 Mw. ANCO concluded that rebates are effective in encouraging small business energy management activities. A wide variety of technically and economically suitable measures can be used to reduce peak demand (kW) and energy (kWh) usage. Rebates are also cost-effective for utility companies: conservation savings were delivered for \$100/kW to \$400/kW, less than most alternatives utilities have.

Based on the PG&E experience, to implement a rebate program, a utility or municipality needs to:

- o identify measures suitable for its customers, based on its customer base, energy end uses, and climate;
- o provide an adequate level of rebate (30 to 40 percent of product cost) which is not too high to preclude a sense of business "ownership" of the decision to invest;
- o develop simple and readily understood nontechnical program guidelines;
- o develop high quality, attractive program literature;
- o use personal contact with its customers to initiate the program; and
- o develop a thorough and well-planned marketing effort.

North Carolina Alternative Energy Corporation (NCAEC)

NCAEC is conducting a Downtown Small Business Demonstration project in three North Carolina Main Street communities. Main Street is a national program with its own funding, independent of NCAEC, focused on restoring downtown areas in small communities. Main Street's national scope could be a basis for similar energy programs in other communities, if the model used by this project is successful. North Carolina was selected as one of four states to receive national Main Street funding for projects to improve small town downtowns. The NCAEC saw this as an opportunity to piggyback an energy efficiency project onto a non-energy program, with potentially beneficial outcomes for all concerned.

NCAEC planned to retrofit nine demonstration businesses in three communities in three classes of energy efficiency: (1) low cost/no cost, (2) lighting, and (3) comprehensive. Energy use would be monitored before and after the implementation of the retrofits.

NCAEC described the formation of the Alternative Energy Corporation itself. This institution is a hybrid of public and private entities, and constitutes an experiment in delivering energy efficiency services that could be used as a model by other states. NCAEC's approach to delivering energy services to the small business sector is also described. The planned demonstration project is not scheduled for completion until 1989; thus, the NCAEC report deals only with the planned activities and a market pretest.

Through the monitoring of business community awareness, interest and ancillary activity in the demonstration communities, the potential for replicating the NCAEC small business model can be assessed. Interest in the surrounding business community and ancillary activities generated as a result of the demonstrations will be monitored. This interest will be compared with interest levels and activities in nondemonstration communities and in non-Main Street communities as control groups to measure the impact of the demonstrations themselves.

The NCAEC final report gives results of a pre-test involving interviews with 161 control group respondents to contrast with nine planned demonstration businesses, only six of which actually agreed to implement recommended measures. Virtually no significant differences were found between the experimental and control samples on variables included in the study. The more meaningful findings will occur at the time of the post-test, with results available in 1990.

NONPROFIT ORGANIZATIONS

Technical aspects of program delivery--such as what energy conservation measures to implement--would be identical for small business and for nonprofit organizations occupying small commercial buildings. RCCP analyses have shown, however, that the motivations for nonprofit organizations to invest in energy conservation are different from those of small businesses. While small businesses are interested in bottom-line profits, nonprofit organizations are concerned with maximizing the human services they can provide within their budget limitations. Therefore, the nontechnical aspects of program delivery is different for nonprofit organizations than for small businesses to heighten the probability of their participation in them.

The NOPI project funded two projects at organizations with extensive experience in dealing with nonprofit organizations: (1) the Interfaith Coalition on Energy, which works with congregational buildings in the Philadelphia area, and (2) the national headquarters of the United Way, which had been working to involve local United Way members in energy conservation programs for themselves and the nonprofit agencies they supported. The United Way combined forces with the Nonprofit Energy Conservation Project in New York City, which also had extensive experience in facilitating development of community funds and programs specifically for nonprofit agencies.

Innovations are diffused in society either horizontally or vertically. The vertical diffusion model is classically exemplified by the structure of the U.S. Department of Agriculture's Agricultural Extension Service. Through this hierarchical structure, which included headquarters in Washington, land-grant universities in each of the 50 states, and cooperative extension services and their county agents in each county of every state, agricultural innovations were developed and disseminated to the nation's farmers. This system was highly efficient in developing such innovations as hybrid seed corn, and stimulating their adoption to the point of saturation in remarkably short periods of time. Much of what is known about the efficient diffusion of innovations in society has been learned from the experiences and studies of the Agricultural Extension Service.

A key characteristic of a vertical diffusion model is the very high quality of information which is disseminated. In agriculture, the research carried out by agricultural specialists at the land-grant universities was considered to be excellent, and the research results had an existing system through which they could be transferred to every farmer in the state via the county agent. The results were accepted by the county agents and passed on to farmers as they were received from researchers. Such mechanisms as demonstration projects involving community opinion leaders were found by county agents to be effective means to transfer information about agricultural innovations.

The vertical diffusion model worked well for agricultural innovations, given the institutions invented to carry it out. The question for energy conservation organizations is whether or not a variant of this vertical diffusion model could be contrived that would be effective in the contemporary energy situation.*

*The Energy Extension Service has used the Cooperative Extension model to attempt to reach energy end users, especially homeowners, with conservation information.

The horizontal diffusion model is markedly different from the vertical one. If the vertical model can be depicted as a hierarchical ladder or pyramid where information starts at the top and flows downward, the horizontal model can be described as a fishnet, using a decentralized network approach, in which information flows between nodes in all directions more or less simultaneously. No classical example of the horizontal diffusion model has emerged as yet; however, energy vanpool programs appeared to diffuse during the late 1970s and early 1980s in a horizontal manner. Vanpool programs were initiated in California cities after the oil embargo of 1973-74 and slowly were adopted by other communities because of unofficial, informal networks of conservation activists in the towns and cities involved. These people would get together and share information about how vanpooling was done in one community; the next community would take existing ideas, arrange them in new ways and add a few features making the program more suitable to local conditions, and implement them. Then people from another community might visit them, see how it was done, and the process would repeat itself somewhere else.

A key characteristic of the horizontal diffusion model is the relatively low or uneven quality of information on the network. There are few, if any, authorities to whom to appeal for verification of findings, methods, or results.

However, the decentralized horizontal process has the advantage of spontaneity and flexibility, often permitting better program fits with local conditions and thus more effective programs. These programs may be more socially acceptable and more enthusiastically supported than those coming from "on high." For energy efficiency programs in buildings occupied by nonprofit organizations, then, the question was whether the horizontal approach--within and among local communities--might be the best way to proceed.

The Interfaith Coalition on Energy (ICE)

ICE was formed in 1982 by the religious community in Philadelphia to reduce energy costs in religious buildings. ICE offers seminars, technical information, newsletters, a slide/tape presentation, and energy audits. For seven years, ICE has been working with the 4,200 congregations in the Philadelphia area to help them reduce their energy costs. ICE has conducted on-site energy analyses for about 280 congregations, distributed 28 issues of a newsletter on conserving energy costs in congregational buildings, conducted more than 50 workshops, developed and used a slide/tape program, and offered many hours of telephone consultation. Based on its analyses, ICE has found that the cost savings from installing conservation measures alone have averaged about \$1,700 per year per congregation. Additional cost savings have been achieved with rate changes, fuel switching, requesting bids for fuel oil, sales tax rebates, and utility rebates.

ICE was interested in increasing its effectiveness, beyond its prior successes in aiding Philadelphia congregations to reduce their energy costs. Its NOPI project had two purposes: (1) to subject the ICE program to critical review to improve its information analyses and dissemination, and (2) to explore two different approaches to information dissemination as a basis for deciding a possible national role for ICE in promoting energy conservation in congregational buildings. ICE is a unique organization in having both researched questions of specific interest for congregational buildings, such as how pipe organs fare in low temperature environments, and provided energy services effectively to congregations.

One approach--the vertical diffusion model--involved a national religious denomination leveraging their headquarters staff and resources as a possible national technology transfer mechanism for energy efficiency. ICE explored this possibility with the national headquarters of the Episcopal Church, which has a Building Fund. The question was to see whether the Episcopal Church hierarchy was willing to be a vehicle for energy efficiency information through its diocesan offices and to its parishes across the nation.

The second approach--the horizontal diffusion model--involved working with an existing interfaith organization in a local community other than Philadelphia to disseminate information throughout local congregations regardless of denomination. ICE worked with Wilmington, Delaware, to explore the possibility of disseminating information across the local religious community.

In addition to its explorations with the Episcopal Church and Wilmington, ICE worked with denominational leaders and 14 congregations in Phoenix, Arizona, in cooperation with the Arizona Interfaith Coalition on Energy, patterned after the Philadelphia ICE. Arizona ICE had received \$133,000 in oil overcharge funds from the Arizona State Energy Office to conduct a three-year project for congregational buildings. ICE also presented information to 17 New York State community foundations to stimulate interest in energy conservation in the nonprofit sector, including congregational buildings. In addition, ICE worked with organizations at other locales to further energy conservation in religious buildings.

ICE concluded, on the basis of its experience with this project, that working at the community level to reach local congregations was more effective than working through a national organization to reach its member congregations nationwide. ICE concluded that program guidelines have to be tempered by local politics, climatic differences, funding sources, and project configurations. That is, ICE found that the horizontal model would be more effective in communicating information about energy conservation in religious buildings than the vertical model would be.

The ICE Advisory Board has decided to concentrate its efforts on the Philadelphia area rather than pursuing a national technical assistance role. ICE is unwilling to accept professional liability for energy audits conducted outside of Philadelphia. However, the ICE project director, Andrew Rudin, continues to pursue contacts in other parts of the country to facilitate development of ICEs in other communities.

United Way/Nonprofit Energy Conservation Project (UWay/NOPEC)

United Way and NOPEC have experience in delivering energy services and encouraging local energy partnerships in the nation's nonprofit buildings. For their NOPI project, United Way and NOPEC developed for review and dissemination the background, rationale, and practical implementation issues related to both "macro" and "micro" approaches to the application of energy conservation to nonprofit organizations. The "macro" level applies to national charitable umbrella organizations as instruments for implementing energy conservation policies and disseminating energy conservation information through their memberships. The "macro" approach is analogous to the vertical information dissemination model. The idea here was that United Way, the American Red Cross, the Salvation Army, and other charitable organizations have national organizations that could possibly set policy, and, at a minimum, serve as the source of energy conservation information for their member agencies across the country.

The "micro" level referred to the establishment of local partnerships to provide energy conservation to nonprofits. The "micro" approach is analogous to the horizontal diffusion model, which assumes that the most effective way to diffuse energy conservation information is through local networks.

United Way and NOPEC planned to address the issue of the appropriateness of the two different approaches, alone or together, as nationally replicable models for delivering energy services to nonprofit organizations.

The two organizations reported that the horizontal diffusion model (or the "micro" approach) would work best to provide energy services to nonprofit organizations. The only role they deemed important for national organizations was a facilitative, technical assistance role. That is, the national-level organization could visit local communities and facilitate the development of local partnerships to provide energy services for nonprofits. The national organization could also provide expertise on technical aspects of organizing the local programs.

THE NOPI PROCESS

The Notice of Program Interest (NOPI) approach represented an alternative to the standard Request for Proposal (RFP) process. As such, the NOPI process itself was an experiment in funding innovative energy projects and their evaluation, and in transferring the results of innovative program approaches being developed by organizations outside of government. This section gives our informal evaluation of that process. DOE needs to understand the advantages and disadvantages of the NOPI approach to view the NOPI as an alternative program management tool.

Strengths

Five major strengths of the NOPI process are evident.

- (1) **The process enhances existing innovative approaches.** It therefore served admirably in furthering RCCP's goal to foster voluntary actions to increase energy efficiency by utility companies and other program implementers. Each project benefited from the interaction between SERI and the awardee organization, a conclusion shared both by the task leader, SERI staff, and the project directors themselves.
- (2) **The process helped develop models for potential national replicability.** A key RCCP interest in funding the NOPI project was to determine whether any of the innovative approaches being developed and pursued by program implementing organizations might serve as models for other similar organizations, thus precluding their having to "reinvent the wheel" in designing programs. The RCCP target markets of highest priority--Weatherization Assistance Program-eligible lower-income and moderate-income home owners and renters, small business tenants and owners, and nonprofit organizations--were target markets in this project. Each market had two different approaches by two different organizations as potential models, and some answers about what might work resulted from these pilot efforts.
- (3) **The process provided a wide range of technical assistance to program implementers.** SERI had agreed to provide technical assistance to each project. The types of technical assistance provided included the following:
 - o Evaluation design
 - o Electricity usage analysis methodology and algorithm review
 - o Technical review of conservation measures in southeastern climates
 - o Review of public information efforts and materials
 - o Literature reviews*
 - o Sampling
 - o Instrument construction
 - o Data analysis
 - o Program planning
 - o Reporting results.

*Literature reviews were completed on (a) the effect of information feedback on electricity consumption, and (b) small commercial energy programs related to small business motivations and barriers to conserve energy. (See the publications list in Appendix C.)

Technical assistance was an element of the project for which the capabilities of a national laboratory were especially germane. The task leader was able to bring the diverse expertise of the SERI staff to bear on technical questions ranging from computer algorithms to professionally developed slide shows to layouts and type styles for newsletters. The organizations receiving this technical assistance would ordinarily either not have access to such a range of expertise or could not afford to purchase it. Each project director stated, at the NOPI workshops at the American Council for an Energy Efficient Economy (ACEEE) 1988 Summer Study at Asilomar, that they and their projects had benefited from receiving technical assistance. Our impression is that the technical assistance was critical to project success in at least half of the projects and was at a minimum supportive in the others.

- (4) **The process either caused evaluations to occur which would not have occurred otherwise, or improved evaluations which were planned.** Some projects, such as ANCO Engineers, Inc.'s evaluation of the Pacific Gas and Electric Great Rebate Program, were strictly devoted to evaluation research. Others, such as Boston Edison's EASY-Plus pilot project, provided both for a service and an evaluation of it. In each instance, the NOPI project was supportive in enhancing evaluations of innovative program efforts. This result probably occurred because organizations are typically more reluctant to allocate resources to systematic evaluations of project efforts than they are to fund the projects in the first place. The NOPI approach seemed to have special relevance in project evaluation, which was particularly important because of RCCP's concern about the potential national replicability of the approaches explored.
- (5) **The process uses both government and private sector networks to disseminate results.** Although some details of transferring the results of the project are still being worked out, some dissemination has already been accomplished. The project directors have met with each other, have reported at the American Council for an Energy Efficient Economy 1988 Summer Study at Asilomar, California, and have prepared final reports. One project director reported at the 1988 All-States meeting, while another has met informally with at least six other groups, including the American Gas Association and the New York State Energy Office. The results of the effort are published in summary and full-length forms. The literature reviews developed for technical assistance purposes have been published as part of the energy literature. The project was, and shows every sign of continuing to be, fertile in products, networking, and future experimentation.

Each participant worked very hard on the project. It's difficult to assess whether this was a result of something inherent in the process itself, a function of the individuals involved, or a side benefit of the process itself being an experiment--a kind of Hawthorne effect. Our hunch is that the willingness to go beyond the call of duty was at least partly a function of the style of project management, which attempted to be facilitative rather than controlling. Whatever its sources, personnel extending themselves to produce a higher quality project is a definite plus in the NOPI approach.

Weaknesses

Three major problem areas surfaced during the course of the project. Some of these probably should have been anticipated, as they appear obvious in hindsight.

- (1) **The NOPI project was too ambitious for its funding level.** Initially, SERI had planned, and DOE had funded, three projects. When the proposals came in and were evaluated at SERI by an evaluation team that included the DOE program manager, the excitement was such that six projects were approved for funding rather than the originally planned three. Apparently due to miscommunications between SERI and DOE personnel, no further funding was made available to SERI to manage twice the number of projects. The task leader, at the time the award decisions were made, did not know the level of effort required in managing the six projects, since the NOPI was, by definition, an experiment. If we had known then what we know now, we would have allocated more resources to the NOPI project. This weakness affected and was affected by some of the other problem areas described below.
- (2) **The project suffered from management problems.** This in itself is not unusual. The fact that the NOPI resulted in a final report from each project may even represent something of a management feat. Still, the areas of management difficulty were: (a) personnel turnover, (b) issues of control, (c) complexity, and (d) delays in products.
 - (a) **Personnel turnover.** In three projects, the project manager resigned, and in two of these, the manager resigned without notifying SERI. These resignations created major disruptions in the progress of project work.
 - (b) **Issues of control.** Some project managers benefited more from technical assistance than others because they were more open to it, and less inclined to view it as an issue of who was controlling the project. These were, after all, projects under the direction of the awardee organizations responsible for them. In retrospect, it would have been helpful to work out in advance the meaning of technical assistance, especially in one or two cases, to increase the accuracy of expectations on both sides.
 - (c) **Complexity.** Most projects had multiple organizational players, such as subcontractors and consultants. This compounded the work involved in effective communications between the SERI task leader and the other players. To be facilitative, which was the style of this project, communications needed to occur with all of the participating organizational players. Thus, instead of contact with six project directors, the SERI task leader maintained some contact with as many as 18 different people.
 - (d) **Delays in products.** Because of the problems already mentioned, delays in SERI receipt of project deliverables were, perhaps, inevitable. However, by giving the project directors time to adjust and recover from setbacks they had experienced, and by working with them through iterations of project presentations and reports, final reports of reasonable quality resulted.
- (3) **Quality control.** This was the element most worrisome to the task leader. SERI, RCCP, and other program implementing organizations need to be able to rely on the findings if the results are to be used in decision making about program design by other organizations throughout the nation. The credibility of the findings is at stake here. The staffs involved in these projects were not necessarily qualified to

perform evaluation research. The concepts involved in the diffusion of innovations (such as vertical and horizontal diffusion models) were unclear to them. Time for developing shared vocabularies was at a premium.

The quality of the research results was uneven, and some of the reports were of more value than others. For example, the ANCO Engineers, Inc., evaluation offers solid evidence of the effectiveness of carefully designed rebate programs for the small commercial sector. The Massachusetts Audubon Society evaluation of the HEAT program showed that zero-interest loans were desired by and were effective in eliciting the involvement of lower- and middle-income home owners. The Interfaith Coalition on Energy project, coupled with findings from United Way and the Nonprofit Energy Conservation Project (NOPEC), showed that horizontal diffusion models are more likely to be effective in generating energy efficiency projects for nonprofit organizations than vertical diffusion models would be. Results from NCAEC are too incomplete to permit a conclusion about the efficacy of demonstration projects in small town downtown areas in encouraging energy conservation among other small businesses. The NCAEC project is not scheduled to be completed until 1990. Finally, the Boston Edison results, while encouraging for the potential of disaggregated utility billing, must be viewed with caution. The research design agreed upon between SERI and Boston Edison was not carried through, and the sample sizes used in the evaluation were too small to permit statistically valid generalizations to be drawn.

These problems would be alleviated partly by more funding. The task leader could have worked full-time on the project for one and one-half years. (This work was accomplished in about one-third time over two years, with periodic assistance from other SERI and DOE staff.) Each organization spent more time on its project than was budgeted for; that situation should be corrected in any future NOPI type of project.

The facilitative management style appears to be effective for a NOPI project. This approach would be improved by the task leader's anticipating the difficulties outlined above and working to increase frequency of communication among the players. The face-to-face meetings held between the task leader and each project director were essential. Later feedback from project directors was that they would have appreciated having had a team meeting. (Resources were unavailable for that in this project.)

CONCLUSIONS

Several key conclusions are suggested by the NOPI projects. First, the NOPI process itself appeared to be successful in enhancing the implementation and evaluation of innovative programs for the delivery of energy services and in making the results of such projects publicly available.

In the residential sector, two very different approaches appeared to be successful in reaching the lower- to middle-income micromarkets of interest to RCCP. One successful approach is to provide, through local community organizations and backed by the utility company, zero-interest loans for the installation of energy efficiency measures in homes. These programs should be advertised purposefully by word-of-mouth and in local media. The programs should provide quality control of contractor work, perhaps by an inspection mechanism. Banks should be involved in actually making the loans, the interest on which can be subsidized if funds are available.

A second demand-side approach holding promise for electric utilities is the disaggregated electric usage analysis. This service, delivered by mail, appears to be effective in reducing the electricity consumption of the micromarkets of concern. It is useful as well in improving utility customer relations. While some research on the effectiveness of information feedback has been done, and the Boston Edison study is encouraging, the actual potential of the approach in conserving electricity and the cost-effectiveness of providing this service on an annual or a monthly basis is still unknown.

For small commercial buildings, the findings on energy rebates are highly promising. The widespread participation in the PG&E rebate program by both owners and tenants of small commercial buildings and the permanence of the resulting installations is encouraging. This program should serve as a model for other utilities offering rebates, and for those considering what service to offer their commercial/industrial customers. A rebate program designed after this model offers real promise of meaningful energy savings and improved public relations.

The model of demonstration businesses being explored in North Carolina does not appear to be as promising as the rebate program. The difficulties in getting participation among even nine self-selected businesses--of whom only six decided ultimately to implement measures--suggest the limitations of this approach. Also, while the rebate program in California succeeded in part because trade allies there--who saw profits for themselves in selling measures approved for rebates--were enthusiastic program boosters, in North Carolina local trade allies were program opponents who didn't stock the recommended measures, didn't know anything about them, and advised local business people against using them. These NOPI results suggest that program staff should work with trade allies as part of demonstration projects to improve the likelihood that the energy efficiency measures being demonstrated will have broader appeal in rural small towns.

Until the final results are available on the demonstration project, the use of equipment rebate programs may offer the most promise in reaching the small commercial sector in the near-term, particularly in urban areas where trade allies can be expected to help with the program.

For nonprofit organizations, both ICE and United Way/NOPEC have argued that working at the community level is the most effective method of disseminating information and implementing energy conservation programs for nonprofit agencies. Unless further evidence is generated to the contrary, the use of local partnerships appears to be the most promising approach, based on extensive experience, for reaching nonprofit agencies.

These results should prove useful to organizations implementing energy programs as they design energy conservation and demand side management programs for their clientele.

On balance, the NOPI experience was valuable. The outcome is still being decided, because the evaluation of the approach cannot be complete until the dissemination stage is completed, and some attempt to track utilization of project findings is made. Based on the input of both SERI and awardee organization staffs, however, the NOPI was a productive and useful project in which to be involved. We recommend that DOE continue to use the NOPI process as an alternative to the RFP for projects in which such an approach holds promise.

APPENDIX A

**ACTUAL NOTICE
OF PROGRAM INTEREST (NOPI)
ISSUED**

December 31, 1986

CLOSING DATE: February 28, 1987

Ladies and Gentlemen:

NOTICE OF PROGRAM INTEREST

Innovative Energy Efficiency Program Delivery for Homes and Small Businesses

The Solar Energy Research Institute (SERI) invites utility companies; state energy offices; trade, professional, non-profit and industry associations; and others to submit proposals for innovative approaches to the delivery of energy efficiency services to residential, commercial, or non-profit energy end users. The building sectors of interest are (1) single-family (SF) residential buildings occupied by owners with low to moderate incomes* or (2) small (less than 10,000 sf) commercial buildings (or separately-metered units in small buildings) occupied by small business or non-profit owners or renters. This work is in support of the Department of Energy's (DOE) Residential and Commercial Conservation Program (RCCP). One goal of the RCCP is to foster voluntary actions to increase energy efficiency by utility companies and other program implementers and energy intermediaries, such as state energy offices, utility regulators, local governments, non-profit organizations, private sector organizations, and trade and professional associations.

This Notice of Program Interest (NOPI) is directed toward organizations that are, or will be, developing or are already fielding, with existing budgets, their own innovative energy efficiency programs targeted toward one or both sectors of interest. The NOPI is for a collaborative effort with SERI providing technical assistance only or technical and monetary assistance related to program design, implementation, and/or evaluation and disseminating results of the field test broadly. SERI has extensive expertise in program implementation, significant technical resources and facilities, and access to national level data and resources. Assistance will be provided in the spirit of collaboration to achieve truly innovative and tested projects which enhance energy efficiency in the sectors of interest as models for national replication without significant federal resource commitments.

It is anticipated that three (or more) technical assistance or combined technical assistance and monetary awards will be issued for this program, with assistance provided over a period of approximately one year. A definite contractual date for beginning and ending the assistance will be negotiated. Results from selected projects will be required by January 31, 1988 for SERI to make a final report to DOE by March 15, 1988. Technical assistance services to be provided are in-kind services from SERI based on the requests from proposers; examples of such services are described in further detail in Section II of this NOPI. Monetary awards of up to \$20,000 each will be made for the purpose of technically enhancing already-funded programs, making field tests feasible, and disseminating results to other program implementers. It is expected that at least one award will be made in each sector of interest; however, SERI reserves the right to make no awards under this NOPI.

I. BACKGROUND

One of the RCCP's goals is to foster effective voluntary energy efficiency program activities by utility companies and by other program implementers (such as state energy

offices, utility regulators, local governments, non-profit organizations, private sector organizations, and trade and professional associations) and energy intermediaries (such as product manufacturers and lenders). The RCCP has selected existing low- to moderate-income (WAP-ineligible) SF housing occupied by homeowners and small commercial buildings as two sectors of initial focus owing to the high energy savings potential in these buildings, among other criteria.

The SF owner-occupied sector is the largest of the residential building sectors nationally, comprising 54 million homes using 10.53 quads of energy per year. Although several federal and nonfederal energy efficiency programs such as the Residential Conservation Service (RCS) Program, the Energy Extension Service (EES), and WAP target SF homeowners, significant additional savings can still be achieved in this sector. Potential energy savings are estimated to be approximately 2.08 quads per year. In particular, RCCP analyses have determined that there are two significant under-served micromarkets which have not participated extensively in energy efficiency programs or have not used residential energy tax credits: (1) a lower-income (below \$15,000/year) micromarket ineligible for WAP and (2) a moderate-income (\$15,000-30,000/year) micromarket.

About three-quarters of existing commercial buildings in the nation are relatively small in size. These smaller buildings are used most frequently as retail stores and service shops, offices, restaurants, grocery stores, public or private assembly buildings, and warehouses. Small commercial buildings use about 2.47 quads of energy annually. Technical energy savings potential for these buildings has been estimated at 0.49 quads per year. Over two-thirds of these commercial buildings are occupied by business tenants and the remaining third by owners. While commercial buildings have received attention from federal programs (such as the State Energy Conservation Program, the Energy Extension Service, and the Commercial and Apartment Conservation Service Program) and from private sector efforts (such as those by energy service companies), occupants of smaller commercial buildings have not participated as extensively as those in medium-size and large buildings. The smaller buildings are most apt to benefit from generic technology applications in a manner analogous to residential buildings.

More needs to be learned about how to design and deliver effective energy efficiency programs to these sectors and how to stimulate them to install energy conserving retrofits. The "general market" programs used in the past have not been as successful as desired in involving either of these sectors. The RCCP is looking for ways to assist program implementers in delivering energy efficiency programs most effectively through such means as field testing alternative approaches, evaluating participation and retrofit rates, and disseminating the results to others. Therefore, SERI is offering technical and monetary resources to organizations interested in developing and testing innovative approaches in the design, delivery and/or evaluation of energy efficiency services to these sectors.

II. OBJECTIVE AND PURPOSE

The objective of this NOPI is to solicit a wide range of innovative proposals from organizations interested in receiving technical assistance or combined technical and monetary assistance in improving the design, delivery and/or evaluation of energy efficiency programs for single-family homes occupied by WAP-ineligible low to moderate income homeowners, or commercial buildings occupied by non-profits or small businesses. The intent is to help make the selected projects as successful as possible and replicable across the nation in other small businesses, industries, non-profit organizations, and homes. The technical assistance provided will be in response to the

proposer's needs and could take the form of ongoing partnership between SERI and successful proposers with: periodic brainstorming meetings; assistance from SERI in, for example, planning, field tests, document development, evaluation of what does and doesn't work; and publication services where SERI assists in making results widely known.

Due to time and resource constraints and the pressure to implement energy programs quickly, local organizations often don't have the ability to study alternative approaches to program planning, operation and evaluation nor, frequently, the access to a wide variety of technical and programmatic expertise. This NOPI offers proposers the opportunity and resources to draw upon a wide range of diverse talent which can assist in developing improved program effectiveness. A benefit of the technical resources offered to proposers is that more rigor can be applied to project planning, implementation, evaluation activities, and information sharing. A second difficulty is that many innovative projects have been implemented with insufficient reporting to other potential program implementers so that they could learn from shared experience. SERI, with its staff of technical writers, editors and graphic artists, can assist in developing information products to make proposers' innovative and successful projects widely available as models for others to follow.

SERI offers the following kinds of capabilities to successful proposers:

- o SERI is currently involved in retrofit research programs for DOE's Office of Buildings and Community Systems. Through this involvement, SERI is familiar with different approaches to program implementation throughout the country, whom to contact, what information exists, key technical resources, and alternative funding mechanisms.
- o SERI staff have extensive training and experience in energy efficiency program delivery. SERI has worked with states and utilities since the late 1970s on program delivery and has knowledge of products, installation, field monitoring, and program evaluation. SERI has a diverse staff with a variety of technical and programmatic areas of expertise to offer.
- o SERI staff includes nationally-recognized experts in analytical design and experimental procedures development.
- o SERI has the ability to access and review a wide range of energy efficiency literature and data bases.
- o SERI has a publications department with technical writers, editors and graphic artists to assist in information product development, design, publication and dissemination.

Each successful proposer can expect to receive up to 300 person-hours of technical assistance on program design, implementation, evaluation, and/or dissemination of program results. Examples of the topics on which proposers might desire technical assistance include:

- o Design
 - Market research.
 - Ideas and approaches on how to reach markets once defined.
 - Determination of cost-effective retrofit measures for the target climate regime.
 - Design of information pieces to reach target markets.

- Project planning and scheduling.
 - Participation in project brainstorming sessions.
 - Data base and literature searches.
 - National level data gathering on alternative approaches to achieve desired objectives.
- o Implementation
- Technical assistance regarding field installation problems.
 - Analysis of retrofit impact.
 - Site inspection.
 - Loaning of equipment or personnel for on-site data collection (primarily for one-time tests; e.g., blower door, flue gas, etc.).
 - Information development and dissemination.
 - Technical assistance concerning field personnel effectiveness.
- o Evaluation
- Alternative experimental design specifications.
 - Questionnaire development for data collection.
 - Analysis techniques.
 - Gathering feedback.
 - Information development and dissemination.
 - Program process evaluation.
- o Dissemination
- Documentation of program.
 - Drafting of information products.
 - Workshop/seminar design.
 - Partnership development facilitation.
 - Training trainers.

Proposers should indicate what topics are of interest to them and what kinds of technical assistance is desired.

III. OUTCOMES

Where appropriate, SERI will co-author, or otherwise assist successful proposers in the preparation of, articles, synopses, and other information products for distribution through channels such as the trade press. SERI will also prepare, with review and input from successful proposers, a report for DOE which highlights the lessons learned from the program. If appropriate, case studies or other materials designed to encourage replication may also be prepared.

IV. COST PARTICIPATION

Two different general types of programs will be considered:

- (1) those involving services delivered by a utility company, state energy office, or other organization, and
- (2) those involving energy efficiency information products or activities, such as those developed by a national trade, professional, non-profit, or industry association for its member organizations or individuals.

The proposer is expected to pay for the field test(s) including design of the project(s) and any incentives, marketing or dissemination, and evaluation data collection and analysis. In exchange for the technical assistance to be provided, it is hoped that the proposer would be willing to include (or has already included) evaluation in its internal budget for the project. SERI can provide technical assistance as requested by the proposer on program design (including market research, design of incentives packages, retrofits , or design of information products), evaluation design, and/or dissemination.

The monetary portion of the award is intended to enhance energy programs already being planned or conducted, with funding already in place, by qualifying organizations. The monetary portion of the award is therefore limited to augmenting already-existing budgets. The appropriate uses of the monetary award will vary by type of project.

For on-site energy program services in the residential and commercial sectors, the monetary award could appropriately be used for:

- o collecting/analyzing data for market segmentation;
- o collecting/analyzing data for program evaluation purposes;
- o producing/disseminating information products for other similar energy program implementers; or
- o working with the SERI technical assistance team;

and should not be used for:

- o delivering energy efficiency services;
- o advertising the energy efficiency program; or
- o producing information products for consumers.

For trade, professional, non-profit or industry association programs, the monetary award could appropriately be used for:

- o collecting/analyzing data on energy use and market characteristics of member buildings;
- o providing technical input on members' energy-related problems;
- o analyzing how energy efficiency will improve members' cash flows;
- o evaluating the impact of the program on members; or
- o working with the SERI technical assistance team;

and should not appropriately be used for (because these functions would represent the major activity of this type of project; therefore, the proposing organization should already have funding for them):

- o printing/disseminating information products for membership;
- o conducting workshops or seminars; or
- o advertising the program to members.

These limitations on how the monetary portion of the award may be used are intended to ensure that the awards go to support qualifying organizations already planning or implementing their own innovative programs, and are not intended to limit the range of program concepts proposed.

V. SELECTION PROCESS AND EVALUATION CRITERIA

Proposals submitted in response to this NOPI will be evaluated in accordance with the selection process and award criteria described below.

Selection Process

Proposals shall be evaluated by qualified SERI personnel. SERI reserves the right to use the technical assistance of qualified personnel within the federal government and the national laboratories and private consultants to SERI for the technical evaluation if it so desires. By submission of its proposal, the proposer thereby consents to the disclosure of its proposal contents to such personnel for the purpose of evaluation.

There is no commitment made by SERI to award a particular number of agreements. Proposals will be evaluated in accordance with the evaluation and award criteria shown below and a competitive range determined. Once proposers within the competitive range have been identified, they may be contacted by SERI for written or oral discussions or clarifications. A common cut-off date or due date will be established for receipt of any clarifications. Responses received will be evaluated and a negotiation ranking order will be established.

Proposers are advised to submit their best effort initially. Final negotiations will only be held with the top-ranked proposers that equal the number of potential awards. Final negotiations will not be held with the remaining proposers in the competitive range if a final subcontract is negotiated with a higher ranked proposer(s).

Evaluation Criteria

The following evaluation criteria will be used to evaluate proposals and are listed in order of importance.

Proposals will be evaluated for technical approach, relevance to overall RCCP objectives, qualifications and capabilities of the proposing organization and key personnel, and project management plan and schedule, as follows:

1. Technical Approach

- o Technical feasibility of the project.
- o Innovative approach toward program delivery to the sector(s) identified.
- o Attention to target audience characteristics.
- o Overall potential for high participation and implementation rates.
- o Completeness and conceptual clarity with which the project is described.
- o Adherence to the guidelines presented in this NOPI.

2. Relevance to Overall RCCP Objectives

- o Potential for replication of the project, project elements, or approaches in other regions, businesses, or industries without federal support.
- o Identification of key implementation issues relevant to the sector and creative approaches for resolving them.
- o Non-duplication with other activities funded by RCCP or other areas of DOE.

3. Qualifications and Capabilities

- o Technical capability of the personnel proposed to carry out their part in the project, as evidenced by training and experience in like activities.
- o Proposing organization's funding of and capabilities to undertake the proposed project.
- o Proposing organization's dedication to developing an effective program.

4. Project Organizational Structure and Schedule

- o Quality of the proposed project in terms of potential effectiveness, data integrity, and analysis.
- o Extent of collaboration with utility, community, stakeholder, or other relevant organizations.
- o Clarity and simplicity of organizational lines of responsibility, both within the proposer's organization (as they relate to this project) and between the proposing organization and SERI.
- o Completeness and feasibility of the proposed schedule; meeting the project deadline of January 31, 1988 for results.
- o Identification of important milestones.

SERI may solicit, from available sources, relevant information concerning the proposer's record of performance and use this information in evaluation and selection.

VI. PROPOSAL FORMAT

The proposal should not exceed 7 pages (counting the cover page). The proposer should summarize clearly the actual project and the target sector(s) it is intended to reach as well as how the project is to be performed.

To save time in proposal preparation and evaluation, a proposal format is presented. Only proposals submitted in this format will be considered.

- A. Cover page (see Appendix A).
- B. One-page summary description of the project.
- C. One-page checklist of essential information (see Appendix B).
- D. One-page summary of the qualifications of key personnel.
- E. One-page summary describing any collaboration with other organizations, organizational capabilities, schedule, organizational structure for the project, and proposed relationship with SERI.
- F. One-page budget for the project reflecting the project budget without SERI assistance and identifying source(s) of funding.
- G. Up to one additional page of information on any relevant topic the proposer deems essential for clarifying the proposed project.

Use of appendixes is strongly discouraged.

VII. SUBMISSION OF PROPOSALS

- A. Three copies of your proposal must be received on or before 4:45 p.m. MST at the Solar Energy Research Institute, Golden, Colorado on February 28, 1987. A preproposal conference is not planned. Any proposal received after the time specified will not be considered unless it is received before award is made, and

1. it was sent by registered or certified mail and SERI determines that the late receipt was due solely to delay in the mails for which you were not responsible; or
 2. it was sent by mail (or telegram if authorized), and SERI determines that the late receipt was due solely to mishandling after receipt at its installation; or
 3. it is the only proposal received; or
 4. it offers a significant technical advantage to SERI.
- B. Any modification of a proposal is subject to the same conditions as in A. above.
- C. Proposals may be withdrawn by written or telegraphic notice received at any time prior to award. Proposals may be withdrawn in person by the proposer or the proposer's authorized representative, provided that person's identity is made known and he or she signs a receipt for the proposal prior to award. (Note: the term "telegraph" includes mailgrams.)

Address proposals and questions concerning this NOPI submission to:

Solar Energy Research Institute
 Attn: Mr. Fred C. Brooke, 330
 1617 Cole Boulevard
 Golden, CO 80401

For personal delivery, the address is Building 15, Denver West Office Park, 1617 Cole Boulevard, Golden, CO.

Questions of a technical nature regarding this NOPI may be directed to Mr. Thomas F. Potter at (303) 231-1083.

VIII. AWARDS

- A. Awards may be without discussion of proposals received.
- B. SERI intends to place multiple awards based on the proposals submitted and available funding.

IX. PROPOSAL EXPENSES AND COSTS

The NOPI does not commit SERI to pay any costs incurred in the preparation and submission of a proposal or for any other costs in the execution of a field test.

X. ACKNOWLEDGMENT OF AMENDMENTS

If this NOPI is amended, the proposer must acknowledge receipt of the amendments (by number and date) in the proposal transmittal letter.

**APPENDIX A
COVER PAGE**

Title of Proposal: _____

Proposal in response to Notice of Program Interest (Synopsis No. 7-103) entitled, "Innovative Energy Efficiency Program Delivery for Homes and Small Businesses."

To: Solar Energy Research Institute, 1617 Cole Boulevard, Golden, CO 80401

From: Organization: _____

Address: _____

Name of key contact: _____

Telephone number: _____

Type of organization (*please check one*):

- | | |
|---|--|
| <input type="checkbox"/> Utility company | <input type="checkbox"/> State energy office |
| <input type="checkbox"/> Local government agency | <input type="checkbox"/> Utility regulatory agency |
| <input type="checkbox"/> Non-profit organization | <input type="checkbox"/> Private sector organization |
| <input type="checkbox"/> Trade, professional or industry organization | |
| <input type="checkbox"/> Other organization (<i>please specify</i>) _____ | |

The proposed project is designed to reach (*please check one*):

- Low-income WAP-ineligible homeowners
- Moderate-income homeowners
- Low- to moderate-income homeowners
- Small commercial building owners/tenants
- A specific business or non-profit sector in commercial buildings (*please specify*) _____
- Other (*please specify*) _____

Proposed Starting Date: _____

Proposed Ending Date: _____

Total Amount of Funding Requested: \$ _____

Total Number of Hours of Technical Assistance Requested: _____ Person-hours

Date of Proposal: _____

Proposer: _____

Name (typed) _____ Title _____

Authorized Organization Representative: _____

Name (typed) _____ Title _____

**APPENDIX B
CHECKLIST OF ESSENTIAL INFORMATION**

1. What technical approach will be used in the proposed project?

2. What are the key implementation issues?

3. What evaluation of the proposed project will be conducted?

4. Summary of existing funding and requested assistance:

	\$ Amount Already Funded	\$ Amount Requested	Person- Hours of Technical Assistance Requested
Design	_____	_____	_____
Implementation	_____	_____	_____
Evaluation	_____	_____	_____
Dissemination	_____	_____	_____
Other (<i>specify</i>) _____	_____	_____	_____
Totals	\$ _____	\$ _____	_____ PH

5. Specifically what activities are proposed to be funded by the monetary award?

6. Specifically what types of technical assistance are requested?

APPENDIX B

STATEMENTS OF WORK

Residential projects:

Massachusetts Audubon Society

Boston Edison Company

Small commercial projects:

ANCO Engineers, Inc.

North Carolina Alternative Energy
Corporation

Projects for nonprofit organizations:

Interfaith Coalition on Energy

United Way and Nonprofit Energy
Conservation Project

4/22/87

STATEMENT OF WORK
HEAT Program Market Study
MASSACHUSETTS AUDUBON SOCIETY
AND

MASSACHUSETTS EXECUTIVE OFFICE OF ENERGY RESOURCES

Scope of Work

The Subcontractor shall perform the following: The project will produce a market segmentation and evaluation study on Massachusetts' new Home Energy Assistance Team (HEAT) program, a statewide program providing zero interest loans and energy counseling. Its purpose is to determine the most successful marketing and counseling methods to involve WAP-ineligible lower-income and moderate income (\$15,000-30,000/year) single-family homeowners into program participation and in implementing energy efficiency measures.

The Subcontractor will test the different methods mentioned in the proposal used by the various communities and agencies involved to deliver the HEAT program to shed light on the question of the most successful program delivery mechanisms for the sectors in question.

The Subcontractor will perform four research activities:

1. A market segmentation analysis to include distinguishing homeowners from tenants and segmenting WAP-ineligible single-family homeowners with incomes under \$15,000 and those with \$15,000-30,000 annual incomes to determine HEAT program participation rates and implementation rates in these sectors.
2. A systematic characterization of each of the different methods used to deliver the HEAT program and the identification of factors distinguishing these methods for purposes of testing in the telephone survey.
3. Data collection from a random sample of the two sectors noted above, including both participants and nonparticipants concerning:
 - the desirability of a zero-interest loan program vs. other types of incentives that could be offered;
 - factors motivating these households to implement energy-conserving measures; and
 - the desirability and efficacy of the characteristics of the different methods used to reach these sectors.

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4. Preparation of a report on the comparative success in promoting participation and implementation of the different incentives and methods used to deliver the HEAT program with recommendations concerning successful program design for the two sectors of interest.

SERI will not fund nor assist in data collection involving window and heating contractors.

The SERI technical assistance schedule is:

<u>SERI Technical Assistance</u>	<u>Hours</u>	<u>Period</u>
Project design brainstorming	20	6-7/87
Review of data collection development	30	7-9/87
Literature review on project-related topics	80	5-12/87
Assist preparation of preliminary project report (including editing and graphics support)	55	1/87
Attend steering committee meetings	<u>35</u> <u>220</u>	7/87, 8/87, 11/87

Deliverables from Subcontractor to SERI

	<u>Due</u>
1. Working paper characterizing the different methods of service delivery	8/31/87
2. Market segmentation characterization working paper	9/30/87
3. Completion of final instrument	9/30/87
4. Preliminary final project report	1/31/88

Addresses

1. One copy of each deliverable shall be sent to:

Mr. Thomas F. Potter
Solar Energy Research Institute
1617 Cole Blvd.
Golden, CO 80401

2. One copy of each deliverable shall be sent to:

Mr. Fred Brooke
Solar Energy Research Institute
1617 Cole Blvd.
Golden, CO 80401

4/21/87

STATEMENT OF WORK
"EASY-Plus" Electric Usage Analysis
BOSTON EDISON COMPANY

Scope of Work

The Subcontractor shall perform the following: The disaggregated electricity billing pilot program will gather a useful customer data base, test customer behavioral response to information feedback, and lay the foundation for significant residential energy efficiency programs. Boston Edison will field a pilot disaggregated billing program to at least 500 customers in nine different communities, selected randomly from RCS Program participants. Information will be collected from "EASY-Plus" Program participants--those receiving disaggregated billing--as to their income levels to permit determination of the response to the program of single-family homeowners with incomes of \$15,000 to 30,000/year and Weatherization Assistance Program-ineligible homeowners with incomes under \$15,000/year.

The Subcontractor will use an experimental or quasi-experimental design to test adequately the impact of disaggregated billing on implementation of recommended measures and actual electricity consumption. Therefore, the Subcontractor will test the effect on the following dependent variables: (1) customer understanding, (2) customer motivation, (3) implementation of recommended measures, and (4) actual electricity consumed by income level of:

- o the different methods of community-based on-site delivery vs. mailed delivery of services and
- o regular RCS Program participants compared with EASY-Plus Program participants.

The testing of EASY-Plus participation rates will not be accomplished as part of this project because program participants will be selected as part of a study sample.

SERI wishes to provide some technical assistance on the format to be used in presenting disaggregated billing information to customers. Also, program and evaluation design input from SERI should come early in the process to influence the actual implementation, data collection and analysis procedures used in the study.

The SERI technical assistance schedule is:

<u>SERI Technical Assistance</u>	<u>Hours</u>	<u>Period</u>
Project design brainstorming	8	5/87
Assist in the design and pretest of the format to be used in presenting disaggregated billing information to customers	16	5/87
Review of bill analysis methodology	8	5/87

[Assumes disaggregated billing is fielded . . .]		6-8/87
Evaluation design brainstorming	8	5/87
Review of questionnaire development	8	9/87
Assistance with focus group	8	10/87
Review (1) building energy conservation information, (2) building energy conservation experience, and (3) national literature/data bases for appropriate retrofit measures and product evaluations	50	5-10/87
Follow-on program planning:		
o review evaluation results	8	11-12/87
o brainstorming on implications of results for program planning	8	11-12/87
o assistance designing information products or other program elements	8	12/87-1/88
Review draft of project report	<u>10</u>	12/87-1/88
	140	

Deliverables from Subcontractor to SERI

	<u>Due</u>
1. Bill analysis methodology and initial format of customer report (one copy with cover letter)	5/29/87
2. Letter report on focus group (two copies)	11/30/87
3. Draft project report (two copies)	12/15/87
4. Final project report (two copies)	1/29/88

Addresses

1. One copy of each deliverable shall be sent to:

Mr. Thomas F. Potter
Solar Energy Research Institute
1617 Cole Blvd.
Golden, CO 80401

2. One copy of each deliverable (cover letter only for deliverable #1) shall be sent to:

Mr. Fred Brooke
Solar Energy Research Institute
1617 Cole Blvd.
Golden, CO 80401

4/22/87

STATEMENT OF WORK

Small Commercial Energy Program Study

ANCO ENGINEERS, INC.

Scope of Work

The Subcontractor shall perform the following: The project's purpose is to identify factors associated with the success of small commercial energy programs delivered by utility companies. Specifically, the project will involve a post-hoc evaluation of Pacific Gas and Electric Company's programs to define program elements that were attractive to small commercial owners and tenants, to assess what made the programs successful, and to identify special program features attractive to tenants as compared with building owners. ANCO will conduct personal interviews with approximately 10% of a stratified (by building type) random sample of commercial customers who participated in the utility programs. In addition, ANCO will collect a completed mail questionnaire from approximately 300 participating commercial customers in the sample.

ANCO will prepare the sample, construct the data collection instrument, pilot test the instrument through personal interviews, collect and analyze the data, and prepare a project final report. In addition, Pacific Gas and Electric and ANCO may collect data and analyze the following questions: (1) how permanent are the energy-efficiency improvements which have been obtained? (2) how can successful programs be transferred to and implemented by other private, public and municipal utilities? and (3) what actions or programs might be necessary for the replicability of successful programs? Answers to these questions would be included in ANCO's final report to SERI.

The SERI technical assistance schedule is:

<u>SERI Technical Assistance</u>	<u>Hours</u>	<u>Period</u>
SERI meets with ANCO/PG&E &/or BPA	20	5/87
Technical assistance on overall project and evaluation design and procedures	40	5-6/87
Assist with sampling methodology	30	6/87
Assist with questionnaire development	80	7/87
Data collection		8-10/87
Data analysis	20	10-11/87
Review of findings	20	11-12/87
Assist preparation of draft project report	40	12/87-1/88
	<u>250</u>	

4/22/87

Deliverables from Subcontractor to SERI

	<u>Due</u>
1. Working paper on study and sampling methodology	6/30/87
2. Data collection instrument completed	7/31/87
3. Project final report	1/31/88

Addresses

1. One copy of each deliverable shall be sent to:

Mr. Thomas F. Potter
Solar Energy Research Institute
1617 Cole Blvd.
Golden, CO 80401

2. One copy of each deliverable shall be sent to:

Mr. Fred Brooke
Solar Energy Research Institute
1617 Cole Blvd.
Golden, CO 80401

6/9/87

STATEMENT OF WORK

Downtown Small Business Demonstration Project

NORTH CAROLINA ALTERNATIVE ENERGY CORPORATION

Scope of Work

The Subcontractor shall perform the following: The demonstration of cost-effective opportunities to increase energy efficiency in small North Carolina businesses will be conducted as part of the NCAEC Main Street Program. Three to five towns will be the sites for the demonstrations. Energy use will be monitored before and after the implementation of three classes of energy efficiency in businesses and a cost/benefit analysis will be performed. Interest in the surrounding business community and ancillary activities generated as a result of the demonstration will be monitored.

The Subcontractor will use a pre-test/post-test design to measure motivations, barriers, energy consumption, knowledge, and interest among the demonstration and nearby businesses. SERI will provide some technical assistance on design of the pre- and post-tests.

The Subcontractor will provide results in three areas: (1) pre-test data on motivations, barriers, interest, and knowledge of small businesses in the demonstration communities, (2) description of Alternative Energy Corporation formation and the NCAEC approach to delivering energy services to the small commercial sector, and (3) a description of the design and methodology of delivering and evaluating the Downtown Small Business Project.

NCAEC will provide documentation concerning small business owner/tenant motivations/barriers, through existing data which NCAEC might have in hand and through the collection of new data on these questions. To provide models for other energy program implementers in the nation, SERI is interested in receiving a description of how the Alternative Energy Corporation was formed, how the Main Street Program was designed, initiated and implemented, and how the current small commercial demonstration was developed through this partnership.

SERI views as highly significant the monitoring of business community awareness, interest and ancillary activity in the demonstration communities and feels that this should be conducted in a thorough and systematic fashion. Through the data from this monitoring activity, the potential for replication of the NCAEC small business model across the nation can be assessed. SERI is interested in providing technical assistance for this monitoring activity and in exploring ways that these results can be shared with SERI when they become available. The Subcontractor will develop and implement a methodology for monitoring business community response to the program as part of this project.

SERI is also interested in providing technical assistance on analyzing retrofit measures and reviewing small business energy efficiency programs, as mentioned in the proposal. The requested SERI representation on the Project Advisory Committee will be provided, with the proviso that schedules are mutually feasible.

6/9/87

The SERI technical assistance schedule is:

<u>SERI Technical Assistance</u>	<u>Hours</u>	<u>Period</u>
Project design assistance	16	6/87
Input on design of identifying small business motivations/barriers and monitoring business community awareness, interest, and ancillary activity	30	6/87
Technical assistance on analyzing retro-fit measures for southeast climate regimes	80	6-7/87
Review of small business energy efficiency programs in the U.S.	60	6-8/87
Review of results from pre-test	16	8/87
Review of draft final report	8	12/87
Representation on Project Advisory Committee	<u>40</u>	8/87, 11/87
	250	

Deliverables from Subcontractor to SERI

	<u>Due</u>
1. Results from pre-test on motivations, barriers, and monitoring	8/31/87
2. Working paper describing AEC formation and approach to the small commercial sector	10/15/87
3. Report on design and methodology of delivering and evaluating the Downtown Small Business Project	1/29/88

Addresses

1. One copy of each deliverable shall be sent to:

Mr. Thomas F. Potter
Solar Energy Research Institute
1617 Cole Blvd.
Golden, CO 80401

2. One copy of each deliverable shall be sent to:

Mr. Fred Brooke
Solar Energy Research Institute
1617 Cole Blvd.
Golden, CO 80401

5/1/87

STATEMENT OF WORK

ICE Review and Development Project

INTERFAITH COALITION ON ENERGY

Scope of Work

The Subcontractor shall perform the following: The project's purpose is to subject the ICE program to critical review to improve ICE's information analysis and dissemination so that information on energy efficiency can be more effectively presented to congregations across the nation.

ICE will submit materials on its past program, as described in its proposal, to SERI for review, with a specific list of questions that ICE would like SERI to address concerning each piece of material sent. Questionnaires and interview guides should be included only with a written statement of the purpose for each instrument. SERI will assist ICE in brainstorming information dissemination and evaluation possibilities.

ICE will explore, during the project period, two different pilot approaches to information dissemination--one with a national religious denomination leveraging that denomination's headquarters staff and resources to be the technology transfer for energy efficiency, and one in a local community other than Philadelphia, possibly working through an existing interfaith organization.

SERI will assist in database analysis in addressing ICE's questions about how best to use the existing database to further ICE objectives. The random poll mentioned in the proposal might be useful for market characterization or troubleshooting but not necessarily for information dissemination purposes, and will not be pursued as part of this project.

SERI will plan to meet with ICE's Advisory Board once or twice during the project to assist in explaining the project to them or otherwise offering assistance.

SERI will not fund nor technically assist in the study of relative humidities involving installation of recording hygrometers in congregational buildings and schools, as mentioned in the proposal.

While SERI would appreciate receiving feedback from ICE on the cooperative effort, the evaluation results SERI requires by 1/31/88 involve a detailed plan with initial contacts made for the two different pilot approaches explored during the project period.

5/1/87

The SERI technical assistance schedule is:

<u>SERI Technical Assistance</u>	<u>Hours</u>	<u>Period</u>
ICE mails information package to SERI		5/87
SERI reviews package	60	5-7/87
SERI meets with ICE	20	6-7/87
Database analysis (potentially)	20	8-9/87
Project planning	40	6-7/87
Pilot project exploration	20	8-12/87
Evaluation of exploration	40	12/87-1/88
Assist preparation of draft final report	20	12/87-1/88
Meeting with ICE Advisory Committee	<u>30</u> 250	6/87, 12/87

Deliverables from Subcontractor to SERI

	<u>Due</u>
1. ICE sends information package to SERI with questions	5/31/87
2. ICE completes initial contacts and provides letter report	9/30/87
3. Final report evaluating the pilot approaches and plan on how to continue to implement them	12/31/87

Addresses

1. One copy of each deliverable shall be sent to:

Mr. Thomas F. Potter
Solar Energy Research Institute
1617 Cole Blvd.
Golden, CO 80401

2. One copy of each deliverable (except #1) shall be sent to:

Mr. Fred Brooke
Solar Energy Research Institute
1617 Cole Blvd.
Golden, CO 80401

6/22/87

STATEMENT OF WORK
Energy Service Delivery to Non-profit Organizations
UNITED WAY OF AMERICA
AND
NONPROFIT ENERGY CONSERVATION PROJECT

Scope of Work

The Subcontractor shall perform the following: The United Way/Nonprofit Energy Conservation (NOPEC) Project will develop for review and dissemination the background, rationale and practical implementation issues related to both "macro" and "micro" approaches to the application of energy conservation to non-profit organizations. The "macro" level applies to national charitable umbrella organizations as instruments for implementation of energy conservation policies throughout their memberships. The "micro" level refers to the establishment of local partnerships to provide energy conservation to nonprofits. These products will address the issue of appropriateness of the two different approaches, alone or together, as nationally replicable for delivering energy services to non-profit organizations.

Both United Way and NOPEC have extensive experience in promoting and implementing energy efficiency projects for nonprofit organizations. United Way has worked with headquarters of national non-profit organizations with offices nationwide--the "macro" level--as well as with United Way agencies in local communities. NOPEC has worked intensively in partnerships formation in local communities--the "micro" level--to finance and provide energy service delivery for nonprofits.

Based on their broad and in-depth experiences, United Way and NOPEC will develop working papers addressing the following questions:

1. National charitable umbrella organizations seem like perfect instruments for implementation of energy conservation policies throughout their memberships. Using United Way of America as an example, how do national programs become established, have a positive effect from the "macro" level on their constituents, and succeed in changing institutional behavior throughout a network? What kinds of institutional constraints exist that limit the effectiveness of these "top down" programs? Finally, what are the best paths or links to local programs that address a diverse group of service agencies as a system in a community?
2. NOPEC has had a role in the establishment of local partnerships to provide energy conservation to nonprofits in communities throughout the U.S. Each local project draws on a variety of resources to become established and thrive. Over 100 corporations, United Ways, and other local funding organizations have participated in establishing these programs (sometimes called energy conservation funds or ECFs). How do these local programs become established, have a positive effect on energy use patterns of individual nonprofits, and succeed in changing the energy behavior of individual nonprofit agencies over time? What kinds of constraints exist that

limit the effectiveness of these grassroots programs? Finally, what are the best paths or links to national programs that address a variety of human service agency needs throughout the country?

The SERI technical assistance schedule is proposed as:

<u>SERI Technical Assistance</u>	<u>Hours</u>	<u>Period</u>
Brainstorming project approaches	20	4-6/87
Review first working paper draft and/or review meeting	20	9/87
Review second working paper draft	20	11/87
Review third working paper draft	<u>20</u>	1/88
	80	

Deliverables from Subcontractor to SERI

	<u>Due</u>
1. Working paper describing how "macro" and "micro" level programs become established and work effectively with their networks	8/31/87
2. Working paper on institutional constraints at the "macro" and "micro" levels	10/31/87
3. Working paper evaluating the most successful linkages or pathways to local programs from the "macro" level and to national programs from the "micro" level, including recommendations on the appropriateness of the two approaches, alone or together, as nationally replicable models	12/31/87

Addresses

- Two copies of each deliverable shall be sent to:

Mr. Thomas F. Potter
Solar Energy Research Institute
1617 Cole Blvd.
Golden, CO 80401

- One copy of each deliverable shall be sent to:

Mr. Fred Brooke
Solar Energy Research Institute
1617 Cole Blvd.
Golden, CO 80401

APPENDIX C

**LIST OF PUBLICATIONS RESULTING
FROM THE NOPI PROJECT**

PUBLICATIONS

Experiments in Alternative Energy Program Design, Report Series (1989). Barbara C. Farhar, Editor. Golden, CO: Solar Energy Research Institute.

Volume One: *Experiments in Alternative Energy Program Design*, Barbara C. Farhar.

Volume Two: *Evaluation of the Boston Edison Company "EASY-Plus" Dissaggregated Utility Electric Usage Analysis* (1989). Stephen J. Morgan, Technology Development Corporation, Boston, Massachusetts.

Volume Three: *Massachusetts Home Energy Assistance Team Marketing Study* (1989). Nancy Schalch and Marika Tatsutani, Massachusetts Audubon Society, Lincoln, Massachusetts.

Volume Four: *Small Commercial Energy Efficiency: Lessons from A Successful Program* (1989). Craig B. Smith, ANCO Engineers, Inc., Culver City, California.

Volume Five: *North Carolina Alternative Energy Corporation Downtown Small Business Demonstration Project* 1989. Meredith Emmett and William Stevens, North Carolina Alternative Energy Corporation, Raleigh/Durham, North Carolina.

Volume Six: *The Diffusion of Information about Energy Cost Reduction to Religious Congregations* (1989). Andrew Rudin, Interfaith Coalition on Energy, Philadelphia, Pennsylvania.

Volume Seven: *United Way's Energy Service Delivery to Nonprofit Organizations: The View from the National Office* (1989). Martin I. Scherr, United Way, Alexandria, Virginia; *Designing Local Energy Programs for Nonprofits: A Micro-level Perspective* (1989), Susan Stamler, Nonprofit Energy Conservation Project, New York, New York.

Effects of Feedback on Residential Electricity Consumption: A Literature Review (1989). Barbara C. Farhar and Colleen Fitzpatrick. SERI/TR-254-3386. Golden, Colorado: Solar Energy Research Institute.

Small Business Energy Conservation Programs: A Literature Review (1989). Barbara C. Farhar and Colleen Fitzpatrick. SERI/TR-254-3387. Golden, Colorado: Solar Energy Research Institute.