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Electric and Gas Utility Marketing of Residential Energy Conservation Case Studies

May 1980

Prepared for:
U.S. Department of Energy
Economic Regulatory Administration
Office of Utility Systems
Under Contract No. ET-78-C-01-3356

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Prepared for:
U.S. Department of Energy
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Office of Utility Systems
Washington, D.C. 20461

Prepared by:
Booz, Allen and Hamilton, Inc.
Bethesda, Maryland 20014
Contract No. ET-78-C-01-3356

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METHODOLOGY BY WHICH STUDY WAS PERFORMED

Two separate tasks were performed for this study to gather utility information about their marketing activities for residential conservation programs. One major task involved identifying and visiting those utilities actively engaged in providing residential conservation services. The second task involved contacting a large number of utilities by telephone to determine the type and extent of market research related to consumer attitudes and behavior concerning energy conservation. This study was performed during the summer of 1979.

1. UTILITIES SELECTED FOR STUDY

(1) Nine Utilities With Experience in Administering and Marketing Residential Conservation Services Were Selected for This Study

The objective of this research was to obtain information about utility conservation marketing techniques from those companies actively engaged in performing residential conservation services. Many utilities currently are offering a variety of services; a lesser number are offering comprehensive services (audits, listing of contractors and lenders, post-installation inspection, advertising, and performing consumer research).

An attempt was made to obtain a sample of municipal and investor owned utilities from states in different parts of the country having different climatic conditions. (Thus utilities with different seasonal peaks and customer demand were obtained.) Approximately 25 utilities were contacted and questioned about their residential conservation services. From this list, the nine utilities shown in Exhibit 1 were selected. These utilities include:

- . Niagara Mohawk Power Corporation
- . Tampa Electric Company
- . Memphis Light, Gas, & Water Division
- . Northern States Power-Wisconsin
- . Public Service Company of Colorado
- . Arizona Public Service Company
- . Pacific Gas and Electric Company
- . Sacramento Municipal Utility District
- . Pacific Power and Light Company

The following broad criteria were established to select the nine utilities which together could provide

EXHIBIT 1
Utilities Selected for Study

*THIS MAP REPRESENTS STATES IN WHICH UTILITIES PROVIDE SERVICE. IT IS NOT MEANT TO REPRESENT THE EXTENT OF UTILITY SERVICE AREAS.

a reflective view of the problems and successes in offering and administering residential conservation services.

- . Utilities had to have experience in auditing residential dwellings, preferably in an on-going program
- . Utilities with comprehensive residential conservation services (i.e., auditing, financing, post-installation inspection, etc.) were preferred
- . Advertising/marketing had to be an essential element of program operations
- . Utilities performing market/consumer research concerning conservation were preferred

(2) A Nationwide Telephone Search Was Conducted to Determine Which Utilities Promoting Residential Conservation Services Had Performed Customer Surveys

Because customer surveys are an important marketing technique, useful as feedback about a program's success or shortcomings, an attempt was made to identify the current customer research activities undertaken by utilities providing residential conservation services. This was done for two primary reasons:

- . Identify the degree to which utilities are actively engaged in consumer market research
- . Obtain information about customer satisfaction with current programs and, broadly, their general attitudes toward residential conservation.

At the onset of the examination of utility customer surveys, it was not known how many surveys had been conducted. The telephone search of utility associations, state agencies and utilities across the nation identified 21 surveys of various types that had been conducted since 1977.

The group of surveys obtained is not presented as a statistically representative sample, nor is it exhaustive. Yet because all geographical areas of the continental U.S. were included in the search and because survey material was obtained from 13 states, it is likely that the information provided is typical of what might be found in other utility surveys.

2. INFORMATION AND DATA COLLECTED

(1) Though Marketing Strategies Were the Focal Point of Discussions With Utilities, Information Pertaining to the Full Range of Residential Conservation Services Was Collected During Site Visits to the Nine Utilities

Discussions with utility personnel covered virtually every aspect of the residential conservation services but were oriented toward increasing customer participation. The following information was discussed with each utility:

- . Background/Origin of Programs: Were the utilities motivated by the Federal RCS program or were conservation and load management primary considerations?
- . Objectives of Current Conservation Program: How many customers were to be affected and how much energy was to be saved?
- . Utility Regulatory Environment: What were the various state regulatory authorities' opinions/actions pertaining to utility programs?
- . Operational Aspects of Conservation Program:
 - Organization of program within utility
 - Resources (money and personnel) devoted to program and allocation of resources
 - Suggestions for other utilities in developing and initially operating program

Residential Energy Audit

- Audit types
- Features included in audit
- Audit output
- Cost and payment
- Energy auditors
- Customer response to audit program
- Suggestions for other utilities in offering audit programs

Other Conservation Services Offered

Utility Marketing Strategies

- Advertising methods
- Market research and analysis of consumer response
- Barriers to marketing conservation programs
- Suggestions for other utilities in marketing conservation programs

Utility Evaluation of Conservation Program.

(2) Utilities Contacted About Their Use of Customer And/Or Market Research Were Asked About Their Surveys' Purpose, Methodology and Data Collected

Though some of the utilities performing market assessments were interested in evaluations of public response to on-going programs, other utilities surveyed customers about appliance saturation inventory and public relations feedback.

The methodological aspects of utility surveys were queried. If conclusions from utility-collected data were to be drawn for this study, data gathered by utilities had to be judged by the quality of the research methods used. The diverse nature of the research methodologies used by utilities made it difficult to

generalize reliably about customer attitudes and perceptions about energy conservation.

The data collected by utilities varied as widely as the different survey methods employed. Because of the lack of similarity among different utility surveys, much of the information aggregated for this study relied upon making comparisons of customer responses to similar types of questions posed by the different utilities. For example, a number of utilities asked questions about the costs of conservation measures and the resulting effects on customer willingness to install these measures. Though questions and responses varied widely, it is fairly clear from the different responses that high first costs of measures is a major deterrent to customers investing in conservation equipment/measures.

* * * * *

The information gathered for this study reflects many similarities as well as differences among utility approaches to marketing conservation. The methodology used for gathering information on-site from utility personnel has assured a good deal of coordination. Thus, results (i.e., conclusions) from this data do, to a large extent, accurately represent the collective impressions and experiences from the 9 utilities visited.

As for the conclusions drawn from telephone interviews with utilities engaged in market/consumer research, these are reliable to the extent that the information collected could be compared across surveys of different types using different methodologies. Overall, however, the research methods used for this study are reliable and, therefore, the conclusions are sound.

UTILITY: Arizona Public Service (APS)

UTILITY PERSONNEL CONTACTED:

Tom Morron
Manager of Marketing Services

I. OBJECTIVES OF CURRENT CONSERVATION PROGRAM

The APS corporate philosophy toward their energy supply is that "today's peak is tomorrow's base load." Conservation, therefore, is a matter of economic sense for the utility. APS is extremely concerned about reducing peak demand and improving the system load factor. Thus, APS hopes to defer capital requirements to build new generating capacity. From the customer's perspective, however, APS is advocating conservation to reduce customers' monthly energy costs.

II. BACKGROUND OF CURRENT RESIDENTIAL CONSERVATION PROGRAM

1. DEVELOPMENT OF CURRENT PROGRAM

In 1976 APS management established a corporate objective to advocate conservation.

- . APS already possessed a marketing staff which, since 1971, had ceased marketing activities oriented toward building new load capacity. This department was available to work on conservation marketing.
- . APS peak growth was increasing faster than customer growth and this began to seriously affect the APS load profile. Thus conservation for purposes of load management made sense.
- . Load research was required and directly overlapped with marketing activities, which required data on such things as demand factors and the status of the housing industry in Arizona.

From January through March 1977 APS began planning their approach to achieving their goals. By March they developed 13 conservation programs including:

- . Professional Home Energy Analysis Program (PHEAP)
- . APS Answers kit
- . New Home Construction Standards
- . Media campaign using T.V., radio, newspapers and other marketing techniques.

The attempt was to show APS customers conservation techniques that they could employ and explain why APS wanted less energy used by those customers.

2. OUTSIDE INTEREST IN PROGRAM

There has been a great deal of outside interest in the APS programs, particularly Enercom and the APS "Hot Tap" air conditioner waste heat recovery system. The Manager of Marketing Services has been in contact with the major California utilities and other companies interested in the audit process/program have investigated APS.

III. UTILITY REGULATORY ENVIRONMENT

1. BACKGROUND

The Arizona Corporation Commission (ACC), while generally supportive of APS conservation activities, has not dictated any conservation programs.

2. LOAD MANAGEMENT

Load management is a key aspect of the APS conservation efforts and is included in all of the forecasts; 285 megawatts have been deducted from 1987 forecasts due to all of the various conservation programs. APS feels that, if the 1980 marketing programs are as successful as their predecessors, by the end of 1980 APS should have realized 110 MW of the 10-year objective to reduce demand. (See Exhibit 1 from APS Load Management Peak Load Forecast.)

IV. OPERATIONAL ASPECTS OF CONSERVATION PROGRAM

1. ORGANIZATION OF PROGRAM WITHIN UTILITY

The Market Research section, which normally does market studies for APS's general project activities, load research and hardware development studies, performs the marketing and research for the residential conservation programs. Market Services has a large responsibility, therefore, in program development prior to offering customer conservation services.

EXHIBIT 1

ARIZONA PUBLIC SERVICE 10 YEAR FORECAST

Long Range Forecast of Peak Load
(megawatts)

Within Programs and Applications there are two subdivisions; one responsible for customer information and the other responsible for implementation. Six people respond to customer inquiries on the toll free C-L-I-M-A-T-E 'hot line.' This section both collects and provides customer information. The Implementation Section of Programs and Applications maintains the program's budgetary responsibilities and additionally feeds information and data back to Market Research.

The Economic Development Section, which reports to the Manager for Marketing Services is focusing on adding new customers whose load factors exceed 56 percent (the current APS overall load factor). The Economic Development people discuss marketing and promotion along with the advertising agency used by APS. The product of these dialogues then goes back to Programs and Applications as further input to the residential conservation programs.

2. RESOURCES ALLOCATED TO PROGRAM

Currently APS is spending \$1.2 million for nonadvertising program costs for their 13 conservation programs and \$600,000 for advertising. In 1978 the PHEAP advertising expenditures were \$236,000.

Looking toward the future, and considering the advent of the Residential Conservation Program, APS plans to spend approximately 1% of its operating budget on conservation by 1981. In 1980, the PHEAP program funds will be spent on gearing up for the RCS, with a budget four times larger than the current budget. 1980 PHEAP expenses on marketing and communication will be \$78,500 and approximately \$109,000 for salaries directly related to program activities.

V. THE RESIDENTIAL ENERGY AUDIT

1. BACKGROUND

APS began experimenting with energy audits in the summer 1977. Initially a Class B audit was used but did not work because the computer program was: 1) not detailed enough; and 2) depended upon accurate measurements which customers often could not provide. A 100 sample customer pilot program was performed and the poor results contributed to developing the approach APS currently is using.

The utility's attitude toward approaching customers is positive in nature, attempting to overcome the sometimes adversary relationship which exists between customers and the energy supplier. APS estimates it can probably reduce customer's energy costs by 12-15%, which slightly exceeds the utility's 10% (approximately) annual rate increase.

2. AUDIT TYPES

APS offers both Class A and Class C energy audits. The Class A audits are part of the PHEAP program and the Class C audits are a continuation of the original APS Answers, begun in 1977.

For the Class A audit calculations, APS relies on 13 months of billing information. The audit includes 32 factors and uses the Enercom System. The current Class C audit is included in the Energy Consumer's Guide, developed after APS Answers had fully saturated the APS market area, between 1977 and 1978. Of the 275,000 major load customers, APS estimates that approximately 206,000 used the Class C information, which provided:

- . A weatherization worksheet
- . Cost analysis worksheet
- . Information on modified lifestyles to reduce energy consumption.

3. FEATURES INCLUDED IN AUDIT

The Professional Home Energy Analysis, a Class A audit, is the Enercom audit sheet using 33 different factors including information about:

- . HVAC
- . Floor, ceiling, wall insulation
- . Hot water heating
- . Door and window conservation
- . Thermostatic control information
- . Hottap - Waste Heat Water Heater using excess heat from central air conditioners.

The Class C booklet generally covers the same material as the Class A audit but includes information about appliances, load management, and solar energy.

4. AUDIT OUTPUT

The output includes a prioritized list of conservation items required to improve the building's thermal efficiency. The total cash price is provided, as is financial information regarding monthly and annual costs and monthly and estimated annual savings.

5. COST AND PAYMENT OF AUDIT

Based upon market research of customer attitudes toward an energy audit, APS charges \$12.50 for their home energy audit. This was used as a screening mechanism to avoid a rush of customers seeking free audits. Each audit costs the utility approximately \$40.00. The cost of each home audit can be paid to the utility in cash, by check or by credit card.

6. ENERGY AUDITORS

Initially there were 16 energy auditors; 12 women and 4 men. Over time, considering there is approximately 35% turnover, the mix changed to 5 women and 6 men. Currently there are 5 full-time auditors in the Phoenix metropolitan and Western service territories and 6 auditors in the remaining 6 divisions.

The auditors are from the Customer Service Division of the utility and must go through a specific training period which includes:

- . 3 days of classroom training
- . 3 days of field training in utility employee homes performing audits
- . 3 days of communication training where they learn: 1) APS's position on major issues concerning the utility; and 2) where in the company additional information can be obtained.

Each auditor goes into the field for 3 days with an experienced auditor and then goes out on his/her own.

Auditors work a normal 5-day week but perform some Saturday audits on a demand basis in those circumstances where customers are unavailable during the weekdays.

7. CUSTOMER RESPONSE TO AUDIT PROGRAM

As of the end of 1978, 2,483 customers in 8 service territories had received home energy audits. Sixty-seven percent of these were performed in the Metro (Phoenix) area. According to the market research conducted by APS, the installation rate of recommended products was, as of December 1978, as follows:

. All products installed	= 6%
. Some products installed	= 43.1%
. None installed but will be in future	= 39.9%
. None installed, will not be in future	= 11%

Forty-eight percent installed the conservation measures themselves, while 29% had contractors perform the work. Approximately 24% used a combination of their own labor plus contract labor.

VI. OTHER CONSERVATION SERVICES OFFERED

1. LISTING OF CONTRACTORS

APS provides lists of qualified contractors, as determined by lists provided by the Electric League of Arizona (whose members must be licensed for membership). The names of two lenders offering reduced lending rates also are provided.

2. POST-INSTALLATION INSPECTION

APS does not do post-installation inspections except for tracking studies. The company will intervene, however, if a customer complains of shoddy contractor work.

3. FINANCING

The utility does not finance. However, 2 lenders offer special interest rates and their names are given to customers.

4. OTHER PROGRAMS OFFERED

APS is active in other areas of conservation. Their other programs include:

- . Load Research (residential and commercial) using 600 Magnetic Tape Recorders
- . Residential Demand Installation program
- . Time-of-Use Peak Billing program (3 programs including irrigation customers)
- . Solar Heating of Domestic Hot Water Load Study
- . Domestic Hot Water Heating by Air-Conditioning Waste Heat (Hottap) program.

VII. UTILITY MARKETING STRATEGIES

1. ADVERTISING METHODS

APS has and does use a wide variety of advertising types including newspapers, television and radio ads, door hanger announcements and thermogram displays. Thermograms supplied by a local Air Force

base were used in 1977 to advertise the home audit program in 5 local area shopping centers. Of the 60,000 people who viewed thermograms of their homes, APS received approximately 1,500 requests for home energy audits. Bill stuffers also were used and APS market research indicates approximately 30-40% of the customers read this information.

2. MARKET RESEARCH AND ANALYSIS OF CONSUMER RESPONSE

APS does extensive market research to test a wide variety of customer attitudes. APS performs a biannual survey of attitudes, a quarterly survey tracking insulation installations and a monthly general awareness 'dipstick' survey to test customer awareness of APS activities and advertising. Additionally, when APS begins a new program, such as occurred with the Hottap program, focus groups are used to test product acceptance in the marketplace.

Findings from this research indicate favorable attitudes about the two audit programs run by APS. Regarding the APS Answers kit, customers were increasingly 'satisfied' or 'very satisfied' (48-91%) with the utility program. Ninety-five percent of the customers surveyed had read the Energy Efficient Living Booklet; 92% had read the Weatherization booklet; 35% filled out the Weatherization Worksheet included in the Answers kit; 38% used the Energy Efficient Living Worksheet; and 58% used the energy saving calculator (the Answer Machine).

3. BARRIERS TO MARKETING CONSERVATION PROGRAM

APS found that many customers 'fear' the energy audit findings because they don't really want to know that their homes are energy inefficient or that it may cost money to improve their homes. Additionally, there is an element of fear/uncertainty when it comes to altering lifestyles based upon energy conservation.

Customer apathy, however, is not one of the major barriers for APS residential conservation. APS has attempted to target market their conservation programs but recognizes that such targeting is difficult for many utilities without sophisticated marketing staffs. APS attempted to identify their higher demand customers because it is felt that conservation will save more for customers who use more energy.

VIII. UTILITY EVALUATION OF CONSERVATION PROGRAM

As would be expected, based upon the very favorable feedback from the market research, APS is convinced that their efforts to conserve are beneficial to the utility, beneficial to the customer and recognized by the customer as being a positive action on the part of the utility to save energy and money.

IX. SUGGESTIONS FROM UTILITIES: DO'S AND DON'Ts

1. DEVELOPING AND INITIALLY OPERATING PROGRAM

- . Planning: Up front planning is considered a key element to developing any conservation program. The scope and goals of the program must be clearly defined, objectives established and then a marketing plan implemented to achieve these objectives. Additionally, APS recommends that a dry run or pilot program be developed in advance of beginning a large-scale program
 - . Establish Procedures: Once program objectives are established, procedures need to be established to:
 - Handle telephone inquiries
 - Survey customer response and acceptance/rejection or satisfaction with the program
 - Monitor auditor training procedures
 - Calculate from the utility's perspective program costs and benefits, particularly in terms of energy savings
 - Hire new employees for the program
- APS feels that internal employees, not outside contractors, are the best type of individuals to perform the audits.
- . Feedback: Formalized data is required to maintain and improve conservation programs. Market research surveys provide both an opportunity to gather data and maintain customer contact.
 - . Load Research: Designing programs and understanding the impacts of customer conservation must consider load factors as a critical element to achieving the utility's purposes. Such issues as deferring new plant construction or changing fuel mixes all will play a role in developing and refining conservation programs.

2. RESIDENTIAL ENERGY AUDIT

The role of the energy auditors needs to be precisely defined with respect to:

- . The technical information they are to provide
- . The value of their role in terms of public relations
- . The auditor's role in general customer relations.

APS highlights the fact that auditors should be trained to some degree in communications and customer contact.

3. MARKETING ASPECTS OF AUDIT PROGRAM

- . Advertising: The conservation ethic must be an integral part of the advertising, however, the utility's perspective is not the most important pitch to the customer. APS stresses that customers want to know, "What's in it for me?", and the utility's marketing should be aimed at answering this question in terms of dollars and energy saved. Utilities should not get 'trapped' into using only radio, T.V. and newspapers for advertising programs. Door hangers, thermograms and other forms of outdoor advertising all can be useful in promoting conservation programs.
- . Customer Contact: Telephone personnel as well as auditors need to be trained in customer relations and basic communications skills. Additionally, these individuals must be informed about where in the company answers to various questions can be obtained.

UTILITY: Memphis Light, Gas and Water Division (MLGW)

UTILITY PERSONNEL CONTACTED:

Paul S. Harris
Superintendent, Energy Management Department

Larry W. Papasan
Vice President, Customer Relations

Paul Payne
Superintendent, Communication Services

I. OBJECTIVES OF CURRENT CONSERVATION PROGRAM

TVA hopes through its program to audit every home in the Valley. In conjunction with this, MLGW wants to audit all homes in its service area. TVA also wants to reduce the need for new generating capacity through this program, since new plants will cost \$1000/kW while previous plant construction costs were \$250/kW. By the end of 1978 TVA data reported that 87,726 audits had been performed and estimated annual savings of \$82.3 million kWh.

II. BACKGROUND OF CURRENT RESIDENTIAL CONSERVATION PROGRAM

1. DEVELOPMENT OF CURRENT PROGRAM

Before the TVA program, MLGW planned an audit program but the plan was never implemented. This program would have been aimed at the low income population to reduce energy consumption in this sector, but would have provided low interest loans rather than no interest loans, as is current TVA practice.

- . Because most low income people cannot afford to own a home, they primarily occupy low rent multifamily units. Since virtually no landlords would participate in the program, the program would have limited success.
- . The purpose of an audit is to educate consumers. However, the Memphis area is comprised of a high percentage of low income people with relatively poor levels of education. Therefore, the audit itself needs to be augmented to contain

educational material to increase the low income customers' understanding of the role personal habits play in lowering utility costs.

MLGW has always offered free audits where auditors would walk through the home and point out energy inefficiencies, as well as conduct a heat loss-gain analysis.

2. OUTSIDE INTEREST IN PROGRAM

MLGW has experienced much outside interest in the program since the program began. TVA had a lot of trouble convincing the small cooperatives in the valley to participate in the program (MLGW is the largest TVA distributor, using 10-11% of TVA generation). Most utilities that contact MLGW about its program are public utilities.

III. UTILITY REGULATORY ENVIRONMENT

1. BACKGROUND

TVA is the regulatory body for MLGW's electric service. TVA offers the audit program to its distributors on a voluntary basis and some TVA distributors do not participate in the program. MLGW will come under TVA's plan for the RCS program. While TVA provides the services for its program it will pay a member distributor \$35 per audit if the utility wants to conduct its own audits. MLGW, however, is a full participant in TVA's audit program.

2. LOAD MANAGEMENT

MLGW does not attempt to coordinate this program with load management techniques. The utility is currently interested in time-of-use rates. In conjunction with the solar demonstration program, the solar backup units have off-peak timers on them to prevent them from coming on during peak.

IV. OPERATIONAL ASPECTS OF CONSERVATION PROGRAM

1. ORGANIZATION OF PROGRAM WITHIN UTILITY

The Energy Management Department, within Customer Relations is responsible for operating the audit program. Energy Management handles the bulk of the phone calls and makes the contacts in the field. If the Customer Service Department (C.S.) is contacted by a customer, or a C.S. representative sees a need for an audit while at a customer's home, the customer is referred to Energy Management. Program promotion is handled by the Communications Services Department, also under Customer Relations, and is closely coordinated with the program operation.

The Credit Department runs credit checks on all loan applicants through past utility bills. The Customer Accounting Department sets up the billing procedures for the conservation loan, since the loan is listed as a separate account on the customer's bill.

2. RESOURCES ALLOCATED TO PROGRAM

The Energy Management Department provides overall program coordination and direction. This primarily consists of one person within the Department. Promotion is handled by one person who also has other duties. The billing procedures for conservation loans have required the equivalent addition of one full-time person to process bills. The audit work is performed by 15 TVA employees.

MLGW has no special budget for the audit program. However, the expenditures are roughly categorized in the following way:

- . \$60,000 for program administration
- . \$300,000 for 15 TVA auditors
- . \$1,100,000 for loans over two years
- . \$81,000 for advertising all conservation ads (approximately 65% of total advertising budget).

TVA will pay a utility \$35 per audit to perform the audit itself. This amount approximates the average cost per audit but does not include post-installation inspection. The money for the loans comes from rate revenues (i.e., this cost is expensed).

V. THE RESIDENTIAL ENERGY AUDIT

1. BACKGROUND

MLGW adopted TVA's residential audit program in August 1977. The program is primarily targeted toward the single family and multi-family residential markets. MLGW service area is comprised of 250,000 residential customers, (of which 40,000-50,000 are multi-family units). The program consists of:

- . A free energy audit for any residential customer who requests one
- . Interest-free financing to qualifying consumers for conservation measures.

2. AUDIT TYPES

TVA auditors perform Class A audits. Most audit requests are phoned in to MLGW. Approximately 1/4 to 1/3 of all requests are mailed in from brochures. The customer is told how long the backlog is and that he will be called for an appointment. Appointments are made according to zip code to minimize travel time.

3. FEATURES INCLUDED IN AUDIT

The audit addresses physical characteristics of the home and makes recommendations regarding:

- . Attic, floor, and wall insulation
- . Insulated doors
- .. Water heater insulation
- . Weatherstripping and caulking
- . Duct repair and insulation
- . Attic ventilation when needed
- . Vapor barrier ground cover.

4. AUDIT OUTPUT

Once the auditor has checked the specific audit areas, the auditor fills out a booklet entitled "Home Energy Survey Findings and Recommendations." This booklet contains descriptions of existing conditions, the auditor's recommendations regarding specific conservation measures, and estimated costs of the measures. The auditor is also equipped with payback charts to provide the customer with estimated payback periods; but the numbers change so rapidly that the auditors don't really use these charts. Before the auditor leaves the house, the customer is given a "hard copy" of the audit results (in the form of the booklet) and the necessary paper work for participating in the program. The audit also involves answering the customer's questions and prioritizing measures on the basis of cost-effectiveness. MLGW quotes an average price for the conservation measures, based on contractors' prices. Some contractors have complained that these prices rule out their products, which are the "Cadillac" versions of conservation measures.

5. COST AND PAYMENT OF AUDIT

MLGW estimates that the cost of an audit and a post-installation inspection is \$25 for each. These figures only include the direct costs. The customer receives both the audit and the inspection at no direct cost, and TVA will reimburse a distributor \$35, per audit performed, if not performed through TVA's program. MLGW uses utility employees to perform the final inspections and pays for these inspections through a grant from the Tennessee Energy Authority.

6. ENERGY AUDITORS

MLGW uses 15 Energy Advisors (auditors) to perform the audits in the MLGW service territory. All auditors go through a 3-week training course for auditors that is operated by TVA. Before the auditors start performing audits by themselves, they perform an audit with another auditor, as part of the training. MLGW indicated that it takes two to three months to hire and train additional auditors. Therefore, when deciding to hire and train new auditors, MLGW must be sure that an increase in audit requests isn't just a temporary phenomenon.

MLGW attempts to limit audits to weekday working hours whenever possible. However, each auditor works one Saturday each month. Each auditor performs approximately four audits per day, each taking an average of 1½ hours to perform.

7. CUSTOMER RESPONSE TO AUDIT PROGRAM

To date MLGW has performed approximately 13,500 audits and has made 3,700 loans (roughly 25%) for conservation improvements. While this represents 5.4% of all residential customers within the service area, it is approximately 6.7% of all non-multifamily units. Additionally:

- . MLGW receives around 20 audit requests per day. In June the auditors performed 600 audits, or roughly 30 audits each day.
- . While the utility tries to keep a backlog of work, last winter there was a backlog of 8-9 weeks for an audit.
- . Last winter MLGW performed 3,000-4,000 audits and believes the response rate for audits to be cyclical since the response rate dropped off in the summer.

VI. OTHER CONSERVATION SERVICES OFFERED

1. LISTING OF CONTRACTORS

MLGW provides the customer with a list of 60 contractors, including services offered and phone numbers. The utility will let a customer use any contractor not on the list if the customer notifies the utility and if the contractor uses approved material. MLGW advises the customer to obtain three or four estimates for installation of the recommended measures.

MLGW certifies the materials used by the contractors on the list. If the contractor supplies/installs an approved material (e.g., rockwool) the contractor will be listed. If the contractor performs a job poorly, he can be de-listed. Because MLGW inspects every job (that is financed through TVA) MLGW feels they have good quality control to ensure that installations are properly performed.

Typically, once the job has been completed by the contractor, the contractor sends the completion report to MLGW. If the job has been performed properly, the homeowner signs a repayment agreement and the contractor is paid by the utility.

Contractors have complained to MLGW about the time lag between completion of work and payment for work. Additionally, contractors have complained about auditors recommending materials other than those they install (e.g., rockwool versus cellulose).

2. POST-INSTALLATION INSPECTION

MLGW customers view the post-installation inspection as an important part of the audit. Due to the critical nature of the repayment agreement and the paper work required, MLGW feels the post-installation inspection should be done by advisors who specialize in this work. (Some people who want the post-installation inspection, but not the loan, set up a one-month loan.)

The post-installation inspection is performed before the contractor is paid because MLGW has certain program standards to which contractors participating in the program must adhere (e.g., R-19 minimum attic insulation). If the work is defective, the contractor is contacted and is sent a letter explaining the deficiencies in the work. The contractor will then correct the problem or reduce the price of the job to reflect the mistake.

MLGW currently has two inspectors that spend one half of their time performing inspections. MLGW will soon add five more inspectors, for one day each week. All inspectors go through a 3-week training course at TVA.

3. FINANCING

As part of TVA's program, MLGW offers an interest-free loan up to \$2,000 over seven years for the following conservation measures for homes with electric or natural gas heating and/or cooling:

- . Attic and floor insulation
- . Caulking and weatherstripping
- . Storm windows
- . Insulated doors

- . Duct repair and insulation
- . Attic ventilation
- . Vapor barrier ground cover.

TVA feels that the most effective conservation program includes loans made by utilities. So far, MLGW has received no complaints from the financial community regarding its interest-free loans. One bank in the Memphis area spent approximately \$250,000 in 1976 promoting energy conservation and offered a conservation loan for 1% below regular loans. Most banks are reluctant to make loans for less than \$1,000, and have strict requirements for loan applications.

Once the customer takes a loan from the utility, the loan becomes a separate account on the utility bill. The loan shows up on the customer's bill as a separate account. The programming costs to achieve this billing system were large, according to MLGW. MLGW added the equivalent of one full-time person, due to this billing procedure, to handle the processing of bills, contractor paper work, etc.

VII. UTILITY MARKETING STRATEGIES

1. ADVERTISING METHODS

MLGW has used a variety of advertising media to promote the program. When the program first started in 1977, MLGW was given free advertising by media and put an ad in the paper describing the program. The response was so strong that advertising was temporarily stopped after that. Other advertising methods have included direct mailings (separate from the utility's post card type bill), and newspaper ads.

MLGW indicated that they have done very little paid advertising, and have received a lot of free publicity.

- . MLGW has a regularly scheduled bi-weekly call-in talk show paid for by the radio station. The Home Insulation Program, as well as other matters, are discussed.
- . MLGW operates a speaker's bureau and receives numerous requests for talks on energy conservation and their audit program
- . The utility is receiving numerous requests for audits from people who know other people who had already received an audit and were satisfied with the results. MLGW is convinced that the satisfied customer is one of the best forms of advertisement for the program.

- . The utility receives a lot of TV coverage from talk shows as well as coverage from news spots.

The most successful advertising scheme, according to MLGW, was a newspaper ad for which the theme was "Clip MLGW." The reader could clip the coupon for an audit and mail it back to the utility.

2. MARKET RESEARCH AND ANALYSIS OF CONSUMER RESPONSE

While MLGW has no formal, on-going or planned market research, TVA currently is developing a data bank on the audit program to analyze cost and savings. From MLGW's perspective, however, results of residential electric conservation are hard to measure. During the last few years the utility stopped making gas main extensions. Thus, houses constructed during this period have had mostly electric heating which tends to distort the average consumption figures used to measure relative kwh savings due to conservation.

Customer response to a small number of utility programs and data collection efforts have been mixed.

- . Due to a small initial response rate from the low income residential sector a direct mailing campaign was initiated for these customers. The response rate to the direct mailing was 1-1½ percent. The mailing was then shifted to higher income customers and MLGW received a 5 percent response.
- . MLGW co-sponsored a project at a local fair with contractors to give away 1,000 square feet of insulation. As part of this effort the utility advertised the audit program, which resulted in a disappointingly low response of 300-400 audit requests.
- . MLGW sent out questionnaires to determine consumer response to the audit program. While the number of questionnaires returned was extremely small (28) most responses indicated a favorable response to the program.
 - Nearly everyone who responded indicated that they planned to install insulation and to take advantage of the interest-free loan.

3. BARRIERS TO MARKETING CONSERVATION PROGRAM

The major barriers to successfully marketing TVA's residential conservation program in Memphis according to MLGW, include:

- . Long Backlog: A backlog of longer than approximately four weeks significantly reduces consumer interest in the audit, once the audit has been requested
- . Lack of Participation by Landlords: Because most of the low income population in Memphis resides in multifamily rental units, it is crucial to involve landlords in conservation efforts. However, landlords do not appear to be interested in MLGW's audit program.

VIII. UTILITY EVALUATION OF CONSERVATION PROGRAM

Both TVA and MLGW believe that the audit program is cost-effective and is worthwhile. The utility has received very few complaints, but those received primarily pertain to:

- . Long backlog of audit requests
- . Inconvenient scheduling of audit
- . Cost problems with cellulose installations
- . Some people have made improvements and complained that their bills are higher after the conservation measures were installed.

MLGW is planning to change the program in several ways:

- . The program has been expanded to include commercial and industrial customers. For nonprofit and most commercial buildings, MLGW provides low interest loans for conservation measures. MLGW also loans money to large industrial customers if the payback for the conservation measures is three to ten years.
- . MLGW will finance storm windows for gas homes.

- . Post-installation inspections will be provided for all customers, whether or not they financed the measures through the utility.
- . MLGW hopes to initiate an effort to identify low income families, perform audits and make necessary energy-efficient improvements through a grant program. MLGW will identify three low income apartment units, make the necessary structural improvements at MLGW's cost, and operate an intensive educational program with those tenants to instruct them on ways to conserve energy. MLGW will monitor the units and, if any savings are identified after six months, the utility will promote conservation based on this. The improvements installed will be low cost improvements that a tenant could install himself, such as thermostat monitors, water heater jackets, and flow restrictors. MLGW's objective is to generate tenant interest and to place demands on landlords to implement energy conservation measures in apartment buildings. Almost all features included in this project will be eligible for interest-free financing.

IX. SUGGESTIONS FROM UTILITIES: DO'S AND DON'Ts

1. DEVELOPING AND INITIALLY OPERATING PROGRAM

- . Operation of the entire audit program may require the equivalent of approximately four full-time administrative persons. However, more effort may be required during the start-up phase. The breakdown of responsibilities would be one 1/2-time supervisor, 1-1/2 clerks, two others for operation, promotion and administration.
- . Computerized audits and processing would be beneficial since it would save time and provide an instantaneous record of customer requests, loan requests, backlog, etc.
- . The entire program staff should be ready and all necessary processes should be in place by the time the program is initiated so that initial demand for audits can be handled.

2. RESIDENTIAL ENERGY AUDIT

- . A backlog of four weeks is desirable in order to ensure continuous work for the auditors.
- . A post-installation inspection is one of the most important aspects of the program from the customer's viewpoint. The post-installation inspections should be performed by

only a few utility employees since this helps to avoid potential collaboration between auditors and inspectors.

- . Initiation of the audit procedure must be made as simple as possible for the customer, e.g., one phone call.

3. MARKETING ASPECTS OF AUDIT PROGRAM

- . Before program is started, the utility should attempt to judge potential demand for the program in order to ensure the availability of adequate resources.
- . During the initial program kick-off phase involve the media so that the utility can get free advertising for the program. In some cases, this type of advertising could significantly cut the amount of paid advertising that the utility must undertake.
- . Optimal time to initiate a residential audit program is just prior to the high billing season, if the utility hopes to achieve a large initial response.
- . The best way to encourage customer participation in the program is to provide some type of incentive. Tax credits, no or low interest loans are believed to be a very effective tool in encouraging consumer action.
- . MLGW does not encourage utilities to implement thermogram studies, since this program achieved a very poor response.

MLGW SOLAR DEMONSTRATION PROGRAM

1. BACKGROUND

MLGW is currently involved in TVA's solar water heater demonstration project. As part of this project, MLGW provides low interest, 20-year loans for solar water heaters with off-peak electric backup. The South Memphis Development Corporation (SMDC), a non-profit community development corporation, trains installers for this program, while Sunbelt Solar, Inc. and five other contractors install and maintain the systems.

2. OBJECTIVES

TVA's primary objectives for this project are to operate a successful solar demonstration program to be used as a model throughout the Valley and to lower TVA's peak. Additionally, TVA hopes to provide jobs for minorities and small business manufacturers in the Valley. If this program is successful, it could potentially be used as a national model demonstration program.

3. OPERATION

The demonstration program is operated from a separate office, "Solar Resource Center," with separate telephone lines, and is staffed by TVA employees. An interested customer can call MLGW or the Solar Resource Center to request information about the program. A TVA employee goes to the home to determine whether the house is suitable for a solar system (less than 50% of the homes looked at are).

The first demonstration unit was installed in Spring 1978. Official announcement of the program coincided with Sun Day, May 1978. TVA wanted the units installed to last 20 years (the period of the loan) with minimum maintenance. The units were purchased from small Tennessee Valley firms and were inspected by Sun Harvester. The program initially encountered some local opposition from solar advocates who criticized the materials, and from solar installers who felt the program discriminated against them (MLGW informed these installers that they could participate if they sent their installers through the training course).

4. PROGRAM COST AND PAYMENT

Installation of a solar system required no initial downpayment. The monthly installments are \$12 per month for the system plus \$1 per

month for a routine service contract on monthly utility bills. The customer receives a \$600 credit from the Federal Tax Credit. According to MLGW, the systems are breaking even right now, compared with traditional energy sources. There is still uncertainty, however, about the ultimate cost of the system.

TVA has allocated approximately \$3.3 million for the demonstration program. Internal processing costs for each installation are averaging \$29 per unit (equivalent to one man year). MLGW and TVA share the administrative and advertising costs while TVA funds the operation of the Solar Resource Center and the loans.

5. EVALUATION OF PROGRAM

MLGW feels that the program has been reasonably successful as a demonstration project. TVA had originally planned to market 1,000 units but this figure may be increased. It is believed that the tax credit and current national emphasis on solar have stimulated demand for the systems. However, there are very few installations in lower income homes, indicating that the program appeals to a select market of higher income people. Additionally, the system is only feasible for replacing electric water heaters which are mostly in newer homes. Thus, the market for this program is quite well defined.

The utility has not had any problems from banks objecting to the financing part of the program. There have also been no problems with the installing contractors. All work is inspected before the contractor is paid. MLGW felt that it was very important to overcome the skepticism surrounding solar by ensuring strict quality control of the systems and their installation.

MLGW has filed for a grant to demonstrate a passive solar installation on a commercial office building. The utility has asked for TVA's participation in this effort. While TVA currently has a passive program, Memphis is not one of the demonstration areas.

UTILITY: Niagara Mohawk Power Corp. (NMPC)

UTILITY PERSONNEL CONTACTED:

Norman Harrington
System Director of Consumers Relations

Ed Kaish
Acting Supervisor of System Public Relations

Steve Lavranchuk
Director, Residential, Rural, and Outdoor Lighting
Markets, System Consumer Relations

Joe Romanow
Communications Specialist

I. OBJECTIVES OF CURRENT CONSERVATION PROGRAM

The overall goal of the current conservation program is to comply with the New York State Home Insulation and Energy Conservation Act.

II. BACKGROUND OF CURRENT RESIDENTIAL CONSERVATION PROGRAM

1. DEVELOPMENT OF CURRENT PROGRAM

Niagara Mohawk originally implemented an insulation program without energy audits which was primarily promotional in January 1970, during the gas shortage in the Northeast.

In August 1977, the New York State Home Insulation and Energy Conservation Act was signed into law. This legislation mandated all utilities to audit homes, provide lists of insulation contractors and suppliers, and to provide a financing plan for conservation measures that are determined to pay back through energy savings within a seven-year period. Financing is to be made available regardless of the source used for heating. The NYS Public Service Commission was named in the legislation as the organization charged with carrying out the requirements set forth.

2. OUTSIDE INTEREST IN PROGRAM

NMPC has experienced a lot of interest in its conservation program from other utilities as well as from both state and Federal agencies. Most inquiries about the program relate to program promotion, calculation of energy savings, overall operational characteristics, and consumer response to the program. Some of the inquiries have come from utilities (particularly in New England), DOE, the National Bureau of Standards, and the California Energy Commission.

III. UTILITY REGULATORY ENVIRONMENT

1. BACKGROUND

The NYS PSC administers the implementation of the Home Energy and Conservation Programs provided by the utilities. Annual program activity and cost reports are furnished by the utilities which, in turn, are summarized by the PSC and forwarded to the state's legislative bodies.

The NYS PSC is very conservation-oriented and has issued a number of conservation orders including ones pertaining to residential structures meeting high insulation standards as a prerequisite to receiving electric service, regardless of the type of heating source.

2. LOAD MANAGEMENT

The PSC currently wants to involve all seven utilities in the state in load management and does not distinguish among the utilities in terms of different characteristics--such as load factor. (NMPC has a favorable load factor of 68-72%.) NMPC has studied time-of-day (TOD) rates, marginal cost pricing (MCP), and is currently involved in a project to control loads at the 1980 Olympic Village in Lake Placid. The utility will attempt to manage customer loads from the utility and is spending approximately \$500,000 on this project.

NMPC feels, however, that MCP and TOD rates may not significantly benefit NMPC because of its load factor and generation mix (hydro, coal, oil, natural gas, and nuclear). The utility has not performed an analysis of the impact of the PSC program on their load and has not incorporated the results of the program into their load forecasts.

IV. OPERATIONAL ASPECTS OF CONSERVATION PROGRAM

1. ORGANIZATION OF PROGRAM WITHIN UTILITY

NMPC's program was designed, staffed, and is conducted (audits, reports, etc.) and directed by the Consumer Relations Department. Promotion and all interaction with outside advertising agencies and media are handled by the Public Relations Department.

2. RESOURCES ALLOCATED TO PROGRAM

The program is managed by the System Consumer Relations Director for the Residential Market, who also has other responsibilities. Overall, NMPC devotes the equivalent of one person full-time to running the program. Recordkeeping, audit backlog reports, PSC reports, and calculations of results (via talking computer) are computerized.

V. THE RESIDENTIAL ENERGY AUDIT

1. BACKGROUND

NMPC initiated its energy audit program (in response to state legislation) in June 1978 and chose the Enercom Computerized Audit System.

2. AUDIT TYPES

NMPC performs three types of audits:

- Class A Audit. NMPC sends an auditor to the home to perform on-site audit; computerized results are provided on-site by a talking computer. A hard copy of the results is also provided to the homeowner.
- Class B Audit. Customer fills out a form with data on his home and sends it to utility to be processed. Computerized results (same as Class A) are mailed back to homeowner.
- Class C Audit. Customer fills out a form and does calculations to determine results.

NMPC does not offer solar audits and has not promoted solar since it has not been proven to be economically practical in NMPC's service territory. However, NMPC is funding solar R&D and wants to help the consumer to understand solar. They are considering providing "data sheets" on actual solar installations. The utility also is considering a program in 1980 to offer solar hot water heater installations.

3. FEATURES INCLUDED IN AUDIT

The on-site auditor checks various aspects of the home and provides the homeowner with additional energy-saving tips. Inspections are made of:

- . Walls
- . Windows
- . Doors
- . Type of thermostat
- . Attic
- . Water heater
- . Furnace (e.g., replacement of filter)
- . Floors.

Measurements of the outside area of the house are taken and used to determine the area that can be insulated, the cost, and savings. The auditor then suggests that the customer get at least two estimates from contractors for suggested conservation measures. Each on-site audit takes approximately one to two hours.

NMPC currently is adding audits of oil-burning furnaces for the program (required by the PSC) and will finance replacement of oil burners. The utility, however, is prohibited from inspecting gas furnaces and cannot finance replacement of gas burners. Oil burner audits will be conducted by members of the oil heating industry.

4. AUDIT OUTPUT

The audit findings are presented to the homeowner in terms of:

- . Cost of measures to be taken, given current material costs (updated quarterly)
- . Energy savings in kWh/CCF, given current energy prices (updated quarterly).

The audit output provides a point estimate for the potential energy saved and is required by the PUC to provide the highest estimated savings (the utility has a disclaimer associated with this). The recommended measures are determined through potential energy savings and are prioritized on this basis.

5. COST AND PAYMENT OF AUDIT

The Class A audit costs the customer \$10; Class B, \$3 (for computerized results); and Class C, free. The customer pays for the audit when applying for the audit or when he/she forwards the field data in the case of a Class B audit. The customer is not billed

for the audit as part of the monthly bill. The reason given for this is that the billing procedure is already complicated without allowing an additional burden.

While the audit costs the customer \$10, it actually costs the utility approximately \$60 to perform the audit (this does not include advertising). The \$50 differential is recouped by the utility as an expense item through the regulatory process. The \$10 customer charge is the maximum amount allowable by the PSC and is primarily used as a screening process. The PSC feels that the program costs are extremely small when spread among all ratepayers. NMPC believes that if full audit costs were passed on to each customer who requested an audit, fewer requests for an audit would be received.

NMPC spent \$30,000 on developing the computer program to be used for the audit (Xenergy tailored the audit program to match the needs of the NMPC system). Computer costs for processing a Class A audit are about \$4-\$6 to calculate and store the information and are about \$3-\$5 for a Class B audit.

6. ENERGY AUDITORS

NMPC has approximately 50 auditors who are NMPC employees and are located in the 38 regional offices throughout the 24,000 square mile service territory. These auditors have completed an in-house NMPC training program and are able to respond to many different types of customer questions about the utility and energy costs. Xenergy participated in the auditor training program and taught auditors how to operate the computer equipment, fill out forms, etc.

7. CUSTOMER RESPONSE TO AUDIT PROGRAM

The audit program has not received the consumer response that was anticipated. NMPC estimated that the anticipated number of people who would take advantage of the program was ten times greater than the number who actually had an audit performed (NMPC originally estimated 10,000/year.) They added, however, that this was not necessarily bad since their internal resources would not have been able to cope with that many audit requests but have been able to handle the actual responses.

NMPC maintains a daily record of audit requests and has found program inquiries to be seasonal and proportional to the amount of advertising that is done in a given period. Most audit requests are received in spring and fall, primarily because during summer people are on vacation and in winter people pay Christmas bills.

NMPC does not have a target for the number of audits to be done. To date the number of audits requested is approximately:

- . 3,300 Class A audits
- . 1,500 Class B audits forms requested; 140 forms have actually been returned to the utility for processing
- . 12,000 Class C audits.

Of the homeowners who actually recieved an audit:

- . 25% of the Class A audits actually installed conservation measures
- . 43% of the Class B audits (43% of the 140) actually installed conservation measures.

This information was obtained from a statistical survey as part of the reporting requirements to the PSC.

There is a backlog of several hundred audit requests. The time lag between audit request and performance of the audit is approximately 3 weeks--the maximum allowed by the PSC.

NMPC does not know whether the program has been "successful" in terms of energy saved since the actual amount of energy savings is unknown. The utility is, however, about to initiate a study to determine the energy savings.

VI. OTHER CONSERVATION SERVICES OFFERED

1. LISTING OF CONTRACTORS

NMPC does not install conservation measures but provides a list of installers who do the work:

- . Over 1,000 contractors are included on the list that is provided to consumers.
- . The list is divided by regions and the entire list is provided to the consumer.

2. POST-INSTALLATION INSPECTION

NMPC randomly inspects jobs performed.

3. FINANCING

NMPC does not finance conservation measures but provides a list of lenders that will finance the measure; this list currently consists of two local lending institutions:

- . The maximum interest that can be charged by these lenders is equal to NMPC's overall rate of return (ROR) allowed by the PSC. If the lender charges more than this, NMPC must make up the difference.
- . The lenders currently included on the list charge 9.35%, and NMPC's allowed ROR is 9.44%.
- . NMPC will guarantee conservation loans through these institutions.

VIII. UTILITY MARKETING STRATEGIES

1. ADVERTISING METHODS

NMPC employs an advertising agency to do much of the media advertising and uses a variety of media to advertise their program. Some of these include:

- . Bill inserts
- . Newspapers
- . Television.

In addition to this, the utility gets "free" advertising through such media as press releases and local TV talk shows.

NMPC has a 20-minute film presentation about their Class A audit. This film was given to the local cable TV and has been shown several times. The film is also shown to civic groups, etc.

The energy audit program also is widely advertised using coupons for requesting an audit. These can be obtained from:

- . Participating banks
- . Newspapers
- . Regional NMPC offices (about 45 offices)
- . Home shows
- . Telephone requests.

The utility also has an in-house conservation program to foster employee awareness of conservation. This is primarily promoted through "newscope," a video presentation that is available to all employees.

The utility is currently planning a new advertising strategy by which the utility will cooperatively advertise their program with participating contractors (i.e., contractors included on the list). This opportunity to "co-op advertise" will be extended to all listed contractors. NMPC feels that contractors are highly competitive and that it would be advantageous to the program to have the contractors advertise the program, in cooperation with the utility.

The utility so far has been able to respond to all consumer requests for the energy audit, as a result of program promotion. However, when NMPC runs three to four TV spots in a given marketing area over a period of time (e.g., a week), they are inundated with audit requests and have to temporarily stop advertising the program in that area. The bottom line is: when they promote the program, they receive responses to the promotion.

2. MARKET RESEARCH AND ANALYSIS OF CONSUMER RESPONSE

While the utility has not tried to measure the cost effectiveness of advertising, the utility believes that, overall, the cost justifies the results. (The utility will spend \$500,000 on advertising for all programs--not just conservation--this year.) NMPC believes that paid advertising ensures that the proper message is delivered to the consumer, while free advertising (e.g., talk shows) sometimes deviates from the direct message about the audit. Advertising conservation is believed to have a positive psychological effect on consumers.

NMPC has not performed a rigorous analysis of customer response to various marketing methods. However, they do feel that TV has achieved a very good response, especially when used in conjunction with newspaper advertising (the customer sees the advertisement on TV that directs him to the audit coupon in the newspaper).

During the spring of 1977, the utility performed several preliminary market surveys to estimate the customer response that a residential energy audit program would elicit from their 1.2 million residential customers:

- An initial telephone survey indicated that 22% of all residential customers would pay \$10 to receive a Class A energy audit.

- . A subsequent direct mail survey indicated that when the customer was sent an audit request form, only 2% of the customers responded. (The survey is based on sending customers actual audit request forms.)

The utility acknowledges that the data to analyze consumer response to marketing methods is available but NMPC has not had the time nor resources to do this analysis and, at this time, does not plan to do so in the future.

3. BARRIERS TO MARKETING CONSERVATION PROGRAM

NMPC identified several types of barriers to marketing conservation programs:

- . Customers still view the energy shortage as somewhat of a hoax and are skeptical as to the motives of utilities offering a conservation program.
- . The conservation field is being inundated with many different groups, all of which are trying to provide the consumer with conservation advice (e.g., local energy offices, extension services, utilities, state energy office). This multiple effort has confused people and they don't know whose advice to follow.
- . A recent New York statewide insulation survey indicated that 80% of the homes had installed some insulation. The other 20% is comprised of the low and fixed income sector that would be difficult to reach with almost any type of marketing method.

VIII. UTILITY EVALUATION OF CONSERVATION PROGRAM

NMPC indicated that consumer conservation efforts have increased over the last several years for a number of reasons, including previous and current utility programs, inflation, etc., as evidenced by the fact that the average use of natural gas has decreased 14% over the last 5 years.

Except for complaints from customers who had to wait 4-5 weeks for an audit, and a few comments pertinent to the "optimistic" calculated energy savings, NMPC feels that the program has been well accepted by the general public. NMPC also feels that the program will develop increased activity during the 1979-1980 heating season, particularly once the formal RCS program begins.

IX. SUGGESTIONS FROM UTILITIES: DO'S AND DON'Ts

1. DEVELOPING AND INITIALLY OPERATING PROGRAM

NMPC had several suggestions for other utilities who are in the design and initial implementation phases of their programs:

- . Acquire commitment of top management to the conservation program.
- . Utilize adequate resources in the initial design of the program; at least one full-time system manager and with a full-time secretary to operate the program.
- . Auditors must be properly trained and must be able to respond to the participants' demands for audits.
- . Use utility personnel.

2. RESIDENTIAL ENERGY AUDIT

- . A key element is to keep customer contact with the utility to a minimum so that the customer does not have to do much "work" to obtain an audit. The more steps the customer has to take to obtain an audit, the less likely it is that he will request or receive one.
- . Keep close track of audit applications so that they don't get lost. Computerizing the applications is a good idea to ensure their security.
- . A computerized audit is best. A computer helps recordkeeping and provides instant results to the customer. Additionally, the "talking" computer is a novelty and has been a strong selling point for the program.
- . The utility must control the offering of the audits (e.g., temporarily stop advertising) so that the backlog doesn't become too great. If consumers have to wait too long for an audit, they will lose interest. (At one point NMPC customers had to wait 2-3 months for an audit and this damaged the utility's public relations.)

3. MARKETING ASPECTS OF AUDIT PROGRAM

- . Initially survey the potential market by mail to obtain at least an estimate of the potential market response to the program. Determine the needs of the market and concentrate on those needs.

- . Advertising is crucial to the success of a conservation program, but the advertising must be fully integrated with the program; there must be total coordination between promotion and operation of the program. Otherwise, uncontrolled promotion could lead to a glut in demand for audits.
- . The customers must be convinced that the program will benefit them. This message must be delivered to customers and the program must be credible. If customers don't believe in the program, they won't take advantage of it. In general, homeowners seem to invest in conservation if the measures pay back in 3-4 years.
- . Make sure that the program is completely in place and fully workable before going public. If the program initially receives poor public relations, it will affect the total success of the program.
- . Before starting the program, meet individually with key media personnel to inform them about the program and the message to relay to consumers about the program. Full media support will help proper advertisement of the program.
- . It is worthwhile to meet with local agencies and offices that may receive inquiries about programs of this nature. Program promotion may result in inquiries to these offices; prior explanation about the program will result in proper channeling of the inquiries as well as a good working relationship with local agencies.

UTILITY: Northern States Power Company - Wisconsin (NSPW)

UTILITY PERSONNEL CONTACTED:

Dennis Holt
Administrator of Conservation and Energy
Management

I. OBJECTIVE OF CURRENT CONSERVATION PROGRAM

In October 1977, the Wisconsin PSC set a goal for all Wisconsin utilities of reducing natural gas consumption 15-25% per residential customer by 1985. NSPW's gas customers fall into two categories: those served by domestic gas and those served by (more expensive) Canadian gas. NSPW has experienced a significant decline in the residential gas consumption by both of these groups. Since 1975, residential demand for Canadian gas has declined 17% and residential demand for domestic gas has declined by approximately 13-14%.

As for conservation of electricity, as part of NSPW's Advance Plan procedure for the Wisconsin PSC, NSPW calculated that conservation of electricity would have a significant impact on its peak requirements. The potential impact of the NSPW's conservation programs* on the NSPW system peak through 1998 is included in Exhibit I.

II. BACKGROUND OF CURRENT RESIDENTIAL CONSERVATION PROGRAM

1. DEVELOPMENT OF CURRENT PROGRAM

In late 1976 NSPW saw a need to provide customers with a conservation program. The utility contracted with an outside firm, Energy Efficiency Systems, Inc. (EES) to operate a residential conservation audit program. The primary purpose of the EES program was to help gas customers cope with skyrocketing gas costs.

EES went out of business about one year ago and NSPW replaced the EES program with their own audit program. NSPW feels that their own program is more successful than was the EES program. The program was initiated in response to a PSC order in October 1977 that stated

* Includes commercial and industrial, as well as residential audit programs.

EXHIBIT 1
Impact of Conservation Programs on NSPW Peak
(Cumulative MW)

<u>YEAR</u>	<u>SUMMER</u>	<u>WINTER</u>
1979	1.3	1.5
1980	3.2	3.5
1981	5.8	6.2
1982	9.1	8.8
1983	12.1	11.1
1984	15.6	13.4
1985	17.8	14.4
1986	19.9	15.3
1987	21.6	15.8
1988	22.9	16.5
1989	23.9	16.9
1990	24.8	17.5
1991	24.8	17.5
1992	24.8	17.5
1993	24.8	17.5
1994	24.8	17.5
1995	24.8	17.5
1996	24.8	17.5
1997	24.8	17.5
1998	24.8	17.5

that all utilities in Wisconsin must offer conservation programs to gas customers. Specifically, this program was to include an on-site Class A audit with requirements similar to the federally mandated RCS.

When the PSC order came out, representatives of all utilities in the state met to discuss ways of implementing the program. NSPW differed from its parent company (NSP-Minnesota) because NSPW believed that the audit should be a one-call audit and that the results should be delivered in person. Therefore, NSPW developed its own approach for a residential audit program.

NSPW concentrated on residential gas customers for about a year and found that even though the promotion referred to gas customers, other customers were requesting audits.* Around February 1979 the utility decided to conduct an audit for any residential customer. Since that time, approximately 50% of all audits performed have been for gas customers. Others are primarily oil since most electric homes are quite well-insulated and are energy efficient.

2. OUTSIDE INTEREST IN PROGRAM

NSPW has received a number of inquiries about its audit program, particularly since the RCS proposed rules were published. Even prior to that, NSPW's program was written up in a trade journal. The utility has had inquiries from all over the country regarding the format of the audit output forms. Most inquiries are about the audit procedure.

III. UTILITY REGULATORY ENVIRONMENT

1. BACKGROUND

As described in the previous section, in 1977 the Wisconsin PSC ordered all utilities to offer audit programs for gas customers. The PSC has held hearings regarding non-essential uses of natural gas and construction standards for new gas residential customers.

Consumer interest groups appear at most hearings, and their attitudes and opinions have been varied. One attorney for Friends of the Earth has commended NSPW for their Energy Efficient Home Program and suggested that the PSC should look into adopting the standards for that program. However, many groups take adversarial positions with respect to this utility. Consumer groups were recently instrumental in scrapping the Tyrone nuclear plant. The utility now wants to build a coal plant, but consumer groups are protesting that.

* Exhibit 2 shows the breakdown of NSPW customer heating systems by fuel.

EXHIBIT 2
NSPW CUSTOMER HEATING SYSTEMS BY FUEL

		(%)		
	<u>1 Family</u>	<u>Apartment</u>	<u>Mobile Home</u>	<u>Total by Fuel</u>
GAS	32	27	43	32
OIL	53	20	24	48
ELECTRIC	6	48	2	10
PROPANE	5	2	29	6
OTHER and COMBINATION	4	2	2	3

Adds to 99% due to rounding

2. LOAD MANAGEMENT

The Wisconsin PSC has been placing increasing emphasis on load management. NSPW's load factor in 1978 was 63.1%. NSPW is currently looking into load control systems for water heaters. Time-of-use meters are mandatory for industrial and commercial customers over 500 kW demand.

NSPW looks at load management as "cheap generation" and considers conservation to be a load management device as well as a method of reducing the system's peak.

The utility has very high peak shaving requirements. The NSPW decided that it was an additional burden to existing customers to bear the added cost of peak shaving, so in late 1977, NSPW put a total moratorium on gas hook-ups (residential, commercial, and industrial). However, now that oil is so expensive, NSPW will probably begin to accept limited requests for gas hook-ups next spring.

Every two years, NSPW files an Advanced Plan for 20 years and includes the effects of load management on system peak. The 1978 NSPW Advance Plan included projected impacts to load management systems on peak. NSPW is currently researching company-owned load management systems primarily for residential water heating and air conditioning loads. Application of such a system would be voluntary and Exhibit 3 shows NSPW's projected impacts on peak, both with and without such a system.

IV. OPERATIONAL ASPECTS OF CONSERVATION PROGRAM

1. ORGANIZATION OF PROGRAM WITHIN UTILITY

NSPW's residential audit program is operated through the Consumer Services Department. Within that department the Administrator of Conservation and Energy Management is responsible for implementing and operating the programs. Below the Administrator are two Supervisors of the Residential Conservation Program. These people are responsible for the program at the division level within the utility system. Underneath the Supervisors are 5 Residential Energy Analysts (i.e., auditors). There are also 2 clerical staff - one in each division - to keep records, maintain files and make audit appointments. In total, approximately 10 people are involved in the program.

The Administrator currently spends approximately 30% of his time on the residential audit program which he does not feel is enough. He is planning to hire another full-time person to assist with the program. All promotion is handled by the Consumer Services Department.

EXHIBIT 3
IMPACT OF LOAD MANAGEMENT ON NSPW PEAK
(CUMULATIVE MW)

YEAR	<u>No Co. System</u>		<u>With Co. System</u>	
	SUMMER	WINTER	SUMMER	WINTER
1979	1.0	1.0	1.0	1.0
1980	2.0	2.0	2.0	2.0
1981	2.8	2.5	2.8	2.5
1982	3.6	3.1	3.6	3.1
1983	4.9	3.9	8.4	7.4
1984	6.2	4.7	13.2	11.7
1985	7.8	5.7	18.3	16.2
1986	9.0	6.7	23.0	20.7
1987	10.1	7.6	27.6	25.1
1988	11.3	8.5	31.3	28.5
1989	12.4	9.4	37.9	34.9
1990	13.6	10.3	40.6	37.3
1991	14.7	11.3	41.7	38.3
1992	15.8	12.1	42.8	39.1
1993	16.9	13.0	43.9	40.0
1994	18.0	14.0	45.0	41.0
1995	19.1	14.8	46.1	41.8
1996	20.2	15.7	47.2	42.7
1997	21.3	16.6	48.3	43.6
1998	22.4	17.6	49.4	44.7

The Administrator believes that the conservation program has a strong commitment from the NSPW officers. The Board is provided with a status report regarding the program at Board meetings.

2. RESOURCES ALLOCATED TO PROGRAM

NSPW's 1978 budget for the residential conservation program is categorized as follows:

<u>Expenses</u>	<u>Cost</u>
Wages & Salaries	\$122,556
Employee Expenses	8,242
Advertising & Promotion	50,626
Training Expense	3,250
Materials & Supplies	7,182
Thermal Scanners	907
Contractor Program	<u>214</u>
TOTAL	\$192,977

This budget accounted for approximately 0.3% of NSPW's total annual operating expenses. The 1978 budget includes most of the program start up costs. The 1979 budget is \$261,000. It is estimated that the 1980 budget will be increased by 75% to accommodate the RCS rules. All program costs are expensed.

V. THE RESIDENTIAL ENERGY AUDIT

1. BACKGROUND

NSPW has 130,000 residential customers and has for the most part, focused on the 27,000 natural gas customers for the audit program. Even though other customers are now receiving the audit, gas customers still receive priority.

2. AUDIT TYPES

NSPW only performs Class A audits. This type of audit gives the utility a chance to communicate directly with the customer and to show the customer the benefits of an audit. NSPW believes that a Class B audit does not have the impact of a Class A audit and that a Class B audit often relies on generalized information or wrong information obtained from the customer.

While NSPW does not have a formal solar audit program, if someone calls for information regarding renewable resources, the customer is referred to the Administrator of Conservation and Energy Management for information. The utility has, at the request of the PSC, undergone extensive hearings on life cycle cost analyses of alternative energy systems.

3. FEATURES INCLUDED IN AUDIT

Generally, the customer requests the audit by a phone call. The audit takes approximately 1½ hours and auditors perform around 3 audits per day (this includes office work). A computer is used to store all information regarding the pre-audit condition of the home.

The audit includes recommendations for conservation measures based on an analysis of existing:

- . Attic and wall insulations
- . Windows
- . Doors
- . Fireplaces
- . Basement
- . Crawl space
- . Heating equipment
- . Appliances.

The PSC is still addressing the question of whether or not utilities should be involved in furnace retrofit. NSPW did indicate that using a contractor would be one potential way to deal with this issue. Currently, the auditor will look at the type of system, and determine whether to replace the filter and visually inspect the burner flame. (The auditor can look at oil, gas and electric furnaces.)

4. AUDIT OUTPUT

The audit results are calculated using graphs for thermal and economic analyses to provide recommendations to the homeowner. NSPW believes that the auditors can compute the recommended measures as quickly as using a calculator. The estimates are based on ASHRAE standards and savings are initially calculated in Btu's.

- . Monetary savings are based on current prices, and installation costs are continually updated by talking with contractors
- . Measures are prioritized according to a benefit ratio--justifiable investment/estimated cost.

A hard copy of the results and recommendations is left with the homeowner.

An attempt is being made by NSPW to obtain feedback as to customer actions once the audit has been completed. Installers have not provided this feedback so the utility is trying to get this information from customers. Installers are required by the utility to sign a certificate of installation which the customer receives at the time of the audit. This verifies that work recommended in the audit actually has been performed. (Installers also are required to provide a 2-year warranty on work performed.) The utility company then uses a computer to input the pre-audit condition of the home as well as the post-installation condition of the home to determine the program's contribution to conservation.

5. COST AND PAYMENT OF AUDIT

The audit is free for the customer. The full cost of the audit to the utility is approximately \$70. This includes all costs associated with the program.

6. ENERGY AUDITORS

The auditors began the program in December 1977. The auditors are utility employees and most come from the insulation/weatherization industry or have a related background (e.g., building construction). All auditors must go through a two-week training program that includes one week of classroom instruction and one week of field training. Once the auditor has completed the week of classroom instruction, the following week the auditor is required to:

- . Observe actual on-site installation of weatherization materials
- . Perform audits in two utility employee homes, with the help of a supervisor
- . Perform on-site audits with supervisors.

NSPW currently employs 5 auditors to perform residential audits. However, this number will likely be doubled, once the RCS is implemented.

7. CUSTOMER RESPONSE TO AUDIT PROGRAM

As of July 1, 1979, NSPW had a backlog of 135 audits, or about 2 weeks. The utility tries to keep the backlog to a 2-3 week maximum, and the PSC generally agrees that this is acceptable and advisable. So far the utility has performed approximately 3800 audits, or 3000 per year. Originally NSPW had hoped to audit 50% of the gas customers by 1985. To date, the utility has audited approximately 12% of its residential gas customers. (Additional audits have been performed, primarily on oil-heated homes.)

NSP is currently satisfied with customer response to the program. However, the utility realizes that at some point they will have to change their strategy to encourage additional audits (e.g., by offering some type of incentive).

VI. OTHER CONSERVATION SERVICES OFFERED

1. LISTING OF CONTRACTORS

NSPW provides its customers with a list of its installers. When the program initially started NSPW mailed a short letter to all insulation contractors in the area to determine contractor interest in the program.

All participating contractors are required to sign a contract and provide a certificate of insurance. Additionally, these contractors must have been in business for at least one year. Once on the list, a contractor can be removed from the list by the utility through notifying the contractor. So far the utility has not had to remove any contractors from the list.

2. POST-INSTALLATION INSPECTION

NSPW offers a post installation inspection as part of all audits, if the customer requests one. However, the utility has not received many requests for these inspections (19 since January 1, 1979).

3. FINANCING

NSPW is a lender of last resort for customers who want to finance their conservation measures. The utility will finance the measures up to \$2500 at 9% for three years. The utility will loan any customer the money unless the customer has been disconnected from service due to nonpayment of bills in the last 3 years. NSPW additionally stays in contact with the local lending institutions in order to keep customers informed about special low interest loans being offered for conservation measures through financial institutions or by Federal government loan and grant programs.

VII. UTILITY MARKETING STRATEGIES

1. ADVERTISING METHODS

NSPW uses an advertising agency to coordinate promotion for the program. The program generally has 3-4 newspaper ads that are run over six months. Additionally, 2-3 radio announcements are used as well as one television advertisement. These ads are changed periodically and are seen at the same time bill stuffers and special mailings are distributed. Consumer response was increased throughout the program.

- . When NSPW initiated the program, they advertised the program through a bill insert and television, radio and newspaper. That effort received approximately 2-2½% response (from the 27,000 residential gas customers).
- . In September 1978, NSPW sent out a separate mailing from the Division General Manager to the customers, urging each customer to call the Division to request an audit. The message was continued through the media and received a 7½% response during the first 9 months (the letter was sent to the same 27,000 residential gas customers).
- . In June 1979 NSPW randomly mailed 2500 letters by division that had the same message as the earlier mailing and also mentioned that weatherization is important in the summer. NSPW received 208 requests (8.3%) from that mailing.

NSPW believes that separate mailings by city are the most effective means of advertising and that supplementing these mailings with other media contributes to the effectiveness of the message. Bill stuffers are not seen as being very effective as a promotional method for the conservation program. Many audit requests are received as a result of next door neighbors being satisfied with an audit and talking about it with a neighbor. NSPW tried using a thermogram program to promote conservation but the results of this program were somewhat disappointing since relatively few people responded.

Within NSPW, most advertising associated with the residential audit program is separate from other PR since program promotion is coordinated with consumer response in order to control audit requests. (This is also done to facilitate accounting procedures.) It is, however, very time consuming to analyze consumer response and plan promotion to coordinate audit demand.

2. MARKET RESEARCH AND ANALYSIS OF CONSUMER RESPONSE

NSPW's market research into the residential audit program has primarily consisted of surveying (by both telephone and questionnaire) approximately 20% of all customers who received an audit to determine what actions are being taken after the audit has been performed.

- . Approximately 50% of all customers who responded to the questionnaire are installing some recommended measures, based on the audit results.
- . Approximately 40% are installing all recommended measures.
- . Many respondents said they haven't installed any measures yet, but plan to do so.

The Administrator said that NSPW has not yet done specific target marketing for the audit program but will do so at some point. The utility did, however, attempt to focus on the rental sector and was totally unsuccessful in this endeavor. The utility has calculated that the conservation potential for NSP's residential gas market is approximately 10% of the current sales. However, the potential in areas with cheap gas is greater than in areas with expensive gas, since customers receiving expensive gas have already undertaken conservation measures. NSPW has calculated that the conservation potential for homes with expensive gas is around 7% while the potential for homes with cheap gas is approximately 14%. Currently, the gas price differential is about 12¢/therm; domestic gas customers pay 28¢/therm while Canadian gas customers pay 40¢/therm (and this will soon increase to 50¢/therm).

The utility has thought about the possibility of offering incentives, such as flow restrictors, to encourage participation in the program. Ultimately the utility believes that high bills will stimulate conservation and will be an incentive in itself. NSPW has also considered showing the customer month-to-month differences in energy usage to make the customer aware of his energy consumption.

3. BARRIERS TO MARKETING CONSERVATION PROGRAM

The major barriers to customer participation in conservation programs are considered to be:

- . Public acceptance of the energy situation. Until people understand and believe that there is an energy problem they won't be motivated to conserve energy.
- . Utility credibility. Many people blame utilities for the current energy situation and therefore are reluctant to take advantage of utility programs to conserve energy.

VIII. UTILITY EVALUATION OF CONSERVATION PROGRAM

NSPW feels that the program has been very successful, as reflected by customer satisfaction with the program. The utility has received 40-50 favorable letters from customers in addition to positive comments on the questionnaires.

The utility does, however, intend to examine the program further to determine whether it is paying for itself through such measures as reducing peak shaving requirements.

The utility hopes to expand the program to encompass all residential customers (even though non-gas customers are tacitly included now) and will probably include furnace replacement as part of the program at some point.

IX. SUGGESTIONS FROM UTILITIES: DO'S AND DON'Ts

1. DEVELOPING AND INITIALLY OPERATING PROGRAM

- . Conservation should be viewed as a load management and PR device
- . An effective conservation program must have utility commitment. With respect to the RCS, the utility should view the program as an opportunity to encourage conservation and help utility operations, rather than as simply a rule with which the utility must comply and therefore implement the minimum requirements.

2. RESIDENTIAL ENERGY AUDIT

- . The utility must hire qualified people to perform audits since these people will establish the credibility of the program with consumers.
- . Auditors should be utility employees, in order to project the utility image and they must believe in what they are doing
- . The audit, including the results and recommendations, should be conducted in one visit to maintain customer interest.

3. MARKETING ASPECTS OF AUDIT PROGRAM

- . In order to maximize customer response to the program, the utility should not charge the customer for the audit
- . The most crucial aspect in a residential conservation program is successful promotion.

UTILITY: Pacific Gas & Electric (PG&E)

UTILITY PERSONNEL CONTACTED:

Mary T. Beller
Supervisor, Energy Conservation Center

Judith L. Cohen
Market Research Coordinator

Jim Dickenson
Supervisor, Solar Programs

Dan Fitzgerald
Conservation Analyst

R. M. Mertz
Manager, Energy Conservation & Services

Donald F. Mull
Senior Conservation Planner

Mike Willhoit
Supervisor, Weatherization Programs

I. OBJECTIVES OF CURRENT CONSERVATION PROGRAM

PG&E faces a serious load capacity problem and needs to reduce consumption to avert emergency load shedding procedures during particularly heavy demand periods. Coupled with the goals for the weatherization program, 91% of all existing single family dwelling units are planned to be insulated to a minimum of R-19 in PG&E's service area by the end of 1981. It is estimated that 43,000 audits will be performed in 1979 and that at least 11,000 insulation sales will result.

II. BACKGROUND OF CURRENT RESIDENTIAL CONSERVATION PROGRAM

1. DEVELOPMENT OF CURRENT PROGRAM

In September 1978 PG&E introduced a pilot audit program in the East Bay Division to audit homes and install attic insulation. The

program used college students to identify homes needing insulation. By year's end, 597 homes were inspected and 97 attics insulated. PG&E questioned the success of this initial program because customer consumption patterns were basically unchanged.

PG&E then hired 6 energy auditors to perform audits on call for the more affluent, generally large residential energy customers. This program was not totally successful, because customers still failed to alter their energy consuming behavior significantly.

Beginning in 1979, however, PG&E moved to expand their audit/weatherization program significantly by offering services to all residential customers in its service area. PG&E, meanwhile, continued its attic inspection and insulation program which, in 1978, resulted in 4,922 inspections and 91% installation rate. An additional 4,380 attic inspections have been done in 1979 through September.

Also in 1978 PG&E created its Stockton Weatherization Training Center to assist government funded community action agencies in their efforts to assist low income, disabled and elderly customers. This training center is now being used to train auditors for the ongoing home energy audit program.

2. OUTSIDE INTEREST IN PROGRAM

PG&E has received inquiries about their programs from utilities across the country. The success of their aggressive market service-oriented programs, and relatively extensive marketing research has generated much outside interest.

III. UTILITY REGULATORY ENVIRONMENT

1. BACKGROUND

PG&E maintains a good relationship with the California Public Utility Commission and the California Energy Commission, which will be the lead state agency in developing the statewide Residential Conservation Service Program. The PUC provides PG&E with suggestions regarding conservation and programs and PG&E provides the PUC with a variety of analyses resulting from their data collection and program efforts.

2. LOAD MANAGEMENT

Load Management is an integral part of PG&E's conservation plans and programs. For the 12 months ending October 1978, residential gas use was down 10% from the previous 12 months while individual residential electric consumption has increased less than 1% since 1974.

PG&E estimates its 1979 expenditures on Load Management programs to be \$18,822,900 and Load Management RD&D at \$1,382,000.

California has proposed Load Management Standards for:

- . Residential load cycling
- . Commercial audits
- . Swimming pool filter pumps
- . Marginal cost tariffs

These may affect PG&E's conservation plans somewhat although the utility is already engaged in activities designed to affect its system's load.

IV. OPERATIONAL ASPECTS OF CONSERVATION PROGRAM

1. ORGANIZATION OF PROGRAM WITHIN UTILITY

The Energy Conservation and Services Department maintains responsibility for program development and implementation while Marketing Services plays an important role in program development, research and program evaluation. Advertising is contracted to a private agency.

2. RESOURCES ALLOCATED TO PROGRAM

PG&E has a total of 135 people devoted full-time to the residential conservation and weatherization program. There are 75 auditors on a contract basis and 13 staff supervisors.

As for program funding, PG&E estimates its Weatherization program (including audits) will cost \$7.046 million in 1979. The company will spend approximately \$2.5 million on general awareness and advertising.

V. RESIDENTIAL ENERGY AUDIT

1. BACKGROUND

As of this year, the residential conservation and weatherization program is operating in all 13 PG&E divisions. Overall, 81% of the single family, owner occupied homes in PG&E's service territories have some insulation. Over 11,000 audits have been done in 1979 and the utility plans that by the end of 1979, 20,000 audits will have been completed.

The audit is initiated by the customer, who calls a toll-free number or the Weatherization Center in the Operations Division headquarters to request utility services or inquire about the program.

Each telephone inquiry is recorded on a Weatherization Memo-Input and the information is coded for keypunch and computerized. Thus, the utility has a record of the nature of each telephone inquiry, knows which form of public relations/advertising prompted the phone call and has a record of the follow-up action to be taken.

2. AUDIT TYPES

PG&E does Class A audits only. A standard Enercom form and system is used whereby the customer receives the results of the audit via computerized voice telephone linkup. If for some reason the results cannot be given to the customer at the time of the audit, the output forms are completed and returned by mail to the customer.

3. FEATURES INCLUDED IN AUDIT

The basic Enercom features are included in the audit:

- . HVAC
- . Floor, ceiling, wall insulation
- . Hot water heater
- . Door and window conservation
- . Thermostatic control information
- . Lighting conversion.

4. AUDIT OUTPUT

As already mentioned, the standard Enercom output form is completed by the energy auditor and returned to the customer.

5. COST AND PAYMENT OF AUDIT

The PG&E energy audit is done free of charge. Each audit costs the utility approximately \$35-\$40 although this is an estimate.

6. ENERGY AUDITORS

The 75 energy auditors work on a contract basis. The auditors are monitored as to their performance in the field.

Auditors are available during the day, evenings and weekends. Audits are scheduled one week in advance and auditors travel to customer homes using their own transportation.

7. CUSTOMER RESPONSE TO AUDIT PROGRAM

Customer response to the program has been favorable in terms of number of houses audited, number and types of responses and numbers of measures installed. By mid July 1979 the utility had received almost

40,000 inquiries (mostly by telephone) regarding insulation, insulation financing, inspections, conservation devices and solar energy. On average, PG&E receives approximately 1,245 inquiries weekly. PG&E's marketing research indicates that the Insulation Financing Program (discussed below) and the Home Energy Audit are the programs that are most known by utility customers. Sixty-three percent of the customers surveyed (sample size of 1,013) were aware of the insulation program and 59% knew of the audit program. As of May 1979, after only 4 months into the program, .4% of the residential customers had received an audit, indicating that as the program continues, a large number of customers may request home audits.

VI. OTHER CONSERVATION SERVICES OFFERED

1. LISTING OF CONTRACTORS

PG&E provides lists of contractors who will, upon customer request, install specific measures in customers' homes. Alternatively, PG&E contracts with installers who provide services for utility customers through PG&E.

2. POST-INSTALLATION INSPECTION

In 1978, 4,922 attics were inspected, a 228% increase over 1977. By the end of September 1978, 4,380 had been done in that year. PG&E attic inspections included most direct sales program participants, all PG&E financed do-it-yourself installations, random samples of jobs by PG&E recommended contractors, and inspections requested by customers and contractors through the Energy Conservation Center (in San Francisco).

3. FINANCING

From February 1978 through the end of 1978 PG&E offered \$829,000 worth of low-interest financing for R-19 (or greater) ceiling insulation. From January to the end of September 1979, 5,422 customers loaned a total of \$2,227,289. Homeowners and renters could finance up to \$500 for ceiling retrofit materials and services at 6% interest. For multifamily dwellings, a total of \$2,000 is offered if the per unit costs did not exceed \$400.

4. OTHER PROGRAMS OFFERED

- Consumer Information: The Energy Conservation Center with a toll-free number is available as a clearinghouse of conservation information for customer use.

- . Appliances and Devices Program: This program encouraged consumers to use existing appliances more efficiently, to purchase energy efficient models when buying new appliances and to install and use energy saving devices. In 1978 PG&E spent \$1.8 million on this program and estimated its savings at 375,788,000 kWh's and 89,567,000 therms.
- . Insulation Incentive Program: Homeowners will receive a free hot water heater insulation wrap and a shower flow restrictor if they install insulation to the R-19 level in a home constructed prior to state regulation requiring R-19 insulation.

PG&E also provides the following:

- . Shopper's Guide
- . Heating Efficiency Improvement Program
- . Central Furnace Efficiency Test Program
- . Intermittent Ignition Device Sales Pilot Program
- . Pilot Lighting Instructions
- . Swimming Pool Pump Load Shift Program.

VII. UTILITY MARKETING STRATEGIES

1. ADVERTISING METHODS

PG&E uses a wide range of advertising methods including:

- . Radio
- . TV
- . Newspapers
- . Bill Stuffers
- . Truck posters
- . Outdoor posters
- . Point of purchase material
- . Bangtail Envelopes (where conservation information must be removed from envelope prior to sealing it)
- . Appearances at fairs, shopping centers, etc. with energy displays
- . Bus posters (inside bus).

In 1979 PG&E spent approximately \$2.5 million on their various advertising campaigns including a number of different animated television ads.

2. MARKET RESEARCH AND ANALYSIS OF CONSUMER RESPONSE

In past PG&E has done market research related to specific programs. In 1979 PG&E used a private firm to conduct an overall baseline study intended to:

- . Evaluate each of the residential conservation programs in terms of consumer awareness
- . Evaluate consumer attitudes and behavior relating to each of these programs.

Progressive Analysis of Conservation Effort (PACE) now is performed bi-annually. PACE studies were done in December 1976; May 1977; January 1978; June 1978; January 1979 and June 1979. A brief summary of just some of the findings are highlighted below:

- . In January 1978 approximately 48% of those residential customers sampled felt a serious energy shortage existed in Northern California. In January 1979, only 33% felt this way. This was down to 30% in June 1979. Sixty-three percent felt that the energy situation will become worse in January 1979 compared to 34% who felt this way in January 1978. This was up to 65% in June 1979.
- . In June 1979 approximately 54% of all homeowners claimed they would be willing to accept a lower standard of living to conserve energy. Forty-eight percent of homeowners also feel that the amount of money that can be saved on their utility bill, through conserving energy, is not enough to cause them to change their lifestyle.
- . In June 1978, 36% of homeowners said that conserving energy in the home is 'very easy.' By January 1979 25% felt this way.
- . In June 1979 65% of homeowners claim they don't attempt to save more energy in their homes because they "don't always remember to conserve."
- . Approximately 34% of homeowners claimed in January 1979 that they planned to install at least one conservation device in their homes in the next six months. Items mentioned most often were insulation, weatherstripping, and water heater blankets.

3. BARRIERS TO MARKETING CONSERVATION PROGRAM

Unless confronted with a dramatic energy shortage, such as occurred with the gasoline and water shortage in California, many people are unconvinced that there is an energy shortage or energy availability problem. Generally speaking, cost is the number one barrier, then technology, reliability and aesthetics.

- . People do not seem to be willing to alter lifestyles significantly to reduce their energy consumption. (There seems to be a willingness, however, to purchase energy efficient appliances.)
- . First costs of installing conservation measures is a serious barrier to marketing conservation.
- . With regards to solar, the visual aesthetic effects of mounting solar collectors on rooftops may be a barrier.
- . People do not yet understand which of the conservation measures will result in the most energy savings.
- . Once certain conservation measures have been installed, some residents believe that their behavior need not be altered to conserve energy; that their conservation measures installed are adequate.

VIII. UTILITY EVALUATION OF CONSERVATION PROGRAM

PG&E is pleased with the progress of their conservation programs. Response to the advertising is perceived as adequate judging from participation in programs and the large number of inquiries. And, though PG&E is spending significant amounts on energy conservation programs and information dissemination, they are saving significant amounts of energy as a result.

IX. SUGGESTIONS FROM UTILITIES: DO'S AND DON'Ts

1. DEVELOPING AND INITIALLY OPERATING PROGRAM

- . Pilot program and target marketing helps in the initial development of a residential conservation program. Target marketing can test what consumers will want as well as their motivations (or lack thereof) to conserve.
- . Customer attitudes must be tested on an ongoing basis so that program elements can be evaluated and potentially refined and improved.

- . Post-installation inspections should be done, particularly for do-it-yourself jobs.
- . Care should be taken to hire/contract enough auditors. Depending upon customer demand, a general estimate of auditors per 1000 customers could be devised to ensure that backlogs of no greater than four or five weeks occur.
- . The utility should not assume anything about customer attitudes. The utility must do market research, particularly to monitor the utility's credibility. Utilities should be careful about thinking 'they know their market' without doing careful, in-depth market research regarding consumer attitudes and behavior.

2. MARKETING ASPECTS OF AUDIT PROGRAM

- . Advertising: Advertising timing is important and should be climate-adjusted to coincide with the times of greater use, depending upon peak seasons for heating/cooling. In a large and varied service area with many weather variations (such as PG&E's) this becomes a difficult task, considering the significant temperature fluctuations between districts within the service territory.
- . Customer Contact: PG&E codes and computerizes customer inquiries which enables the company to judge what types of questions are uppermost in customers' minds. For instance, many questions about insulation resulted in PG&E's producing advertising and brochures talking about those insulation concerns most often expressed by customers.
- . Cooperation With Contractors: PG&E believes that installation of insulation and other measures should be contracted out to private companies/individuals. The utility can provide lists but the contractor who is contacted by the customer can provide cost estimates for the work to be performed.

UTILITY: Pacific Power and Light (PP&L)

UTILITY PERSONNEL CONTACTED:

A.C. Bartholomew
Senior Vice President

Carl E. Ertler
Manager, Weatherization Services

Donald R. Grimm
General Manager
Energy & Conservation Services

Dan Hitchcock
Director of Training and Program Planning
Energy & Conservation Services

I. OBJECTIVES OF CURRENT CONSERVATION PROGRAM

The primary objective for initiating an aggressive conservation program is to delay the addition of new generating capacity. PP&L has set a goal of 20,000 audits to be completed systemwide in 1979.

II. BACKGROUND OF CURRENT RESIDENTIAL CONSERVATION PROGRAM

1. DEVELOPMENT OF CURRENT PROGRAM

PP&L began their residential audit program in 1977. The program was initiated throughout Pacific's service territory focusing on electric customers. The audit only addresses electrical usage in the home. PP&L advocates high insulation standards for electrically heated homes in order to make electricity competitive with fossil fuels (these standards include R-19 in floors, R-38 in ceilings and R-18 in walls). PP&L currently serves 535,000 residential customers in six states.* PP&L's market saturation of all-electric residential customers is approximately 40%.

* PP&L's service territory includes parts of Oregon, Washington, Idaho, Montana, California and Wyoming.

PP&L offers several types of conservation financing programs to their customers, all of which include a residential energy audit. The most widely publicized of these programs is the zero percent financing program (offered only to electric space heating customers) in which the amount of the loan is rolled into the rate base until the home is sold. PP&L developed their programs independently, even though they investigated other programs before initiating their programs.

2. OUTSIDE INTEREST IN PROGRAM

PP&L has received much publicity and numerous inquiries regarding their zero percent financing program. Most inquiries into the program have focused on:

- . Customer response to the program
- . Program economics; i.e., how to economically justify the program from both the utility's and ratepayers' perspective.

III. UTILITY REGULATORY ENVIRONMENT

1. BACKGROUND

Before PP&L initiated their audit and financing program, the utility submitted its proposal to the Commissioners in each of the six states. Most Commissioners have been generally supportive of PP&L's efforts although the zero percent financing program is available only in Oregon, Washington, Idaho and Montana.

2. LOAD MANAGEMENT

PP&L does not use conservation as a load management technique since load management is not currently a major problem. PP&L characterized their primary problem as being energy short. In other words, the utility has adequate peaking capacity (i.e., through hydro) but requires additional baseload capacity.

IV. OPERATIONAL ASPECTS OF PROGRAM

1. ORGANIZATION OF PROGRAM WITHIN UTILITY

The utility stopped marketing energy in the early 1970's and became involved in conservation. PP&L made a strong corporate commitment to conservation in 1977. Exhibit 1 shows the organization

EXHIBIT 1
Organization of PP&L Energy & Conservation Services Department

of the Energy & Conservation Services Department within which the energy audit program is operated. All program planning and auditor training is carried out by the Director of Training and Program Planning. Advertising is also coordinated with the advertising department.

2. RESOURCES ALLOCATED TO PROGRAM

PP&L has a staff of thirteen people in the main office devoted to the audit program. This staff includes:

- . Four Technical Consultants
- . Two Program Planners
- . One Training Administrator
- . One Educational Services Planner.

Additionally, PP&L has a staff of approximately 150 Energy Consultants (i.e., auditors) and 15 Expeditors (to perform post installation inspections) in the field.

PP&L estimates that the utility will spend in excess of \$9 million for the conservation programs in FY 79 including outstanding residential weatherization loans. Of that amount, approximately \$500,000 will be allocated to staff payroll (headquarters) and program development. In addition \$700,000 will be spent on program promotion.

V. RESIDENTIAL ENERGY AUDIT

1. BACKGROUND

For the first 1½ years of the audit program, all reporting procedures were performed manually. When the zero percent interest program was implemented in 1978 the entire status and report system was computerized.

The procedure by which a homeowner receives an audit is to initially phone the utility (or send in a coupon); a field representative then makes an appointment to visit the customer. An Energy Consultant visits the homeowner, performs the analysis, and provides the homeowner with recommendations for energy efficient improvements. This procedure takes up to four hours. The total process--audit, contractor bidding and work, and post-installation inspection--takes around 11-12 hours to complete.

PP&L is preparing to offer renewable resource audits.

2. AUDIT TYPES

The Home Energy Analysis (HEA) is a Class A audit performed by a trained utility employee. The audit requires approximately 1-2 hours for a non-electrically heated home, and 3-4 hours for an electrically heated home.

3. FEATURES INCLUDED IN AUDIT

The auditor performs a heat loss calculation estimate by analyzing windows, doors, walls, ceilings and floors. The audit also includes examinations of:

- . Electric space heating systems
- . Electric hot water heaters
- . Lighting
- . Major electrical appliances
- . Portable heaters
- . Fireplaces and wood stoves.

4. AUDIT OUTPUT

The audit recommendations are calculated manually to provide suggested measures, based on the percentage of energy the measures would save if they are installed. The savings estimates attempt to reflect realistic savings potential that could be achieved from the measures. The savings potential from recommended measures vary for different homes since they are based on actual customer bills. Ultimately, the recommendations are prioritized according to payback and estimated savings potential.

The audit recommendations are often calculated in the homes and left with the customer. However, sometimes it is not practical or feasible to perform the calculations on site. In these cases the auditor prepares the results and recommendations at the field office and either mails back the results or personally delivers them to the homeowner. (The utility does prefer to have the auditor deliver the results in person.)

PP&L has investigated the Enercom computer system to determine its applicability to PP&L's audit program and is still studying its application. PP&L bases its audit recommendations on actual customers energy usage and felt that it would be difficult to adapt Enercom to reflect actual customer usage. However, the utility ultimately does plan to computerize the HEA audit procedure. The PP&L representatives additionally expressed the view that having auditors perform hand calculations is beneficial since it forces the auditors to understand the recommendations and therefore facilitates the explanation to the homeowner.

5. COST AND PAYMENT OF AUDIT

The cost of the audit is free to the homeowner. However, PP&L has calculated that the direct cost of each audit to PP&L is \$50-\$100, depending on factors such as travel time and type of home. The utility estimates that the entire audit process, including post-installation inspection costs around \$150.

6. ENERGY AUDITORS

PP&L employs approximately 150 Energy Consultants in 60 regional offices who, as part of their duties, perform audits. Fifteen Expeditors act as liaison between customers and contractors to ensure that the work that was bid was actually installed and to perform post-installation inspections. The auditors are full-time employees and devote approximately 60-70% of their time to performing residential audits. More experienced auditors are also involved in performing commercial and industrial audits.

Most auditors have a college degree and a relatively non-technical background. In hiring auditors, however, the utility does look for a technical aptitude as well as sales and communication experience or ability. PP&L has devised a 7-phase training course for its auditors that encompasses:

- . Classroom training
- . On-site training
- . Technical skills
- . Advanced, specialized training (e.g., sales skills).

Additionally, PP&L provides communication training to all auditors in the field offices. Energy Consultants have frequent one-to-one interchanges with homeowners, and may even go to a person's home to discuss a bill complaint.

7. CUSTOMER RESPONSE TO AUDIT PROGRAM

Since October 1978, PP&L has received 16,900 requests for Home Energy Analyses, of which 13,300 were electric space heating customers. The utility has completed about 11,000 of the requests and has had approximately 2,000 cancellations of audits. The utility currently has a backlog of almost 3,000 audits. However, PP&L believes that a backlog is necessary to allow proper work scheduling.

The audit program has received the greatest response in the milder climates, while the response in colder climates, such as Idaho and Montana, has been lower. The PP&L representatives believe that this may be due to the fact that homeowners in colder climates may believe that they are already well insulated and, therefore, do not need to participate in the program.

Approximately 13,000 electric space heating customers have requested to participate in the zero percent financing program. Of those requests 1,397 cancelled before the audit was performed while 1,624 homeowners cancelled after audit but before the conservation measures were installed. The PP&L representatives said that the acceptance of the zero percent financing program has been lower in Washington than in Oregon. They believe that this is due to the fact that Washington homeowners must pay back the loans in 10 years, if the homeowner has not yet sold the house. The average amount of a loan under this program is about \$1,350.

VI. OTHER CONSERVATION SERVICES OFFERED

1. LISTING OF CONTRACTORS

Under the zero percent financing program the utility becomes the general contractor for the customer and obtains three bids from sub-contractors to perform the necessary work. PP&L then selects the lowest bidder to perform the work and finances this amount through the utility. The contractors who bid for these jobs have previously applied to be included on PP&L's list of contractors. To be included on this list, the contractor must meet specific bonding and insurance requirements.

If the customer does not participate in the zero percent financing program but wants to install conservation measures PP&L will still offer to obtain bids for the work, but the contractors are identified from the Yellow Pages.

2. POST-INSTALLATION INSPECTION

PP&L employs approximately 15 Expeditors to ensure that what was bid by the contractors is actually installed. As part of the zero percent financing program, PP&L allows the contractors 45 days to perform the work and then inspects every job. Once the Expeditor is satisfied that the job has been completed properly, PP&L pays the contractor.

3. FINANCING

PP&L operates several different financing programs for residential customers who receive a Home Energy Analysis and want to install recommended conservation measures.

"Operation Insulation" was introduced by PP&L in 1978 and provides zero interest financing to qualified residential electric heat customers for cost effective improvements (available in Oregon, Washington, Idaho and Montana).

The loans are repayable to the utility at the time the home is sold (except in Washington, where the loan must be repaid to the utility in 10 years). Weatherization improvements applicable for this program include:

- R-38 ceiling insulation with proper ventilation
- R-19 floor insulation over unheated space
- Ground covers for crawl space
- Wrapping of water pipes in unheated spaces
- Storm doors and windows
- Weatherstripping and caulking
- Duct wrapping
- Timed thermostat on forced air system.

The amount of the loan is included in PP&L's rate base until the customer sells the home, at which time the loan is deducted from the rate base.

The cost effectiveness of conservation measures is determined by comparing the cost of building future generating capacity to the cost of installing the conservation measures.

- . In Oregon, PP&L offers weatherization financing at 6½ percent interest rate over 10 years to qualified electric space heating customers. The total amount of money loaned to the customer cannot exceed \$1,500 unless storm windows are installed along with other weatherization services, in which case the loan cannot exceed \$2,000. This program includes multifamily dwellings.
- . PP&L offers a similar program to California customers, except that it includes an 8 percent interest rate and product incentives to encourage customers to obtain an audit.

All program costs, except those associated with the company's zero interest weatherization program, are reflected in operating expenses in the period in which the costs are incurred.

VII. UTILITY MARKETING STRATEGIES

1. ADVERTISING METHODS

At the beginning of the zero interest financing program PP&L planned a two-week TV campaign, supplemented by newspaper ads. This campaign was stopped after 1½ weeks since the program response was so great. The initial advertisement did not mention that the

program was only for electric heating customers, so the utility received a lot of requests for participation from gas customers.

The PP&L representatives indicated that the utility plans to increase program promotion. Consumer response is such that if the utility runs an ad in an area on one day, consumers will react quickly the next day. However, the PP&L representatives indicated that, as more consumers receive audits, the market is becoming harder to penetrate and they will soon have to initiate strong marketing programs targeted toward specific market sectors to obtain consumer participation in the program.

PP&L indicated that bill inserts and direct mailings have been a very effective means of promoting their conservation programs. These promotional means have elicited around 1-1½% consumer response to PP&L's programs. While TV is believed to be an effective promotional means, it is difficult to measure consumer response to TV promotion.

PP&L offers incentives for customers to receive an audit. With every Home Energy Analysis the consumer receives a free water heater wrap if the electric water heater is located in an unconditioned space (e.g., garage). However, this incentive is not offered in Wyoming. The utility also offers flow restrictors in California (in compliance with a CPUC order). PP&L believes that any incentive provided to customers must be justified in terms of energy and therefore cost savings to the consumer and the utility.

2. MARKET RESEARCH AND ANALYSIS OF CONSUMER RESPONSE

PP&L originally assigned a five-year time frame to the zero interest program and hoped to retrofit all applicable homes over that time. Approximately 105,000 customers qualify for the PP&L program and PP&L has determined that around 60-70% could ultimately take advantage of the program. This was determined based on data collected by Portland General Electric and PP&L. The data indicated that 30-40% of the homes have insulation levels that would prohibit program participation on a cost effective basis.

A Portland market research firm has performed a consumer awareness survey for Oregon to determine customer awareness to utility conservation programs. The results indicated that:

- . 52% residential consumers are aware of the zero interest financing program
- . 40-60% consumers read bill stuffers while 25% read them with some familiarity.

The utility did minimal market research before initiating the zero interest finance program since the HEA program was already in place. The representative did indicate that they are currently planning to do additional market research.

- . PP&L has initiated a pilot program to test consumer response to different media.
- . PP&L is also sending bill inserts to high use customers to test target marketing of the programs. This program also includes newspaper ads and radio testimonials relating to the programs.
- . PP&L recently produced a television show aired this fall in their service territory and will conduct focus group interviews to determine public response to the show. The show will not focus directly on their conservation programs but will be a test to determine how much consumers know about energy. The primary purpose is to convey general energy information to consumers.

3. BARRIERS TO MARKETING CONSERVATION PROGRAMS

- . Low utility rates discourage customer participation in conservation programs because the economic incentive to conserve is not great.
- . Payback on measures is consequently often prohibitively long since energy costs in the Northwest are so low. This is one of the primary reasons for PP&L deciding to treat cost effectiveness using cost of future generation as a basis for the zero financing program. Because the cost is so high the utility can justify interest free loans that are included in the rate base.
- . Consumer Confusion resulting from many organizations being involved in conservation. Many community and state agencies currently offer consumer advice on programs concerning conservation. The consumer receives so much information from so many different sources that he becomes confused, and thus reluctant to participate in utility conservation programs.

VIII. UTILITY EVALUATION OF CONSERVATION PROGRAM

PP&L believes that the utility has a positive public image and that most consumers are satisfied with utility activities. The utility looks at the zero interest program as an incentive for the consumer to weatherize. The utility representatives felt

that consumer response to the zero interest program is adequate and that the energy savings from the program will amount to 1-1½ years' worth of load growth. This translates into capacity deferral of 1-1½ years although the program will not eliminate the need for new plants. The manager estimated that the utility will spend around \$100 million for the program, over the life of the program. In Oregon, with an average of 4500 degree days and an average calculated annual savings of 5000 kWhs from the zero interest program participants' savings should be close to one half of the customers' electric heating bills.

The PP&L representatives stressed that while the zero interest program is working very well for PP&L, it may not do so for other utilities. The program was specifically tailored to meet PP&L's needs and operating characteristics, but may not be appropriate for other utilities.

IX. SUGGESTIONS FROM UTILITIES: DO'S AND DON'Ts

1. DEVELOPING AND INITIALLY OPERATING PROGRAM

- . Maintaining a positive relationship with contractors will help a utility's program through cooperation by contractors in performing satisfactory jobs.
- . Computerizing the audit tracking system helps to ensure accuracy and greatly facilitates evaluation of the program.

2. RESIDENTIAL ENERGY AUDIT

- . Using subcontractors to perform audits is probably not a good idea since these people usually do not fully understand the utility and therefore are unable to answer customer questions about the utility.
- . The key factor in the audit output is to provide accurate results and recommendations. It is more important to have accurate results than to maintain a one-visit audit, although this is desirable.
- . Estimating savings and paybacks of conservation measures based on actual customer usage provides the customer with a more realistic estimation of the impact of recommended conservation measures.

3. MARKETING ASPECTS OF AUDIT PROGRAM

- . Bill inserts and direct mailings can be a very effective means of promoting a utility conservation program.

- . The utility needs to understand the customers and market for the program. Market surveys are a good means by which to identify market characteristics and incentives that will increase consumer participation in the program.
- . The audit itself is not enough incentive to attract adequate consumer participation in an audit program. Utilities should offer some type of incentive to encourage participation. These incentives should be individual to the utilities, and each utility should determine what incentive will be most effective for that specific market. .

UTILITY: Public Service Colorado (PSC)

UTILITY PERSONNEL CONTACTED:

Curt Dallinger
Engineer, Gas Utilization & Testing

David P. Davia
Residential Services & Utilization Manager

Rodney McLenon
Senior Research Analyst

Frank Oliver
Supervisor, Training and Program Development
Marketing and Energy Utilization Division

Tom Potter
Senior Training Coordinator

James Thornton
Senior Technical, Gas Utilization & Testing

I. OBJECTIVES OF CURRENT CONSERVATION PROGRAM

The utility has two main objectives for developing their residential conservation program:

- . Help residential customers save energy and money. It is anticipated that PSC will reduce by at least 10% each residential customer's bill (of those who adopt the recommended conservation measures). The 'penetration' goal for PSC is to perform 24,000 audits per year amounting to 3.2% of the residential customers per year (all electric as well as electric/gas combination).
- . PSC hopes to reduce both their peak day gas deliverability and generation (as opposed to their instantaneous peak).

II. BACKGROUND OF CURRENT RESIDENTIAL CONSERVATION PROGRAM

1. DEVELOPMENT OF CURRENT PROGRAM

In December 1978 PSC ended its attic insulation program after having inspected 75,000 attics and insulating approximately 35,000 consumer attics. Planning for the current audit/conservation program began in February of 1978 and was operationalized as of January 1979, using existing employees working from the attic insulation program.

2. OUTSIDE INTEREST IN PROGRAM

To date, many other utilities and government agencies have expressed interest in PSC's audit program.

III. UTILITY REGULATORY ENVIRONMENT

1. BACKGROUND

The Public Utility Commission (PUC) favored PSC's conservation program but did not take the lead in advocating its development. As for the development of the Residential Conservation Service (RCS) plans, the State Energy Office will be the lead state agency. PSC is heading up the audit part of that program.

2. LOAD MANAGEMENT

Load management is not a major consideration in PSC's residential audit program, but is in its commercial and industrial audits.

IV. OPERATIONAL ASPECTS OF CONSERVATION PROGRAM

1. ORGANIZATION OF PROGRAM WITHIN UTILITY

The PSC audit program is operated by the Residential Services and Utilization Division and is in charge of overall program responsibility, training and program development. Advertising for the program is done in-house by the utility's advertising division, though much of the copy is written and/or cleared through the Marketing & Utilization Division.

Each of the utility's 16 Divisions is responsible for energy audits performed in their service area.

2. RESOURCES ALLOCATED TO PROGRAM

Approximately 100 individuals from the Consumer Service Department were trained as auditors. These individuals also are responsible for inspections, sales and other related customer activities apart from

auditing. Approximately 20-50% of their time currently is spent on residential energy audits. There are approximately 10-15 support personnel assigned to the residential audit program activities.

Budget allocation for the audit program is not clearly separated from other utility expenses.

V. THE RESIDENTIAL ENERGY AUDIT

1. BACKGROUND

A total of approximately 320 utility employees were given some type of training regarding the substance and operation of the residential audit program.

Other non-auditor employees--supervisors and support staff--were familiarized with the details and goals of the residential program. Employee awareness about the program was considered essential to ensure that customer inquiries could be dealt with adequately by a large number of utility employees.

Generally speaking the audit program is aimed at the customer who will install his/her own conservation measures, although the use of contractors is not discouraged.

Audits are performed by PSC Monday through Friday between 8:00 a.m. and 5:00 p.m.

2. AUDIT TYPES

PSC does not believe that an in-home or mail-in computer audit is effective. Therefore, only Class A audits are offered. At present, no solar audit is offered. Audits now average approximately 2½ hours from start to finish. PSC also is planning a do-it-yourself audit which will consist of 2-3 hour classes for customers.

3. FEATURES INCLUDED IN AUDIT

There are seven major areas included in the audit:

- . Heating System: Indicates type of system; location of thermostat and recommendations for day and night temperatures, and the distribution system, noting duct and register locations and need for taping or clearing obstructions (appliance efficiency is not addressed as yet)
- . Automatic Water Heater: Indicating need for reduced water temperature, insulation, draining, etc.

- . Caulking: Considering improvements to internal and external seals
- . Weatherstripping: Doors, windows and electrical outlets
- . Insulation: Attic, walls, basement walls and floors
- . Glass Areas: Noting need for storm windows and suggestions for passive solar techniques
- . Fireplaces: Recommendation for improving efficiency.

4. AUDIT OUTPUT

Following the walk-through audit the auditor explains the outcome to the customer. The audit is not computerized and auditors do not say how much energy is likely to be saved or what reductions in utility bills can be expected. Auditors do, however, prioritize the suggested measures and customers are expected to accept the 'good faith judgments' of the utility. Priorities are based on cost/payback.

Along with the audit results, customers receive a package including one tube of caulking, sample of foam rope and weatherstripping for windows and doors, sample plastic sheeting for do-it-yourself storm windows, a water flow restrictor and a booklet called "Your Energy Conservation Reference Guide" which provides detailed explanations about conserving energy in residences. Auditors use the samples to show customers exactly what types of conservation supplies they should use in their homes. This helps customers decide on what types of supplies to purchase and is useful when shopping for these items. Additionally, auditors verbally identify stores in their local service territory which carry the various supplies included in the customer's sample kit.

5. COST AND PAYMENT OF AUDIT

After having sampled customer attitudes toward an audit program prior to the start-up of the program, (summer 1978), PSC decided to charge \$18 for each audit. This covers the cost of the conservation kit and part of the auditor's time. PSC has not determined the specific cost of each audit above the \$18, which is borne by all the utility's customers.

Customers can pay for the audit with cash or check. If customers do not wish to pay the full amount at one time, the utility will add \$1 to the monthly utility bill for 18 months. (No interest is charged.)

6. ENERGY AUDITORS

Auditors are usually consumer service representatives who maintain other responsibilities within the utility company.

Potential energy auditors participated in a five-week program of one four-hour class per week for a total of 16 hours class time and 4 hours field work. As a group the auditors also performed a walk-through audit of one home and were required to audit their own homes as well. Auditors were tested before, during and after their training classes about the content of their class work.

7. CUSTOMER RESPONSE TO AUDIT PROGRAM

To date PSC has received audit requests from approximately 4,500 customers at the rate of approximately 80-100 per week. (PSC hopes to reach 500-600 requests per week.) As of August, the utility had approximately 400-500 backlog of audits, which was anticipated as a 2-week backlog.

VI. OTHER CONSERVATION SERVICES OFFERED

1. LISTING OF CONTRACTORS

PSC does not provide lists of contractors.

2. POST-INSTALLATION INSPECTION

PSC does not do post-installation inspections.

3. FINANCING

PSC does not provide financing.

4. OTHER PROGRAMS OFFERED

- . PSC offers a commercial/industrial audit
- . PSC is developing a two-night per week classroom presentation to teach homeowners how to perform a do-it-yourself audit for a fee of \$8. PSC hopes to bring these sessions into customer homes, much like the Tupperware Party concept, to motivate consumer interest in conservation.

VII. UTILITY MARKETING STRATEGIES

1. ADVERTISING METHODS

PSC began advertising its residential audit program in January 1979. In the first instance, one full-page advertisement per week in two newspapers were run. Additionally, PSC ran 30-second TV spots announcing the program. Following the initial advertising campaign,

PSC received approximately 100 audit requests per week. Bill stuffer ads will be included in monthly utility bills starting in August and will reach all the utility's service areas by the end of September. The audit program budget for this advertising has not yet been calculated.

2. MARKET RESEARCH AND ANALYSIS OF CONSUMER RESPONSE

During the Summer 1978 the utility did some market research as a pre-test of their upcoming audit program. The utility attempted to:

- . Assess the potential market for home audits
- . Find out what customers were doing to conserve energy
- . Identify customer attitudes toward conservation and the utility
- . Attempt to find out what customers already had done to conserve energy.

In July 1979 a postcard questionnaire was sent to those customers receiving audits (as of June 1st). As of August 1st, a total of 429 responses were received. These responses have not yet been analyzed.

3. BARRIERS TO MARKETING CONSERVATION PROGRAM

The major barriers to residential conservation identified by the PSC staff is that customers feel conservation is expensive and is something which will significantly alter their lifestyle. Residential customers must, therefore, be convinced that conservation need not be extraordinarily expensive nor will it lower the quality of their lives. Other obstacles to conservation mentioned are:

- . People don't know how to apply conservation measures in their own homes.
- . The relatively low price of energy does not promote conservation. The economic motivation should, however, change as energy prices continue to climb.
- . The rapid turnover in houses (approximately 3-5 years) inhibits investments in conservation
- . There exists a large population of out-of-staters now residing in Colorado who, before moving to the area, paid energy prices far in excess of Colorado prices. To them, energy remains relatively cheap and, therefore, conservation is not yet a serious issue.

- Certain useful modifications, such as furnace adjustments and derating, cannot be done until the building envelope has been made more thermally efficient.

VIII. UTILITY EVALUATION OF CONSERVATION PROGRAM

Basically the utility is happy with their existing conservation program. Additionally, as of the Summer of 1979, in-depth evaluations of market research and surveys had not been accomplished.

IX. SUGGESTIONS FROM UTILITIES: DO'S AND DON'Ts

1. DEVELOPING AND INITIALLY OPERATING PROGRAM

- Utility personnel, particularly those handling customer relations, should be familiar with the conservation program. Even when customers call to complain about high prices, the utility should take a marketing posture in an attempt to get customers to invest in conservation.
- Program planners must focus on the various market components in residential conservation such as:
 - Thermal envelop efficiency
 - Buyer behavior (in terms of investing in conservation)
 - Furnace, with an eye toward modification
 - Merchandising energy efficient appliances
- Backlog on performing energy audits should not exceed 2 or 3 weeks
- Projects such as the residential conservation program should not be of short duration or of limited support-staff commitment
- Upper level utility management must give their full support to the program.

2. RESIDENTIAL ENERGY AUDIT

- Auditors need to sell the concept of energy conservation, not just conservation measures and improvements. This needs to be done while the auditor is with the customer.
- Auditors must make an effort to explain the various components of the audit to customers so that they fully understand the conservation value of installing measures.

3. MARKETING ASPECTS OF AUDIT PROGRAM

. Advertising

- The idea of comfort must be stressed. Increasing building thermal efficiency through conservation will result in greater comfort in the home for less money spent on energy.
- Conservation options need to be highlighted/explained in the advertising.
- It is important for the advertising to reach the women customers, because generally women homemakers tend to spend more time in the home, know more about energy using appliances, and are more concerned about residential conservation.

. Customer Contact

- Inquiries: It is important for utility employees with customer contacts to be familiar with the audit program.
- Auditor Contacts: It is important for auditors to be fully committed to the utility's perspective toward conservation and committed to serving the customer's needs.

. Cooperation With Contractors/Lenders

Cooperation with contractors (in PSC's case, the Colorado Thermal Insulation Association) is valuable so that an adversary, competitive relationship with the utility does not develop.

UTILITY: Sacramento Municipal Utility District (SMUD)

UTILITY PERSONNEL CONTACTED:

Freeman Dom
Supervising Power Advisor

Bernard Gembinski
Principal Energy Analyst

Pete Hollick
Director of Conservation

Lowell B. Orange
Supervisor, Power Advisory Division

Kilburn D. Stoner
Principal Power Advisor

I. OBJECTIVES OF CURRENT CONSERVATION PROGRAM

The objectives of the current residential programs are to:

- . Obtain experience in providing home energy audits in preparation for the RCS program.
- . Help customers save energy and money by improving the thermal efficiency of their homes.
- . Lower system peak.

II. BACKGROUND OF CURRENT RESIDENTIAL CONSERVATION PROGRAM

1. DEVELOPMENT OF CURRENT PROGRAM

The home energy survey analysis program was motivated by the National Energy Act's RCS program. Although SMUD is attempting to gain practical experience running an audit program, it is not their intention to anticipate or "second guess" the California state RCS plan. The original objective of this aspect of the residential conservation program was to audit 200 customers' homes. By the end of the program (June 1979) a total of 160 audits were conducted.

SMUD also has created a low income weatherization program scheduled to begin in September 1979. This is an expansion of SMUD's ongoing Residential Insulation Sales Program. CETA employees will be used by SMUD to audit homes. Community based organizations using CETA employees will install insulation and weatherization materials. Funding will be provided from city and county sources (the Fruitridge Neighborhood Center and the Sacramento Area Equal Opportunity Council). Funds for materials will come from the Federal government through community block grants. Additionally, the audit used in the pilot audit program may be used in some form for the weatherization program.

The current residential programs pertaining to audits include:

- . Home Energy Workshop (HEWS) parties which involves gatherings of neighborhood groups in a customer's house to witness/participate in a home energy audit
- . Short Workshops for community groups on how to conduct an energy audit
- . College-level classes to provide instruction on energy audit techniques
- . Slide shows presented to community service groups demonstrating audit techniques
- . Home Energy Survey Analysis pilot program to audit customer homes and provide on-site advice on thermal efficiency improvements (completed 6/79)
- . Residential Insulation Program provides attic insulation survey and sales.

2. OUTSIDE INTEREST IN PROGRAM

Much of the outside utility activity is with PG&E but some inquiries from other utilities have been made.

III. UTILITY REGULATORY ENVIRONMENT

1. BACKGROUND

As a municipal utility, SMUD is not subject to California PUC authority. As for the RCS, however, SMUD will have the option to join the State plan or submit a plan independently to DOE. The California Energy Commission is in the process of formulating the state plan and SMUD's participation will be strongly considered by the utility's management.

2. LOAD MANAGEMENT

At this point in the development of the program, load management is not considered as a major element.

IV. OPERATIONAL ASPECTS OF CONSERVATION PROGRAM

1. ORGANIZATION OF PROGRAM WITHIN UTILITY

Overall responsibility for the pilot audit program (and the other program elements) is within SMUD's Conservation Department. The Power Advisory Division (within Conservation) performs the project management function.

2. RESOURCES ALLOCATED TO PROGRAM

Personpower used for these home conservation programs consists of a variety of auditors/inspectors. The initial attic insulation program used 14 insulation technicians contracted from the Volt Agency. Because customer requests for attic surveys have slackened, there are now only 4 insulation technicians selling insulation and 3 contractors (one for each generic type) currently installing attic insulation. Six CETA employees who were trained as auditors are to be used for the low income weatherization program. Two of these individuals along with 2 other utility employees performed the audits as part of the home audit program.

Since 1977, SMUD has spent approximately \$908,000 in multi-media conservation advertising. In 1979 through July, approximately \$318,000 has been spent including \$126,000 on this summer's HELP program, successfully aimed at lowering summer peak. A very small portion of the above was directed at specific ongoing residential conservation programs.

V. THE RESIDENTIAL ENERGY AUDIT

1. BACKGROUND

For the insulation program only attic inspections are done. Complete home energy audits are not performed. The 160 participants in the home energy survey analysis did receive a full audit by one of two CETA employees and an accompanying utility employee. The CETA employees' on-the-job training with the home audit program gave them the necessary experience to perform home audits as part of the low income weatherization program.

2. AUDIT TYPES

Class A audits are the only type of audit performed in the customer's home.

3. FEATURES INCLUDED IN AUDIT

- . Customer demographic data
- . Swimming pools
- . Attic, Wall and Floor insulation
- . Caulking and weatherstripping
- . Windows and doors
- . HVAC and thermostats
- . Water heating usage
- . Energy savings resulting from changing the above variables/factors
- . Information packet of brochures, lists of suppliers, samples of weatherstripping, etc.

4. AUDIT OUTPUT

Along with each of the measures identified in the energy audit/survey, the auditor calculates estimated savings due to potential actions taken by the customer. The information is calculated on a hand-held calculator. As indicated on the SMUD calculating sheets, "The savings and payback periods from recommended energy conservation measures are estimates based upon (the customer's) past usage and averages obtained from other programs and studies. The savings shown are meant to serve as guidelines only."

5. COST AND PAYMENT OF AUDIT

Audits were free to customers but cost SMUD approximately \$40 per audit.

6. ENERGY AUDITORS

The energy audit program used 2 of the 6 CETA employees hired by SMUD originally for the low income weatherization program. Additionally, two permanent utility employees were used along with the CETA people.

The CETA auditors were trained for a total of three weeks. Seven full days of classroom training were followed by a period of field training. These same individuals later participated in the PG&E auditor training program in preparation for the weatherization program. For the attic insulation program 14 people were hired on contract to inspect attics and sell insulation. As demand for attic inspections dropped, 10 individuals were dropped from the program.

7. CUSTOMER RESPONSE TO AUDIT PROGRAM

Customer response to the pilot program was less than anticipated. There were 1651 letters mailed with an overall response rate of 10%. By building/income categories, response rate varied widely, from 2% in low income, gas-heated newer homes to 88% in middle-income, gas-heated newer homes.

Customers were selected from various geographical areas living in different types and ages of homes using both gas and electricity or all electricity. Only SMUD customers of one year or longer were selected and gas-heating customers requested their gas usage in therms from PG&E to be mailed to SMUD so that dollar savings from conservation measures could be calculated. There were several reasons identified by SMUD for the low participation:

- . Occupants of newer homes tended to be less responsive to SMUD offers to perform the audits. For instance, only 7% of those customers in all electric residences 5 years old or less responded to SMUD audit offers. (8 responses to 110 letters.)
- . There were few customers in certain categories (e.g., low income, 5 years old, electrically-heated homes). Emphasis was shifted to survey older (10-15 years) residences.
- . Data on gas usage from PG&E was not always supplied to customers in a timely fashion. This prevented auditors from calculating cost/benefits of conservation measures for these customers and in many cases delayed setting up appointments.
- . A segment of the population does not feel that they need an energy audit.

VI. OTHER CONSERVATION SERVICES OFFERED

1. LISTING OF CONTRACTORS

SMUD does not provide lists.

2. POST-INSTALLATION INSPECTION

SMUD performs inspections of all insulation jobs performed.

3. FINANCING

SMUD does not provide financing.

4. OTHER PROGRAMS OFFERED

Other conservation services for residential, commercial and industrial customers include the following programs:

- . "I Care" Heat Pump & Energy Conservation
- . Residential Attic Insulation
- . Weatherization Assistance
- . Large Commercial/Industrial Audits
- . Small Commercial/Industrial Audit Workshop
- . Agricultural Energy Audit
- . Agricultural Pump Testing
- . Residential Air Conditioning Load Management
- . Swimming Pool Filter Pump Load Management
- . Solar Domestic Hot Water Monitoring Experiment
- . Solar Design & Assistance
- . Power Advisory Service

VII. UTILITY MARKETING STRATEGIES

1. ADVERTISING METHODS

For the attic insulation program standard bill stuffers, "Bang-tail Envelopes" and some radio advertisements were used. TV advertising on conservation was not specifically directed to the individual conservation programs. Because the pilot audit program focused on specific customers via letter, there was no advertising done for this program.

The pilot audit program first used direct mail letters requesting customers to call for audit appointments. Response was poor so SMUD added a pre-paid postcard, which did not improve the response rate significantly.

2. MARKET RESEARCH AND ANALYSIS OF CONSUMER RESPONSE

SMUD has not done any market research to date regarding their residential conservation programs.

SMUD did send a follow-up questionnaire to participants of the home energy audit pilot program. As of July 1979, 79 responses had been received and analyzed. The following sample of customer responses indicate those that plan to install measures or change living habits:

- . 25% to increase attic insulation
- . 34% to caulk
- . 52% to weatherstrip
- . 41% to install water heater jacket
- . 5% to add storm windows
- . 39% to lower thermostat to 68° in winter.

Seventy-three percent of the respondents thought the SMUD representative was very knowledgeable about conservation and the auditing. Sixty-six percent thought the conservation information was very useful; 35% thought it somewhat useful. Eight-six percent felt that the audit program should be offered to all customers.

3. BARRIERS TO MARKETING CONSERVATION PROGRAM

The greatest barrier to marketing conservation seemed to be the lack of customer interest in the pilot program. Secondly, a major barrier to conservation is the inexpensive price of gas and electricity.

VIII. UTILITY EVALUATION OF CONSERVATION PROGRAM

SMUD generally is pleased with their overall conservation program. Regarding the pilot audit program in particular, the 160 responses did not really achieve the anticipated 200 customers, but SMUD did gain experience in running an audit program.

IX. SUGGESTIONS FROM SMUD: DO'S AND DON'Ts

1. DEVELOPING AND INITIALLY OPERATING PROGRAM

- . SMUD had some difficulty getting access to customers' homes, many of whom (72% by their account) work during normal business hours. The program, therefore, should be designed so that only one visit per residence is needed.
- . One possible way to deal with audit programs is to develop a separate residential section within the department to handle administrative matters associated with the program.

2. RESIDENTIAL ENERGY AUDIT

- . Although SMUD does not now use a computerized audit, they foresee the possibility of developing or altering an existing computerized audit.

- . SMUD contracted out for insulation technicians because they feared that permanent civil service employees could not easily be terminated once their jobs were completed. They will probably follow the same procedure with energy auditors.

3. MARKETING ASPECTS OF AUDIT PROGRAM

- . Advertising bill inserts and local public relations are important for the first 5-6 months of the program. After that, bill inserts do not work adequately and advertising must shift more toward radio and television.

UTILITY: Tampa Electric Company (TECO)

UTILITY PERSONNEL CONTACTED:

Jerry J. Kordecki
Manager. Economic Research Consumer Affairs

Louis J. Rinaldi
Manager, Residential Energy Analysis Programs
Consumer Affairs Department

G. Pierce Wood
Senior Vice President

I. OBJECTIVE OF CURRENT CONSERVATION PROGRAM

The current residential conservation program was motivated by the National Energy Act and is intended to fulfill several objectives:

- . Gain valuable "learning experience" regarding the development and implementation of a residential conservation program in preparation for the Residential Conservation Services (RCS)
- . Promote good public relations for utility customers
- . Potentially contribute to demand reduction. Although significant short-term reductions are not foreseen, long-term demand may be achieved if a massive conservation ethic is adopted by consumers.

II. BACKGROUND OF CURRENT RESIDENTIAL CONSERVATION PROGRAM

1. DEVELOPMENT OF CURRENT PROGRAM

Throughout the 1960's TECO's sales emphasis was on promoting electric heating, although insulation was encouraged along with their sales. By 1973, conservation generally was advocated, particularly for builders of new homes. In 1975, TECO prepared a conservation program for new homes, which, because of the rapid growth and construction rate in Florida, are considered to be a major potential conservation market. The current residential retrofit program was stimulated

by the April 1976 National Energy Plan which included the Residential Conservation Service program.

2. OUTSIDE INTEREST IN PROGRAM

III. UTILITY REGULATORY ENVIRONMENT

1. BACKGROUND

TECO has a Rate Tariff Approval by the PSC to charge \$15 for the audit but it is unclear whether in the future the PSC will require TECO to charge the full price for the audit (\$60-\$80 by TECO's estimation) or whether a free audit will be provided once the RCS program is implemented by the Federal government.

2. LOAD MANAGEMENT

The current conservation program aimed at retrofitting residences is not considered by TECO to contribute significantly to load management for two primary reasons:

- . 70% of the existing housing stock was built since 1960 and is considered to be more thermally efficient than older housing stock
- . Savings potential from predominantly cooling loads, which make up a large portion of TECO's residential energy load, is not as great as the potential for conservation of heating load in colder climates.

IV. OPERATIONAL ASPECTS OF CONSERVATION PROGRAM

1. ORGANIZATION OF PROGRAM WITHIN UTILITY

Because TECO's service area is relatively small, approximately 70-mile radius from the corporate office, the entire residential audit program is operated and administered from the corporate office. The Consumer Affairs Department is in charge of all the operational aspects of the audit program, although the Public Affairs Department creates the advertising which is coordinated through Consumer Affairs.

2. RESOURCES ALLOCATED TO PROGRAM

The program development was handled by the Manager of Economic Research Consumer Affairs. He spent approximately one-half person-year initiating the audit program and now devotes some time on the program to all of the software aspects such as consumer outreach, brochures, and follow-up surveys. (Survey work is performed by an outside, independent contractor.)

TECO has one full-time Manager of the Residential Analysis Program within the Consumer Affairs Department who is responsible for all of the day-to-day program operations including the auditors' activities.

TECO has four full-time auditors, two males and two females. TECO's philosophy is to have a full commitment from their auditors, who work on Tuesdays through Saturdays from 8:00 a.m. to 5:00 p.m.

Regarding the financial resources devoted to the program, to date TECO has spent approximately \$125,000-\$150,000 on advertising and \$4,000-\$5,000 on program development. The current program, including auditing at between \$60-\$80 per audit, has a \$125,000 budget exclusive of advertising.

V. THE RESIDENTIAL ENERGY AUDIT

1. BACKGROUND

The energy audit program was planned at the end of 1977 and audits were initiated in September 1978. Of the 255,000 residential customers served by TECO, 42,000 large-user, single-family customers (approximately 16%) were targeted for the audit program. TECO assumed that their audit program is applicable to approximately 25% of their residential customers based upon their energy consumption levels. The 42,000 single-family dwelling customers were targeted for mailed advertising based upon their consumption in July 1978; an 1,800 kWh minimum in single-family homes was established as the cutoff for receiving audit information.

Mobile homes, as single-family dwellings, were not targeted in the program because:

- . TECO believes that mobile homes more than 5 years old cannot be helped substantially because the lifespan does not normally exceed 10 or 12 years on the average.
- . Because of the unique structural characteristics of these residences, not a significant amount can be recommended by the utility to retrofit mobile homes apart from weather-stripping (in some instances) and floor insulation and window shading.
- . TECO doesn't really know what can be included successfully in the energy audit apart from inspecting accessible duct connections for leaks.

2. AUDIT TYPES

TECO performs only Class A audits and has little faith in audits performed by the customer without any guidance other than an information booklet or computerized form. They believe that:

- . Customers using a Class B audit form often do not know what to look for
- . Some customers have little interest using a computerized form to "do it themselves"
- . 45% of the customers don't understand enough about their heating equipment, thermal efficiency or the building envelope to perform a proper audit. TECO said that some customers don't even know whether they have a heat pump or electric resistance heating.

3. FEATURES INCLUDED IN AUDIT

The audit included information about the physical features of the house and addresses:

- . Waste heat recovery systems for hot water heaters
- . Ceiling, wall and floor insulation analysis and recommendations
- . Weatherstripping and caulking analysis and recommendations for windows and doors
- . Duct inspection for leaks
- . Storm windows
- . Water heater wraps
- . Adequacy of attic ventilation
- . Water heater temperature settings
- . Shading of sun on exposed glass areas.

4. AUDIT OUTPUT

The output form is provided by Enercom. The standard, computerized Enercom system is used to process and analyze the audit findings. Information about conservation measures includes:

- . Priority for installation
- . Estimated installed costs
- . Payback years
- . Estimated first-year energy savings.

5. COST AND PAYMENT OF AUDIT

Customers pay the auditor \$15 at the time of the audit. The utility accepts cash, checks and, though they don't advertise it, major credit cards. (The utility prefers not to accept credit cards in lieu of cash/checks.)

6. ENERGY AUDITORS

The four energy auditors received in-depth, "hands-on" training experience retrofitting houses with conservation measures. Since they are required to explore attics, ducts and other areas of houses, the utility wanted to ensure that auditors could actually perform the installation work, and thus better serve customers who needed advice to install measures themselves, if so desired.

Initially, auditors were sent out with local contractors and installers in the field to work as trainee apprentices with these private firms engaged in conservation services. Finally, auditors were trained using utility employees' homes. This entire program took 3-4 months.

7. CUSTOMER RESPONSE TO AUDIT PROGRAM

By the end of September 1979 TECO had received 2,095 requests for audits and had completed a total of 1,854 audits. Two hundred and forty-one customers (11½%) requested but did not receive audits for a variety of reasons. Approximately 40% of these customers cancelled their initial request either because they moved, were unavailable to be home, or due to a combination of different reasons. Approximately 11% of these cancelled requests did so because they really were interested in other energy-related information and did not want an audit. By the end of October 1979 TECO had performed 2,001 audits.

VI. OTHER CONSERVATION SERVICES OFFERED

1. LISTING OF CONTRACTORS

The Florida PSC requests that all contractors be listed until they request to be de-listed, (these contractors are not bonded): the list is not a "recommended" list. The contractor list is categorized according to services offered. The utility therefore does not warrant the contractors' work or materials.

2. POST-INSTALLATION INSPECTION

TECO does not do post-installation inspections.

3. FINANCING

TECO provides a list of financial institutions available to finance conservation measures. However, most people already have financing available, if they need it. TECO does not provide financing.

VII. UTILITY MARKETING STRATEGIES

1. ADVERTISING METHODS

TECO uses mass mailings, newspaper and radio advertisements to reach customers in their service area. The utility sends separate mailers (apart from the monthly utility bills) describing the residential audit program. The mailer includes a business reply card (no postage required) for customers to request a TECO home energy audit.

The first direct mailing to residential customers was done in October 1978. Ten to eleven thousand separate mailer cards (not bill stuffers) were sent out by zip code in the local Tampa area only. The program did not initially receive much publicity and was not heavily advertised. TECO received 40-50 responses at this time. This initial response was considered low by TECO and, in addition to the lack of advertising, was attributed to:

- . Low utility bills during the fall season, just following the cooling season and just prior to the relatively short heating season
- . Thanksgiving and Christmas holidays resulted in many cancellations of requested audits.

Another set of mailers were sent in January 1979 and response to this was gauged as a "test marketing" of the program to measure potential customer response and measure the utility's ability to respond to customer requests for audits.

The current radio advertisements consist of customer testimonials touting the benefits of TECO's audit program. In addition, the Manager of the Residential Energy Analysis Programs participated in a radio call-in-type talk show and will appear on local television shows to increase the public's awareness of TECO's efforts.

2. MARKET RESEARCH AND ANALYSIS OF CONSUMER RESPONSE

To date TECO has performed three customer surveys and will be doing another follow-up survey relative to their residential audit program.

The first customer survey of Thermal Efficiency was mailed to customers and followed up by utility employee interviews of respondents. As a precursor to performing the audit work, the purpose of this survey was to obtain a qualitative rating of what customers perceived to be their homes' thermal efficiency relative to actual thermal efficiency levels. Specifically TECO wanted to know:

- . How do TECO customers perceive their residential thermal efficiency in terms of:
 - Insulation levels and adequacy
 - Need for weatherstripping and caulking
 - Ownership of other thermal aids
 - Other measures which would aid in reducing energy use.
- . What are the actual thermal efficiencies of customers' residences relative to TECO employee evaluations of these customers' homes
- . How consistent was the TECO employees' evaluation of residences with the customers' evaluations?

Four months after the beginning of the audit program TECO contracted an opinion survey company to poll program participants. Ninety-seven participants were questioned as to:

- . The thoroughness and accuracy of the home audit
- . The completeness of the auditor's work
- . The nature of improvements made and planned.

Four months after the initial "Response Survey," the same utility customers were reinterviewed to ascertain what conservation measures had been installed and which measures were planned for the future. This survey was performed in April, at the end of the "winter" season. Another series of interviews are planned for October 1979 to measure the results of the audit program following the long Florida cooling season, which is expected to motivate further residential conservation.

The Thermal Efficiency Study showed that customers tend to view their residences as being more efficient than they actually are. While 86.2% judged their home's thermal efficiency to be fair to excellent (on a scale of "poor," "inadequate," "fair," "good," and

"excellent"), the utility employees' follow-up analysis indicated that only 61.8% of homes fell in that same range.

As for customers' knowledge about their residences' energy-related equipment and condition, many of the customer responses fell within a factor-of-error range of 5% of the analysis performed by the utility employees. The largest discrepancy pertained to existing insulation:

- . Almost 13% of the customers said they had no insulation
- . Utility employees found that, in fact, 23.3% had no insulation
- . 41% of the customers did not know how many inches of insulation their homes contained
- . Utility personnel, on the other hand, were unable to determine insulation levels in only 20% of the cases examined.

The first post-audit program survey (December 1978) indicated an overwhelmingly favorable reaction to TECO's audit program:

- . 98% felt the survey was very or generally accurate
- . 96% rated the utility auditor as very knowledgeable
- . 91% thought the Home Energy Survey was worth the \$15 charged by TECO
- . 98% said they would recommend the service to others.

Of the 97 respondents, 23 had made improvements suggested by TECO. The most popular among these improvements were:

- . Hot water heater insulation (42%)
- . Attic insulation (27%)
- . Weatherstripping or duct taping (18%).

TECO also asked participants for educational/income information, which indicates the degree to which their sample population represents the "average" utility customer.

- . 87% had attended college or had a college degree. (14% had advanced degrees)
- . 89% earned in excess of \$20,000 per year.

This data suggests that those individuals installing conservation measures in their residences tend to be more highly educated and wealthier than the average population.

The second post-audit program survey (April 1978) showed an increase in the number of individuals who installed conservation measures recommended by TECO.

- . 65.5% had installed at least one conservation item (compared to 24% from the first survey)
- . 30% planned to install at least one item, as compared to 95% from the first survey, who planned to make improvements
- . 5.6% did not plan to add measures in the future (compared to 64% from the December survey).

The items most often installed were:

- . Duct tape
- . Weatherstripping
- . Water heater wrap
- . Attic insulation.

3. BARRIERS TO MARKETING CONSERVATION PROGRAM

The major barriers to successfully marketing residential conservation programs are:

- . Customer apathy: Most consumers do not believe there is an "energy crisis".
- . Customer profile and conservation: From the utility's perspective, the potential for conservation is greatest among the heavier energy users. For those customers who are larger energy users, conservation could be valuable. For the consumers who use less energy, greater conservation efforts may reduce overall energy consumption by marginal amounts.
- . First cost of conservation measures: TECO indicated that the high first cost of retrofitting conservation measures may inhibit installation.
- . Anticipated energy savings: Savings sometimes do not meet the customer's expectations.
- . Physical constraint to installing measures: Such things as cathedral or vaulted ceilings or other physical building features inhibit conservation.

- . Setting up audit appointments: Customers often cancel audits or reschedule times, which complicates procedures.
- . Customer rejects conservation options: For a variety of reasons, some customers do not take the auditor's advice, even though conservation could result.

VIII. UTILITY EVALUATION OF CONSERVATION PROGRAM

The utility has been pleased with the initial results of their conservation program. They are receiving good public relations and are helping a segment of the customer population to invest in conservation improvements in their homes. TECO feels that they are well ahead of the federal program requirements for residential conservation services. TECO plans to continue its program and will make necessary alterations after assessing the results of their third customer survey in September. Apart from that, TECO plans to wait until the final RCS rules are published before changing their program.

IX. SUGGESTIONS FROM UTILITIES: DO'S AND DON'Ts

1. DEVELOPING AND INITIALLY OPERATING PROGRAM

- . Responsibility for the overall operation of the program should be given to one individual, although responsibility for various program elements could be delegated.
- . Day-to-day program operation is a full-time job and should not necessarily be mixed with other responsibilities.
- . Major program elements should all be prepared in advance of implementation, to avoid potential breakdowns in the program (advertising, auditor training, etc.)
- . The program should attempt to have a utility employee at a customer's house only once.
- . Extensive computer programming is not essential, but this may vary depending upon the method selected by each utility.
- . Internal utility personnel, particularly auditors, should be used for a majority of the work. Such things as survey research can be contracted privately.
- . Utility personnel handling telephone inquiries should be aware of those individuals in the utility who are associated with the program. This avoids delays in having customers wait to make audit arrangements.

- . Local contractors should be contacted, informed of the program and involved to some extent in the program's operation. Good relations with insulation installers, general energy contractors, and others were viewed as a benefit throughout the program.

2. RESIDENTIAL ENERGY AUDIT

- . Internal utility personnel who are familiar with customer relations should be used as auditors.
- . Auditors should be required to undertake some form of training. The use of highly trained engineers as auditors should be avoided because of the routine nature of performing these audits. Untrained people who must acquire new skills are more likely to be challenged by new tasks.
- . Women are valuable auditors, particularly since many customers who will receive audits are female.
- . The use of a computer is valuable for assessing the conservation options required in each home. A computer provides a sense of objectivity, which customers find useful. While individual auditor judgements may be accurate, customers found the computer/telephone Enercom useful and interesting. Additionally, the feedback is immediate, which is an attractive feature.
- . Auditors should have "hands on" experience in installing the various conservation measures they recommend to customers. This enables them to advise customers on the pros and cons of self installation and makes auditors generally more knowledgeable about the work they perform.
- . Auditors should be spot checked to ensure that they are taking adequate time to perform the audits and serve customers. Arrival times logged by auditors cross checked with the time they accessed computer time (if a time-sharing computer exists) is one way of auditing auditor jobs. Physical spot checks or audits by supervisors also can be performed.
- . The backlog of audits should be a maximum of three weeks. Any longer than a three-week waiting period (between the time the audit was requested and subsequently performed) will frustrate customers and cause a loss of utility company credibility.

3. MARKETING ASPECTS OF AUDIT PROGRAM

- . The utility should begin their program modestly without large amounts of advertising to:
 - Test program operations
 - Avoid a deluge of audit requests
 - Perform preliminary market analysis of services that need to be provided.
- . The timing of advertising is important. Advertising campaigns should precede peak demand periods such as summer and winter months.
- . An effort should be made to involve contractors in the program, not only for marketing purposes but to assist training of auditors and to keep informed of the average market prices of products and services. TECO sent auditors to train with contractors, although it was necessary to make clear that the utility was not "competing" for business with the contracting companies.
- . A list of contractors should be separated/divided as to the services each performs. For instance, some contractors will install insulation but not weatherstripping.