DOE/RG/00335-03

August 1980

Prepared for:
U.S. Department of Energy
Economic Regulatory Administration
Office of Utility Systems
Washington, D.C. 20585

Under Contract No. FC01-77ZZ00335

Discussion Series on PURPA Related Topics*

54321

METERING

BILLING

INFORMATION TO CUSTOMERS

LOAD MANAGEMENT

MASTER METERING

*Based on Experiences from DOE Electric Rate Demonstrations

DISCLAIMER

Available from:

National Technical Information Service (NTIS)
U.S. Department of Commerce
5285 Port Royal Road
Springfield, Virginia 22161

Price: Printed copy: A09
Microfiche: A01

DOE/RG/00335-03
Dist. Category UC-97

MASTER

Prepared for:
U.S. Department of Energy
Economic Regulatory Administration
Office of Utility Systems
Washington, D.C. 20585

August 1980

Prepared by:
James I. Sturgeon
City Utilities of Springfield, Missouri
Springfield, Missouri

Under Contract No. FC01-77ZZ00335

Discussion Series on PURPA Related Topics*

54335

INFORMATION TO CUSTOMERS

*Based on Experiences from DOE Electric Rate Demonstrations

ACKNOWLEDGEMENTS

This report was prepared under a subcontract from City Utilities of Springfield, Missouri. The work is part of the cooperative agreement between City Utilities and the United States Department of Energy. The principal author of the report is James I. Sturgeon of the University of Missouri-Kansas City and Mid-America Economic Research Associates, Inc. He would like to acknowledge the assistance of all of the members of the project staff and in particular Robert E. Sanders. Also, Ms. Cathleen F. Meyer of City Utilities of Springfield was very helpful in reviewing earlier drafts and outlines and in seeing that administrative details involving the work were promptly and expertly completed.

The report was reviewed by Mr. Ronald White, Mr. Steven Mintz and Dr. Gary Selnow of the United States Department of Energy and the author is very grateful for their comments and suggestions.

A note of thanks is also due to the government technical representives and the participating utilities and commissions. Many Demonstration and Pilot Implementation Project personnel took time to provide information, make files available and clear up various aspects of their specific project. All of these people are listed in Appendix 2, but special thanks are due to Richard H. Brown, Connecticut Light and Power; Neil Dikeman, University of Oklahoma; Charles Elliott, Green Mountain Power Corporation; Paul Hart, Arizona Public Service Company; Richard E. James, Wisconsin Public Service Corporation; Robert J. Kohlenberg, University of Washington; Cathleen F. Meyer, City Utilities of Springfield, Missouri; Mimi Sheridan, Seattle City Light; Jerry Taylor, Grand River Dam Authority; David Thompson, Jersey Central Power and Light; Billy J. Yarborough, Carolina Power and Light; and Phil Zins and Peter Lazare, Minnesota Department of Public Service.

The statements, findings and conclusions are the responsibility of the author and do not necessarily reflect or state those of the Department of Energy, City Utilities of Springfield, or those who have contributed data to this report.

ABSTRACT

Information to customers in the Demonstration and Pilot Projects fell mainly into four categories: 1) administrative communications, 2) explanations of new rate structures, 3) information and advice on load management, and 4) facts, recommendations and encouragements about energy conservation and end-use improvement.

Administrative communications were about such matters as the existence of Projects, their funding, their periods of performance, the selection of their test customers, conditions of participation, procedural changes during the tests, and the time and conditions of ending the tests. These communications were important to good customer cooperation.

All Demonstration Projects devoted considerable effort to the crucial task of clearly explaining the rationale of TOU pricing and the test rate structures. They pointed out that the demand on the utility varies during both the day and season, that utilities must maintain adequate generation capacity to meet the maximum demand and that this requires the intermittent use of less efficient generators. The Projects then presented the concept of TOU pricing as a means of a) fairly charging customers the true cost of their electricity and b) rewarding them for shifting consumption to times when costs are less. For the most part, Demonstration Projects gave specific information on the individual customer's own rate structure and none on any others that were under test. The role of time in TOU rates, especially seasonal changes, was particularly difficult to make clear. One concern of most of the Projects was to strike a balance between adequate information to test customers and increased individual attention to them. The latter factor was considered a potential source of artificially inflating responsiveness to test conditions.

Most Projects worked on enabling customers to profit from TOU rates by way of load shifting. They gave information on the major energy users in homes and strategies for shifting certain loads. Much information on insulation, weatherizing, and conservation practices in appliance use was disseminated. Pilot Projects concentrated on the energy efficiency of homes via energy audits and re-insulation programs.

The means of providing information included face-to-face interviews, printed cards, and copies of tariff sheets. Some Projects sent out only an introductory letter or booklet explaining TOU rates while others had extensive information programs. Other methods of dissemination included magazines, an "energy bus" with visual displays, conservation kits, bill inserts, television and radio programs and group presentations. The more effective methods were generally more costly and time consuming, although the less measurable effects of public media messages may have been very cost effective in some cases. The information programs were organized by the participating utilities, usually using in-house personnel.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

THE DISCUSSION SERIES ON PURPA RELATED TOPICS

INTRODUCTION

The Discussion Series on PURPA Related Topics is composed of five volumes: Metering, Billing, Information to Customers, Load Management Techniques and Master Metering. These reports are based on twenty-five Demonstration and Implementation Projects sponsored and directed during the past five years by the U. S. Department of Energy, Office of Utility Systems. Each of the topics bears directly on one or more of the federal standards contained in the Public Utilities Regulatory Policies Act of 1978 (PURPA). This volume, Information to Customers, relates primarily to the Time-of-Day rates standard, PURPA IB(d)3. The experiences related in this report deal, in part, with the content and methods of providing rate and conservation information to customers when Time-of-Day rates are used.

One goal of these reports is to describe how people in a variety of settings have dealt with the many practical issues in each topic area. Another is to highlight the lessons and summarize the experiences of the Project participants. These reports do not stand as systems manuals or provide prescriptive guidelines on how to deal with these topics. Rather, they offer an account for those charged with the responsibility of implementing PURPA requirements to learn from the insights and problems which occurred during the Rate Demonstration Projects.

This series of reports will be useful to utility and regulatory people in judging the full scope of work related to these topics, anticipating problems and planning the spectrum of requisite activities.

THIS PAGE

WAS INTENTIONALLY

LEFT BLANK

CHAPTER ONE: INTRODUCTION

The DOE sponsored Electric Rate Demonstration and the Pilot Implementation Projects (Projects) were more than elasticity measurements, demand projections, usage figures, and statistical analyses. Behind each table and graph in the Project reports are experiences in planning and implementation of work which has been ongoing in each Project for several years. This third report on Information to Customers looks at the many field experiences in the Projects dealing with Time-of-Use (TOU) rates and related information.

This volume is not an information specialist's manual but an account of field activities involving many aspects of the process of providing information. The purpose here is to synthesize the experiences and highlight patterns and anomalies with specific examples. By so doing, it is hoped that the uninitiated will have the opportunity to learn from the experiences of others before themselves engaging in customer information programs for Time-of-Use rates and conservation.

A number of electric utilities and public service commissions will soon become involved for the first time in the implementation of the PURPA standard on Time-of-Day rates, IB(d)1. This report is primarily for their use. Information contained here, however, may also be useful to consultants and others interested in customer information programs. They will be able to assess Project accounts of field experiences, providing a viewpoint which may ultimately aid in design and the preparation of customer information projects.

Large volumes of data, daily logs, field reports and other documentation from the Projects served as sources of information for this report. Follow-up interviews with Project personnel provided the detail and richness of first-hand experience.

Three general observations stand out in this report.

- A proper method of announcing projects can help alleviate reluctance on the part of customers to participate. When the initial announcement was made by the utility commission the Project seemed to have fewer refusal problems.

- Effective communication of rate information proved to be very difficult in many Projects and even though significant attempts were made to inform customers, many did not understand TOU rates until they were well into the test period. Some customers never understood the TOU rates.

- Information from one medium can interact with information from another and provide joint reinforcement and heighten the effects of each.

CHAPTER TWO: AN OVERVIEW OF PROJECT EXPERIENCES

INTRODUCTION

This chapter provides a concise overview of the various types of information provided to customers, and of the methods used to disseminate that information. As a group, the Projects provided a wide array of information and used different dissemination techniques. Some Projects had extensive multifaceted information programs, while others distributed very little information to customers. What follows is a discussion of the various categories of information, as well as a discussion of how the programs were run.

GENERAL CATEGORIES OF INFORMATION

Most of the information given to customers was initiated by the Project team and disseminated either by the utility or by the commission. The information falls into four general categories: 1) administrative communications concerning the Projects; 2) explanations of experimental or newly implemented rates; 3) explanations of load management; and 4) conservation and end-use improvement. Details of these categories are presented in Chapter 3 but a brief description is offered here.

Administrative communications concerning the Project were usually transmitted in form letters to participants. Most Projects sent an introductory letter which explained the purpose of the Project. The letters were usually signed by the commission chairperson or the utility president, or both. In some Projects, participants were introduced to the experiment by an interviewer who explained the nature of the Project as well as its duration, sponsors and participation policy (voluntary, mandatory, requests for dropping out, etc.). Usually the interviewer gave each customer an information booklet which contained a written explanation of various aspects of the Project. Some Projects used both introductory letters and interviewers

to announce the Project and explain its administrative aspects.

Explanations of TOU rate structures took a variety of forms, but all of the Demonstration Projects deemed it important to explain the specific rates and why they varied with respect to the time of use. This information took various forms: fact booklets, brochures, 5 x 8 cards, and fact sheets. Most of the Projects took care to insure that customers did not know the specific rates paid by others participating in the test. They were concerned that if customers knew that the rates varied, they might file complaints, causing delays, confusion and irritation. Consequently, each customer was given information about his own rate only.

Information on load management was integral to rate information. Most customers were given information on how to save under TOU rates. This information provided suggestions on how to shift loads, and how to manage loads in order to reduce peak usage, and thus save on bills. The information provided included identification of major electricity users, feasibility of shifting loads, and devices to aid in load management.

Information on conservation and end-use improvement was closely connected to load management. A number of Projects provided information on functional usage areas and how to conserve within those areas. For example, electric space heating and cooking formed an important area for end-use improvement information. Some Projects provided information on how much money and energy could be saved by such specific techniques as cleaning the furnace and changing the filter. This information was usually provided as part of an information packet, but was sometimes reinforced by including reminders or additional ideas in the monthly bill.

Two other types of information were given to customers: one had to do with participation incentives or compensation payments, while the other was issued in response to customer feedback. This feedback usually took the form of requests for information or complaints about the Project.

Participation incentive payments were used in some of the Projects. Some gave the incentive at the time of the interview, if the customer agreed to participate. Others distributed the incentive at the end of the Project. The announcement of the incentive payment during the interview also varied. Some Projects stated immediately that such incentives were to be paid. Others mentioned the payment only after customers agreed to participate, while some announced it only after a customer had declined to participate in an effort to convince him. However, in most Projects the incentive was not used to solicit participation but was announced at the conclusion of the interview after a customer had agreed to participate. When its Project began, Edmond, Oklahoma announced one month's "free" electricity at the conclusion of the test year. Other Projects had incentives related to bill size: Connecticut, for example, paid incentives of up to $150 depending upon previous consumption.

Most of the Projects set up a procedure to answer customers questions and complaints. One method of answering complaints about participation involved sending a pre-written letter explaining participation selection. In Projects that had mandatory participation it was sometimes necessary to mail a series of letters to further explain the Project to reluctant customers. Typically, telephone calls were most often used to handle customer questions and complaints once a Project had begun. In almost all of the Projects, customers were given a special number to call if they had a question. The customer was thus put in contact with someone familiar with the Project. If the question involved a bill, the customer was put in contact with the billing representative for the Project.[1]

INFORMATION PROGRAMS

The extent to which a Project intended to disseminate information was a key to the resources it devoted to organization

[1]This is discussed in more detail in the Billing report, which forms the second in this PURPA Discussion Series.

and personnel. Typically the program was organized and run by the participating utility with joint contribution and review by commission personnel.

Other Projects, such as City Utilities of Springfield, Missouri (CU), and the Grand River Dam Authority (GRDA), which are not regulated by a commission, developed their own programs, and information materials were not reviewed by an outside agency.

Only Puerto Rico established an "information office." Customer information was normally part of the overall Project. For example, in North Carolina a committee for handling Information to Customers was appointed as a part of the Project team. This committee discussed the types of information to be disseminated.

A few Projects hired consultants, but the usual case was to use in-house personnel and provide additional training if necessary. Some of the Projects which used consultants were Washington, North Carolina and Los Angeles. The consultants were, in effect, part of the Project team. For example, Research Triangle Institute (RTI) was deeply involved in the North Carolina Projects and Rand held the same status in the Los Angeles Project. Both Rand and RTI provided a significant "consultant" resource in these Projects' information to customers program.

In the Edmond and Washington Projects, University personnel were part of the Project teams. Since the Edmond municipal utility was a distributor utility only, persons from the University of Oklahoma and Central State University developed most of the information provided to customers. This information was reviewed and discussed by all members of the Project team, including the Edmond City Manager.[2] In the Washington Project, a Psychology Professor from the University of Washington played a major role in developing and designing the information which went to customers in the rate experiment.

---

[2]Telephone interview, Neil Dikeman, University of Oklahoma, August, 1980.

Most of the Projects relied upon public media for dissemination of certain types of information. A working relationship with these sources was important in some of the Projects. In the Edmond Project, for instance, relations with the media were good. The local newspaper generally cooperated by printing information requested by the Project team. There was, however, an exception. The headline for one newspaper story included the words "Guinea Pigs." The story was favorable to the experiment, but the headline caused some adverse reactions in customers who did not want to be "test animals." This "headline" incident shows that discretion is needed in selecting information content. Customers may be sensitive about experimental programs, and even though it may be unintentional, some information may have negative impact.

Relations with the local press in the Arkansas Project were not particularly good. Local papers printed several stories and editorials which were critical of the experiment. One story accused the test of bankrupting an entire town: it is reproduced as Figure 1.

When there was negative reaction to the TOU experiments in the local media the Project teams would sometimes attempt to provide information by meeting with customers or town leaders. In Arkansas, representatives of the Project conducted a group meeting in some of the towns. However, very little headway was made in changing the attitudes of some of the irate customers.[3]

Many Projects called press conferences or prepared news releases to announce the Project and to issue information on specific aspects of the Projects. Project personnel felt that press conferences gave them better control of the information that participating customers received than if the news coverage was left solely to media personnel.

The use of public media was more prevalent in the Pilot Implementation Projects than in the Demonstration Projects.

---

[3]Arkansas Project, Final Report.

FIGURE 1

Newspaper Article
Arkansas Demonstration Project

Experimental Electric Rates at Beebe is 'Town Killer'

Business Owners Petition PSC to Junk New Rate Schedule at Beebe

Several Beebe business owners--and professional people--are attempting to persuade the Arkansas Public Service Commission to scrap an experimental-commercial electric rate schedule begun at Beebe in February.

Beebe Attorney Richard Berry--one of the leaders in the effort--said the experiment should have been titled: "How to Kill a Town."

His reference was "economic" death--in the sense that the rate schedule will prove a crippling financial burden on many Beebe businesses.

At a public meeting of Beebe business leaders Thursday night, several expressed deep concern about their electric bills this summer.

One heavy users of electricity said he had consulted a utility expert and was told that his power bill this summer might be as much as $900 more per months than previous paid.

Ray Ostergrant, Beebe Police Court Judge and a motel owner, said he is fearful that in his business--this summer--he simply will be "working for APGL." This is not a pleasant thought, the judge indicated.

How long will the experiment run? APGL spokesman indicate 13 months; Attorney Berry has said he isn't so sure of that...that the schedule might even be expanded state wide.

Many business leaders at the Thursday meeting said they could not understand the validity of such an experiment; that business firms operate on fixed hours and their power needs are more or less not controllable. Under the experimental rate schedule, power users pay the highest rate from 11 a.m. to 7 p.m. ---the so-called "on peak".

More than 50 Beebe business and professional people have signed a petition directed to the PSC.

Source: Arkansas Demand Management Demonstration Study: Final Report p.IV-7.

These Pilot Projects tended to use radio and television to communicate information, which often took the form of public service announcements. Many such announcements were used to notify customers of thermograph locations or to announce peak alerts. Interview shows were also used, by at least two Projects. The usual procedure was to feature Project personnel as guests on call-in or direct interview programs. Such programs sparked other coverage by newspaper, radio and television. When Project personnel or participating customers were interviewed on radio or television, they had less direct control of the information conveyed. For this reason most of the Projects avoided or even discouraged some types of news coverage.

In fact, a problem faced by all of the Projects was deciding how much information to provide customers. Vermont, for example, decided to do as much as possible to provide information to all experimental customers. However, almost all information was provided on a one-to-one personal basis. Utility personnel went to homes to explain rate structures, bills and how to save on bills with TOU rates. The rates manager was personally in charge of talking to customers on the phone and sending personnel to answer questions if necessary.

In one Project it was discovered that the customer relations personnel were "sales" oriented. This attitude had to be tempered in order to communicate effectively with the TOU customers. There were sessions designed to train personnel in various aspects of the Project so that they could answer customer questions. Part of this training stressed "informing" customers, instead of "selling" them.

SYNOPSIS OF PROJECT INFORMATION

Table 1 presents a synopsis of each Project's customer information program. The table is a convenient reference for both specific Projects' information program and for the total Demonstration and Pilot Project information program. The synopsis includes the topic of the message, the medium through which it

was transmitted, the frequency or schedule, who developed it, the cost, and comments on the success of the information. Not all of the categories have information. This is especially true for cost information: it was difficult to furnish specific cost data on information to customers, since the data were part of the cost of the entire project and could not usually be separated. There were two exceptions: data were available for some of the specific information techniques in the Springfield and GRDA projects.

One of the information sources in the GRDA Project was a magazine called "Econo." Its production cost was 18¢ per copy and the distribution cost was 7¢ per copy.[4] The Springfield Project disseminated two energy conservation kits, one in February and one in July. The kits included a number of graphic displays, such as a ruler to determine R-values, and meter reading instructions. The kit was to be used as a guide to estimate energy cost. The cost of the first (winter) kit, including printing, handling and mailing, was 32¢, while the second (summer) kit cost 17¢. The only item in the summer kit was a slide-rule type device and pamphlet explaining its use. Springfield also mailed an "energy calendar," which received a very good response. The calendar cost 29¢ per copy, including mailing.[5]

As mentioned, Table 1 shows that the most often used methods of dissemination were personal interviews and letters to participants. Both of these methods were used as a "first" contact with customers. An introductory letter was mailed in advance of an interview or was given to the customer at the time of the interview. Both the letter and the interview were designed to pass along information about the nature of the experiment as well as provide certain specific answers to customer expectations.

Letters were also used to reply to customer complaints about being included or not included in the Project. Some projects,

---

[4]This magazine is discussed in more detail in Chapter 4.

[5]Telephone Interview, Cathleen F. Meyer, City Utilities of Springfield, Missouri, August, 1980.

such as North Carolina, had a predesigned letter ready to be sent if customers questioned their selection for the test rates. However, most questions or complaints about TOU bills were received and answered by telephone.

Table 2 is designed to present, on one page, an overview of all the Projects' information programs. The Table was prepared in letter code form with the codes on the following page. The reader can examine Table 2 to gain an overall impression of what Projects used what information methods and the related message. By referring to Table 1, a more detailed view of each information program can be obtained.

Chapters 3 and 4 are dedicated to explaining these information programs. Chapter 3 examines information content while Chapter 4 is a discussion of the form of the information and the methods of distributing it.

TABLE 1

Information to Customers,
by Message, Medium and Project

Topic of Message	Medium	Frequency	Developer	Cost	Comments on Success
ARIZONA[a] 1. Permission to install meter. No explanation of it being used for a rate test.	Person-to-person	Oct.1974	Arizona Public Service Co.(APS)		Very successful - 210 accepted - no rejections.
2.a. Demographic survey b. Rate explanation - told what rate they were on. c. Explanation of incentive of 15% reduction in bill if no consumption change. d. Explanation of sample bill and rate-comparable printout showing current and new rate-left with customer.	Personal interview	Dec.1976	APS	Required over-time payments.	Successful - 183 accepted*-no refusals.

(continued)

TABLE 1 (continued)

Topic of Message	Medium	Frequency	Developer	Cost	Comments on Success
ARIZONA (continued) 3. Customer impression of TOD rate	TV interview with experimental customers.	Occasional	Local TV station.		
4. Bill calculation	Bill insert.	Monthly	APS		
5. Time period reminder	Letter	May 1976	APS		
ARKANSAS[b] 1. Announcement of rate test	Newspaper (press release)	July 1975	Project team(Ark. P&L & Comm.staff)		
2.a. Explanation of why selected b. Summary of rate c. Public notice of hearing - rate change	Letter	Aug.1975	Project team		
3.a. Explanation and history of rate study b. Calculation of typical bills	Group meeting with community leaders	Sept.-Oct. 1975	Project team		Failure

(continued)

TABLE 1 (continued)

Topic of Message	Medium	Frequency	Developer	Cost	Comments on Success
ARKANSAS (continued) 4. Editorials on rate experiment	Newspaper	Monthly July-Dec. 1975, Jan. & July 1976	Local newspapers		
5. Rate changes - TOD	Public hearing	Sept.-Oct. 1975	Commission		
6.a. Daily usage conservation tips b. Suggestion to use Oregon Calendar	Oregon Calendar Letter	Jan. 1976	Oregon Dept of energy Project team		
7. Description of rate structure - conservation tips	Booklet	April-May 1976	Project team		
8. Notification of summer rates	Letter	May 1976	Project team		
9. Notification of winter rates	Letter	Oct.1976	Project team		
10. Post experimental survey	Personal interview	Dec.1976	Elrich Lavidge		
11. Post experim.survey	-	Jan.-Feb.'77	Proj.team		

(continued)

TABLE 1 (continued)

Topic of Message	Medium	Frequency	Developer	Cost	Comments on Success
CONNECTICUT - DEMONSTRATION[c]					
1.a. Demographic survey b. Permission to install meter	Personal interview	June-July 1974	Northeast Utilities		
2.a. Explanation of study and specific rate b. Request customer participation c. Attitude & expectations survey d. Incentive payments	Personal interview (1 hr./customer & rate sheet	Aug.-Sept. 1975	Jointly by consultant (Skelly & White) and Project team (Pub.Util. Control Auth. (PUCA) & NE personnel	$50-$150 - varies with previous usage	1 hr. interview insufficient for TOD usage message. 88% agreed to participate without knowing of incentive. Not told of incentive until after interview 2 customers agreed after incentive added.
3.General TOD and conservation information	Fact booklet	During interview	NE, Comm., State Energy Off.& Consumer Council Off.		

(continued)

TABLE 1 (continued)

Topic of Message	Medium	Frequency	Developer	Cost	Comments on Success
CONN.DEMO. (continued) 4. Explanation of test - informed of special bill - why billing period will vary at beginning of test.	Bill insert Letter	Oct. 1975	Project team Signed by PUCA Chrm.		
5.a. Announcement of start of rate test b. First day coverage	Press release Newspaper, radio, TV	Oct.16, 1975	Project team		Some calls requesting participation in test
6. Miscellaneous test information	Telephone	On customer request (189 calls)	PUCA staff		Most requests satisfied
7.a. Timing devices Product lines b. Appliance repurchase program	Bill insert	Jan. & Mar. 1976 Jan. 1976	Project team		Few requests for devices Failure
8. Food preparation methods. How to minimize effect of TOD on family schedule.	Bill insert	Feb. 1976	Project team		

(continued)

TABLE 1 (continued)

Topic of Message	Medium	Frequency	Developer	Cost	Comments on Success
CONN.DEMO. (continued) 9. How some customers have saved on TOD rates.	Letter to test customers	Mar.1976	Project team		
10. Notice of change to standard time	Letter	Apr.25, 1976	Project team		Judged necessary due to problems in Oct. 1975.
11. Reminder of summer rate	Letter	May 1976	Project team		
12. Announcement of public hearing on test rate extension	General letter Newspaper	Sept.1976	Project team		No customer participation in hearings.
13. Notification of extension of test rate (voluntary)	General letter	Oct.1976	Project team		
CONNECTICUT PILOT[d] 1.a. TOD rate customer agreement 1) Minimum of 1 yr. on rate 2) Change in consumption necessary for benefit	Letter to all customers using less than 20,000 kwh per year	Sept.1978	PUCA		

(continued)

TABLE 1 (continued)

Topic of Message	Medium	Frequency	Developer	Cost	Comments on Success
CONN.PILOT (continued)					
1.a.3) No guaranteed benefit					
4) Availability of appliance controls from utility					
b. Explanation of TOD rate					
1) TOD rate calendar					
2) What to do before signing up					
c. TOD information sheets					
1) Specific residential rate					
2) How to determine if you can benefit from TOD rate					
3) Self-evaluation - TOD and usage					
4) TOD rate self-testing form - meter reading (optional)					

(continued)

TABLE 1 (continued)

Topic of Message	Medium	Frequency	Developer	Cost	Comments on Success
CONN.PILOT (continued)					
2. Peak alert	Radio & TV	254 in 4 days			Failed - had opposite effect.
3. Conservation - customer education	Group presentations	89 in 9 months	Utility		2,500 people addressed
4. Conservation audits availability, by type	Bill insert	-	Utility		
Class A				$45, no cost to customer	900 inquiries, 350 audits. 30 customers made modifications
Class B				-	Never actually offered
Class C				-	Failure - only a few attended
EDMOND, OK.[e]					
1. All aspects of test	Group presentations	Throughout study	Project team		Very successful- hoped for word-of-mouth, etc., this group would influence public opinion about test.

(continued)

TABLE 1 (continued)

Topic of Message	Medium	Frequency	Developer	Cost	Comments on Success
EDMOND, OK. (continued) 2. Demographic survey	Mailed	Feb.1977	Project team (City & Ok.Univ. personnel)		
3.a. Nature of study b. Information packet 1) Specific rate 2) Length of study 3) Behavior modification to minimize bill.	Introductory letter Booklet, 5 x 8 rate card. Both a. & b. hand-delivered.	June 1977 Aug. 1977 (for sample replacement)	Mayor & Project team Central State Univ.		
4. News story	TV	Summer '77 Fall 1977	Local TV station		
5. Energy management: Bill reduction associated with change in time of use.	Bill message	Monthly	Project team		
6. Nature of Project	Workshop for new city council members	Nov.1977	Project team		Successful

(continued)

TABLE 1 (continued)

Topic of Message	Medium	Frequency	Developer	Cost	Comments on Success
EDMOND, OK. (continued)					
7. News articles - nature of Project	Newspaper	Nov.1977 Jan.1977	Interview of Project team		Favorable - no adverse response to article.
8. Seasonal rate change	Bill message	Apr.1978	Project team		Successful
9. Termination of Project	Letter	Sept.1978	Project team		
GRAND RIVER DAM AUTHORITY - Pilot[f]					
1. Offer to put on conservation program for civic organizations.	Letter	1977	Project team (GRDA personnel)		Well received, many responses (at least half of civic clubs)
2. Conservation	Magazine "ECONO"	2 issues Fall 1977 Spring 1980 (40,000 each)	Project team & free lance writers	Product. .18¢/copy; distrib.7¢/copy	Very successful

(continued)

TABLE 1 (continued)

Topic of Message	Medium	Frequency	Developer	Cost	Comments on Success
GRDA (continued) 3. Energy conservation	Group program to civic groups a.Personal presentation b.Slide show-sometimes c.Booklet hand-out-with presentation	On request 15 or more	Project team		Varied somewhat but usually successful.
4. Energy conservation a.Thermograph program b.Insulation contractors	Radio	4 over 2-yr.period	Radio station & GRDA Project team		Good response.
5. Thermograph program a.Where photographs located b.Who to contact	TV	22 60-sec. spots	Project team		Immediate response increase in customers who look at thermograph - then decline.
6. Thermograph program a.What is thermograph b.Where to see them c.Why important d.Who to contact	Newspaper	20 or more	Project team		Followed TV spots after response fell.
7. Peak alerts	TV	As needed	Project team		Worked only to some degree - short term response - only worked in crisis.

(continued)

TABLE 1 (continued)

Topic of Message	Medium	Frequency	Developer	Cost	Comments on Success
LOS ANGELES[g]					
1. Recruitment for study	Personal interview	Phase 1 completed June 1976; Phase 2, Nov. 1976	Project team(Rand Corp.& LA Dept.Water & Power)		
2. Rate Study[e]					
a.Specific rate (contract)	Customer fact booklet	Once only at interview	Project team		
b.How to save with TOD					
c.Conservation					
3. General information	Telephone "hot line"	On call	LA,DWP		
MINNESOTA PILOT[h]					
1. Insulation financing program					
a.What it consists of	Magazine article	Mar.1978	Northern State Power (NSP)		
b.Survey questionnaire	Mailed	Oct.1979			
2. Residential energy audit	TV & radio		NSP Project staff		
a.Pilot test	Press releases				
b.Questionnaire	Bill insert	May-June, 1978			23.4% response
c.Re-test		Nov.1978			Generally successful
d.Audit results	Mail	July 1979			

(continued)

TABLE 1 (continued)

Topic of Message	Medium	Frequency	Developer	Cost	Comments on Success
MINN. PILOT (continued)					
3. TOU Rates Explanation of rates	Bill insert Pamphlets Tape re-corded message for dial-a-number	July 1978	Project staff & NSP		Well received
4. TOU rates a.Hearings	Bill insert News ads TV, radio	Oct.1978	NSP & Project staff		
b.Rate	Handout - 1 sheet				Very good reaction
5. End-use conservation program	Bill insert Group pre-sentations Radic,TV, news ads	1977-1979	5 utilities- Dakota Elec. NSP Otter Tail Power Interstate Power Wright-Hennepin Coop.Elec.Assn.		

(continued)

TABLE 1 (continued)

Topic of Message	Medium	Frequency	Developer	Cost	Comments on Success
MINN. PILOT (continued)					
6. Energy alert (conservation)	Radio/TV Newspaper Billboard (background)	On-peak days	Participating utilities		
NEW JERSEY[1]					
1. Information on TOD rate form, usage, deferral, recruitment form	Interview	Mar.-Apr. 1976	Jointly by Board of Pub.Util. & Jersey Central P&L		
2. Questionnaires to research customers	Mailed	July 1976			
3. Questionnaires to prospective participants	Mailed	Jan. 1977			Response unacceptable so had to be mandatory.
4. Project recruitment packate					
a.Nature of study	Letter signed by util.president	Apr. 1977	Jersey Central P&L		
b.Explanation of study	Handout	Apr. 1977	Jersey Cent.		
c.Participation agreement	Card	Apr. 1977	Jersey Cent.		

(continued)

TABLE 1 (continued)

Topic of Message	Medium	Frequency	Developer	Cost	Comments on Success
NEW JERSEY (continued) 5. Test recruitment	Interview personal	May 1977	Jersey Central P&L		Hardsell used on 74 customers, poor result
6. Test recruitment	Interview personal hardsell	Sept.1977	Jersey Central P&L		Hardsell excluded low use accounts, poor results
7. Test recruitment	Interview personal hardsell	Dec. 1977	Jersey Central P&L		Hardsell 150 customers 91 refusals; hardsell formally abandoned
8. Notification of participation; customers to be included in study	Letter	May 1978	BPU, JCP&L, State Dept. of Energy	Less than $1000	
9. Basic information on Project	Letter	May 1978			
10. Notice of public hearing	Letter	May 1978	JCP&L plus Commission		
11. Information about Project	Public hearings (2)	May 1978	-		30 customers total, 2 meetings
12. Announcement of toll free lines for experimental customers' questions & complaints	-	May 1978	JCP&L plus Commission		

(continued)

TABLE 1 (continued)

Topic of Message	Medium	Frequency	Developer	Cost	Comments on Success
NEW JERSEY (continued					
13. General information on study (in type set)	Customer Fact Booklet	Aug. 1978			Not completed
14. Formal close-out of experiment	Letter	Unknown			No response
NORTH CAROLINA-DEMO[j]					
1. Announcement of Project	Newspaper, TV, radio	Fall 1977	Project team, Carolina P&L, BREMC, Commission, Consumer Rep., RTI		
2. Notice of hearing	Newspaper ½-page		Project team		
3. Purpose of Project Notification of selection for Project	Letter	Fall 1977	Project team (signed by Comm.chrm.) Comm.letter-head		
4. a.TOD rate schedule	Information packet presented during personal interview	Fall 1977 Once only at time of interview	Project team (drew on material from Georgia)		

(continued)

TABLE 1 (continued)

Topic of Message	Medium	Frequency	Developer	Cost	Comments on Success
NORTH CAROLINA-DEMO (continued)					
4. b. List of appliances & their electricity usage c. Step-by-step, how to calculate bill d. How to save	Reminder cards Booklet				
5. Name & telephone no. of customer rep.	Bill insert	Once at start of Project	Project team		Customers told to call if they had questions 1/3 called - seemed satisfied w/answers.
6. Summer & winter rate change	Bill insert	Once each	Project team		First one (winter) - wording caused confusion on when billing cycle started. 2nd one much better, less confusion.
7. Project termination (return to regular rate)	Letter	Sept. 1978	BREMC		
8. Project termination Meter removed, return to regular rate	Letter	Oct. 1978	BREMC		
9. Project termination May retain TOD rate but charged for meter	Letter		CP&L		

(continued)

TABLE 1 (continued)

Topic of Message	Medium	Frequency	Developer	Cost	Comments on Success
OHIO[k]					
1. Recruitment of customers to load study	Personal interview questionnaire	July-December, 1975	Dayton Power & Light		Questionnaire dropped after first wave of 120 interviews due to customer resistance.
2. TOU radio control	Seminars Interviews	Completed by end of August Completed by end of August	DP&L DP&L		
3. Announcement of consumer participation program	Letter	August, 1975	PUCO-DP&L		
PUERTO RICO[l]					
1. Program announcement	Letter	December, 1977	Puerto Rico Water Resources Authority (PRWRA) with DOE Review		

continued)

TABLE 1 (continued)

Topic of Message	Medium	Frequency	Developer	Cost	Comments on Success
PUERTO RICO[l] (continued)					
2. Customer education brochure	Mailed with letter		Enviro-metrics, Inc.		
3. Project announcement to general public	Press release	December, 1977	PRWRA		
4. General information	Customer interviews	December, 1977 through February, 1978	PRWRA		
5. Detailed rate information, bill format, load shifting and conservation advice	Customer fact booklet	March, 1979	PRWRA and DOE review		Distributed to first 150 experimental customers at second interview
RHODE ISLAND[m]					
1. Nature of project	Press briefing and public meeting	January, 1977	Department of Public Utilities (DPU)		

(continued)

TABLE 1 (continued)

Topic of Message	Medium	Frequency	Developer	Cost	Comments on Success
RHODE ISLAND[m] (continued)					
2. Nature of project	Two newspaper articles	March, 1977	Local news		
3. Rate topics	DPU hearings	March, 1977	DPU		
4. Solicitation of participation	Telephone	April, 1977			
5. Notice of participation (control group)	Letter	April, 1977	DPU		
6. Nature of project	Two newspaper articles	July, 1977	Local newspaper		
7. Nature of project (control group)	Personal interview	July, 1977	DPU		

(continued)

TABLE 1 (continued)

Topic of Message	Medium	Frequency	Developer	Cost	Comments on Success
RHODE ISLAND (continued)					
8. Nature of project (experimental group)	Introduction letter	August, 1977	DPU		
9. Nature of project (experimental group)	Second letter, Educational brochure Personal interview	August, 1977 (one week after first) August-November, 1977	DPU		
10. Nature of project	Newspaper article	September, 1977	Local newspaper		
11. Notification that experimental rates begin in November	Letter	October, 1977	DPU		
12. Nature of project	Three newspaper articles	October, 1977	Local newspaper		

(continued)

TABLE 1 (continued)

Topic of Message	Medium	Frequency	Developer	Cost	Comments on Success
RHODE ISLAND[m] (continued)					
13. Reminder of summer rates	Letter	May, 1978	DPU		
14. Reminder of winter rates	Leter	August, 1978	DPU		
15. End of project	Letter and interview	February, 1979	DPU		
SPRINGFIELD[n]					
1. Qualified attic insulation contractors (Part of Insulation Finance Program)	List "Available to public" personnel to answer questions	January, 1978	City Utilities (CU)		No customer response at all
2. On-site audits a. On-site calculations b. Thermography	News article	January, 1978-June, 1978	CU		
3. Energy audit survey	Mailed				Suspended -- too complex

(continued)

TABLE 1 (continued)

Topic of Message	Medium	Frequency	Developer	Cost	Comments on Success
SPRINGFIELD[n] (continued)					
4. Energy conservation kit a. Guide for estimating energy cost of household appliances. b. Device to determine R-values to insulation. c. Meter reading instructions.	Mailed	February 1, 1978 (prior to energy audit survey	CU	32¢/kit	
5. Energy conservation plans/measures	Telephone survey. Films: Presentation to groups.	October-December, 1977 January-March, 1978	CU CU		Fairly effective

(continued)

TABLE 1 (continued)

Topic of Message	Medium	Frequency	Developer	Cost	Comments on Success
SPRINGFIELD[n] (continued)					
6. Rate Management and Insulation Retrofit	Display bus --visited schools	February 1, 1978 through August; through 1979	CU		Total visitors--47,338 at 102 locations
a. Recommended insulation.					
b. Guide to interpreting utility bill.					
c. Electric gas and appliance meter with reading instructions					
d. Average consumption of typical appliances.					
e. Energy conservation devices.					
f. Insulation display directed to children.					

(continued)

TABLE 1 (continued)

Topic of Message	Medium	Frequency	Developer	Cost	Comments on Success
SPRINGFIELD[n] (continued)					
7. Technical evaluation of energy efficient equipment.	Public information releases		CU		
8. Home weatherizing	CU workshops	May, 1978	CU		Attendance poor despite publicity.
9. Energy saving tips	Three brochures mailed; distributed to businesses. Energy calendar.	July, 1978 - December, 1979			In demand.
10. Summer conservation	Kits mailed. Radio and TV news articles	July, 1978	CU	17¢/kit	Very good response

(continued)

TABLE 1 (continued)

Topic of Message	Medium	Frequency	Developer	Cost	Comments on Success
SPRINGFIELD[n] (Continued).					
11. Reducing summertime peak efficient use of A/C; efficient electric appliances; winterizing homes.	TV program	Monthly starting July, 1978	CU		
12. Aerial Thermography	Thermo-grams at banks. Private showing to news media. Bill stuffer. Public showings. Releases to all media. TV program.	February 18, -March 10, 1979; until June 9, 1979. April, 1979 April, 1979 April 30 - May 6 End of June, 1979 Monthly	CU		
13. Solar heating and cooling	Displays Brochures	April - June, 1979	CU		

(continued)

TABLE 1 (continued)

Topic of Message	Medium	Frequency	Developer	Cost	Comments on Success
SPRINGFIELD[n] (continued)					
14. Energy loan repayment plan	News articles Information packets distributed	First year October, 1977 - September 30, 1978	CU		No inquiries
15. Energy calendar	Mailed		CU	29¢/ copy	
VERMONT[o]					
1. Announcement of project.	Newspaper ad - 1/8 page	July, 1975	Green Mountain Power Co. (GMP)		
2. Questionnaire - individual rates	Person	September, 1975	GMP		
3. Customer problems revealed by questionnaire	Meeting with customer	Fall, 1975	GMP		

(continued)

TABLE 1 (continued)

Topic of Message	Medium	Frequency	Developer	Cost	Comments on Success
VERMONT[O] (continued)					
4. Ripple control system	News articles	December, 1975	GMP		
5. Record of customer consumption	G-9 paper chart demand recorders	Throughout Project	GMP		
6. General information to customers	Service contracts. Telephone interviews. Personal contact.	September, 1975	GMP		
7. Demand control equipment and rewiring of high demand appliances	Unknown	Exact time unknown	GMP		
8. Rate designs	Letter to customers	October, 1975	GMP		
9. Questionnaire - end	Mailing	End of Project	GMP		

TABLE 1 (continued)

Topic of Message	Medium	Frequency	Developer	Cost	Comments on Success
WASHINGTON[p]					
1. Solicitation of participation in rate increase evaluation -consent form	Leter	October-December 1976			
2. Group assignments	Leter	January, 1977			
3. Conservation of electricity--1ç rebate per kwh reduction	Letter, informative bill	September-November 1977. Monthly			Small, if any changes in consumptions
4. Conservation of electricity--no rebate	Letter, informative bill	September-November 1977. Monthly			No changes in consumption
5. Notice of monthly usage --comparison to last year	Special bill	Monthly, for one year			No reliable conservation effect was proven
a. absolute usage					
b. percentage difference					
c. customer usage compared to customer class	On bill supplement	Monthly			

(continued)

TABLE 1 (continued)

Topic of Message	Medium	Frequency	Developer	Cost	Comments on Success
WASHINGTON[p] (continued)					
d. same as c, but as a graphical form on bottom of bill	On bill	Monthly			
e. Conservation packet, meter reading instructions, usage markers (high, low, moderate) tip brochure	Information packet	September, 1977			No conservation effect
6. a. Group 1 meter reading	Hand delivered on that day	Daily for 28 days			Significant conservation effect (listing at least one year after 28 period of test
b. Group 2 daily conservation tip	Hand delivered	Daily for 28 days			Same as a.
c. Group 3 got same tips but all at once at beginning of month	Brochure	One time			No conservation effect found
d. Group 4 no meter reading instructions just information packet	Brochure	One time			No conservation effect found

(continued)

Topic of Message	Medium	Frequency	Developer	Cost	Comments on Success
WISCONSIN[q]					
1. Notice of rate hearing to test customers	Letter	January, 1977	Wisconsin Public Service (WPS)		
2. Nature of project	Mailed questionnaire letter	March,1977	WPS		
3. Nature of project	Interview Information packet after	March,1977	WPS, Commission		Done after questionnaire returned--participant given $5 incentive
4. Reminder of questionnaire		March,1977	WPS		
5. Nature of project	Mailed questionnaire	March,1977	Commission		Sent to those who had completed WPS questionnaire

(continued)

TABLE 1 (continued)

Topic of Message	Medium	Frequency	Developer	Cost	Comments on Success
WISCONSIN (con't)					
6. Reminder	Letter 2nd copy Question-naire	10 days before test rate to start	WPS		
7. Nature of Project	Interview Information packet	One week before test to start	WPS		Conducted for non-respondents to give information
8. a. Total kwh previous bill b. Total kwh this month last year c. % on peak, % off-peak previous month d. % on peak, % off peak this month last year e. %on peak, % off peak this month f. Dollars saved if 5 % shifted to off-peak	On bill or bill supp-lement	Monthly	WPS	had to send bill in envelope instead of card due to extra informa-tion	

continued

Source: a. Arizona Demonstration Project, Final Report, February 1977, and telephone interview, Paul Hart, Arizona Public Service Co., August 1980.

b. Arkansas Demonstration Project, Final Report.

c. Connecticut Demonstration Project, Final Report, May 1977, and telephone interview, Richard Brown, Northeast Utilities, August 1980.

d. Ibid.

e. Edmond Demonstration Project Quarterly Progress Report, March 1977 through September 1978, and telephone interview, Neil Dikeman, University of Oklahoma, August 1980.

f. Grand River Dam Authority Pilot Implementation Project Progress Reports, 1978-1979, and telephone interview, Jerry Taylor, August 1980.

g. Los Angeles Demonstration Project Progress Report, June 1977.

h. Minnesota Pilot Implementation Project Progress Reports, April 1978 - December 1979, and telephone interview, Phil Zins, Minnesota Department of Public Service, August 1980.

i. Telephone interview, David Thompson, Jersey Central Power and Light, August 1980.

j. North Carolina Demonstration Project, Minutes of Planning Session, August 1976, Progress Reports December 1976 - February 1977, and telephone interview, Billy J. Yarborough, Carolina Power and Light, August 1980.

k. Ohio Demonstration Project Progress Reports, August 1975 - May 1977.

l. Puerto Rico Demonstration Project Progress Reports, April 1977 - March 1979, and DOE document, Comments on the Educational Brochure (undated).

m. Rhode Island Demonstration Project Progress Reports, August 1977 - July 1979, and DOE file document, letter. Kaseman to Chmura, September 22, 1977.

n Springfield Pilot Implementation Project Progress Reports, April 1978 - September 1979, and telephone interview, Cathleen Meyer, City Utilities of Springfield, Missouri, August 1980.

o. Vermont Demonstration Project Progess Report, January 1975 - March 1976, and telephone interview, Charles Elliott, Green Mountain Power Co., August 1980.

p. Washington Demonstration Project Progress Reports, June 1977 - March 1979, and telephone interview, Dr. Robert J. Kohlenberg University of Washington, August 1980.

q. Wisconsin Demonstration Project Progress Reports, February 1977 - January 1978, and telephone interview, Richard James, Wisconsin Public Service Corp., August, 1980.

TABLE 2

Synopsis of Information to Customers, by Project

Project	Message					Medium										Frequency				
	A	B	C	D	E	L	BO	BI	G	I*	P	D	N	R	T	A	B	C	D	E
ARIZONA	X	X			X	A	A	A B		E A					A	2 4 5	6			1
ARKANSAS	X	X	X		X	A	C			E	A		E			1 5	6	5		1 4 8
CONNECTICUT DEMONSTRATION	X	X	X	X	X		A C	B D		E A C B*			E	E	E	2 3	3* 6	2	5	1 2 3*
CONNECTICUT PILOT	X		X		X	A		C						C	C	1		3		1
EDMOND OKLAHOMA	X	X	X	X	X	A C E	A C	A B D			E E		E		E	6	6		6	1 3 5 8
GRAND RIVER DAM AUTHORITY			X	X		C	C				C		C	C	D			1 3 3	3	
LOS ANGELES	X		X		X	E	A C			E						2		2		1
MINNESOTA PILOT	X		X		X	E	C A	C A	C				C A	C A	C A	4		1 3		1
NEW JERSEY					X	E	E			E										1 2 8

(continued)

TABLE 2 (continued)

Project	Message					Medium										Frequency				
	A	B	C	D	E	L	BO	BI	G	I*	P	D	N	R	T	A	B	C	D	E
NORTH CAROLINA	X	X		X	X	E	A D	A D B		E			E	E	E	2	6		4	1 8
OHIO		X		X	X	E		B		D	D						6		2 4	1
PUERTO RICO	X	X	X	X	X	E	A D C	D A		E			E			2	6	2	2	1 2
RHODE ISLAND	X				X	E A	E			E	E A		E			1 4				1 2 4 8
SPRINGFIELD			X			C	C	C	C	C	C	C	C	C	C			1 5 3 6		
VERMONT	X	X		X	X	A		B	B	A				E D		2	6		5	1
WASHINGTON	X		X		X	E	C	A C								6 7		6		1 2
WISCONSIN	X			X	X	E	E	A D								6			6	1 2

Source: Compiled from data in Table 1.

Legend for Table 2

Message

A= rate information
B= billing or meter information
C= conservation information
D= load management information
E= project announcements, administration, etc.

Medium

L= letter
BO= Booklet, brochure, magazine, or phamplet
BI= bill insert
G= graphic
I= interview *=telephone interview
P= program or presentation
D= display
N= newspaper
R= radio
T= television

Frequency

1= at the start of project
2= at the start of test
3= periodically throughout test
4= occasionally: non-regularly
5= once during test or pilot
6= monthly
7= daily
8= at the end of the test

CHAPTER THREE : INFORMATION CONTENT

INTRODUCTION

This chapter presents the content of the information given to customers during the Projects. To some extent it is impossible to extract the content from the process of disseminating the information. For the most part, however, methods of disseminating information are left to the next chapter.

Some Projects felt that a broad variety of information to customers was necessary to maximize the effectiveness of the experiments. Customers had to be familiarized with new concepts in the pricing of electricity and new technology, such as TOU meters and load control devices. Other Projects provided minimal information, besides the specific rate for each customer. But in general, the Projects increased the number of areas requiring customer understanding and cooperation.

The principal areas of customer information were 1) administrative communications (i.e., information about the Project as an organized activity); 2) general and specific information on TOU rate structures, including an explanation of the time-of-use pricing concept, both hypothetically and for the individual Project; 3) load management information, including explanations of utility control or local timer control of appliances, as well as advice on voluntary load shifting to maximize benefits from TOU rate structures; and 4) information on conservation by end-use improvement, such as home insulation and the substitution of energy-efficient appliances.

ADMINISTRATION COMMUNICATIONS

Most Project teams thought that the better the customers understood the rate demonstration, the closer their response would be to their true demand elasticity under the particular rate structure. In general, it seemed better for customers to attain this understandin

before the experimental rates became effective. These considerations indicate the importance of accompanying the test rates with enough information to orient the customer to their purposes and their general operational characteristics. The Projects differed considerably in the means of conveying this information and in the exact timing of communications. However, all tended to select the same topics for customer education, including the following:

- A brief reference to goals of the Project, sometimes in context of how the data were to be used.
- Agencies and organizations conducting the study and its financial sponsors.
- An explanation of why an experiment must precede full-scale implementation of the new rate structures. The explanation was usually presented in terms of cost effectiveness.
- A brief description of the method for selecting participants and, where appropriate, a justification for mandatory participation.
- A varying amount of administrative information, such as the duration of the experiment, the Project's policy regarding customer moves and (in a few cases) the policy regarding customers' requests to be dropped from the experiment.
- The name and telephone number or address of the Project representative whom the customer should call for further information.

On the following page are some examples of introductory orientation materials presented to customers at the beginning of the Projects. As can be seen, most of the material mentioned the importance of the study for future policies and rates. For example, the North Carolina Project's introductory letter from the Chairman of the Public Utilities Commission mentioned the importance of the study as a source of input into public policy decisions in electricity pricing, saying that "It may help to identify electricity pricing policies that will encourage users to shift some electricity use to hours when costs are lower, thereby cutting costs and reducing the

need for expensive new generating capacity."[1] In the Edmond Project, an introductory letter, given to the customer during a face-to-face interview, stressed the importance of projecting future rate increases in view of already high electric rates, to justify their TOU study. Customers were told that "The information gained from this study will have wide-spread implications for our emerging national energy policy."[2] The New Jersey Project's introductory letter told the participating customers that they "have the opportunity to play a vital role in helping us keep the price of electricity as moderate as possible, both for you and all our customers."[3] Interviewers recruiting participants in the Arizona Project were instructed to tell customers that the purpose of the study was to "determine the feasibility and the effectiveness of managing residential peakloads by rate incentives."[4] Blue Ridge Electric Membership Corporation told participating customers that the North Carolina Project was aimed at assuring a supply of electric energy "now and in the future" and "doing all things possible which will keep the electric rates . . . as low as possible."[5]

Almost all of the Demonstration Projects stated at some point in their introductory communications that the sample selected was intended to be representative of the entire service population. This was particularly true in Projects with mandatory participation. For example, the Wisconsin Project told

---

[1]Letter, Chairman, NCUC, to all Project customers, June 8, 1977.

[2]Edmond Demonstration Project Progress Report, May, 1977 (with additional material through July 12, 1977).

[3]New Jersey Demonstration Project Progress Report, November, 1976.

[4]Arizona Demonstration Project, Final Report, Appendix B, February, 1978.

[5]Blue Ridge Electric Membership Corporation Peak Load Pricing Research Handbook (no date).

customers that the randomness of the sample was to "make the results of the study statistically sound."[6] The Rhode Island Project told customers that, in order for the experimental results "to reflect Rhode Island's households in general, a computer chose a random stratified sample."[7] Blue Ridge Electric Membership Corporation explained to their North Carolina Project participants that a voluntary participation program would be likely to distort the results "because only those people who know a great deal about peak-load pricing and knew that their lifestyles would fit very easily into the peak-load pricing experiment would volunteer." Each customer was also told that his name was selected "on a pure random basis."[8] No Project seems to have explained the connection between randomness and representativeness in any of their introductory material.

In a "fact booklet" for participants, the Wisconsin Project justified using an experimental sample to test the new rates by stating that the costs of a system-wide implementation "would result in increased bills for all of our customers."[9] In its introductory brochure, the Rhode Island Project attributed most of the additional costs to "sophisticated meters needed to separately measure electricity used during peak hours and that used during off-peak hours."[10]

One purpose for telling customers about the sponsorship of the Projects was to reassure them that they were paying little, if any, of the additional costs. For example, the Connecticut Project's customer fact booklet states: "The research program is . . . sponsored by the Connecticut Public Utilities Commission,

---

[6]Wisconsin Public Service Corporation, Customer Information, Residential Time-of-Use Pricing Study (no date).

[7]Rhode Island Demonstration Project brochure: "Time-of-Day Rates: Some Facts, Some Questions, Some Answers." (no date)

[8]Blue Ridge Electric Membership Corporation, op. cit.

[9]Wisconsin Public Service Corporation, op. cit.

[10]Rhode Island Demonstration Project, op. cit.

a Connecticut energy agency, and Connecticut Light and Power, under a grant of money from the Federal Office of Energy Conservation and Environment. The financing of this research, therefore, is borne primarily by the Federal Government and not by Connecticut citizens or Connecticut Light and Power customers."[11] The Rhode Island Project's introductory brochure specifically mentions that the cost of the new meters was defrayed by the Federal Energy Administration.[12] A letter to Wisconsin Project customers informed them that a grant from the Federal Energy Administration would ". . . pay part of the cost associated with 700 special attachments to a regular meter that will measure the time of . . . usage."[13]

One type of administrative communication to customers was an announcement of commission hearings on the proposed experimental rates. Such a hearing announcement was the very first notice that Wisconsin experimental customers received of the Project's decision to implement TOU rates after the collection of baseline data. This notice was transmitted at least two months before any further communication on the experiment.[14] The Arkansas[15] and New Jersey Projects[16] announced their hearings in introductory letters to experimental customers. Some public utility commissions required general public announcements of the hearings. For example, the Minnesota Pilot Project was explicitly ordered by the Commission to publish times, places, and subjects of such rate hearings in bill inserts and newspaper

---

[11] Connecticut Demonstration Project Customer Fact Booklet, August, 1975.

[12] Rhode Island Demonstration Project, op. cit.

[13] Wisconsin Demonstration Project Report, June, 1976.

[14] Telephone interview, Richard E. James, Wisconsin Public Service Corporation, August, 1980.

[15] Arkansas Demonstration Project, Final Report (no date).

[16] Telephone interview, David Thompson, Jersey Central Power and Light Company, August, 1980.

advertisements.[17] The North Carolina Public Utility Commission ordered half-page newspaper advertisements of its hearings on the experimental rates.[18] The Connecticut Project was announced to the general public in the legal notices columns of newspapers.[19]

In some cases, hearings subsequent to those establishing the experimental rates were to be announced. Toward the end of the Connecticut Project both experimental and control customers were notified by letter of Commission hearings to consider extending the test rates for three months.[20]

Of the Projects with mandatory participation, only two--Rhode Island and Edmond, Oklahoma--offered experimental customers a recompense beyond the opportunity to reduce their bills by load shifting. The Rhode Island Project paid $100 to each customer on experimental rates and $25 to each customer in the control group.[21]

The Edmond Project announced at the beginning that participating customers would receive one month's free electricity at the end of the Project. Unannounced to customers was a $50 bonus payment made at the end of the test period. The bonus of a month's free electricity was required by the Edmond City Council as a condition of their approval of the Project. It was not part of the original Project plan, but was adopted after billing on experimental rates had been under way for some months.[22] Thus,

---

[17]Minnesota Pilot Project Year End Report, October, 1977-September, 1978.

[18]Telephone interview, Billy J. Yarborough, Carolina Power and Light Company, August, 1980.

[19]Telephone interview, R. Brown, Connecticut Light and Power Company, August, 1980.

[20]Connecticut Demonstration Project Product User's Guide (no date).

[21]Rhode Island Demonstration Project Progress Report, July, 1977.

[22]Telephone interview, Neil Dikeman, University of Oklahoma, August, 1980.

this payment could not have served as an incentive to join the Project. The purpose of these rewards seems to have been to make the customer feel better about participating, or having participated, in the Project.

All of the voluntary participation Projects under consideration offered monetary incentives in one form or another. For example, participants in the Ohio,[23] Los Angeles,[24] and Arizona[25] Projects were exempted from rate hikes. The Puerto Rico Project exempted experimental customers from fuel cost adjustments up to a fifteen percent increase in the cost of fuel.[26] The Arizona Project built into its rate structure a guarantee that each bill would be fifteen percent less than the corresponding bill of the previous year if the customer did not change his consumption pattern at all. Moreover, customers were assured that their experimental bills would never exceed what they would have been were they not participating in the Project.[27] The Vermont Project made the same assurance to the experimental customers: these customers always received a traditional bill along with the experimental bill, and the higher of the two was stamped "Void."[28] The Connecticut Project paid an initial participation incentive to customers that ranged from $50 to $150, depending upon the previous year's consumption. Only rarely did these payments actually serve as incentives to participate. An effort was made to secure the participation of the customer during the initial interview without mentioning these incentive payments.

---

[23]DOE File Document: Summary of FEA Demand Management Demonstration Project (Ohio) Meeting held on January 23, 1976.

[24]Los Angeles Demonstration Project customer fact booklet "Questions and Answers about the Electricity Rate Study" (no date).

[25]Arizona Demonstration Project, op. cit.

[26]Puerto Rico Demonstration Project Customer Education Brochure (draft covered by letter dated September 7, 1977).

[27]Arizona Demonstration Project, op. cit.

[28]Telephone interview, John Keene, Green Mountain Power Corporation, May, 1980.

Normally, the payments were mentioned at the close of the interview so that the majority of customers had already agreed to participate by the time they knew of the "incentive" at all. In only two cases did customers who had refused agree to participate after mention of the incentive.[29]

In many Projects a significant question arose concerning what such payments were to be called. The problem seemed to be that the customers perceived the payment as compensation for money they would have lost under the new rate structure by not shifting to off-peak periods. If this were the case, there was a risk that the customers would make no change in their temporal consumption pattern. On the other hand, some Projects were concerned about holding constant the customers' relative ability to purchase electricity during the test. It was in these cases that an interest arose in manipulating the customers' perceptions of the money they received. The Puerto Rico Project personnel judged that if payments were made quarterly, instead of in every billing period, they were less likely to be interpreted as compensation for the difference between the TOU bill and the traditional bill. Further, to mitigate any disincentive to load shifting that such payments might produce, the customers were told that the payments were "participation bonuses." These payments were never referred to as compensation for bill increases.[30] The Los Angeles Project, on the other hand, made similar compensation payments to remove income effects of the rates. This purpose was openly stated in the customer information booklet given to prospective participants.[31] The Rhode Island Project's payment of $100 to experimental customers and $25 to control customers was simply intended to be a participation reward. However, the Project staff tried to prevent these payments from being perceived as incentives to

---

[29]Telephone interview, R. Brown, Connecticut Light and Power Company, August, 1980.

[30]Puerto Rico Demonstration Project Second Year Workplan (1977-78), October, 1977.

[31]Los Angeles Demonstration Project, op. cit.

participate, or compensation for any customer's losses due to the TOU rates.[32]

Participant Selection Explanations

When participation was mandatory, a TOU rate experiment was almost certain to be perceived by some customers as an added financial pressure. They were certain that they could not adjust their temporal consumption pattern sufficiently to avoid bill increases, and wanted to leave the experiment. Since non-TOU rate structures continued to operate, these customers asked, "Why should customers who can't properly respond to these rates be confined to them while others, who can, be left on traditional rates?" In most cases, the answer to this question was that the whole customer population, including customers who could not profit from TOU rates as well as those who could, must be represented in the experimental sample for an unbiased test of the rates. The effect of this answer often deepened the dispute: "Why am I required to suffer for the (problematic) social good of knowing how these rates will affect the whole system?" The only direct answer was an appeal to the randomness of the sample, suggesting that it could have happened to anyone.

Perhaps the real problem was that customers tend (and are encouraged) to think of public utilities as vendors of service rather than as quasi-governmental service agencies. If the relation of customer to utility is essentially commercial, does the utility have the right to unilaterally institute any form of arbitrary price discrimination? From the objecting customers' point of view a private business arrangement was substantially altered without their consent, and to their perceived disadvantage. It did not appear to help much to tell them that a random process intervened at some point: the objectors did not see anyone as having the authority to start the random selection in the first place.

---

[32] Rhode Island Demonstration Project Product User's Guide, Preliminary Draft, December, 1977.

If the heart of the objection was that one part of an ordinary, private business transaction had arbitrarily "changed the rules" to hurt the other, then perhaps the first point to be clarified is that rate experiments are not private business transactions at all. It should be made very clear to the customer that utilities execute rate studies on instruction from regulatory bodies, so the customer's inclusion in a mandatory participation TOU experiment is the result of a governmental act. This is no less the case when the utility involved is publicly owned: although experiments by such utilities are not initiated by public utility commissions, they are legally the acts of the governments to whom the utilities answer. An example of a letter from a utility to Project participants is shown in Figure 2.

In light of this consideration, the general practice was for the responsible governmental body to communicate at least once with the objecting customer. In the North Carolina Project, the Utilities Commission prepared two standard letters--to be used in sequence--for this purpose. Both were signed by the Commission chairman. The first letter was a review of the Project and an explanation of why it was being conducted. The second letter was used if customers continued to object after receiving the first. It simply informed customers that their recourse was to file a formal complaint with the Commission against the utility. Enclosed was a copy of the applicable Commission rule. Examples of both letters are shown in Figures 3 and 4.[33]

Another important point which was usually clarified was that rate experiments were designed with the full intention of doing the least possible harm to every participant. The test rates were not designed with the expectation that even a small proportion of the experimental sample would experience sharp bill increases without feasible remedy. After all, the whole point of the test was to find rates advantageous to the general welfare; thus, rates were tested which were expected, on the best empirical and theoretical grounds available, to achieve

---

[33]DOE File Document: Memorandum, Burns to Seekamp, Customer education document drafts, May 24, 1977.

FIGURE 2

Introductory Letter From Wisconsin Public Service Corporation to Customers, Wisconsin Project

WISCONSIN PUBLIC SERVICE CORPORATION

CUSTOMER LETTER

Dear _____:

Did you know that it costs us more to provide electricity at certain times of the day? Your electric meter tells us only how much you use, but not when you use it. For this reason, the rates we charge individual customers do not always reflect our costs.

If we knew when residential consumers used electricity, our company could design rates that would be equitable to all users. To help us do this, we have obtained a grant from the Federal Energy Administration which will pay part of the cost associated with 700 special attachments to a regular meter that will measure the time of your usage. The Public Service Commission (the State agency which must approve our activities) and statistical consultants have helped us select 700 homes which will best statistically represent our 215,000 residential customers so that we can design rates to better serve all of our customers.

Your residence has been one of those selected, and our meter personnel plan to install one of these special attachments at your residence sometime within the next few months. This will be a simple installation which will cause you no inconvenience, and we want to thank you in advance for helping us to obtain this valuable data. If you have any questions, please call.

For the next year or so, we will be collecting information, and billing you according to your regular meter. If, on the basis of this information, it appears that we can design rates which more accurately reflect costs, people with these special meters will be given these rates first, on a trial basis. Should this be the case, you will be personally visited and the details explained. I want to thank you again for helping us to serve our customers better.

Sincerely,

Division Manager

Source: Wisconsin Demonstration Project, Quarterly Progress Report, April - September, 1976.

FIGURE 3

First Letter to Customers Objecting to Participation
North Carolina Project

State of North Carolina
Utilities Commission
Raleigh 27602

RE: Rate Design Experiment

Dear

We understand that you have expressed objections to your selection as a sample household in the time-of-day pricing experiment now underway in North Carolina. The purpose of this letter is to explain the background of the experiment, how you were selected and the reasons for nonvoluntary participation.

The recent energy crisis has had a severe impact on the cost and availability of natural gas and petroleum products thus leading to an increased reliance on the electric utilities serving our nation and our state. As you probably are aware, electricity usage in North Carolina is currently characterized by rapidly growing peak demands. The utilities must build generating capacity sufficient to meet these peak demands although this capacity may be used only a small portion of the time. Since all generating capacity is not used continuously, the actual costs of providing electricity vary with time of day. It is the purpose of this experiment to develop electricity pricing structures which recognize these time-related cost differences and which, by encouraging consumers to shift their usage to off-peak periods, will reduce the growing demand for additional generating capacity.

This experiment is a cooperative effort undertaken in response to the mandate of the General Assembly, which, in June 1975, ratified Senate Bill 420 requiring the Utilities Commission to study the feasibility and practicability of a system of nondiscriminatory peak-load pricing that would reflect the higher costs of providing electric service during a utility's peak demand periods. In December 1975 the Commission held general hearings at which public officials and environmental/consumer groups as well as utility representatives testified.

FIGURE 3 (continued)

On April 26, 1976, the Governor, the Commission, and the participating utilities submitted to the Federal Energy Administration (FEA) a proposal to conduct the current experiment. Based on this proposal, the FEA has entered into a cooperative agreement with the Commission to implement the proposal.

Experimental rates were filed with the Commission in March 1977, along with public notice. On May 3 and 4, 1977, the Commission held a public hearing to consider the time-of-day rates proposed for Carolina Power and Light Company, and on June 6, 1977, the Commission issued an Order approving the rates. Shortly thereafter, you were mailed the letter informing you of your selection to participate in the experiment.

The Commission and its consultants have taken great care to insure that these rates are applied on a nondiscriminatory basis as required by General Statute 62-140. The rates are based upon the actual cost of service at different times of day. They have been designed so that even if there is no change in usage, they will produce the same annual revenue for service to residential customers as the present rates. All customers on time-of-day rates will have the opportunity to reduce their bills by controlling their own usage of electricity.

Participants were chosen on the basis of random sampling procedures developed and conducted by professional statisticians. With minor exception, every residential customer in CP&L's North Carolina service area had a chance of being selected.

In order for the results of the experiment to be representative of what might happen if time-of-day rates were implemented on a statewide basis, however, it is necessary that participation be mandatory. For example, a voluntary study could be expected to overrepresent households which knew in advance that time-of-day rates might be particularly advantageous. The Commission therefore ordered that the approved rate schedule would remain in effect for the selected households through May of 1979.

It is our hope that each of the participants in this study fully understand the nature and purpose of the project, and why the approved time-of-day rate schedule is the only basis on which CP&L is authorized to provide service to your account on or after October 27, 1977 for bills rendered on or after the first of December, 1977. If you have further questions, or if you would like to receive a copy of the official Commission order of June 6, 1977, with your rate, please do not hesitate to call on us.

Yours truly,

Tenney, I. Deane, Jr., Chairman

TIDjr/RWS:lab

Source: North Carolina Demonstration Project, Quarterly Progress Report, June - August, 1977

FIGURE 4

Second Letter to Customers Objecting to Participation
North Carolina Project

State of North Carolina
Utilities Commission
Raleigh 27602

RE: Time-of-Day Rate Design Experiment

Dear

This is in reply to your letter of August 5, 1977, in which you state your continued objections to participating as a sample household in the peak load pricing experiment. We feel it appropriate at this time to provide you with information concerning the recourse procedure available.

Any utility customer who has a complaint concerning any aspect of utility service provided or the rate charged for that service may under the Commission's Rules and Regulations, file a formal complaint against the public utility. Such a complaint should be filed in accordance with Commission Rule R1-9; a copy of which is attached. I believe this rule to be self-explanatory, but should you have any questions, please do not hesitate to call on us.

Once again I wish to point out that this experiment is being conducted in response to a legislative mandate to study the effects of peak load pricing and to determine whether such a pricing scheme should be implemented on a statewide basis. In order to be predictive of the results of statewide mandatory time-of-day rates, these experimental rates must be mandatory as well.

Yours truly,

TIDjr/RWS:lab

Tenney I. Deane, Jr., Chairman

Attachment

Source: North Carolina Demonstration Project, Quarterly Progress Report, June - August, 1977.

that goal. This point needed to be made when customers objected that they lacked the demand elasticity to tolerate the price ratios imposed. It was improbable that the objecting customers could not alter their consumption patterns and avoid the higher bills that a TOU rate structure, typically tested in the Projects, might cause.

An unsuccessful petitioner for removal from the Wisconsin Project requested a Public Service Commission hearing. He denied categorically that he could save on TOU rates because of the complete absence of demand elasticity afforded by his life style. He claimed that his rights were violated, since mandatory participation forced him to pay higher bills than other customers for the same kwh. It is instructive to review in some detail the types of information given to this customer in order to explain the rate structure to him and inform him of ways to save on it. First, the utility provided him with a "billing impact analysis" prior to his request for a hearing. This document compared TOU and standard rate bills over nine billing periods during 1977-78, computed on the customer's own consumption data, with no load-shift assumed. The average TOU bill was $2.64 higher than the average standard-rate bill (a 5.3 percent difference). The customer was also given a table of load-shifting activities and the amount that each would reduce the bill. The total possible savings realized by these means (e.g., to shift one hour of vacuum cleaning per week to off-peak would save 17 cents per month) was about $5.00 per month. The utility contended that since none of these recommended steps constituted a significant distortion of the daily routine, it was surely convenient for even this customer to attain enough of them to abolish the $2.64 difference. In support of this contention, the utility provided the customer with information on predicted versus actual impacts of TOU rates on average bills to customers in his class. Actual bills averaged considerably below the predicted levels, indicating adequate elasticity among these customers. The customer's request for a hearing was denied,

largely on the basis of such data.[34]

However desirable mandatory participation may be from the point of view of sampling theory, there are individual cases where it seems not to have been worth the effort. Indeed, there may have been cases where the trouble involved put the study itself at risk, from legal and political forces. One customer selected as a replacement in the Wisconsin Project refused to participate and threatened a lawsuit if his refusal was not accepted. He claimed not to have received either the introductory letter or the notice of hearing on the test rates. The only evidence of the utility's having contacted him properly was the presence of his name on a mailing list. The Commission decided that this was insufficient evidence and removed the customer from the study.[35] Some unhappy Edmond Project customers went to the City Council with their complaints.[36]

There were customers whose situation would make a genuine hardship out of almost any TOU rate design. The Wisconsin Project released one very old, poorly housed man from the study "for health and humanitarian reasons."[37] Another family was offered exemption because a son was about to undergo kidney dialysis; however, they elected to remain in the study.[38] New Jersey Project participants could apply for exception "based on undue hardship" at public hearings on the TOU rates. No such applications were made at the two hearings held in May, 1978.[39] The only releases approved thereafter were for "medical reasons."[40]

---

[34]Public Service Commission of Wisconsin, Findings and recommendations by staff on . . . a request . . . by (a customer) . . . April 18, 1978.

[35]Wisconsin Demonstration Project Progress Report, April, 1977.

[36]Edmond Demonstration Project Progress Report, August, 1977.

[37]Wisconsin Demonstration Project, op. cit.

[38]Ibid.

[39]New Jersey Demonstration Project, Final Report, Summary of Activities, June, 1975-August, 1978.

[40]Rhode Island Demonstration Project Progress Report, July, 1977.

The Rhode Island Project also excused some "non-cooperative people" in "some extenuating circumstances."[41]

Voluntary participation Projects not only had to forego the assurance of representative samples which mandatory participation would have given, but they had to face the more serious problem of sample attrition. In general, the voluntary Projects minimized customer defections by appealing to the contractual nature of participation. They made "dropping out" of the test a formal procedure. In the Ohio Project, for example, a contract with participating customers required that they notify the utility in writing if they wished to withdraw. After this written request was received, a utility representative interviewed the customer in order to obtain a full history of the situation.[42]

Early in 1976, two customers requested removal from the Connecticut Project. A policy for handling such requests was then determined. The policy stated that customers wishing to withdraw who had received a "pre-test incentive payment" must petition the Public Utilities Control Authority for removal, and were to receive "assistance and counseling on continuing participation."[43]

Not every objection to the perceived unfairness of a Project came from customers who were required to participate. Some customers who learned of the TOU rates test were unhappy that they were not chosen. For example, the Connecticut Project received some 500 inquiries from persons who had heard of the test and were interested in participating. Since the test customers were exclusively chosen from a pool of 250 who were being metered in order to gather load research data, politely turning away this surplus of volunteers was a problem. In at least one case, the customer was moderately persistent: he wrote to the FEA after

---

[41]Rhode Island Demonstration Project Progress Report, July, 1977.

[42]DOE File Document: Summary of FEA Demand Management Demonstration Project Meeting, January 23, 1976.

[43]Connecticut Demonstration Project Status Report, January-March, 1976.

receiving an apparently unsatisfactory explanation from Project personnel. The first explanation given to this customer for his exclusion was simply the statement that "the participants in the program were selected on the basis of electric use and are representing all customers on the system."[44]

Aside from the courtesy of thanking participants for their cooperation, there were often pragmatic reasons for making special communication with customers near the termination of the Projects. Here are some examples of other end-of-project business that had to be brought to customers' attention.

As the end of the North Carolina experiment approached, Carolina Power and Light Company notified experimental customers that the May 1979, billing would be the last under experimental rates, and reminded them of their option to remain on the time-of-use rate, ". . . modified to include the additional cost of metering." Customers were informed that if they elected to remain on TOU rates their magnetic tape recording meter was likely to be removed and replaced by a "special time-of-use meter." Customers not remaining on the rate would have their tape meter removed and replaced by a standard watthour meter. A reply card for customers to return to CP&L was enclosed, should they desire to continue on the TOU rate. Customers not returning the post card were sent a follow-up letter, which offered a ten-day extension of the deadline.[45] At about this same time the North Carolina Utilities Commission also sent a letter to the experimental customers, mentioning that the study was drawing to a close, thanking them for their participation, and asking them to cooperate in the planned follow-up interview.[46]

---

[44]Letter, Burkard to (customer), September 11, 1975.

[45]North Carolina Demonstration Project Progress Report, June 29, 1979.

[46]Ibid.

The Edmond Project sent form letters to all participants announcing the termination of the experiment. This letter explained that when the customer's account was returned to the City of Edmond, the customer might receive a shorter or longer period bill, depending upon which billing cycle the account was assigned to. Compensation payments accompanied these letters if the account was paid up. Payments were only mentioned if the account was in arrears. In the latter case, payment was promised when the account was brought up to date. The letter also reminded the customers that electric service was to be free of charge for the month after the experiment.[47]

A separate form of the letter, making no mention of compensation payments, was sent to those customers who had joined too late to receive them.[48]

In October, 1976, Connecticut Project test customers were notified by letter that PUCA would extend the rate through December.[49] In mid-December, customers were reminded by letter that the experiment was to conclude on the last day of the year.[50]

RATE INFORMATION AND EXPLANATION

Adequate customer understanding of TOU rate structures is at the heart of the successful Demonstration or Implementation Project. The economic rationale of such rate structures must be communicated. While customers might be able to accept variation in the price per kwh overtime, their load management behavior in response to the price signals would probably be more effective if they knew why the prices varied. All the Demonstration Projects took this factor into account and, for the most part, made a significant effort to explain why electricity costs more to generate during times of high system demand than during times of low system demand. While customer communications from virtually all the Projects had the same or similar content,

---

[47] Edmond Demonstration Project Progress Report, November, 1978.

[48] Ibid.

[49] Connecticut Demonstration Project Product User's Guide (no date).

[50] Ibid.

they differed in their approaches. The differences mainly involved discussions of essential concepts and manners of illustrating or exemplifying them.

Several Projects' rate explanations began with an account of how time-variation in demand causes time-variation in generation cost. The Rhode Island Project brochure pointed out that if large generating plants were used to meet peak demand, then much of the time they would not be used to full capacity, and thus a certain proportion of their cost would have been invested for nothing.[51] Customer fact booklets from the North Carolina,[52] Wisconsin,[53] and Puerto Rico[54] Projects made this same point and illustrated it by making an analogy with the purchase of an expensive vehicle that is to be used only infrequently. The Puerto Rico Project customer fact booklet likened the possession of such excess capacity to having a bus that sits all day long in a driveway because one needs to transport only ten people once a day.[55] The Rhode Island Project brochure said that utilities make use of smaller peaking generation plants, activated only during peak demand periods. However, even "though less expensive, these plants are generally less efficient and often use more costly fuel." Thus, the relative diseconomy of peaking plants is the principal cause of higher electricity costs during peak demand periods.[56] This general approach, of first presenting the economic background of TOU rates, was taken by the Edmond,[57]

---

[51]Rhode Island Demonstration Project "Time-of-Day Rates: some facts, some questions, some answers." (no date)

[52]BREMEC "Peak Load Pricing Research Handbook." (no date)

[53]Wisconsin Public Service Corporation Customer Information, Residential Time-of-Use Pricing Study. (no date)

[54]Puerto Rico Demonstration Project Customer Education Brochure.

[55]Ibid.

[56]Rhode Island Demonstration Project, op. cit.

[57]Edmond Demonstration Project "A Consumer's Guide to Time-of-Day Rates for Electric Energy." (no date)

North Carolina,[58] Wisconsin[59] and Puerto Rico[60] Projects as well.

The Arkansas Project began with a description of both the rate structure and bill contents, and continued with an account of the causes of temporal price variation.[61] The Arkansas consumer fact booklet may have taken this approach because it was issued after the customer had received at least one TOU bill. Since the customer had a bill which needed explaining, this procedure might be considered effective. Northeast Utilities, participating in the Connecticut Pilot Project, began their information on optional TOU rates with a general description of time-of-use pricing, followed by an explanation of the temporal variations in cost for the utility generating the electricity.[62]

Regardless of the order or relative emphases of these economic background presentations, the majority of Project communications made the following points: 1) that utilities must maintain sufficient capacity to meet peak demands, and 2) that this capacity requirement is met by the use of intermittently operated peaking generating plants whose relative inefficiency raises the cost of electric generating during high demand periods. Some Projects, such as North Carolina[63] and Rhode Island,[64] illustrated the temporal variation in demand by graphing typical hourly load curves for their systems.

Most Projects introduced the concept of TOU rates after the economics of electric generation was explained. The concept most

---

[58]Carolina Power and Light Customer Fact Booklet (no date).

[59]Wisconsin Public Service Corporation, op. cit.

[60]Puerto Rico Demonstration Project, op. cit.

[61]Arkansas Demonstration Project, "A Guide for Using Electricity" (no date).

[62]Northeast Utilities TOU Information Sheets (no date).

[63]Carolina Power and Light, op. cit.

[64]Rhode Island Demonstration Project, op. cit.

frequently stressed was that if customers were to pay more for electricity during the times that it cost more to generate, and less during the times that it cost less to generate, there would be an incentive to shift consumption away from high cost periods to lower cost periods. For example, the New Jersey Project customer information document stated that their TOU rates reflected the time-varying cost of generating electricity, and that if customers would shift consumption away from the high cost periods in response to this price differential, the net efficiency of the total generating plant could increase, which in turn would decrease the need for an additional plant, and therefore lower rate increases in the future.[65] The New Jersey Project was careful not to promise rate decreases as a result of the system-wide adoption of TOU rates.

Most of the Projects emphasized the benefits of shifting consumption to lower tariff periods. The Edmond Project pointed out that their municipally owned utility was a distribution system only and owned no generating equipment. The utility's wholesaler charged the Edmond utility on a time-of-day basis. Since the customers at that time were not on time-of-day rates, the local utility was forced to charge them a higher average rate to cover peak period costs. System-wide adoption of TOU rates would, if properly used by customers, bring electric bills to a considerably lower average.[66]

Another point emphasized by many of the Projects was that their test TOU rates were designed so that the average customer's consumption pattern would not result in higher electric bills than under traditional rates. In this context, most of the Projects' customer communications were careful to note that this arrangement provided no guarantee of reduced bills--only an opportunity for the customer to reduce them.

---

[65]Untitled, undated draft of information to customers, New Jersey Demonstration Project.

[66]Edmond Demonstration Project, op. cit.

For the most part, customer information on rates was confined to the rate structure assigned to each customer, so that only one rate (TOU energy charge, TOU energy plus demand charges, seasonal TOU energy charge, etc.) was discussed with or presented to each customer. The Vermont Project took special pains to withhold information about all other rates under test from each experimental customer in order to prevent confusion among many different rates.[67]

The manner of presenting specific rate information varied considerably among the Projects. Some simply incorporated all such information into the text of their consumer fact booklets, information sheets, brochures, etc. Others copied official rate schedule sheets and enclosed them in their information packets. A few used graphic devices. The North Carolina Project (Blue Ridge Electric Membership Corporation) prepared a histogram figure, whose bars represented the different tariff periods. Their width and positions indicated when the tariff periods began and how long they lasted, and their heights showed the relative costs of a kwh of electricity in each tariff period.[68] The Connecticut Project used a similar histogram device, but superimposed it on a graph of the daily load curve to show how the variation in cost per kwh to the customer followed the rise and fall of system demand.[69] Figures 5 and 6 show the BREMC and Connecticut tariff graphics. The Edmond Project presented its rate structure information on a 5" by 8" card, designed to be posted in the home as a reminder of the different tariff periods and their different prices.[70] In Edmond considerable effort was made to insure that the customer understood the distinctive

---

[67]Telephone interview, Charles Elliott, Green Mountain Power Corporation, August, 1980.

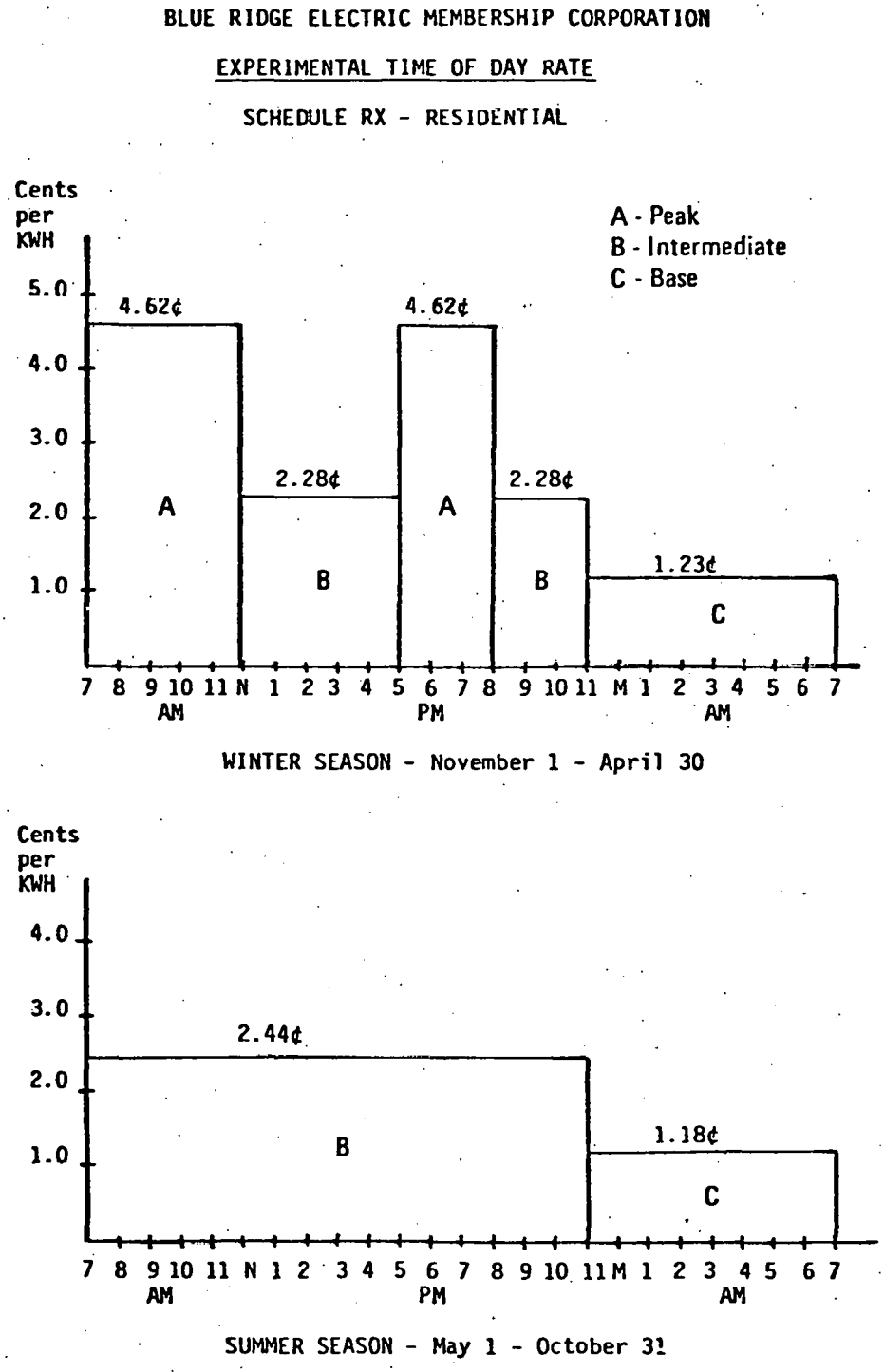
[68]Blue Ridge Electric Membership Corporation, op. cit.

[69]Connecticut Demonstration Project customer fact booklet. (no date)

[70]Arkansas Demonstration Project "A Guide for Using Electricity. (no date)

FIGURE 5

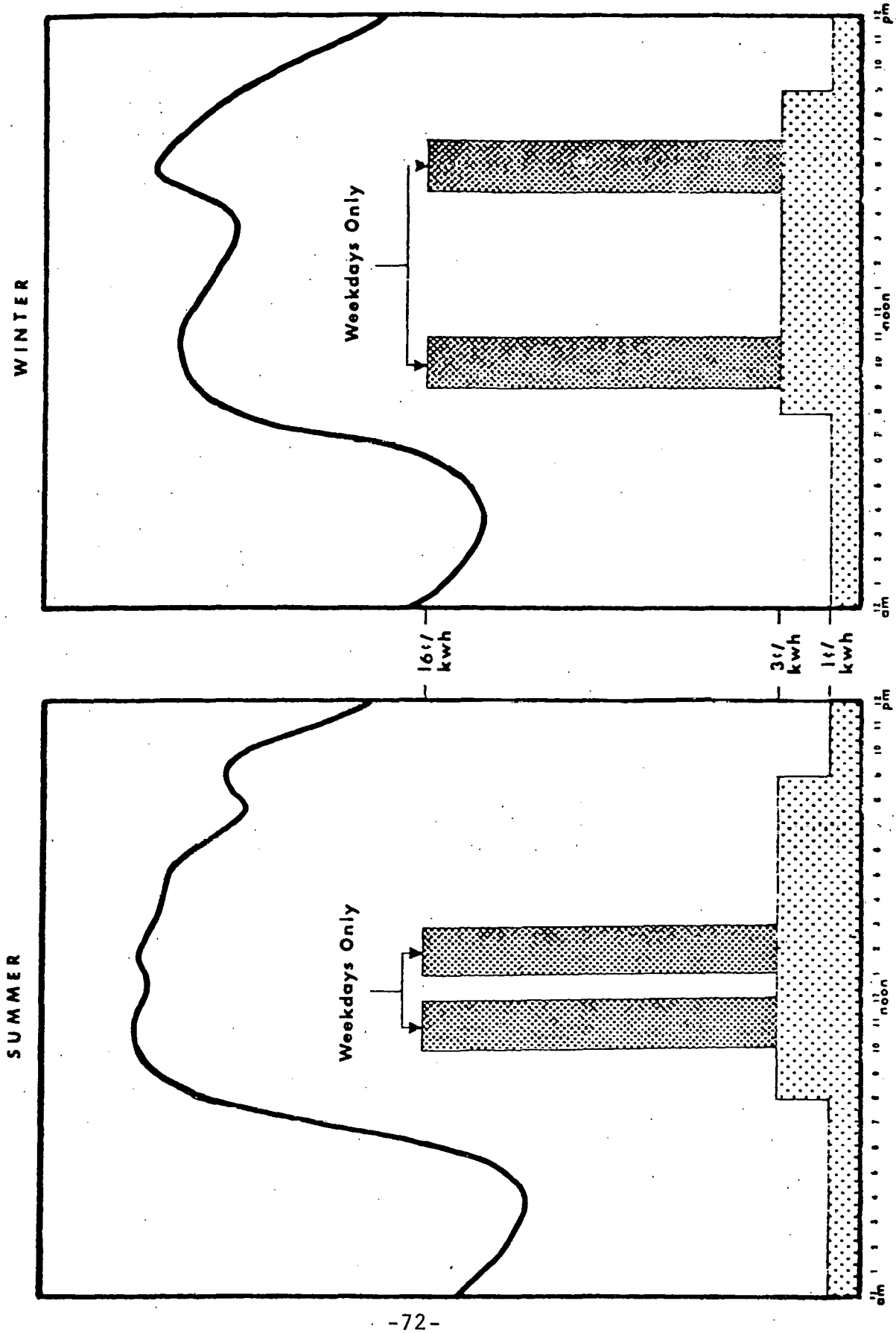
Histogram Showing Residential Peak, Intermediate and Base Rates, Summer and Winter, Blue Ridge Electric Membership Corporation, North Carolina Project



Source: North Carolina Demonstration Project, Blue Ridge Electric Membership Corporation, "Peak Load Pricing Research Handbook", p. 10.

FIGURE 6

Load Curve and Histogram Showing TOU Rates
Summer and Winter, Connecticut Project



features of the TOU rate structure as opposed to other pricing schemes. Project personnel worked up a set of fictitious example rates--declining block, flat, seasonal peak-load--along with a TOU rate. Each was accompanied with a brief, but clear explanation.[71]

In the course of explaining either the rationale of TOU rates or the rates themselves, some of the Projects elected to define special terminology such as "kilowatt," "kilowatt hour," "demand," etc. Such efforts were especially useful in Projects with three-part experimental rates (i.e., energy, demand, and customer charges for a single bill). The Arkansas Project's consumer fact booklet likened measuring electric power in watts to measuring gasoline in gallons.[72] The Carolina Power and Light customer fact booklet (North Carolina Project) suggested, rather than explicitly stating, what "demand" meant by giving an example ". . . if the only electrical usage in your home during a 15-minute interval was burning ten 100-watt light bulbs the demand would be one kilowatt."[73] This statement may not have sufficiently distinguished the relevant concept of power from the irrelevant measure of energy. The kilowatt, as a measure of power, was defined and illustrated with the ten 100-watt light bulb example prior to the definition of demand in the customer fact booklet; however, the novelty of the concept of demand to most residential customers could perhaps warrant an explicit identification with power: a straightforward statement that billing demand is the highest power drawn during a given period. Projects may have been reluctant to identify demand directly with power since demand, as measured by magnetic tape records, is really the energy consumed in a relatively brief period and

---

[71]Edmond Demonstration Project "A Consumer's Guide to Time-of-Day Rates for Electric Energy." (no date)

[72]Arkansas Demonstration Project "A Guide for Using Electricity." (no date)

[73]North Carolina Demonstration Project CP&L) Customer Fact Booklet. (no date).

is treated as a measure of the average power drawn during the period. Perhaps many of the Projects felt that clarifying this surrogate measure of real demand would have been too complex for ordinary customer education purposes.

If customers are not aware of seasonal or irregular changes in the TOU rate structure, at the time these changes affect their electricity costs, the practical goals of TOU pricing can be seriously compromised. One lesson of the Projects is that a single general statement of the whole year's rate structure was not enough to guarantee this awareness at a functional level, and that notification of all such changes should occur shortly before they become effective, thereby eliminating possible misunderstandings.

The Connecticut Project personnel found that one hour of interviewing at the beginning of the test was not adequate to educate customers about the role of time in peak-load energy usage.[74] In the period from two months before the experimental rates began to six weeks after, there were 89 calls from customers regarding the pricing periods, particularly on the matter of weekend rates and change from DST to EST. Subsequent rate-structure changes were more carefully announced. Customers were notified one week in advance of the switch from EST back to DST, and one week in advance of the onset of summer rates. Both notices were by letter and no customer problems arose from either event.[75]

The Wisconsin Project Customer Information Packets did not clearly emphasize that the switch from summer to winter rates occurred in the billing month of November, not the calendar month. Customers were told of the change by letter at the beginning of the summer but no reminders were sent out as the change date approached. These circumstances left a considerable number of customers unprepared for the rate change, and

---

[74]DOE File memorandum by C.R. Beyer: Quarterly Review of the Connecticut Peak Load Pricing Field Test, February 6, 1976.

[75]Connecticut Demonstration Project Status Report, April-June, 1976.

some outcry resulted. From that time on, reminders of approaching seasonal rate changes were to be sent out with bills.[76] The North Carolina Project encountered almost exactly the same problem, even though the CP&L bill insert involved was mailed less than a month before the rate change. Some customers took the phrase "beginning with October usage . . ." to mean the calendar month of October rather than billing cycles designated "October."[77]

The Rhode Island Project observed the practice of timely rate-change reminders from the beginning. Their notice of impending summer rates was given out in May,[78] and the reminder of winter rates, which were to begin on the first of September, was issued in August.[79] This letter detailed the whole winter rate structure, and reminded customers that all of Labor Day was to be counted as off-peak time.[80]

There were, of course, unplanned developments that had much the same effect as a change in rate structure. While such events cannot be advertised in advance, they should be explained to customers as soon as the utility is aware of them. An example from the Edmond Project will serve to illustrate the point. The Project had a longer than normal billing period during the phase when the new meters and associated operations were undergoing "shakedown." Some customers thought that the resulting higher bills had been caused by the TOU rates, rather than by larger total consumptions, even though the new rates were not yet in effect! The Project staff wrote to all experimental customers, explaining the higher bills and reminding them that the new

---

[76]Telephone interview, Richard E. James, Wisconson Public Service Corporation, August, 1980.

[77]Telephone interview, Billy Yarborough, Carolina Power and Light Company, August, 1980.

[78]Rhode Island Demonstration Project Produce User's Guide. (no date)

[79]Ibid.

[80]Rhode Island Demonstration Project Progress Report, October, 1978.

rates would not take effect for another month.[81]

How to Reduce Electric Bills Under TOU Rates

A witness at a Rhode Island Public Utilities Commission hearing on experimental rates asked: "Who will hold the hand of the customers, showing them how to take advantage of the new rates?"[82] In most Projects the answer was "the utility." In almost every case, the utility spent considerable time preparing customer education materials and personally communicating with individual customers about how they could exploit TOU rates by shifting or reducing loads.

As indicated, some Projects told their experimental customers that only shifting of loads--not energy conservation--was encouraged. However, most Projects gave advice on both practices as means to lower bills. In this section, only customer information on the temporal pattern of electricity use will be reviewed; material on absolute reductions of consumption through end-use improvement will be examined separately.

Practical advice about saving under TOU rates necessarily dealt with individual end-uses. The importance of a given end-use for TOU purposes depends mainly upon two factors; how much energy the normal operation consumes, and how feasible it is to operate the end-use less in high-tariff periods and more in low-tariff periods. If the operation of a particular appliance required a small amount of energy, that end-use might be less important than an appliance whose operation could be shifted only modestly from on-peak to off-peak hours, but whose energy consumption was relatively large. Thus, for example, in homes with electric water heating, some fairly minor changes in the times of day that hot water is used could have a larger effect

---

[81] Edmond Demonstration Project Progress Report, August, 1977.

[82] State of Rhode Island and Providence Plantations Public Utility Commission Hearing re: Blackstone Valley Electric Company Docket 1262, March 31, 1977 and April 14, 1977.

on electric bills than would a complete transfer of the operation of many small appliances from on-peak to off-peak hours.

Identifying major electricity consumers in the household was one of the first and most important goals of customer information on end-use. An item of customer information from the North Carolina Project emphasized this point by stating that: the combined annual consumption of an electric clock, heating pad, hair dryer, blender, electric tooth brush, sun lamp, waffle iron, sewing machine, radio, and vacuum cleaner often amount to no more than one-twentieth of annual consumption by an electric water heater. The same document points out that electric space conditioning (heating and cooling) typically account for more than half of total household consumption.[83]

Several of the Projects gave customers a table showing the average electrical consumption per month or year or per use of a variety of common appliances. A particularly useful variant of this table was employed by the Arkansas[84] and Connecticut[85] Projects. The tables in these Projects compared the cost of using each of a variety of appliances during high-tariff periods to their cost of operation during lower-tariff periods. Figure 7 shows one of the tables used in Arkansas.

The proportional contribution of a given end-use to the total electric bill depends upon the overall appliance mix of the household. For example, a chart given to experimental customers during the Los Angeles Project compared a typical "all electric" home and a typical "gas and electric" home. This chart, shown in Figure 8, displays the contribution of major end-use appliances to total electricity costs.[86] In the "all

---

[83]Carolina Power and Light Company. "How to Save on Your Electric Bill." (no date)

[84]Arkansas Power and Light Company. "A Guide for Using Electricity." (no date)

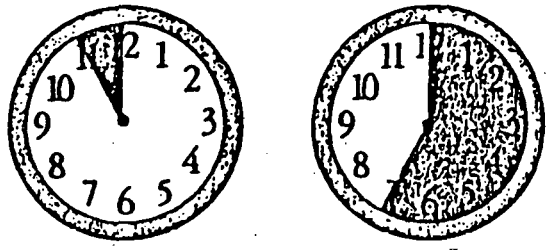
[85]Connecticut Demonstration Project, Final Report, May, 1977.

[86]Los Angeles Department of Water and Power "Questions and Answers About the Electricity Rate Study." (no date)

FIGURE 7

Comparison of Appliance Costs by KWH, Summer Peak and Off-Peak Rates, Arkansas Project

COMPARE THE AVERAGE MONTHLY COSTS FOR OFF-PEAK AND ON-PEAK USAGE UNDER THE SUMMER RATES.



In the summer the electricity you use from 11 a.m. to 7 p.m. costs six times as much as at any other time of day.

APPLIANCE	KWH PER MONTH	ON-PEAK*	OFF-PEAK*
Air conditioning, cost per ton (12,000 btu)	600	$50.70	$ 8.34
Water heater (family of 4)	400	33.80	5.56
Refrigerator-freezer (standard)	105	8.87	1.46
Electric range	100	8.45	1.39
Food freezer (20 cu. ft.)	100	8.45	1.39
Electric clothes dryer	80	6.76	1.11
Lighting (6 to 8 rooms)	60	5.07	.83
TV (color)	40	3.38	.56
Window fan	30	2.54	.42
Dishwasher	30	2.54	.42
TV (black & white)	27	2.28	.38
Stereo	25	2.11	.35
Micro-wave oven	25	2.11	.35
Fry pan	15	1.27	.21
Roaster	15	1.27	.21
Iron	15	1.27	.21
Radio	10	.85	.14
Coffee maker	10	.85	.14
Automatic clothes washer	10	.85	.14
Waste disposal	5	.42	.07

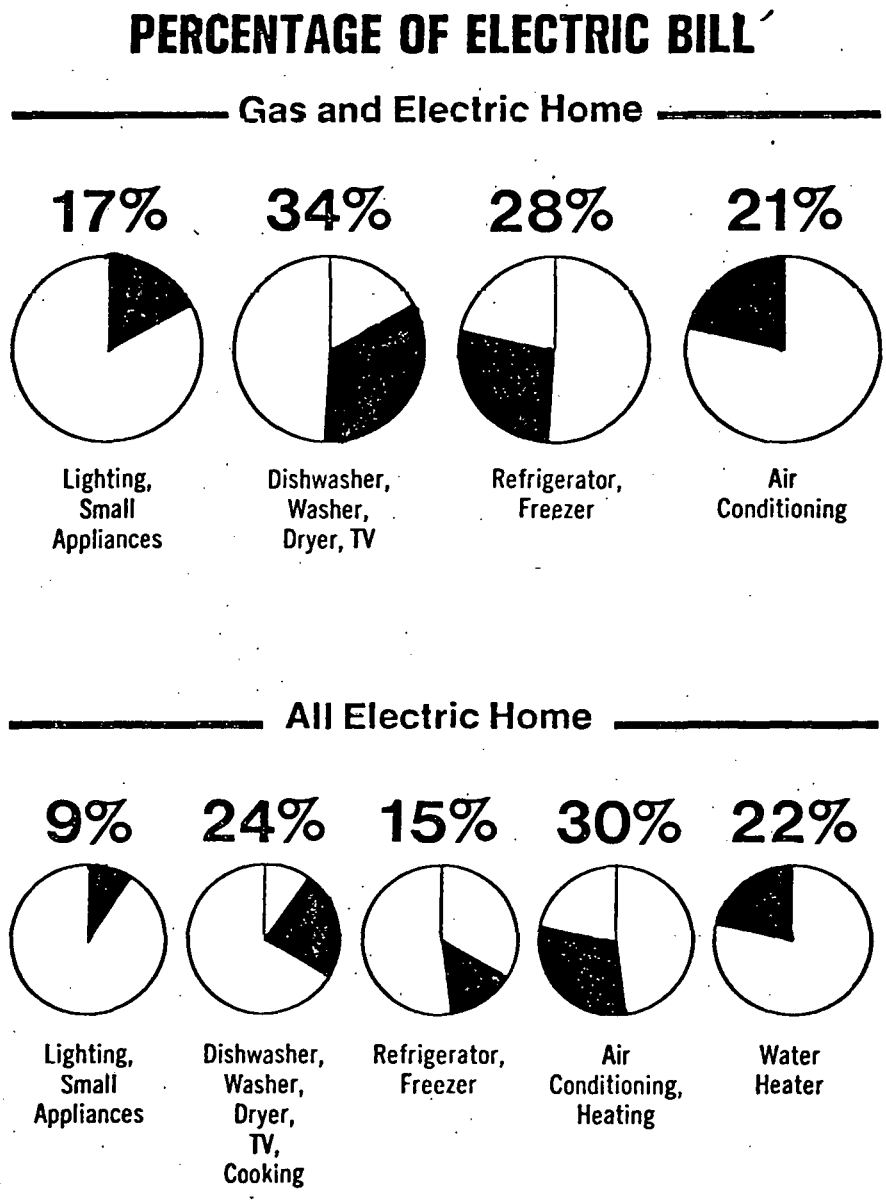
*Although no customer will find it possible to consume entirely on-peak or entirely off-peak, the figures provided illustrate the 6 to 1 summer ratio and allow comparisons of the relative values of performing tasks at different times of day.

Remember that the figures above are energy charges alone and do not include the customer charge, sales tax, and cost-of-power adjustment, all of which must be added to determine the total monthly bill.

Source: Arkansas Demonstration Project Final Report, p. F-3.

FIGURE 8

Contribution to Electric Bill of Selected Appliances, Gas and Electric Home and All Electric Home, Los Angeles Project



Source: Los Angeles Demonstration Project, "Questions and Answere About the Electricity Study".

electric" home, space conditioning and water heating combined accounted for fifty percent of the electricity usage. The "gas and electric" home, on the other hand, did not heat water with electricity and had only air conditioning to represent electric space conditioning.

Information sheets on TOU rates from the Connecticut Pilot Project told customers that the proportion of electricity consumed off-peak necessary for savings ranged from 65 to 70 percent. The document then indicated whether a household could attain the required load-shift. This explanation included different appliance mixes. For example, if a customer had neither electric space heating or water heating but had other major electric appliances such as a dryer, dishwasher and oven and range, almost all use of these appliances would have to take place in the off-peak hours for the customer to benefit.[87]

The second major factor relating an end-use to TOU rates was how readily and to what extent operations were transferred from peak to off-peak hours. The success of TOU rates was not dependent upon large alterations in the customer's daily routine, but there was a need to inform customers of some practical strategies for load shifting tasks that were less constrained by the daily routine. On the other hand, the structure of daily activities involving electricity consumption varied from customer to customer and, short of extensive individual consultation, the best that could be done was to make a number of practical suggestions. The Wisconsin Project, for example, suggested eight modest transfers of activity from on-peak to off-peak hours that could be expected to have a significant effect on the electric bill. The Project recommended shifting

- one hour of ironing per week,
- brewing of two pots of coffee per week,
- one hour of vacuuming per week,
- one hour of oven use per week,

---

[87] Northeastern Utilities TOU rate information packet. (to date).

- one load of clothes drying per week,
- one bath per week from on-peak to off-peak hours; and
- eliminating one hour of on-peak television viewing per day,
- turning off one 100-watt bulb for one on-peak hour each day.[88]

The Edmond Project suggested that experimental customers take showers and baths in the morning (off-peak) rather than in the evening. The Project also recommended that laundry and dishwashing be restricted as much as possible to off-peak hours. They specifically suggested that the washing machine be started at bedtime and the clothes taken from it and dried in the early morning before the peak period began.[89]

The Los Angeles Project recommended shifting as much laundering, dishwashing, vacuum cleaning and cooking as possible to off-peak hours. They suggested that major cooking be done during off-peak hours, the prepared food refrigerated, and reheated quickly before meals during on-peak hours. Customers were urged to operate self-cleaning ovens only during the off-peak hours and to avoid placing hot food in refrigerators during on-peak hours In order to minimize the use of air conditioning or resistance heating during peak hours, customers were advised to cool or heat the house during off-peak hours, as much as possible, and to store the cooled or heated air during on-peak hours by either setting back or turning off the space conditioning equipment.[90]

Customers wishing to shift load in response to TOU rates were helped by knowing how much their bill would decrease if most of the use of each appliance was shifted to off-peak hours. This information was like that given in the Edmond[91] and

---

[88]Public Service Commission of Wisconsin, op. cit.

[89]Edmond Demonstration Project "A Consumer's Guide to Time-of-Day Rates for Electric Energy." (no date)

[90]Los Angeles Department of Water and Power, op. cit.

[91]Telephone interview, Neil Dikeman, University of Oklahoma, April, 1980.

Wisconsin[92] Project bills: such and such amount of money could be saved by shifting an amount of consumption to off-peak hours. However, the information was itemized by end-use. For example, the Connecticut Pilot Project provided this information for thirteen appliances. Customers were told how much would be saved if they shifted from the normal off-peak proportion to an even greater off-peak proportion. Examples of this information are provided in Table 3. The document containing this information further states that "The typical household without electric heat and with one window air conditioner and all the appliances listed above would pay an additional $52 per year on their electric bill if they accepted the TOD rate and did not shift any use. . . . The same household, by shifting the full amounts indicated, could save about $44 a year. . . . The same household with electric heat which shifted all uses to the maximum amounts in the examples above could save about $134 a year."[93]

Some Projects thought that customers might be helped by knowing how much various appliances are typically used on-peak versus off-peak, using standard rate structures. To this end, the Connecticut Pilot Project tabulated the average on-peak and off-peak kwh consumption of sixteen appliances in a medium-sized household (three or four people). The appliances were listed in order from highest to lowest total energy use, so that the contribution of the major appliances to on-peak energy consumption stood out clearly.[94]

Several Projects stressed the value of attaching time control switches to electric water heaters as a means of avoiding operating these especially high-consuming appliances during peak hours. It was important that the water heater not operate

---

[92]Telephone interview, Richard E. James, Wisconsin Public Service Corporation, April, 1980.

[93]Northeast Utilities, op. cit.

[94]Northeast Utilities, op. cit.

TABLE 3

Savings Due to Shifting to Off-Peak Periods, Selected Usages, Connecticut Pilot and Wisconsin Demonstration Projects

Project		Shift		Savings due to Shift
		Normal off-peak	Off-peak after shift	
Connecticut	Appliance			
	electric dryer	20 %	100 %	.90¢/month
	bedroom air conditioner	60 %	100 %	$1.20 /month
	cooking	30 %	90 %	.90¢/month
Wisconsin		from peak to off-peak		
	one load of clothes drying per week			$1.00 /month
	one bath per week			.65¢/month

Source: Northeast Utilities TOD Information Sheets. (undated)., Public Service Commission of Wisconsin.

on-peak if the rate structure involved an on-peak demand charge. In an attempt to help customers avoid operating electric water heaters on-peak the North Carolina Project sent its customers a table showing five common uses of hot water and the time it takes a 40-gallon "quick recovery" water heater to restore the hot water consumed. This allowed customers to finish using hot water and have it reheated before the onset of the peak period.[95] The difficulty of remembering the rather precise scheduling of hot water uses implied here illustrates the convenience of a time controlled water heater switch. With its use, the water heater is disconnected from the power supply for any desired fraction of the on-peak period. The timer can be set to insure that the water heater is not operated during peak tariff periods.

In the Los Angeles Project customers were advised to select their times so that the hot water heater was shut off before the beginning of peak periods to compensate for slippages between the time kept by the timer and that kept by the utility system.[96] The Connecticut Demonstration Project included a reminder at the end of their customer fact booklet that timers should be re-set if electric service is interrupted.[97] Both the Los Angeles[98] and Wisconsin[99] Projects advised customers to raise thermostat settings on their water heaters if they installed a time switch. This would permit the water to remain at a higher temperature through most of the on-peak period. These two Projects also briefly discussed the two main kinds of time control switches: the "plug-in" and the "wired-in" variety. They cautioned customers obtaining plug-in timers to be sure that the devices were rated to handle the size unit to which

---

[95] Carolina Power and Light Company. "How to Save with Time-of-Day Rates." (no date)

[96] Los Angeles Department of Water and Power, op. cit.

[97] Connecticut Demonstration Project Customer Fact Booklet (no date).

[98] Los Angeles Department of Water and Power, op. cit.

[99] Wisconsin Public Service Corporation, op. cit.

they were being applied.[100,101] The Los Angeles Project stated flatly ". . . a timer on your electric water heater will lower electricity bills and pay for itself within a few months."[102]

INFORMATION ABOUT IMPROVEMENT OF END-USE EFFICIENCY

Most Projects emphasized transferring consumption from times of high cost to times of lower cost. However, most of these Projects also advised customers to reduce the total amount of electricity consumed in the household through more efficient use.

The Projects' main customer communications on improvement of end-use concerned 1) conservation behavior, (strategies to promote more efficient use of existing appliances) 2) conservation investment (material and equipment that could be incorporated into the household or its appliances to improve their efficiency) and 3) conservation diagnosis (individualized information about the energy efficiency of a given customer's home). Each of these is discussed below.

Conservation Behavior

Most Projects' communications on conservation were organized according to general household functions: space conditioning (heating and air conditioning), food handling (cooking and refrigeration), and cleaning (laundering, bathing and house-cleaning). Some examples of ways to conserve on electricity usage for these activities is presented in Table 4. The majority of these examples are from the Edmond and North Carolina Projects: customer communications on conservation in other Projects were, for the most part, quite similar, but none were more detailed, better organized or more clearly expressed.

---

[100] Los Angeles Department of Water and Power, op. cit.

[101] Wisconsin Public Service Corporation, op. cit.

[102] Los Angeles Department of Water and Power, op. cit.

TABLE 4

Examples of Conservation Advice Given
to Customers by Selected Demonstration Projects

Project/Advice	Estimated Savings on Electric Bill
EDMOND, OKLAHOMA[a]	
Thermostat settings	
Winter: 68° day	15%
Winter: 60° night	7%
Summer: 78°	--
Summer: Run on only very hot days	
Summer: High setting on circulating fan	
Furnace Annual service Monthly cleaning & filter replacement	10%
Air conditioner Annual service Monthly cleaning & filter replacement	15%
Reduce hot water in baths by one-third	14%
Open drapes in winter on sunny days Close drapes & shades in summer & add awnings	--
Open fireplace damper in summer Close damper when no fire burning in winter	--
Minimize use of light & heat generating appliances during hot weather	--
NORTH CAROLINA[b]	
Thermostat settings	
Winter: 68° rather than 73° day	20%
Winter: 5° reduction night	12
Winter: 10° reduction	16
Close fireplace damper when no fire burning	--
Clean furnace and air conditioner & replace filters	20%

(continued)

TABLE 4 (continued)

Project/Advice	Estimated Savings on Electric Bill
NORTH CAROLINA (continued)	
Cooking	
Use oven to cook entire meal if oven is used at all.	--
Reduce amount of water used in boiling	--
Preheat oven as little as possible	--
Avoid boiling	--
Thaw frozen foods thoroughly	--
High temperature roasting uses less kw's than low temperature roasting	--
Cleaning	
5 minute shower uses less than hot tub bath	20%
Washing & rinsing dishes with running hot water consumes 30 gallons/load	--
Cold water clothes washing cheaper than hot	24¢/load
Set water heater thermostat as low as 120° (if no dishwasher)	--
1 drop per second from leaking faucet wastes 2300 gallons/year	--

Source: a. Edmond Demonstration Project "A Consumers Guide to Time-of-Day Rates for Electric Energy." (no date)

b. Carolina Power and Light Company "How to Save on Your Electric Bill." (no date)

Electric space conditioning received the majority of attention in most Projects' conservation communications. A number of recommendations were given to customers, with information about how much electricity could be saved. For example, in North Carolina each recommendation of conservation was supported with a quantitative estimate of the energy saved by carrying it out, or the costs of not carrying it out. The advice to clean heating and cooling air filters monthly was supported by remarking that dirty filters can raise operating costs by as much as 20 percent.[103] To emphasize the importance of keeping unused fireplace dampers closed, the Project pointed out that a good chimney can draw 20 percent of the warm air out of a house in an hour.[104] Other space conditioning advice given by the North Carolina Project discussed moisture-producing activities that could be engaged in during different times of the day, to maintain higher humidity and hence greater comfort at lower room temperatures during the winter; the heating power of electric lights, in connection with the added burden on air conditioning that lighting can cause; and the ability of heating registers and returns to drain cooled air from an air-conditioned room, hence the recommendation to close them in any room cooled by a window unit.[105]

In the area of food handling, the Edmond Project advised customers that thermostats on refrigerators and freezers could be set higher than customary without impairing their usefulness.[106] The Project recommended increased outdoor cooking in the summertime which should lower the air conditioning burden, as well as the electric energy directly consumed by cooking.[107]

---

[103] Carolina Power & Light Co. "How to Save on Your Electric Bill" (no date).

[104] Ibid.

[105] Ibid.

[106] Edmond Demonstration Project "A Consumer's Guide to Time-of-Day Rates for Electric Energy." (no date)

[107] Carolina Power & Light Co., op. cit.

The Wisconsin Project advised customers that reduced cooking time required by microwave ovens lowered overall energy consumption; slow cookers were energy-economical because of their extremely low demand; and that toaster ovens, while absolutely less energy efficient than full-size ovens, heat a much smaller volume and therefore use considerably less energy.[108]

Water heating was a major component of electricity cost in cleaning activities. The Edmond Project, (as did several other Projects) recommended lowering thermostats on water heaters, maintaining water temperature between 150 and 160 degrees. They also recommended the use of cold water for laundry and for as much household cleaning as possible, operating washing machines, dryers and dishwashers at full load, substituting showers for baths whenever possible, and keeping faucets in good repair so as to prevent leakage, especially of hot water.[109] The North Carolina Project supported their advice about cleaning-related electricity use with a good deal of quantitative information,[110] as it did in other conservation recommendations.

Conservation Investments

If customers had electric space conditioning (heating or cooling) or electric water heating, they could improve the general efficiency of their electricity use by investing in different forms of building insulation, "weatherization" materials, insulation retrofit of heating duct work, water heaters, and so on. Customers with and without electric heating or water heating could all conserve by acquiring more energy-efficient major appliances, e.g., microwave ovens, slow cookers, and toaster ovens. Other significant energy-efficient devices in the area of space conditioning, such as attic fans and wind turbine

---

[108]Wisconsin Public Service Corp., "Consumer Information: Residential Time-of-Use Pricing Study." (no date)

[109]Edmond Demonstration Project, op. cit.

[110]Carolina Power & Light Co., op. cit.

attic ventilators, were also suggested as ways to reduce electricity usage.

The Pilot Implementation Projects played a major role in compiling information on conservation investments, particularly those concerned with house heating systems, water heater insulation and retrofitting. On the whole, the Pilot Project tended to present their insulation information to customers on an individualized basis. For example, energy audits played a major role in this phase of several Pilot Projects (discussed below under "Conservation Diagnosis"). However, nonindividualized information on this topic was transmitted by several of the Projects, both Pilot and Demonstration. For example, the Springfield Pilot Project distributed a list of qualified attic insulation contractors; an energy conservation kit (including a graphic device for determining R values of insulation); and pamphlets on insulation and weatherization. Other information was presented in workshops on insulation, an insulation retrofit display on the utility's "energy bus" (see below), and an insulation financing program which maintained information personnel to answer customer questions by telephone or in person.[111]

The Edmond Project's customer education booklet included a table which presented the thicknesses of both fiberglass and blown wool insulation with R values from 11 to 30. The booklet stated that "the typical home can achieve approximately 30 percent savings by improving attic insulation up to recommended standards." It also stated that 15 to 30 percent of energy costs were due to air infiltration, and that weather stripping could eliminate most of it. It suggested using a lighted candle or thin strip of paper to detect air leaks.[112]

The North Carolina Project pointed out that heated room air escapes through an open chimney whether or not a fire is

---

[111]Springfield Pilot Project Quarterly Progress Report, October-December, 1977.

[112]Edmond Demonstration Project, op. cit.

burning in the fireplace and recommended the use of glass fireplace screens to impede this outflow. Carolina Power and Light Company's brochure on electric bill savings recommended the use of thermostatically controlled attic fans, set to turn on at 100 degrees and off at 85 degrees. The brochure pointed out that temperatures in attics could reach 150 degrees and noted that light colored roofs--with their lower solar absorption--reduced this attic heating and thereby alleviated some of the burden on air conditioning. Wind turbine-type attic ventilators were also recommended, for the same reason.[113]

Storm windows, as a form of insulation or weatherization, were mentioned by more than one Project. The Edmond Project noted that storm windows blocked heat outflow about 50 percent better than single pane windows. The Project mentioned the high initial cost of storm windows as somewhat of an offset to their high energy efficiency.[114]

Conservation Diagnosis

The most potentially effective information to customers about improving end-use efficiency was a specific description of the customer's own household as an energy consumer, i.e., how it wastes energy and where it displays acceptable levels of efficiency. To this end, utilities and regulatory agencies participating in the Pilot Implementation Programs experimented with various forms of energy audits, such as standardized assessments of the size, design, construction, and condition of dwellings and their space conditioning equipment. Formulas commonly used in computer programs had been developed for converting data in these areas into measures of heat loss and, to some extent, specific remedies for the detected defects could be suggested by the computer. The most accurate and comprehensive of these energy audits were carried out by trained personnel who physically inspected buildings. Another form of energy audit

---

[113]Carolina Power & Light Company, op. cit.

[114]Edmond Demonstration Project, op. cit.

was conducted by customers themselves, who filled out a prepared questionnaire. This method was less reliable but it was more broadly applicable and less expensive. Opinions as to the relative merits of these two forms of energy audit varied among the participating utilities and agencies of the Implementation Projects. The Minnesota Pilot Project, through the Northern States Power Company, mailed a home audit questionnaire to over a half-million customers.[115] The Springfield Pilot Project, on the other hand, abandoned development of such a questionnaire on the grounds that an adequately detailed form would be too complicated to permit accurate answers to all the relevant questions.[116] Instead, trained personnel performed on-site audits, particularly for customers who were having difficulty paying their electric bills.[117] The procedure was as follows: on the first visit the auditor gathered data for heat loss calculations and pointed out obvious areas of heat loss to the customer. The customer was presented with a packet of literature, including "Do it yourself" brochures, a list of approved insulation contractors and other basic conservation information. The auditor also answered customer questions. Before the auditor returned, a computer program calculated the heat loss and generated a two-page printout. Page one was a customer oriented presentation of the data. It included an overall energy efficiency rating, a list of conservation measures, and an estimate of the savings that could be attained if these measures were used. The second page was more technical. It contained information on heat loss in BTU's/hr. at an outside temperature of 40 degrees, and zero degrees, for each wall, floor and ceiling of the home. It also gave computations on the percent of heat loss through walls versus floors versus ceiling, etc.,

---

[115]Minnesota Pilot Project Quarterly Progress Report, January-March, 1979.

[116]Springfield Pilot Project Quarterly Progress Report, January-March, 1978.

[117]Ibid.

and the heat loss per square foot of heated floor area. On the second visit the auditor gave the customer this printout, explained each item, made specific recommendations, and answered further questions.[118] A procedure very similar to this was carried out by Minnesota Pilot Project personnel in the development of their home energy questionnaire.[119]

The GRDA[120] and Springfield Pilot Projects[121] made some limited use of thermographic energy auditing. Instead of calculating the heat loss of a building from energy audit information, the heat loss was measured directly with a technique called "thermography." An infrared photograph of a building surface varies in brightness from point to point according to the temperature of each corresponding point on the surface. These temperatures determine how rapidly heat flows from the building to the surrounding air. Bright portions of the infrared photograph indicate regions of high heat loss in the building surface; dark portions indicate regions of low heat loss. GRDA restricted their use of this technique to industrial sites,[122] while the Springfield Project completed almost a thousand thermographic audits of residential sites in the first year of their Project.[123]

The amount of heat lost through the roof of a building can be very substantial, and a measure of this proportion of the total heat loss was thought to be of value to many customers. A technique called "aerial thermography," was used to identify buildings where heat loss might be a problem. In

---

[118] Ibid.

[119] Minnesota Pilot Project Quarterly Progress Report, October-December, 1978.

[120] GRDA Pilot Project Quarterly Progress Report, January-March, 1979.

[121] Springfield Pilot Project Quarterly Progress Report, October-December, 1977.

[122] GRDA Pilot Project, op. cit.

[123] Springfield Pilot Project Progress Report, October, 1978-March, 1979.

this process infrared photographs of communities were taken from an airplane. The relative brightness of the rooftops indicated the relative rate of heat loss. These photographs were then coordinated with maps to determine the address of each building. By using aerial thermography, a partial energy audit of every building in a city can be conducted in a very few days. And, while aerial photography of any kind is expensive, there is a huge economy of scale involved: when aerial thermograms are displayed in public places, large numbers of customers receive the information. The GRDA and Springfield Pilot Projects used area banks and savings and loan institutions to display their aerial thermogram information. The Springfield Project also displayed thermograms at a "Community Energy Fair" and used them as part of a traveling exhibit.[124] Procedures and problems of aerial thermogram display are discussed further in the next chapter.

Knowing how much of a household's total electricity consumption was attributable to certain major appliances was as relevant to conservation as it was to load shifting using TOU rates. An effective and relatively convenient way of conveying this information to the individual customer was to sub-meter particular appliances. The Springfield Pilot Project maintained a stock of appliance sub-meters that could either be installed by the utility at the customer's request or picked up and installed by the customer himself. These meters were available free of charge at the customer's request. More than one appliance could be sub-metered in the same household at the same time. Sub-meters were requested more often by customers who questioned the size of their electric bills. Air conditioners, water heaters, refrigerators and clothes dryers were the most frequently sub-metered appliances. The service person disconnecting the sub-meter at the end of its use calculated the total kilowatt hours for the household and

---

[124] Ibid.

the kilowatt hours consumed by each sub-metered appliance, then the percent of the total contributed by each such appliance. Customers frequently expressed surprise at how much of their total bill was due to the electric water heater or the frost-free refrigerator.[125]

SUMMARY

The content of the information given to customers was divided into the following areas: 1) administrative communications, 2) explanations of TOU pricing and specific rate structures, 3) load management information, and 4) information on conservation.

Administrative communications included introductory material about TOU rates, notices of hearings on experimental rates, explanations of participation incentives or bonuses, responses to customers who did not want to participate in rate experiments, and notifications of Project termination.

Specific rate structure information was usually confined to the particular rate to which the individual customer was assigned. One of the more difficult problems was the role played by time in the new rate structures. This was particularly true for seasonal or irregular changes in the tariff periods. Misconceptions of rate changes were common despite the information efforts.

Most Projects advised customers on reducing their total kwh consumption through more efficient end-use. Customer communications about more efficient end-use contained information on 1) conservation behavior, 2) conservation investment, and 3) conservation diagnosis.

A great deal of advice was sent to customers about conservation behavior in the area of space conditioning, food handling, and cleaning. Information on conservation investment included facts about insulation, weatherization, energy-efficient appliances, and alternative methods of space conditioning such as attic fans and wind turbine ventilators.

---

[125]Springfield Pilot Project Quarterly Progress Report, July-September, 1978.

CHAPTER FOUR : METHODS OF INFORMATION DISSEMINATION

INTRODUCTION

This chapter examines various methods by which the Projects disseminated information to customers. Virtually all of the Projects, whether Demonstration or Pilot, used similar methods of disseminating information to customers: 1) written matter, mailed or handed to the individaul customer; 2) public media, and 3) personal encounters. Written matter included letters, booklets, brochures, etc., many of which have been mentioned in previous chapters, as well as bill inserts and information printed on bills. Public media included both intentional news and public relations material released to newspapers and to radio and television broadcasters, and news items initiated in the media. Personal encounters included interviews with experimental customers, telephone conversations with inquiring or complaining customers, and presentations to groups.

Examples from each of these methods of communicating with customers are examined in the following sections.

WRITTEN MATTER DIRECTED TO CUSTOMERS

Most of the Projects prepared a considerable amount of written material for customers, although some customer literature already on hand was incorporated. Almost all Demonstration Projects had a brief orientation document, usually called a "customer education brochure," and a more elaborate "Customer Fact Booklet." The Fact Booklet usually included the kind of information cited in the previous chapter. Sample customer education brochures and customer fact booklets, from the Los Angeles and North Carolina Projects are presented in Appendix 1.

Materials such as these, as well as letters, flyers, and, in some Pilot Projects, various brochures on conservation topics,

were sent to customers in special mailings, as bill "inserts" or as handouts in personal encounters. The Connecticut,[1] North Carolina,[2] New Jersey,[3] Edmond,[4] and Wisconsin[5] Demonstration Projects employed information packets, which contained a variety of educational items.

Special Mailings

Direct mailings were often used for customer communications. Even the largest Project involved a small enough fraction of the total service population to allow some direct mailing. The Projects used letters for a variety of purposes. For example, Rhode Island used letters to introduce its project, provide additional information, announce the starting date, and provide summer and winter rate-change reminders.[6] The Edmond Project used letters to clear up confusion regarding one abnormal billing period, to announce the end of the project incentive payment, and to replace the face-to-face interview for late-joining experimental customers.[7]

Time and cost considerations made these replacements attractive to more than one Project. Rhode Island also substituted letters for personal contact in recruiting new Project

---

[1]Connecticut Peak Local Pricing Field Test, Final Report.

[2]Telephone Interview, Billy Yarborough, Carolina Power and Light Co., August, 1980.

[3]New Jersey Demonstration Project Monthly Progress Report, April, 1977.

[4]Edmond Demonstration Project Quarterly Progress Report, March-May, 1977 (With additional material through July 12, 1977).

[5]Telephone Interview, Richard E. James, Wisconsin Public Service Corporation, August, 1980.

[6]Rhode Island Demonstration Project Product User's Guide, August, 1978.

[7]Edmond Demonstration Project Quarterly Progress Report, for period ending 31 August 1977, and Quarterly Progress Report, June-August, 1978.

customers, after finding the latter method too costly and time consuming.[8] In the Wisconsin Project, a questionnaire originally administered in a face-to-face interview was subsequently sent by mail.[9] The Wisconsin Project used letters to introduce the person-to-person interview that was later replaced by a mailed questionnaire, and to explain and justify the project to persons who initially refused the interview.[10] The Arizona Project mailed time-period reminders to their TOU customers, as well as explanations of bill computations under the TOU rate structure.[11]

The Connecticut Demonstration Project relied heavily on direct mail. The Project mailed information on saving under TOU rates, advertisements for an appliance repurchase program and general information on electricity costs. Additionally, the Project sent out specifications and prices of various time switches, a notice of the shift from EST to DST, notice of Public Utility Control Authority hearings and rulings, and an announcement of the Project's end.[12] The New Jersey Project mailed more than 10,000 survey questionnaires to prospective test customers.[13] The Arkansas Project also mailed their survey forms.[14]

---

[8]Rhode Island Demonstration Project, loc. cit.

[9]Telephone Interview, Richard E. James, Wisconsin Public Service Corporation, August, 1980.

[10]Ibid.

[11]Telephone Interview, Paul Hart, Arizona Public Service Company, August, 1980.

[12]Connecticut Demonstration Project Progress Report, June, 1976, and Product User's Guide (no date).

[13]New Jersey Demonstration Project Monthly Progress Report, January-March, 1977.

[14]Arkansas Demonstration Project Quarterly Progress Report, January-March, 1977.

Even some Pilot Implementation Projects used direct mailings when very large numbers of customers were involved. The Connecticut Pilot Project, for example, sent information on TOU rates to all Northeast Utilities customers who consumed less than 20,000 kwh per year.[15] The Project also mailed literature on request, sending out about 2,600 items in 1977.[16] The Minnesota Pilot Project included the results of the Home Energy Audit questionnaire as a bill insert.[17]

Information Included With Bills

Bill inserts and messages printed on bills were an important means of customer information in several of the Projects. The Edmond[18] and Wisconsin[19] Projects and the Connecticut Pilot Project[20] added information about the customer's consumption pattern to their bills. The Edmond Project also printed notification of a rate change on one billing.[21] Adding information to the bill itself sometimes represented a significant increase in the costs of billing. The Wisconsin Project, for example, had to switch from postcards to envelope billing because of the space required for extra information.[22]

---

[15]Connecticut Pilot Project Quarterly Progress Report for period ending 30 September 1978.

[16]Testimony of Charles Cook, United Illuminating Company Connecticut Pilot Project, in Docket No. 780717. Public Utilities Control Authority.

[17]Minnesota Pilot Project Quarterly Progress Report, July-September, 1979.

[18]Edmond Demonstration Project Quarterly Progress Report, March-May, 1977 (with additional material through July 12, 1977).

[19]Wisconsin Demonstration Project Quarterly Progress Report, May-July, 1978.

[20]Connecticut Pilot Project Quarterly Progress Report, July-September, 1978.

[21]Edmond Demonstration Project Quarterly Progress Report, March-May, 1978.

[22]Telephone Interview, Richard E. James, Wisconsin Public Service Corporation, August, 1980.

Bill inserts were widely used. The Connecticut Pilot Project used them to announce their energy audit and National Energy Watch programs. Some of these bill inserts resulted in customer requests for additional information.[23] The Connecticut Demonstration Project used a bill insert to explain the transition from old to new rate structures. Another insert informed customers about time switches, and still another outlined ways of taking advantage of TOU rates in food preparation.[24] The North Carolina Project used bill inserts to announce changes in operation, e.g., rate period shifts and seasonal rate changes.[25] The Minnesota Pilot Project used inserts to disseminate general information in conjunction with TOU rate cases involving three utilities.[26] (In order to insert more than one bill stuffer per mailing, Minnesota Utilities had to obtain a waiver from the Public Utilities Commission.[27])

Using bill inserts in place of special-purpose mailings saved a lot of money. When Northern States Power Company (Minnesota Pilot Project) converted its energy audit questionnaire from a multi-page form to a bill insert, it saved $70,000 in postage and handling costs.[28]

Mailing large scale or system-wide bill insert announcements was not a simple affair. For example, the Minnesota Pilot Project announced upcoming public hearings in bill inserts. The process was so time consuming that the hearings

---

[23]Charles Cook, op. cit.

[24]Connecticut Demonstration Project Monthly Progress Report, September, 1975 and Product User's Guide (no date).

[25]Telephone Interview, Billy Yarborough, Carolina Power and Light Company, August, 1980.

[26]Telephone Interview, Paul Zins, Minnesota Department of Public Service, August, 1980.

[27]Minnesota Pilot Project Quarterly Progress Report, October-December, 1978.

[28]Telephone Interview, Peter Lazare, Minnesota Department of Public Service, August, 1980.

had to be rescheduled in order to allow the inserts to reach the customers in advance. Consequently, when it came time to announce the evidentiary hearings on the same issue, bill inserts were not used because of time and cost considerations. Instead, display advertisements of these hearings were placed in Twin City newspapers and a news release went to the mass media in the participating utility's service area.[29]

Hand Delivery of Written Information

Much of the literature disseminated in the Projects was by way of handouts or displays from which customers could take brochures, pamphlets, flyers, etc. The Minnesota Pilot Project developed a handout on TOU rates for use at Commission hearings.[30] The Connecticut Pilot Project handed out literature at a variety of group gatherings. This Project also made liberal use of handout literature in individual customer contacts.[31] United Illuminating Company, a participant in this Project, distributed literature to more than 10,000 customers in 1977 alone. This utility had literature displays in its branch offices.[32] The Springfield Pilot Project distributed brochures from many displays located at banks, stores, and other well frequented public places throughout the city.[33]

INFORMATION IN MASS MEDIA

Television, radio, and newspapers in most Project areas had large enough audiences to make them an attractive means

---

[29]Minnesota Pilot Project Year End Report, September, 1978.

[30]Minnesota Pilot Project Quarterly Progress Report, April-June, 1979.

[31]Testimony of Charles Cook, United Illuminating Company.

[32]Ibid.

[33]Telephone Interview, Cathy Meyer, City Utilities of Springfield, Missouri, August, 1980.

of customer communication (at least by the criterion of cost-effectiveness). As was mentioned above, the Minnesota Project substituted mass media announcements of a rate hearing for a planned bill insert announcement because of the latter's cost and time requirements.[34] The Springfield Pilot Project did not announce the rate reforms of 1978 by mail, but provided extensive public media coverage. Direct mail was thought to be too expensive and time consuming and was deemed unnecessary because the maximum residential bill variance from the old rates--under the new rates--was only 60 cents.[35] The mass media were probably the least expensive of all customary means of communication in terms of the number of customers reached per dollar spent. For example, direct mailing of a bill insert reduced one uncertainty between the utility and the customer: it more or less insured that the message reached the customer's premises. Public media announcements, of course, did not provide comparable certainty because it was not clear whether an individual customer received a public media message. Aside from this one factor in communication from utility to customer, the superiority of bill insert communications over public media communications was problematic. A bill insert not read by customers was no more effective than a radio message they did not hear. Bill inserts and radio messages received but dismissed as incorrect or irrelevant did not accomplish the intended communication.

Advertisements and notices (not articles) played important customer information roles in some Projects. The Minnesota Pilot Project[36] and North Carolina Demonstration Project[37]

---

[34]Minnesota Pilot Project Quarterly Progress Report, July-September, 1978.

[35]Springfield Pilot Project Year End Report, September, 1978.

[36]Minnesota Pilot Project Quarterly Progress Report, October-December, 1978.

[37]Telephone Interview, Billy Yarborough, Carolina Power and Light Company, August, 1980.

used newspaper ads to announce rate hearings. The Vermont Project obtained its volunteer experimental customers through newspaper ads.[38] The Springfield Pilot Project used newspaper notices for a variety of purposes, e.g., to present the itinerary of a mobile conservation display facility, or to alert the public to the mailing of a conservation information kit.[39] The Connecticut Pilot Project (through United Illuminating Company) put 254 announcements on radio and other media, encouraging curtailment of electricity use during the summer peak hours.[40] The Minnesota Pilot Project developed a radio and television "Energy Alert" program comprised of spot announcements during peak hours. These were given free air time by local broadcasters.[41] As part of this same program, Northern States Power Company used its billboard space for peak-hour curtailment pleas.[42]

The GRDA Pilot Project developed one of the most ambitious and elaborate public media messages in the Projects. They put together a complete magazine entitled "Econo," about energy conservation. It was issued once in the Fall of 1979 and again in the Spring of 1980.[43] Forty thousand copies of each issue were distributed as supplements to 14 Oklahoma newspapers.[44] "Econo" magazine presented 15 pages of articles on various

---

[38]Telephone Interview, Charles Elliot, Green Mountain Power Company, August, 1980.

[39]Springfield Pilot Project Quarterly Progress Report, July-September 1978 and Year End Report, September, 1978.

[40]Testimony of Charles Cook, United Illuminating Company.

[41]Minnesota Pilot Project Quarterly Progress Report, January-March, 1979.

[42]Telephone Interview, Paul Zins, Minnesota Department of Public Service, August, 1980.

[43]Telephone Interview, Jerry Taylor, Grand River Dam Authority, August, 1980.

[44]Grand River Dam Authority "Econo" magazine, Winter Issue, 1979 and Spring Issue, 1980.

aspects of home energy conservation, news items on technological innovations in energy efficiency and conservation, graphic/illustrative materials, and editorials.[45] Even though the use of local, amateur and free-lance talent for most of the production kept costs at about 18 cents per copy, the design and production of the magazine were of professional quality. The Project staff estimated that a production run of 100,000 copies would have cut this cost to 9 cents per copy.[47]

The overall cost effectiveness of public media was enhanced because it generated essentially "free" messages on local news programs, when topics were of public interest. Every Project received some degree of press coverage, and it appears that most of this coverage transmitted some useful information to customers. Most of the Projects retained control over most of the content of news stories by issuing press releases. Press releases were used at the beginning of the North Carolina,[48] Puerto Rico,[49] and Vermont[50] Demonstration Projects, and when test rates went into effect in the Connecticut Demonstration Project.[51] The Minnesota Pilot Projects issued press releases regarding the test of their Home Energy Audit questionnaire.[52] The Edmond Project used more than one press

---

[45] Ibid.

[46] Telephone Interview, Jerry Taylor, Grand River Dam Authority, August, 1980.

[47] Ibid.

[48] Telephone Interview, Billy Yarborough, Carolina Power and Light Company, August, 1980.

[49] Puerto Rico Demonstration Project, Product User's Guide, March, 1978.

[50] Telephone Interview, Charles Elliott, Green Mountain Power Company, August, 1980.

[51] Connecticut Demonstration Project Monthly Progress Report, September, 1979.

[52] Minnesota Pilot Project Quarterly Progress Reports, April-June and October-December, 1978.

release, and valued them for their ability to generate media interest and their opportunities for interviews.[53] The Edmond Project was somewhat different from the other Demonstration Projects in its enthusiasm for media coverage. Most of the others did not see media exposure as unconditionally beneficial. At the beginning of the Wisconsin[54] and Rhode Island[55] Projects press conferences or briefings were held rather than distributing written releases.

Media-initiated news stories and editorials on the Projects were fairly common. The Rhode Island Project was especially well covered by area newspapers, and the majority of them wrote reports which were favorable and factually accurate. (One exception was a story quoting the peak and off peak per kwh prices as $3.38 and $1.85, respectively.[56]) Newspaper and TV news stories on the Edmond Project were uniformly neutral-to-favorable and adequately informative. In particular, one of these stories explained the rationale of mandatory participation--a valuable service from the Project's point of view.[57] However, idiosyncracies of journalism caused some embarrassment. For example, an otherwise nonevaluative and informative article on the Edmond Project contained a reference to "Rate Guinea Pigs" in its headline.[58] The Project staff felt that this phrase was definitely perjorative in connotation, and had a negative effect on the

---

[53]Telephone Interview, Neil Dikeman, Oklahoma University August, 1980.

[54]Wisconsin Demonstration Project Quarterly Progress Report, December, 1975-January, 1976.

[55]Rhode Island Demonstration Project Product User's Guide (no date).

[56]Rhode Island Demonstration Project Progress Report, October, 1976-July, 1977.

[57]Edmond Demonstration Project Quarterly Progress Report, December, 1977-February, 1978.

[58]Edmond Demonstration Project Quarterly Progress Report, September-November, 1977.

public attitudes towards the experiment.[59]

A Project was perhaps best represented by news coverage when it took an active part. Interviews of Project personnel on radio or television allowed a clearer and more flexible exposition of Project goals, methods, resources, etc. The GRDA Pilot Project sent a representative to a "call-in" radio talk show. The broadcaster who initiated the show was so pleased with the outcome that he invited the GRDA representatives back for three more appearances. The shows provided a good opportunity for detailed discussion on many conservation topics.[60]

While most news reporting was essentially favorable to the Projects, editorials, as a group, were not. The Arkansas Project did not fare particularly well at the hands of the press--either in articles or editorials. What appeared to be a straight news story was headlined: "Experimental Electric Rates at Beebe is 'Town Killer.'" The story reported nothing but the statements of opponents to the experiment.[61] Editorials tended to be condemnatory. One about the Arkansas Project asserted, in effect, that the experiment couldn't possibly lower or maintain electricity rates.[62] Another, about the Rhode Island Project, was an effort at humorous exaggeration of the life style distortions supposedly induced by TOU pricing.[63] In general, the common theme of these editorial objections seems to have been that demand was too inelastic to respond to the price differences. This phenomenon suggests that media personnel should probably

---

[59]Telephone Interview, Neil Dikeman, Oklahoma University, August, 1980.

[60]Telephone Interview, Jerry Taylor, Grand River Dam Authority, August, 1980.

[61]Arkansas Demand Management Project, Final Report (no date).

[62]Ibid.

[63]Rhode Island Demonstration Project Progress Report, October, 1976-July, 1977.

be selected for special educational efforts by utilities and commissions planning to implement TOU pricing.

Avoiding Media Coverage of Individual Customers

Among the Demonstration Projects there was some concern that extensive media coverage, especially of individual customers, could induce a considerable "Hawthorne" distortion, that is customers would respond less to the rate structure under test than to the attention being paid to them by the media and the public. The Wisconsin Project wanted to avoid media coverage of customers as much as possible. They received cooperation from the local press, although one disgruntled customer managed to get on local television with his objections to participating in the study.[64] The Arizona[65] and Rhode Island[66] Projects also sought to minimize these effects. The North Carolina Project asked media workers not to interview test customers. They did not want the test rates of individual customers divulged to the general public nor to other test customers.[67] They were concerned that a media interview would divulge such information.

PERSONAL MEETINGS AS A METHOD OF INFORMING CUSTOMERS

The virtue of face-to-face encounters as a means of conveying information was that informants could adjust their presentation in response to questions or other signs of need for information from the recipient. It was well and widely

---

[64]Telephone Interview, Richard E. James, Wisconsin Public Service Corporation, August, 1980.

[65]Telephone Interview, Paul Hart, Arizona Public Service Company, August, 1980.

[66]Summary of Quarterly Review Meeting, Rhode Island Demonstration Project, August, 1977.

[67]Telephone Interview, Billy Yarborough, Carolina Power and Light Company, August, 1980.

understood that information transmitted was by no means the same thing as information received. As the difference in responses from a sample of customers showed, it was impossible to rely on a single, fixed item of information. When a message was broadcast to a group of customers it was difficult to have the intended effect on each customer. And it proved to be naive to assume that all would understand the message the way its producers understood it. Appreciation of the recipient's knowledge and motivation proved valuable for improving communications. Thus the immediate feedback provided by face-to-face encounter was very helpful.

The problem with this kind of communication was its relatively large cost. To use personal, interactive communication most of the Projects had to acquire skilled labor or train in-house personnel. Therefore, person-to-person communication was usually restricted to those communications that had to be done with a minimum amount of error. The importance of customer understanding and cooperation for the success of the Demonstration Projects justified face-to-face interviews, in many instances. Most projects used these interviews to introduce and orient their customers to TOU rates. Clarification of the customers' inquiries and the satisfaction of their grievances were also important. Without exception such issues were dealt with by interviews either in person or by telephone.

Group presentations were a compromise between the broadcast and interview methods of customer communication. While not as finely tuned to the requirements of an individual, a group presentation was nonetheless more interactive than a bill insert or television spot. Furthermore, a group presentation reached more people than an interview program with the same amount of effort.

The following are examples of face-to-face (and telephone) encounters in the Projects.

Interviews

A number of the Projects regarded face-to-face interviews as an important medium of customer communication. The Puerto Rico,[68] Connecticut,[69] Edmond,[70] New Jersey,[71] Rhode Island,[72] Vermont,[73] and Wisconsin[74] Projects carefully prepared their interviewers to offer a good deal of information on TOU rates and related subjects. Organizers in the Arizona Project thought that a short letter would not adequately inform customers about their load survey, done preparatory to the rates test. Therefore, they felt it was necessary to approach customers in person for a more interactive explanation of the material.[75]

On the other hand, the Arkansas Project felt that individual interaction with customers would add to "Hawthorne" or "experimental demand" effects (experimental subject behavior due to the social aspects of the experiment rather than to the variables under test). Accordingly, they restricted customer communications as much as possible to direct mailings or group participations.[76] The Connecticut Demonstration Project

---

[68]Puerto Rico Demonstration Project Quarterly Progress Report, July 27-October 20, 1976.

[69]Connecticut Demonstration Project Progress Report, June, 1976.

[70]Edmond Demonstration Project Quarterly Progress Report, March-May, 1977.

[71]Jersey Central Power and Light Company, Load Research Customers--Personal Interviews: Implications for Sample Selection in the NJ/FEA Peak Load Pricing Experiment, August, 1976.

[72]Rhode Island Demonstration Project Product User's Guide, December, 1977.

[73]Vermont Demonstration Project Quarterly Progress Report, July-September, 1975.

[74]Telephone interview, Richard E. James, Wisconsin Public Service Corporation, August, 1980.

[75]Telephone interview, Paul Hart, Arizona Public Service Company, August, 1980.

[76]Arkansas Demand Management Project Final Report (no date).

recognized the value of face-to-face interviews, but a planned mid-test interview was deleted because they thought it would inflate "Hawthorne" effects.[77] In the Pilot Implementation Projects, face-to-face contact with customers was an integral part of on-site energy audits. The interactive opportunities of such contacts was one reason why on-site audits were preferred over questionnaires.

Direct interactions with customers were indispensable when the customers initiated the contact in person. Virtually all the Projects designated persons or departments to handle Project-related customer inquiries or complaints. Some Projects assigned a specific individual to each test customer for the duration of the test rates. In the Connecticut Demonstration Project, a single staff member of the Public Utilities Control Authority was responsible for all customer inquiries and complaints arising from the TOU rates test.[78] However, this person was assisted by personnel from Northeast Utilities and Connecticut Light and Power Company.[79] At least two Demonstration Projects, Vermont[80] and North Carolina,[81] explicitly reported that customer service representatives were a very important medium for customer education. The GRDA Pilot Project assigned one person at each utility office to handle questions about conservation.[82] The Edmond Project went beyond the purely verbal level of dealing with complaining customers. In one instance, for example, a customer's meter was field tested, in his presence, because he thought the

---

[77] Connecticut Demonstration Project Monthly Progress Report, August, 1975.

[78] Northeast Utilities Business Procedures Memorandum: Experimental Peak Load Pricing Billing (no date).

[79] Ibid.

[80] Vermont Demonstration Project Quarterly Progress Report, July-September, 1975.

[81] Telephone interview, Billy Yarborough, Carolina Power and Light Company, August, 1980.

[82] Telephone interview, Jerry Taylor, Grand River Dam Authority, August, 1980.

meter was responsible for his increased bills.[83]

The use of telephones for utility-initiated customer contact proved to be so expensive and labor intensive that it was usually restricted to smaller scale operations within a Project. For example, the Rhode Island Demonstration[84] and Minnesota Pilot[85] Projects used telephone calls either to make or confirm appointments with customers for energy audits (Minnesota)[86] or interviews (Rhode Island).[87] The Connecticut Pilot Project conducted telephone interviews of a small sample of customers in order to evaluate its information program.[88] The Connecticut Demonstration Project used the telephone to interview a control group of customers for demographic data.[89] One utility-initiated telephone information service in the Projects was developed by Northern States Power Company in the Minnesota Pilot Project. The utility prepared tape-recorded messages on a large variety of electricity-related topics to be played to callers.[90]

Group Presentations

Presentations to groups by utility personnel reached moderately large numbers of customers with information that could be tailored to audience response on the spot. It was also possible to develop specific information in advance of such meetings, accordant to the audience's particular background

---

[83]Telephone interview, Upton Henderson, Central State University, April, 1980.

[84]Rhode Island Demonstration Project Progress Report, October, 1976-July, 1977.

[85]Minnesota Pilot Project Quarterly Progress Report, October-December, 1979.

[86]Ibid.

[87]Rhode Island Demonstration Project, op. cit.

[88]Connecticut Pilot Project Quarterly Progress Report, April-June, 1979.

[89]Connecticut Demonstration Project Product User's Guide (no date).

[90]Telephone interview, Phil Zins, Minnesota Department of Public Service, August, 1980.

and interests. The Arkansas Project held meetings between a communications team from the utility and townspeople considered to be "opinion leaders." The aim was to convince these influential people of the value of the rates test and the reasonableness of TOU pricing.[91] Seattle City Light, which conducted the Seattle Pilot Implementation Project, used a speakers bureau to disseminate information about conservation, insulation, more efficient use of electricity, etc. They also brought presentations and exhibits on conservation to home shows.[92] In the Connecticut Pilot Project the Residential Customer Service Department of United Illuminating Company gave presentations to clubs about conservation and efficient electricity use. Eighty-nine such group presentations reached about 2,500 people. In the course of a year about 6,500 customers were informed through group presentations.[93]

The GRDA Pilot Project prepared a presentation on conservation which was delivered by utility personnel to civic groups. Civic organizations in the cities served by GRDA were contacted and offered this presentation. At least half of the groups accepted.[94] The presentations were kept brief enough to allow for questions; the utility team was often kept more than an hour beyond the regular meeting time answering specific questions and giving advice to customers about their particular conservation needs.[95] Some of these customers implemented conservation measures as a direct result of these presentations.[96]

---

[91]Arkansas Demand Management Project Final Report (no date).

[92]Telephone interview, Mimi Sheridan, Seattle City Light, August, 1980.

[93]Testimony of Charles Cook, United Illuminating Company, in Docket number 780717, Public Utilities Control Authority (Connecticut Pilot Project) (no date).

[94]Telephone interview, Jerry Taylor, Grand River Dam Authority, August, 1980.

[95]Ibid.

[96]Ibid.

The effective use of aerial thermograms required public display and interpretation. The level of interaction between the thermogram interpreter and the customer varied from one-on-one conversations to formal lectures. Both the Springfield[97] and GRDA[98] Pilot Projects made substantial use of aerial thermography in educating their customers about home insulation. The GRDA Pilot Project's experiences in thermogram display were particularly instructive. They found that public libraries made the most effective display sites, where a large cross section of the public was expected to have both an interest in such a topic and the time to inspect the display properly. Library locations were generally well known, and the library staffs were enthusiastic about the public relations value of this extra service.[99] An attempt to use utility business offices for the thermogram displays was less successful because, contrary to expectations, relatively few customers went there to pay their bills.[100] An attempt to use banks as thermogram display sites, was also made, but a difficulty arose here, because the bank's interest in providing the service was tied to the publicity and customer attraction they expected. If one bank in a community was asked to display the thermograms, bank administrators responded enthusiastically, and offered to run and pay for the necessary public announcements. But if two or more banks were involved, the interest of each bank disappeared. The Project staff concluded that bank involvement could be counted on only as long as the thermogram display constituted a unique "draw."[101]

Some meetings with groups of customers during the Projects were initiated by the customers. The Connecticut Pilot Project

---

[97] Springfield Pilot Project Quarterly Progress Report, October, 1978-March, 1979.

[98] Grand River Dam Authority Pilot Project Quarterly Progress Report, September-December, 1977.

[99] Jerry Taylor, op. cit.

[100] Ibid.

[101] Ibid.

held informational meetings with a number of elderly customers who had complained about the impact of TOU rates.[102] The Arkansas Project found it desirable to have special meetings with groups of customers in three towns where there were strong and widely held misgivings about the experimental rates.[103]

Reinforcement of One Communication by Another

Whether or not such an effect was intended, one communication with customers sometimes enhanced the effectiveness of another. This occurred when one communication prepared customers to receive another, clarified content of another communication, sharpened customers' attention, or pointed out that other information was available.

When Project participation was voluntary, customers were usually asked to sign participation agreement forms. These documents sometimes conveyed significant information, or at least reinforced information given elsewhere. The items contained in the forms used in the Connecticut Pilot Project and the New Jersey Project are listed in Table 5. The agreement forms provided a convenient way to emphasize certain important details of the customer-utility relationship regarding the new rates. It was thought that having people sign what they read would improve the chances of their reading it carefully.[104]

When a customer communication was reported as an event in the public media, it represented an effort to enhance the effectiveness of one message with another. The Springfield Pilot Project announced the mailing of a "summer conservation kit"

---

[102] Connecticut Pilot Project Quarterly Progress Report, July-September, 1978.

[103] Arkansas Demonstration Project Quarterly Progress Report for period ending 31 July 1976.

[104] New Jersey Demonstration Project Monthly Progress Report, November, 1976.

TABLE 5

Information Conveyed in Participation Agreements, Connecticut Pilot and New Jersey Demonstratration Projects

Project	Information Item
Connecticut	1. Length of time on rates (one year).
	2. Changes in consumption patterns normally necessary in order to benefit from TOU rates.
	3. Disavowal of guarantee of benefit.
	4. Availability of timer-relay control for appliances--at no charge.
New Jersey	1. New metering to be installed.
	2. TOU rates to go into effect at the utilities discretion.
	3. Utility must notify customer by letter of any change of TOU rates.
	4. TOU rates could be changed only if standard rates had to be changed and such changes would be broadly commensurate.
	5. TOU billing would last between 24 and 36 months.
	6. The general existence of options the customer on TOU rate had.

Source: Connecticut Pilot Project and New Jersey Demonstration Project, Monthly Progress Report, November, 1976.

on six radio stations, two television stations and on two occasions in local newspaper ads.[105] Since the conservation kits were mailed to all residential customers,[106] the news items were not announcements of availability; their purpose was simply to call attention to the kits. About one hundred requests for energy audits resulted from customer visits to an "energy bus" display. These are examples of ways customers learned about one source of information through another source.[107] Some of the announcements of customer information events both advertised the project and enhanced public relations. For example, two pre-tests of the Minnesota Project's Home Energy Audit questionnaire were announced in press releases even though the pre-tests themselves involved no more than 1200 customers.[108]

The reinforcement of one communication by another occurred when the public visited the GRDA Project's displays of aerial thermograms. The number of customers visiting the thermogram display sites increased following one-minute television spots promoting the thermography program. This effect declined in time, but interest in the thermogram was revitalized when newspaper ads appeared.[109] The Project also developed a thermogram slide show for presentation to civic groups such as the Chamber of Commerce, Rotarians, Lions, Kiwanis, etc. These presentations included showing those in attendance the thermograms of their homes, if available.[110] Over 340 people attended these presentations during July and August, 1978. Some influential people (e.g.,

---

[105] Springfield Pilot Project Quarterly Progress Report, July-September, 1978.

[106] Ibid.

[107] Ibid.

[108] Minnesota Pilot Project Quarterly Progress Reports, April-June, 1978 and October-December, 1978.

[109] Jerry Taylor, op. cit.

[110] Grand River Dam Authority Pilot Project Quarterly Progress Report, July-September, 1978.

congresspersons, mayors, political candidates) were in attendance.[111]

THE SPRINGFIELD PILOT IMPLEMENTATION PROJECT: AN EXTENSIVE PROGRAM OF INFORMATION TO CUSTOMERS

Many aspects of the Springfield Pilot Project might serve as a model for system-wide customer information programs. The Project used a remarkable variety of communication techniques and invested substantial effort in each.

The impetus for this program came from a telephone survey of City Utilities (Springfield, Missouri) customers.[112] The survey showed that a substantial percentage of customers had relatively little knowledge of electric energy conservation methods and almost no conservation plans.[115] Thus there was a need for "an extensive public relations campaign "to motivate and inform customers about further possible conservation practices, especially those involving little cost or inconvenience."[114]

The major components of Springfield's customer information program were:

- residential home energy audits
- home insulation advice and instruction (with a financing program for customers deciding to re-insulate)
- mailed "conservation kits" (information packets)
- appliance submetering
- aerial thermography
- intensive and broad use of public media for conservation communications
- development and distribution of conservation-related brochures

---

[111] Ibid.

[112] Telephone interview, Cathleen Meyer, City Utilities of Springfield, Mo., August, 1980.

[113] Ibid.

[114] Springfield Pilot Project Quarterly Progress Report, October-December, 1977.

- development of a mobile exhibit facility
- individual and group customer contacts by Energy Management Section personnel of Springfield City Utilities.[115]

The residential energy audits and the appliance submetering program were discussed in Chapter 3 and will be only tangentially mentioned here.

The insulation program used three means of customer communication. The first was a collection of written information, including a list of approved insulation contractors, contractor bid sheets, do-it-yourself insulation guides, and pamphlets on insulation and weatherization. These were displayed for customer pick-up at various public places, and distributed by home energy auditors.

The second means of communication was a series of workshops on insulation and weatherization, using demonstration work-ups and films. The written information discussed above was also handed out on request at these workshops.

The third method was to have utility personnel answer questions on an insulation financing plan. Under this plan customers could pay back loans for home insulation improvement as part of their regular utility bill payments. The utility personnel also handled telephone inquiries and questions from customers visiting the business office.[116]

The program was not judged an overall success. The first year of operation yielded no inquiries about the financing program. The Project staff thought this was because other financial institutions offered the same interest rates as the Project sponsored plan and consequently there was no incentive to use the bill payback arrangement.[117] Attendance at the workshops was

---

[115]Springfield Pilot Project Quarterly Progress Report, January-March, 1978.

[116]These means of communication are cited in Springfield Pilot Project Quarterly Progress Reports for October-December, 1977, January-March, 1978, and April-June, 1978.

[117]Springfield Pilot Project Year-End Report, September, 1978.

not high, despite good media publicity. Those who did attend showed a fair level of interest in the do-it-yourself insulation guide.[118]

Table 6 lists the contents of both the summer and winter conservation kits which were mailed to customers. The original purpose of the winter kit was to prepare customers for a home energy audit questionnaire.[119] The questionnaire was never mailed, however, because on-site audits were chosen instead. The summer conservation kit was mailed to all customers in July. Also directly mailed to customers was an "energy calendar" that presented conservation advice and general information on energy.[120]

The Springfield Project, like the GRDA Project, used highly frequented public places, such as banks and savings and loan companies to display thermograms.[121] They did not use public libraries or utility company offices as the GRDA Project had done, but they did use shopping malls and a "community energy fair" in Springfield as display sites.[122] The thermogram displays were well advertised prior to public display, and there was a private showing of the thermograms to news media personnel.[123] Both handouts and bill stuffers were used to announce the public showings.[124] At the displays, utility employees and thirty-six community volunteers provided interpretations to customers who inspected the thermogram of their homes. These interpreters

---

[118] Springfield Pilot Project Quarterly Progress Report, July-September, 1978.

[119] Springfield Pilot Project Quarterly Progress Report, July-September, 1978.

[120] Cathleen Meyer, op. cit.

[121] Ibid.

[122] Ibid.

[123] Springfield Pilot Project Quarterly Progress Report, October, 1978-March, 1979.

[124] Ibid.

TABLE 6

Contents of Winter and Summer Conservation Kits
Springfield Pilot Implementation Project

Kit	Content
Winter	1. an energy cost estimation guide for household appliances
	2. a graphical display of "no cost, low cost, and moderate cost" conservation devices
	3. a guide to R values of insulation materials
	4. meter reading instructions
Summer	1. brochures on economical air conditioning operation
	2. a "summer energy pie" showing the fractions of total kwh consumption due to various summer end uses
	3. energy saving advice for vacations
	4. load management advice

Source: Springfield Pilot Project Quarterly Progress Report, October-December, 1977 and July-September, 1978.

were trained to explain the thermograms by the contractor who provided them.[125]

On the first day of public showing, 473 customers viewed the thermograms of their homes.[126] At the end of two months, 10,370 had seen the thermograms.[127] Attendance at the fixed display sites declined during the summer of 1979: only 318 additional customers viewed the thermograms between the first of July and the end of September, 1979.[128] After September, the thermograms were carried on the mobile display facility (described later).[129]

No advertising was purchased in conjunction with the customer education effort, although a number of public service announcements were broadcast by local media.[130] The Project also received a great deal of news coverage. For example, the home energy audit program was announced in the local newspaper at the end of January, 1978; two or three days later an article on thermography appeared in the paper, and about one month later a feature article appeared which included pictures of a home audit in progress. These two news stories resulted in many requests for audits from customers.[131]

As soon as the major components of the customer education effort were planned, project relations with media were initiated

---

[125] Springfield Pilot Project Quarterly Progress Report, April-June, 1979.

[126] Ibid.

[127] Ibid.

[128] Springfield Pilot Project Quarterly Progress Report, July-September, 1979.

[129] Ibid.

[130] Cathleen Meyer, op. cit.

[131] Springfield Pilot Project Quarterly Progress Report, January-March, 1978.

through press releases.[132] This resulted in significant journalistic interest. Representatives of all media visited the utility each day looking for news. This generated 5 to 6 newspaper, radio, or television stories per month.[133]

City Utilities produced its own monthly television show, covering such topics as reducing summertime peak systems demand, efficient use of air conditioning, choosing electric appliances for energy efficiency, and winterizing homes.[134] Project personnel were interviewed on radio talk shows several times during the first two years.[135]

An important part of the media phase of customer education was technical evaluation of energy efficient appliances, load management equipment, insulation devices and materials, etc. These evaluations were performed or collected by City Utilities.[136] This information was then made part of the monthly television program and of media news releases.[137] This research effort resulted in news stories and press interviews on fireplace efficiency, vinyl siding and heat pumps.[138]

The Springfield Project relied heavily upon brochures. Some of the brochures, handouts, pamphlets, etc., had been used before the Project, but most of the material was developed or updated for the Project. The number and variety of brochures was augmented throughout the first two years of the Project.[139]

---

[132] Cathleen Meyer, op. cit.

[133] Ibid.

[134] Springfield Pilot Project Quarterly Progress Report, July-September, 1978.

[135] Cathleen Meyer, op. cit.

[136] Springfield Pilot Project Quarterly Progress Report, January-March, 1978.

[137] Springfield Pilot Project Quarterly Progress Report, July-September, 1978.

[138] Springfield Pilot Project Quarterly Progress Report, October, 1978-March, 1979.

[139] Cathleen Meyer, op. cit.

New brochures were developed on thermography, on local management and rate structure, on efficient air conditioning operation, on energy saving for vacationers, and on solar space conditioning.[140]

The brochures were kept current by using the technical evaluation data mentioned above. For example, the hand-out on fireplace energy efficiency was updated, and some of the later energy bus displays were developed, with new technical evaluation information.[141]

Brochures and other handouts were displayed in the City Utilities lobby, the Southwest Power Plant, and on the energy bus. They were also displayed in several departments of City Hall, a Congressman's office, some state and federal government offices, and a number of banks. Single sets of brochures and pamphlets were made available for reading (not taking) in doctors' and dentists' offices, in barber and beauty shops and real estate offices. This literature was also made available at group presentations by Project personnel.[142]

An important feature of Springfield's customer information program was the "Rate Management and Insulation Retrofit Display" housed in a converted city bus.[143] This mobile display facility was commonly referred to as the "energy bus" and was essentially a mobile building that housed a great variety of display equipment and carried it to all parts of the city. This arrangement allowed the Project to reach large numbers of customers in a short time, with information presented in an interactive format which approximated a personal interview.

---

[140]Springfield Pilot Project Quarterly Progress Report, April-June, 1978, and Cathleen Meyer, op. cit.

[141]Springfield Pilot Project Quarterly Progress Report, April-June, 1979.

[142]Springfield Pilot Project Year End Report, September, 1978.

[143]Springfield Pilot Project Quarterly Progress Report, October-December, 1977.

Table 7 lists some of the displays housed on the bus on two of its tours. Some of these displays incorporated "electronic game" features, or were constructed in a manner that allowed the viewer to learn by handling as well as by looking at the display materials.[144]

Also included was a 20-30 minute oral presentation of conservation principles with a question-and-answer session.[145]

Later in the Project, new displays were developed for the energy bus, describing electronic ignition systems for gas furnaces, an automatic clock thermostat, showing a poster on IRS tax credits for insulation, and a set of aerial thermograms.[146]

The energy bus reached a remarkable number of people. From February 1, 1978, when the bus became operational, until the end of September, 1979, the bus visited 102 locations and had 47,338 visitors, nearly one-third of the population of Springfield.[147] Sixty-eight of the locations were at elementary and secondary schools, where 14,498 students were shown the displays and given the oral presentation and discussion.[148] During 10 days in August, 1978, 20,600 people toured the bus.[149]

This kind of mobile display represented a balance between the volume of customer contacts and the effectiveness of the communications. The interactive communication this method made possible was appreciated by Project personnel when the energy

---

[144]Springfield Pilot Project Quarterly Progress Report, January-March, 1978.

[145]Springfield Pilot Project Quarterly Progress Report, July-September, 1978.

[146]Springfield Pilot Project Quarterly Progress Report, July-September, 1979.

[147]Ibid.

[148]Ibid.

[149]Springfield Pilot Project Quarterly Progress Report, July-September, 1978.

TABLE 7

List of Selected Displays on the Springfiled Energy Bus
Springfield Pilot Implementation Project

Tour	Display
First Tour	1. Insulation samples
	2. A guide to interpreting all components of the utility bill
	3. Watthour meters and gas meters with reading instructions
	4. A display showing average consumption of typical household appliances
	5. A collection of energy conservation devices, e.g., clock thermostats
	6. Insulation display aimed at children
School Tours	1. A mural illustrating primary energy sources
	2. A display showing latent energy in a pound of coal, the energy it produces in the power plant and the amount of work done by the electricity generated with it.
	3. An insulated and an uninsulated model house
	4. A utility meter display
	5. A child oriented handout with energy-theme games and activities
	6. Interactive game-type displays such as an "energy crossword puzzle" and an "energy maze"
	7. An insulation poster

Source: Springfield Pilot Project Quarterly Progress Report, October-December, 1977 and July-September, 1978.

bus toured elementary schools. The tours revealed that school children had many misconceptions about energy and its conservation. Most of these misconceptions were effectively corrected during the oral presentations.[150] Representatives of the schools expressed satisfaction with the program.[151]

The Energy Management Section of City Utilities' Customer Service Department coordinated the public information services.[152] Most of their time was devoted to answering questions from individual customers about conservation measures.[153] They also made group presentations. From January through March, 1978, about 2,775 persons were given conservation information by this means.[154]

These presentations were not "canned" programs, but were highly flexible and were used for a variety of audiences.[155] They did, however, use some prepackaged material, such as films.[156] These materials were definitely popular and were requested an average of eleven times per quarter since early 1977.[157]

THE WASHINGTON DEMONSTRATION PROJECT: EXPERIMENTS ON INFORMATION TO CUSTOMERS.[158]

The Washington Demonstration Project was more directly concerned with information to customers and its effect on consumption

---

[150] Cathleen Meyer, op. cit.

[151] Ibid.

[152] Springfield Pilot Project Quarterly Progress Report, January-March, 1978.

[153] Ibid.

[154] Ibid.

[155] Cathleen Meyer, op.cit.

[156] Springfield Pilot Project Quarterly Progress Report, January-March, 1978.

[157] Cathleen Meyer, op. cit.

[158] All objective material in this section is based on R. J. Kohlenberg and S. Anschell, Conclusions and Recommendations for Electrical Energy Conservation based on the Washington Rate Demonstration Project, June 30, 1980.

than the other Projects. Generally speaking, the Washington Project was a study of feedback as information, reward, or disincentive, from the customer's own consumption behavior, as a factor in the control of that behavior. The Project comprised several experiments. Only four of them will be discussed here because the remainder were either not sufficiently complete or not directly related to information to customers. The experiments were:

- a study of the conservation impact of a moderate (15-20%) rate increase;
- a study of the effect of cash rebates on electrical consumption
- an assessment of the conservation effects of the information content of bills and an additional information packet (conservation advice, etc.);
- a study of daily consumption feedback as a stimulus to conservation; and
- two very similar studies of immediate consumption feedback, by way of special energy monitoring devices.

A sixth study was a more traditional end-use survey which did not involve information to customers.

The first experiment was a study of the effects of a moderate rate increase. It attempted to separate the potential conservation effects resulting from the political and economic conditions that gave rise to rate increases from the direct conservation effects of the rate increase itself. A rate increase by two Seattle area utilities was used as a test. A randomly selected group of customers was exempted from the increase and their consumption records were compared with those of a control group which was not exempted from the increase. Although assignment to groups was random, all subjects were volunteers as far as participation was concerned. The customers were recruited by offering them a "50-50 chance" of exemption from the increase. Commercial/industrial customers in the experiment showed no conservation response as a group. The conservation effect among residential customers was small and transient.

The second study analyzed the effect cash rebates--rather than bill reductions--had on conservation. In a Housing Authority project, 74 customers received refunds of 1¢ per kwh for the prepaid utility costs in excess of actual costs incurred. The customers, as part of their total rent, had already paid a lump sum to cover their expected energy consumption. They could get some of this prepayment back by consuming less than the expected amount of energy. Seventy-six customers in the project were given exactly the same information, and had the same contact with Housing Authority personnel, as the experimental customers, but received no money payment for reduced consumption. No difference in energy consumption was observed between the two groups.

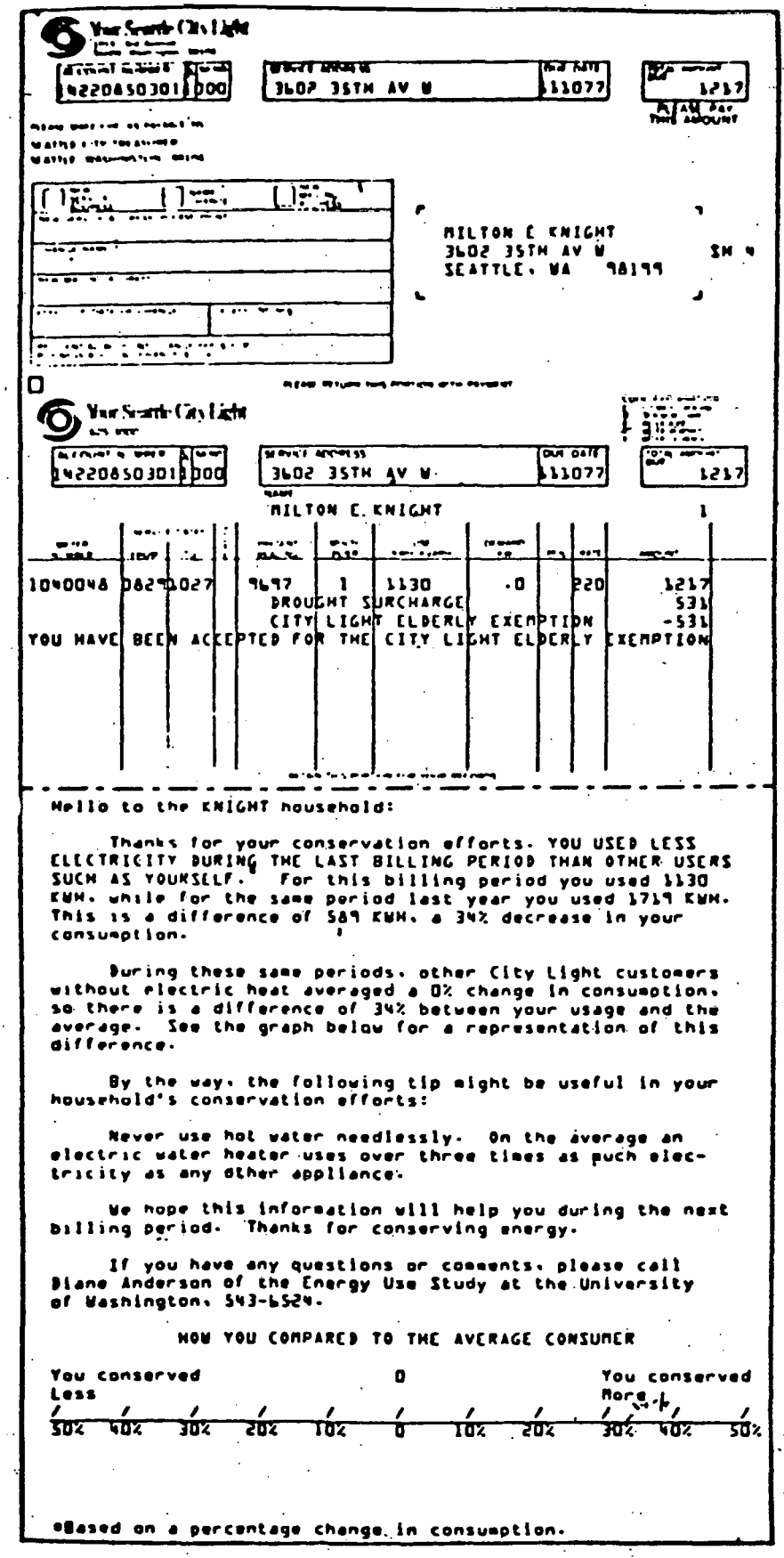
In both the rate-hike and cash rebate studies the Project team thought that the ineffectiveness of "experimental treatments" was due to the very low price of electricity in the Seattle area. Given a price per kwh of about one cent, even substantial changes in rates or in consumption would not change income significantly. For example, the maximum rebate in the second study was about eight dollars per month, and most rebates were well below this level.

Since floor effects severely limited the reward/punishment power of rate changes, the Seattle area seemed to provide a good testing ground for pure information feedback. The purpose of the third study was to determine whether information feedback alone would induce conservation. Two thousand five hundred customers received a special bill for one year. This bill included the traditional Seattle City Light bill and a supplement. This bill and supplement are shown in Figure 9. During the year that this bill was used, the consumption of the experimental customers was compared to that of 2,500 other customers who continued to receive only the traditional bill. The test showed that the informative billing had no reliable effect on conservation.

Half of the experimental customers and half the control customers received an information packet that included a conservation tip brochure, meter reading instructions, and a set

FIGURE 9

Example of Informative Bill, Seattle City Light
Washington Demonstration Project



3602 35TH AV W

MILTON E KNIGHT
3602 35TH AV W
SEATTLE, WA 98199

3602 35TH AV W

MILTON E KNIGHT

1040048	0827	0027	9697	1	1130	.0		220	1217
			DROUGHT SURCHARGE						531
			CITY LIGHT ELDERLY EXEMPTION						-531

YOU HAVE BEEN ACCEPTED FOR THE CITY LIGHT ELDERLY EXEMPTION

Hello to the KNIGHT household:

Thanks for your conservation efforts. YOU USED LESS ELECTRICITY DURING THE LAST BILLING PERIOD THAN OTHER USERS SUCH AS YOURSELF. For this billing period you used 1130 KWH, while for the same period last year you used 1719 KWH. This is a difference of 589 KWH, a 34% decrease in your consumption.

During these same periods, other City Light customers without electric heat averaged a 0% change in consumption, so there is a difference of 34% between your usage and the average. See the graph below for a representation of this difference.

By the way, the following tip might be useful in your household's conservation efforts:

Never use hot water needlessly. On the average an electric water heater uses over three times as much electricity as any other appliance.

We hope this information will help you during the next billing period. Thanks for conserving energy.

If you have any questions or comments, please call Diane Anderson of the Energy Use Study at the University of Washington, 543-6524.

HOW YOU COMPARED TO THE AVERAGE CONSUMER

You conserved Less — 0 — You conserved More

50% 40% 30% 20% 10% 0 10% 20% 30% 40% 50%

*Based on a percentage change in consumption.

of adhesive markers indicating the energy use category (high, medium, low) of various appliances. The markers were to be attached to the appropriate appliances as reminders. However, the study showed that the information packet had no conservation effect.

Immediacy, and high frequency, were thought to play important roles in feedback. The Project thought that perhaps the monthly or bimonthly period of feedback in the studies was too long to allow a detectable effect on customer behavior. In the fourth study, a group of customers had their meters read every day and were notified of their consumption for that day. The daily communication also updated a cumulative record of consumption from the beginning of the study. This treatment lasted 28 days. There were three control groups. One received a daily conservation tip, but no feedback on energy usage. (This was to control for the daily contact incurred by giving the experimental group a daily meter reading.) A second control group received all the information given the first control group, but all at once. At the beginning of the study they were mailed an entire information packet. The last control group received the information packet minus the meter-reading instructions. This study yielded a positive result. The subjects with daily feedback reliably conserved more than the control groups. Furthermore, statistically significant differences between their consumption levels and those of the control groups lasted for at least a year beyond the experimental treatments. (It may have lasted longer, but data were collected for only one year.) Apparently the 28 days of feedback served as an intensive training period. This feedback either established specific conservation habits or enabled customers to realize their ability to control consumption.

The remaining two studies sought to push the frequency of feedback to the limit. Experimental customers were capable of monitoring their level of consumption at the moment of consumption. One study restricted this capability to a special end-use. Monitoring devices were installed in showerheads to

convert water temperature and flow into a digital display showing the energy consumed per shower. The other study allowed general electricity usage to be monitored by way of a digital display device that showed the customer a continuously accumulating kwh total, for the whole household. The display was reset after each 24-hour period. Little can be said at this point about the conservation potential of these devices or of momentary feedback in general. The results obtained came from very few subjects. The data obtained with the showerhead monitors that indicated a positive effect came from only three families; five households and six small businesses were the only subjects in the electricity monitors study.

In general, the results in Washington were disappointing to the Project personnel. The daily meter reading was the only customer communication that had a reliable conservation impact and it was the most labor-intensive and probably the most expensive to implement on a large scale. Moreover, its effect was relatively small (2.6% less electricity used by the daily feedback group). It is questionable whether this method is cost-effective. As mentioned above, the low cost of electricity in the Seattle area made it appear to be a good place to test the impact of customer information on conservation. But if these effects take hold only when customers are first motivated by economic considerations, then the Seattle area may have been a poor site to assess information feedback effects. Since the design and execution of the experiment were apparently sound, it may well be that the inconsequential economic effects were responsible for the Project's results. If true, this conclusion could be important.

SUMMARY

The methods of informing customers were 1) written materials (sent to individual customers), 2) public media, and 3) person-to-person encounters.

Customer fact booklets and brochures were commonly used to introduce customers to the Demonstration Projects. These

written materials were usually hand delivered during interviews of experimental customers. Several Projects also handed out literature at their group presentations or set up displays from which customers could take literature.

Radio, television, and newspapers usually provided a cost effective means of informing customers. Advertisements and notices were important in many of the Projects for announcing such things as peak alerts and rate hearings. Uses of public media ranged in complexity from simple announcements to the production of a magazine on conservation, and a regularly scheduled television show. While news coverage was usually favorable, editorial comments tended to be critical and pessimistic. Future tests might involve giving special attention to educating media personnel about the Project.

Face to face meetings were preferred in most Projects for explaining detailed concepts and for presentations that had to be tailored to individual customers. The relatively large cost of personal interviews usually restricted them to cases where both the recipient and the message were very important: for instance, all customer complaints were dealt with on a one-to-one basis.

CHAPTER FIVE : SUMMARY

INFORMATION CONTENT

The content of the information given to TOU customers was divided into the following areas: 1) administrative communications, 2) explanations of TOU pricing and specific rate structures, 3) load management information, and 4) information on conservation. Communications in these areas were normally developed by the participating utilities, with the advice and approval of regulatory commissions. Some information consultants were hired for this work, but most of it was done by in-house personnel.

A common problem among the Demonstration Projects was deciding how much information to give customers, i.e., should the flow of information be maximized (in order to facilitate other factors as much as possible), or should the information be kept at levels more typical of system-wide programs? Some Projects used high information levels, at least in specific content areas, because they did not want to confuse customers. For example, it was especially important in multi-rate tests that customers did not confuse their assigned rate with that of other customers.

Administrative communications included introductory/orientation material (e.g., goals of the study, who was conducting it, and general method of the study). Some of the topics emphasized were 1) the conservation potential of TOU pricing, 2) the necessity of a smaller-scale test before full implementation of new rates, and 3) the importance of a representative sampling of the service population for such a test. Other administrative information included the starting and ending dates of the test rates, the Project's policy toward customer moves, and the policy regarding customer requests to be taken off of the test rates. When customers in mandatory participation Projects demanded to be taken off experimental rates, it was important

that they understand that mandatory participation was ordered by a governmental body. Dealing with unhappy customers in this respect was very difficult and time consuming. They were told that rates were designed to make real injury to customers highly unlikely, and that savings under the test rates were feasible for almost everyone. When real hardship was apparent and unavoidable, customers were released even when participation was mandatory. The studies could have been jeopardized by legal and political forces set into motion by dissatisfied customers.

A variety of communications resulted from the necessity to explain participation compensations, incentives, bonuses, etc. There was concern in some Projects about what these payments should be called: it was possible for customers to perceive them as eliminating the need to respond to price signals. There was a class of messages that might be called "financial reassurance." These served to guarantee customers that their new rate bill would not exceed their traditional bill if the same number of kwh's was used. Where no guarantee was possible the message informed customers that the design of the rates would leave the "average" customer's bill unchanged even if no load was shifted to off-peak hours.

Customers also needed to be informed about the transition back to traditional billing. Special end-of-project events such as bonus payments and demographic surveys were announced and explained. Some Projects offered customers the option of continuing on the TOU rates, and the terms of this option were also explained.

All Demonstration Projects felt it necessary to give customers an understanding of the rationale of TOU pricing. Much thought and effort went into producing the clearest and simplest explanation of the basic concepts. The fundamental message was that the utility's obligation to meet peak demand required them to operate smaller generators during the peak hours. This caused the cost of generation to increase, because the "peaking" generators were less efficient and used more expensive

fuel than base load generators that ran continuously. Load-curve illustrations often accompanied these explanations. Information about TOU rates included an explanation of the concept of price signals and the need for shifting consumption from peak to off-peak times. The benefit of load-shifting under TOU rates (i.e., increased net efficiency of generation) was stressed in all Projects. Most Projects were careful to empahsize that TOU rates presented an opportunity to lower bills rather than a guarantee of lowered bills.

Specific rate information was usually confined to the rate structure to which the customer was assigned. Customers were not normally told about the other rates being tested.

The role of time in the new rate structures, particularly when there were seasonal or irregular changes in the tariff periods, needed to be explained to customers. Misconceptions and even lack of awareness of rate changes were common, despite these efforts. The conclusion was that reminders of rates or tariff period changes should be issued shortly before such events.

Two questions about end-use needed to be answered in most load management communications: 1) during normal operation how much energy does an appliance use? and 2) how feasible is it to transfer some proportion of the appliance's operation to off-peak hours? A typical way of dealing with the first question was a tabulation of the kwh consumed per unit time or per use for a variety of common appliances. More elaborate tables included the cost of operation per use or unit time, the fraction of the total household consumption for each end-use, and possible changes in the use of these appliances in accordance with the overall end-use mix of the entire household. In answering the second question, Projects typically proposed a variety of common sense strategies. Some Projects estimated the savings that would result from specific consumption shifts.

Most Projects also advised customers to reduce their total kwh consumption by using electricity more efficiently. Customer

communications to this end concerned 1) conservation behavior, 2) conservation investment, and 3) conservation diagnosis.

A great deal of advice was available to customers on conservation behavior connected with space conditioning, food handling, and cleaning. Information on conservation investment included facts about insulation, weatherization, energy-efficient appliances and subsitute methods of space conditioning such as attic fans, warm and cool air storage, and wind turbine ventilators.

For the most part, conservation diagnosis took the form of energy audits. Audits were typically standardized assessments of the conservation-relevant aspects of the customer's home. Some audits were questionnaires which customers filled out. These were probably less reliable than on-site audits, but they did reach a larger proportion of the service population. A very interesting type of audit used in some Pilot Projects involved infra-red imaging of buildings by a technique called "thermography." Both individual home audits and aerial surveys of attic insulation capacity were carried out through this method.

In the Springfield Pilot Project appliance submetering was a valuable educational aid to a substantial number of customers, who were often surprised to learn how much of their total bill was attributable to an electric water heater or a frost-free refrigerator.

METHODS OF DISSEMINATION

Three methods of informing customers were used in the Projects: 1) written material (sent to individual customers), 2) public media, and 3) person-to-person encounters.

Customer fact booklets and brochures were commonly used to introduce customers to the Demonstration Projects. Most Projects also used special mailings discussing administrative business, recruitment of replacement customers, collection of demographic data, and conservation information. Other forms of written

communication were bill inserts and extra material printed on bills. Bill inserts were very widely used. As a rule, they were found to be more economical than special mailings, but on a large scale they were costly and time consuming. Some Projects did not use them for these reasons.

In many Demonstration Projects, written information was hand delivered during interviews of experimental customers. Several Projects also handed out literature at their group presentations, or set up displays from which customers could take literature.

In areas where mass media audiences were large, radio, television, and newspapers were a cost effective means of informing customers. Advertisements and notices were important to many of the Projects for announcements of peak alerts, and of rate hearings, and in alerting the public to other communications.

The uses of public media ranged in complexity from simple announcements to the production of a magazine on conservation by one Project, and the broadcast of a regularly scheduled television show by another. Most media found the Projects newsworthy and initiated their own coverage. Many Projects issued press releases or held press conferences. News coverage was usually favorable and informative. However, some Projects feared that test results might be distorted by excessive media interest in test customers, and sought to control media access to them. When the Projects actively participated in their own news coverage, especially in interviews and talk shows the usual result was a clear, interactive discussion of their goals, methods, resources, etc. Both Project and media personnel seem to have been satisfied with the results of these collaborations.

While news coverage tended to be favorable, editorial comment tended to be critical and pessimistic.

Face to face encounter was preferred in most Projects for explaining the more detailed concepts, and for presentations that had to be tailored to individual customers. The relatively large cost of personal interviews usually restricted them to

cases in which both the recipient and the message were critically important. All customer complaints and inquiries were dealt with on a one-to-one basis. Some Projects reported that the specially designated personnel handling these affairs were indispensable to the customer education program.

Presentations to groups were more flexible and interactive than written material or broadcasts, and cost less per customer contact than individual interviews. Projects using them found them to be successful, popular, and particularly valuable in informing customers about home insulation. One application of the group presentation technique that often involved a one-to-one interaction with customers was public display of aerial thermograms.

The Springfield Pilot Project made a large scale, apparently successful, effort to inform customers about conservation. The Project offered energy audits and advice on insulation, mailed information packets, provided appliance submetering, conducted aerial thermography and displayed the results, made intensive use of electronic media (including production of their own TV show), developed and distributed many brochures, and operated a mobile conservation display facility visited by tens of thousands of people. The Project made numerous individual and group contacts concerning many conservation topics.

The Washington Demonstration Project was an experimental study of the effects of information to customers on conservation behavior. Rate increases, cash rebates, detailed information on bills, and the frequency of consumption feedback were studied as stimuli to conservation of electricity. Only one experimental study, daily feedback of kwh usage, produced a significant and lasting effect. The other treatments were probably ineffective because of the very low cost of electricity in the test area.

APPENDIX 1

Customer Fact Booklets:
North Carolina and Los Angeles

FIGURE 1A

Customer Fact Booklet, "Peak Load Pricing Research Handbook, Blue Ridge Electric Membership Corporation, North Carloina Project

Blue Ridge Electric

Membership Corporation

Peak Load Pricing

Research

Handbook

I. WHY RESEARCH

Your Cooperative feels a very deep commitment to and responsibility for participating in all necessary research which will lead to two things:

(1) An assured supply of electric energy, now and in the future, for its members.

(2) Doing all things possible which will keep the electric rates to the members of Blue Ridge Electric as low as possible.

There are many ways to meet these two objectives. One such way is to study different types of pricing structures of electricity which can have the effect of more efficiently using the electric facilities your Cooperative has. Therefore, your Cooperative has entered into an agreement with the North Carolina Utilities Commission and the Federal Energy Administration to study, for one year, the use of "peak load rates" (also known as "time of day rates.")

II. PEAK LOAD RATES

The term "peak load rates" means that electricity used during certain periods of the day will be priced differently from electricity used at other times of the day. This is because the cost to your Cooperative, now and in the future, for electricity is different for different usage times. As an example for the need of peak load pricing rates, on page 6 is a drawing of a typical daily usage curve for electricity by Blue Ridge Electric members.

Blue Ridge Electric must furnish the necessary electric facilities to provide electricity at the highest usage at any one time during the day or year. Because of this, much of the time our electric facilities are not being efficiently used. (It's sort of like buying a very expensive car to drive to church one time a week—that just isn't a very financially feasible plan.) In order for your Cooperative to make more effective use of its electric facilities, and thus save you and the Cooperative money, we are conducting this experiment.

III. EXACTLY HOW THE EXPERIMENT WILL WORK

All participants on the experiment will be from the residential classification. Approximately 100 will be on the rate for one year; and approximately 100 in a "control" group (it is necessary to have a controlled group that very closely resembles the makeup of the test group so that the actual changes in usage pattern can be monitored. These members in the control group will have the recording device meters on their homes but their rates will remain the same as all other members of the cooperative. They will not be on peak load pricing.)

A. There will be a two and three part rate by time of day, based on kilowatt hours with a seasonal rate (winter/summer) (see rate detail, page 9). There will be a survey of all members on the rate and control group before the rate actually begins, and a survey at the end of the experiment. There will also be an industrial, commercial, and residential consumer questionnaire survey (even though industrial and commercial accounts will not be placed on the rate for this experiment, there will be a survey with them to determine what their reaction would be to peak load pricing, should it occur in the future). It will be a 24-month study with three months for testing the equipment and collection of data; a 12-month period when the rates will actually be charged; and following this a 9-month period for analysis of the experiment.

B. Why a non-voluntary program? The purpose of this experiment is to determine what would be the reaction of all of the residential members of Blue Ridge Electric should, at some time in the future, it be necessary for us to go to peak load pricing for all of our residential members. If the experiment were to be done with just volunteers, this would give distorted results as to what the reaction would be from all of our members sometime in the future, because only those people who know a great deal about peak load pricing and knew that their lifestyles would fit very easily into the peak load pricing experiment would volunteer. But, in order to make this sampling accurate, we

needed to have a good cross section of all of the residential members of Blue Ridge Electric.

IV. SELECTION METHOD OF PARTICIPANTS

The method of selection of participants in the FEA Peak Load Pricing Experiment was done by what is called scientific random sampling. This means that all residential members of Blue Ridge Electric had equal chance of being a participant in this program. Your name was selected on a pure random basis as conducted by the Research Triangle Institute of Durham, N. C.

V. ACTUAL RATES

On page 9 are the rates which you will be on for a period of one year beginning October 1, 1977.

Electric Rate

SCHEDULE RX - RESIDENTIAL

EXPERIMENTAL TIME-OF-DAY RATE

Availability:

This schedule is applicable to only those residential consumers who are randomly selected to participate in the time-of-day rate experiment developed under F.E.A. Contract No. CA-04-60643-00, between The Federal Energy Administration and the North Carolina Utilities Commission.

Monthly Rate:

Winter Season - November 1 - April 30

Time Periods (All Days)	Rate
7:00 A. M. - 12:00 A. M. and 5:00 P. M. - 8:00 P. M.	4.62¢ per KWH
12:00 A. M. - 5:00 P. M. and 8:00 P. M. - 11 P. M.	2.28¢ per KWH
11:00 P. M. - 7:00 A. M.	1.23¢ per KWH

Summer Season - May 1 - October 31

Time Periods (All Days)	
7:00 A. M. - 11:00 P. M.	2.44¢ per KWH
11:00 P. M. - 7:00 A. M.	1.18¢ per KWH

Basic Consumer Charge:

$6.10 per month . (This is in addition to the above KWH charges.)

Minimum Bill:

The minimum monthly bill shall be $6.10 (the basic consumer charge.)

Power Cost Adjustment:

Any fuel cost adjustment or change in the base rate for power purchased from our power supplier shall be reflected as an increase or decrease on a percentage of revenue basis on all power sold under this schedule.

Other:

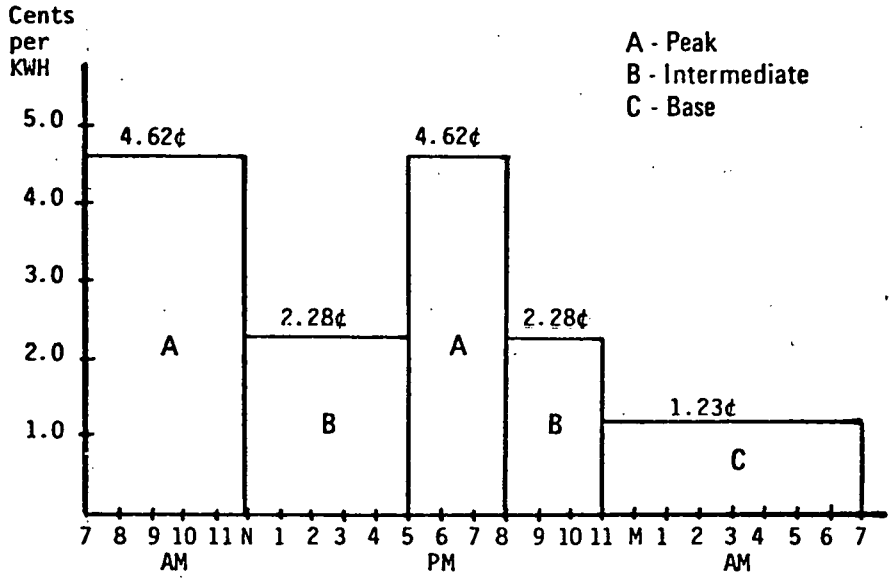
All other terms and conditions of our regular Schedule R (Residential) Rate shall be applicable to consumers served on this rate.

Adopted by Blue Ridge Electric Membership Corporation
Board of Directors February 26, 1977

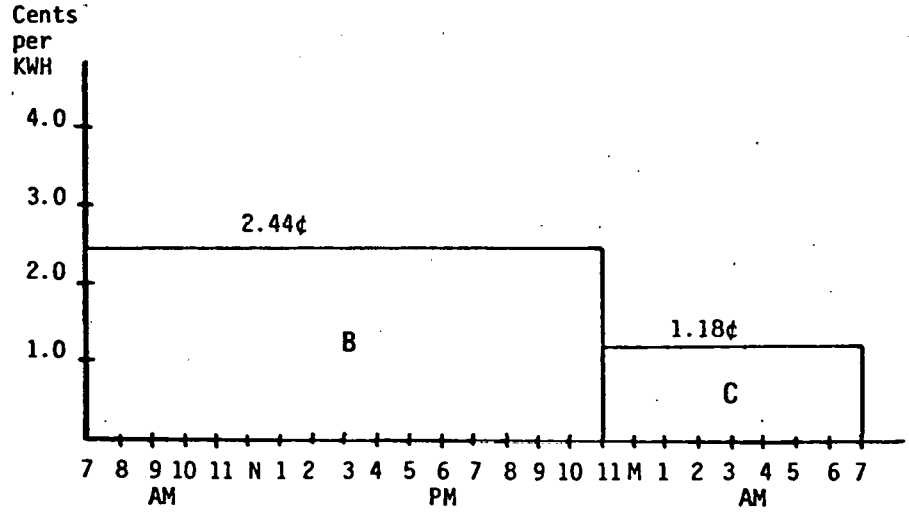
BLUE RIDGE ELECTRIC MEMBERSHIP CORPORATION

EXPERIMENTAL TIME OF DAY RATE

SCHEDULE RX - RESIDENTIAL



WINTER SEASON - November 1 - April 30



SUMMER SEASON - May 1 - October 31

As you can tell, during the winter season, there are three different rates which will be in effect every day. The peak load rate, 4.62¢; the intermediate rate, 2.28¢; and the base, 1.23¢. This reflects the actual projected cost of service for these time periods. In the summer season, there are two rates—an intermediate rate of 2.44¢; and the base rate of 1.18¢. These rates have been designed to offer you an opportunity to actually lower your electric service bill if you are willing to make some minor adjustments in your usage pattern of energy (you will be furnished a booklet containing many helpful suggestions as to how you can conserve energy with this or any other rate which can help keep the cost of your electricity below what it otherwise would be.)

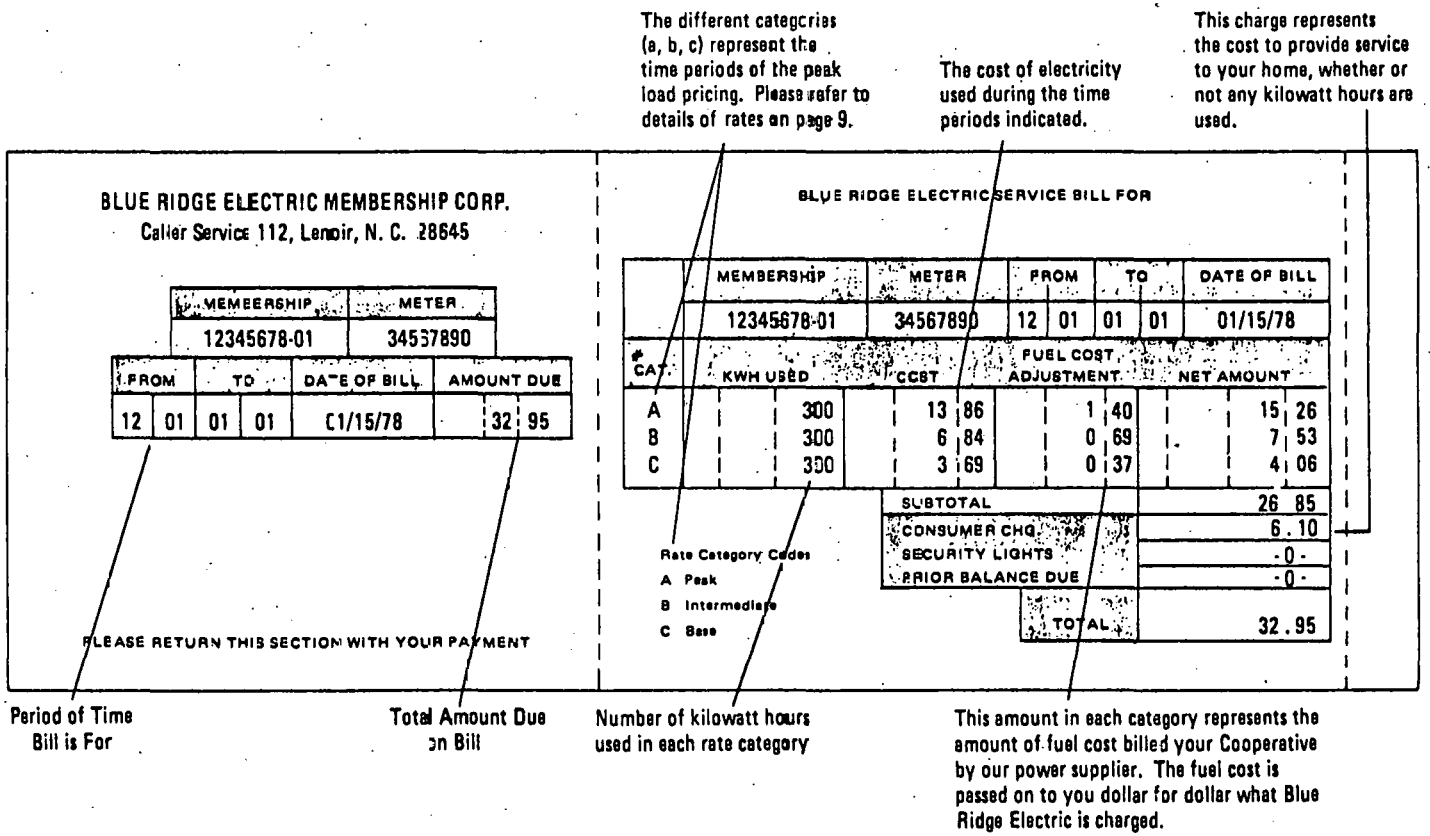
These rates have been approved by your Board of Directors and have been reviewed by the N. C. Utilities Commission to make certain that these rates are not discriminatory to the consumers who are participating in the project.

VI. BILLS

The bills that you will be receiving during this one-year time period are different from the bills that you have been receiving from Blue Ridge Electric.

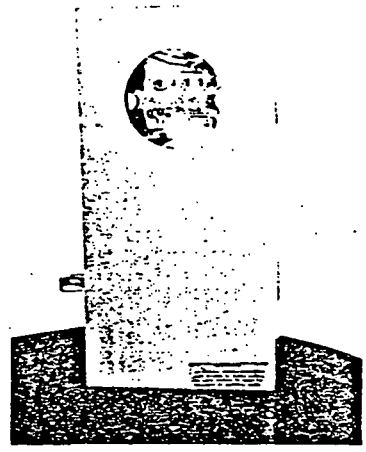
VII. METHOD OF PAYING BILL

You will be billed monthly for your electric usage.


The different categories (a, b, c) represent the time periods of the peak load pricing. Please refer to details of rates on page 9.
The cost of electricity used during the time periods indicated.
This charge represents the cost to provide service to your home, whether or not any kilowatt hours are used.
BLUE RIDGE ELECTRIC MEMBERSHIP CORP.
Caller Service 112, Lenoir, N. C. 28645
MEMBERSHIP
METER
12345678-01
34567890
FROM
TO
DATE OF BILL
AMOUNT DUE
12 01 01 01
01/15/78
32 95
PLEASE RETURN THIS SECTION WITH YOUR PAYMENT
BLUE RIDGE ELECTRIC SERVICE BILL FOR
MEMBERSHIP
METER
FROM
TO
DATE OF BILL
12345678-01
34567890
12 01 01 01
01/15/78
CAT.
KWH USED
COST
FUEL COST ADJUSTMENT
NET AMOUNT
A 300 13 86 1 40 15 26
B 300 6 84 0 69 7 53
C 300 3 69 0 37 4 06
SUBTOTAL 26 85
CONSUMER CHG. 6.10
SECURITY LIGHTS -0-
PRIOR BALANCE DUE -0-
TOTAL 32.95
Rate Category Codes
A Peak
B Intermediate
C Base
Period of Time Bill is For
Total Amount Due on Bill
Number of kilowatt hours used in each rate category
This amount in each category represents the amount of fuel cost billed your Cooperative by our power supplier. The fuel cost is passed on to you dollar for dollar what Blue Ridge Electric is charged.

VIII. DIFFERENT METER

The meter which is used to record your electric usage on the experiment is different from the meter that has been used by you previously.



This meter records all of the KWH used and also has a tape recording device with the meter which records the number of kilowatt hours you use during different periods of time during the day (in case there is an outage, your meter contains a "power pack" which will keep the clock in your meter recording, very accurately, the time of day any KWH are used).

IX. WHAT BLUE RIDGE ELECTRIC HOPES TO LEARN FROM THIS EXPERIMENT

As we mentioned earlier, Blue Ridge is interested in experimenting with peak load rates to accomplish two basic objectives:

(1) To assure an adequate supply of electricity for its members, now and in the future.

(2) To keep the cost of electricity to its members as low as possible.

These are our two overall objectives of this and other research; however, there are several other things that Blue Ridge hopes to learn from this experiment:

(1) To determine the system electricity needs and possible changes in these needs as a result of this experiment.

(2) To evaluate the communications necessary for understanding of a time-based electric rate.

(3) To estimate the potential future percentage changes in generation and distribution (plant) needed to supply electricity to the EMC members.

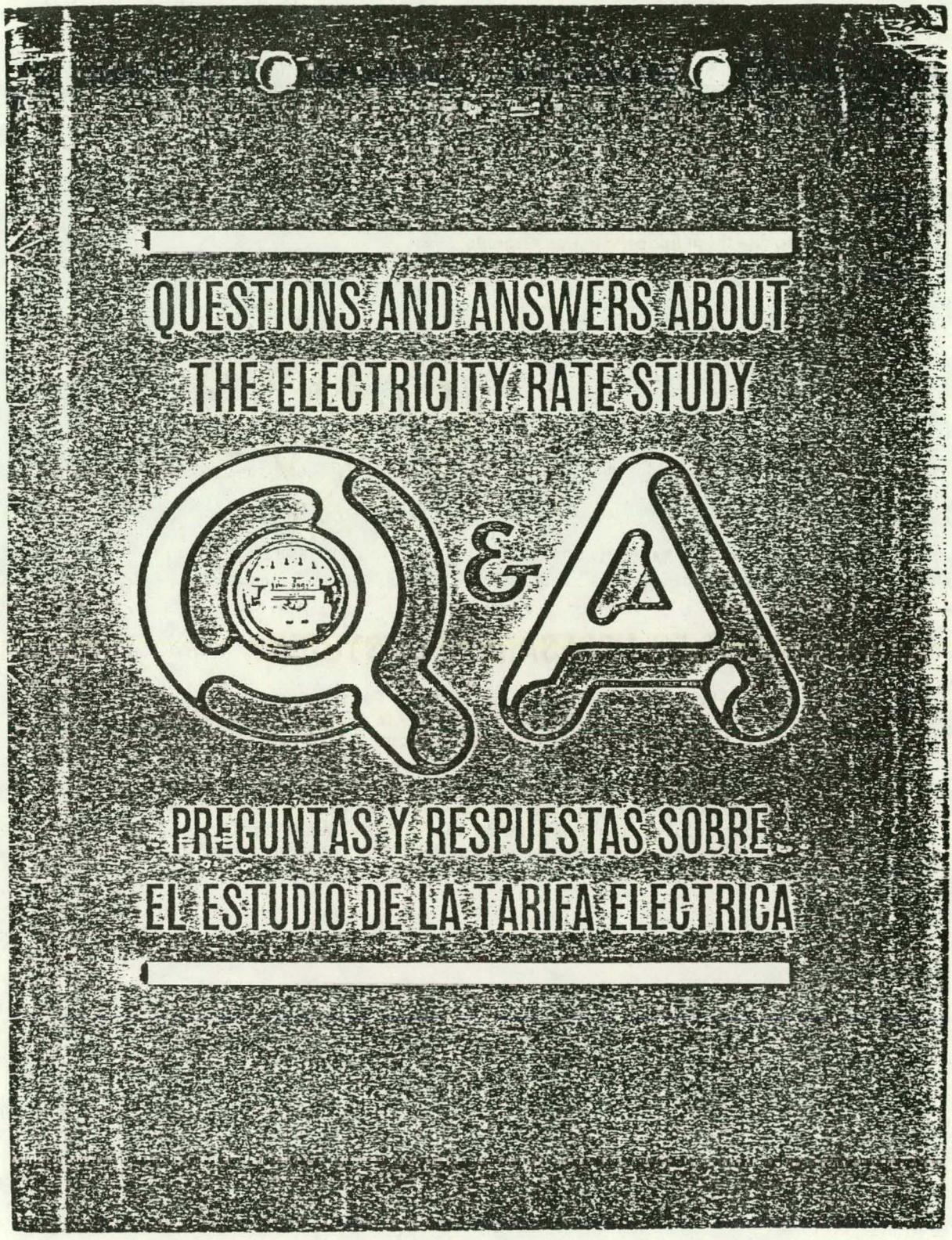
(4) To determine the cost and benefits of time based rate within certain residential classifications.

(5) To determine potential changes in electricity bills by income classes among the Electric Membership Corporation's residential members.

If you, now or at any time during the course of the experiment, have any questions pertaining to the experiment, please contact your Member Relations Director in your district, who will be happy to talk with you about any questions or concerns which you may have.

FIGURE 1B

Customer Fact Booklet, "Questions and Answers About the Electricity Rate Study", Los Angeles Project.



WHY IS THIS STUDY NEEDED?

No one is happy with his or her electricity bill. Everybody seems to be paying more for electricity than they would like to pay, but no one is sure what can be done about it.

Recently, some ideas have come up for changing the method of pricing electricity so that people can pay less for electricity during the times of the day or year when it is more economical to supply and pay more when the electricity costs more to supply. These ideas look good and people want to see them adopted in Los Angeles.

POR QUE ES NECESARIO EL ESTUDIO?

Nadie está feliz con su cuenta de la electricidad. Todos ven que están pagando más por electricidad de lo que realmente quisieran, pero nadie está seguro sobre qué se puede hacer al respecto.

Recientemente han surgido algunas ideas para cambiar los métodos de fijar precio a la electricidad de manera que el público pueda pagar menos durante el tiempo del día o del año en que resulta mas económico el abastecimiento, y pagar mas, cuando cuesta más el suministro eléctrico. Estas ideas parecen buenas y al público le gustaría verlas aplicadas en Los Angeles.

WILL THE NEW METHODS OF PRICING ACHIEVE THEIR OBJECTIVES?

It is only with your help that we can answer that question.

We need to know the *facts* about how households use electricity in order to judge whether the new pricing principles will be a good idea for Los Angeles. We are inviting your household to join us in a trial of new electricity rates that will, we hope, encourage the domestic customer to buy electricity more economically, both for himself (or herself) as well as for the electricity system.

That is why we at the Department of Water and Power have invited your cooperation in the Electricity Rate Study we are conducting along with the Rand Corporation and the Federal Energy Administration. We want you to help us try these new rates so we can decide together whether they are a good idea or not.

PODRAN LOS NUEVOS METODOS DE PRECIOS LOGRAR SUS OBJETIVOS?

Es solamente con su ayuda que podremos responder la pregunta.

Tenemos que saber las *verdades* sobre la forma en que se usa la electricidad en las casas para poder juzgar si los nuevos principios sobre precios son una buena idea para Los Angeles. Su casa está siendo invitada para que se una a nosotros en el juicio de las nuevas tarifas eléctricas que, segun esperamos, podrían animar a los clientes domésticos a comprar la electricidad mas economizante para ambos, (él o ella) asi como para el propio sistema eléctrico.

Es por eso que nosotros en el Departamento de Agua y Electricidad hemos solicitado su cooperción en el Estudio de la Tarifa Eléctrica que estamos realizando conjuntamente con la Corporación Rand y la Administración Federal de Energía.

Queremos que usted nos ayude a intentar estas nuevas tarifas de manera que podamos decidir en conjunto si realmente es una buena idea, o nó lo es.

HOW DOES THE STUDY WORK?

Specially-selected households will be offered a trial electricity rate in place of their present rate. Households that join the Study will pay for electricity according to the new rate for 30 months. During that time, we will collect information about how much electricity is used — by time of day, week month, and year. Participating households will be interviewed during the Study in order to record factual data about the family that may affect energy use. This information will be used for a statistical analysis to help judge if the new pricing methods will benefit Los Angeles customers. People's opinions are important, too, so we will need to find out what households think of the new electricity rate they try.

COMO TRABAJARA EL ESTUDIO?

Casas especialmente seleccionadas, recibirán la oferta de la tarifa eléctrica experimental para sustituir la que actualmente pagan. Las casas que se unan al estudio pagarán por la electricidad de acuerdo a esa nueva tarifa durante 30 meses. En ese tiempo estaremos reuniendo información sobre cuánta electricidad se consume — durante el día, la semana, el mes y el año. Las familias participantes serán interrogadas durante el Estudio para poder registrar los datos exactos de las mismas que pudieran afectar el uso de la energía. Esta información será utilizada en analisis estadísticos que ayuden a juzgar si los nuevos métodos de precios beneficiarán a los clientes de Los Angeles. Las opiniones de las personas son importantes también, así que tendremos que descubrir qué piensan las familias acerca de la nueva tarifa eléctrica que están ensayando.

WHY CHOOSE ME?

Your household was especially chosen to participate in this study because you can help represent electricity use in Los Angeles. Using information from the United States Census, we first selected 600 neighborhoods in the City to represent all types of differences in climate, housing, kinds of appliances people have, income of residents, and so forth. To make the results of the study statistically sound, we then asked a computer to choose households for this study at random from the neighborhoods, taking into account your current electricity use. You are one of 2000-specially selected Department of Water and Power customers and, as such, the information you provide us is very important to the statistical results.

POR QUE ME SELECCIONAN?

Su casa ha sido especialmente seleccionada para participar en el Estudio porque usted puede ayudar en la representación del uso de la electricidad en Los Angeles. Utilizando información del Censo de los Estados Unidos, primero seleccionamos 600 barriadas de la Ciudad que representen todos los tipos de diferencias en clima, vivienda, tipo de utensilios eléctricos que poseen, ganancias de los residentes y, así por el estilo. Para lograr que los resultados del estudio sean estadisticamente justos, pedimos despues a la computadora que seleccione al azar, a las familias para éste estudio entre las barriadas, tomando en cuenta el uso actual de la electricidad. Usted ha sido uno de los 2000 clientes del Departamento de Agua y Electricidad especialmente seleccionados y la información que nos facilite es muy importante para los resultados estadísticos.

WHAT KINDS OF NEW ELECTRICITY RATES ARE BEING TRIED?

There are several different rates under consideration. The study is looking at methods that charge more for electricity during some hours of the day and less at other hours. Other trial rates charge more on weekdays and less on weekends. Still others charge more for electricity during some months of the year and reduce the rate in other months. For statistical reasons, we also let some of the higher rates apply to short periods of time (as short as 3 hours of the day) and others of the trial rates apply to long periods (as long as 12 hours). In all, there are 41 different trial electricity rates under study for this project so that we can select the best combination for Los Angeles customers.

The precise electricity rate offered to your household is described in the *Rules of Operation* attached to your *Enrollment Agreement.*

QUE CLASE DE NUEVAS TARIFAS ELECTRICAS SE INTENTAN?

Hay muchas tarifas de diversos tipos bajo consideración. El estudio está buscando los metodos de cobrar más por la electricidad durante ciertas horas del dia y menos en otros horarios. Otras tarifas en examen cobran más en dias laborables y menos en los fines de semanas. Y, en otros casos, se cobra más por la electricidad durante algunos meses del año y reduce los precios en otros meses. Por razones estadisticas, también permitimos que las tarifas mas altas apliquen a breves espacios de tiempo, (como tres horas al día) y otros de tarifas experimentales aplican a largos periodos, (hasta doce horas). En total, existen 41 tarifas eléctricas experimentales bajo estudio para éste proyecto, de manera que podamos seleccionar la mejor combinación para los consumidores de Los Angeles.

La exacta escala de precios ofrecida a su casa esta descrita en las *Reglas de Operación* adjunta a su *Convenio de Alistamiento.*

HAS THIS EVER BEEN TRIED BEFORE?

Yes, but not in the United States. Several European countries — where all forms of energy have been scarcer and more expensive for a number of years — have used these new electricity rates for some time. The idea has worked well there and many households have chosen to stay on the new rates in preference to the conventional electricity charges. Of course, long distance telephone rates in the United States have used this sort of pricing principle for many years.

But we want to be sure it is a good idea for Los Angeles before we make an important change in electricity rates. After all, the climate here is different from the climate in other countries where this has been tried. So are the appliances people use, and their general energy habits. That is why we are asking for your help in a test of these new rates for Los Angeles.

SE HA INTENTADO ESTO ANTERIORMENTE?

Sí, pero no en los Estados Unidos. Numerosos países Europeos, donde por años todas las formas de energía han sido escasas y costosas, han empleado durante algun tiempo estas nuevas tarifas eléctricas. La idea ha trabajado bien por allá y muchos consumidores han decidido mantenerse en las nuevas tarifas en vez de seguir con las cuotas convencionales de la electricidad. Por supuesto, las tarifas telefónicas de larga distancia en Estados Unidos han usado esta forma de precios por muchos años.

Pero queremos estar seguros de que es una buena idea para Los Angeles antes de hacer un importante cambio en la tarifa eléctrica. Despues de todo, el clima aquí es diferente al de otros paises donde esto se ha intentado. Al igual que los artefactos eléctricos que la gente usa y los hábitos generales de energia. Es por ello que le estamos pidiendo su ayudà en el experimento de la nueva tarifa para Los Angeles.

CAN I CHOOSE THE RATE PLAN THAT I WANT?

Unfortunately, no. In order to make the study a valid test of customer reaction, each household can be offered only one trial electricity rate. If you choose not to join the study and not to accept the trial rate, then you will continue tc be billed for electricity on the same basis as all other residential customers in Los Angeles.

PUEDO SELECCIONAR EL PLAN DE PRECIOS QUE YO QUIERA?

Desafortunadamente nó. Para poder hacer del estudio un examen válido de la reacción del cliente, cada casa recibirá solamente una tarifa experimental de electricidad. Si usted prefiere rechazar el estudio y no aceptar la tarifa de prueba, se le seguirá cobrando por la electricidad al mismo nivel que los demas residentes de Los Angeles.

WILL MY ELECTRICITY BILL GO UP?

On average, from research data on the use of electricity in the home, we have calculated that most of the 41 different electricity rates under study will not cause a household's electricity bill to go up. Of course, you may possibly be using your electricity in some very different way from most other households, and at first it could work out to be a lot more expensive or much cheaper for you. You do have the opportunity of changing your habits of usage — if it's not too inconvenient — to take advantage of the new methods of pricing and reduce what you pay for electricity. In fact, this is what the trial is all about.

For a few of the experimental electricity rates, however, we know that the average household's bill would go up. For households being offered these rates, we offer a special cash participation payment to make up the loss.

If you choose to participate in the study, we will keep your electricity rate constant for the duration of the study, and exempt you from the fuel adjustment charge that other customers pay for the entire 30-month period. Since you could otherwise expect your electricity bill to go up due to normal rate increases during this time, this guarantee against adjustments is an increasingly attractive benefit the longer you stay in the study.

PODRA SUBIR MI CUENTA DE ELECTRICIDAD?

De acuerdo con los datos investigativos del uso de la electricidad en el hogar, hemos calculado, en promedio, que de la mayoria de 41 diferentes tarifas electricas bajo estudio, estas no causarán un alza en la cuenta de los consumidores. Por su puesto, es posible que usted haga uso de la electricidad en forma variada y distinta a la de otros clientes y, en principio, podría resultar mas costosa o mas barata para usted. Si no resulta inconveniente, tiene la ventaja de cambiar sus hábitos de uso para sacar ventaja de los nuevos métodos de precios y reducir lo que paga por la electricidad. Despues de todo: esto es lo que se propone el experimento.

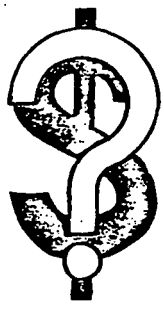
Sabemos, sin embargo, que en una cuantas de las tarifas experimentales la cuenta promedio del consumidor podria subir. Para los que tengan estas tarifas, ofrecemos un sistema especial de pagos en efectivo a fin de que los participantes pueden obtener alivios en sus pérdidas.

Si usted prefiere participar en el estudio, mantendremos su tarifa eléctrica constante durante la duración del mismo y exenta del cargo de ajuste de combustible que otros clientes pagan, durante el periodo completo de 30 meses.

Si usted es de los que esperan que su cuenta de electricidad suba durante los aumentos normales de las tarifas en ese tiempo, ésta garantía contra los ajustes es un atractivo beneficio que se prolongará todo el tiempo que usted permanezca en el estudio.

WHAT IS THE PARTICIPATION PAYMENT?

The participation payment is a cash payment to the few households whose electricity bills can be expected to rise under the experiment. It is determined by the amount the household would pay, on the average, under its trial rate minus the amount the household pays under its present electricity rate. The calculation is based on the individual household's usage of electricity over a 12-month period preceding the study. The amount of participation payment for your household — if one is needed — is explained in the *Rules of Operation* along with a description of your experimental electricity rate.



The amount of the participation payment is determined before the trial begins, and it will not change during the study. The payment is made every three months as long as the households remain in the study. Of course, households receiving the payment can use the money for whatever purpose they wish. If households take steps to lower their electricity bills, the participation payment will still be made.

CUAL ES EL PAGO DE PARTICIPACION?

El pago de participación es un pago en efectivo a los pocos consumidores cuyas cuentas de la electricidad es posible que suban durante el experimento. Se determina por la cantidad que el cliente podría pagar, en promedio, bajo esta escala, restando la cantidad que pagaría bajo la presente tarifa eléctrica. El cálculo está basado en el uso individual del consumidor en los doce meses anteriores al estudio. La cantidad del pago de participación para su casa, si alguno fuera necesario, está explicado en las *Reglas de Operación* junto a la descripción de su tarifa experimental eléctrica.

La cantidad de pago de participación es determinada antes de comenzar el proceso y no cambiará durante el estudio. El pago se hara cada tres mese mientras las participantes permanezcan en el estudio. Por su puesto, los participantes que reciban pagos podrán usar el dinero en el propósito que quieran. Si los consumidores toman medidas para reducir sus gastos de electricidad el pago de participación seguirá haciendose.

WHAT IF I HAVE A QUESTION ABOUT MY BILL OR ABOUT THE STUDY?

Special people have been assigned by the Department of Water and Power to help households in the study. If you have a question, contact

Mr. Dane Hooper
Electricity Rate Study
111 N. Hope, Room 1116
P.O. Box 111
Los Angeles, Calif. 90051
(213) 481-5800 or 482-8290

He will answer any questions you have about your bill, the study, or other matters related to electricity use.

QUE HAY SI TENGO ALGUNA PREGUNTA SOBRE EL ESTUDIO O MI CUENTA?

Personal especializado ha sido asignado por el Departamento de Agua y Electricidad para ayudar a los participantes en el estudio. Si usted tiene alguna pregunta, comuníquese con el Sr.

Sr. Dane Hooper
El Estudio de la Tarifa Eléctrica
111 N. Hope, Cuarto 1116
P.O. Box 111
Los Angeles, Calif. 90051
(213) 481-5800 o 482-8290

El le responderá cualquier pregunta que usted tenga sobre su cuenta, sobre el estudio o cualquier otra cuestión relacionada con el uso de la electricidad.

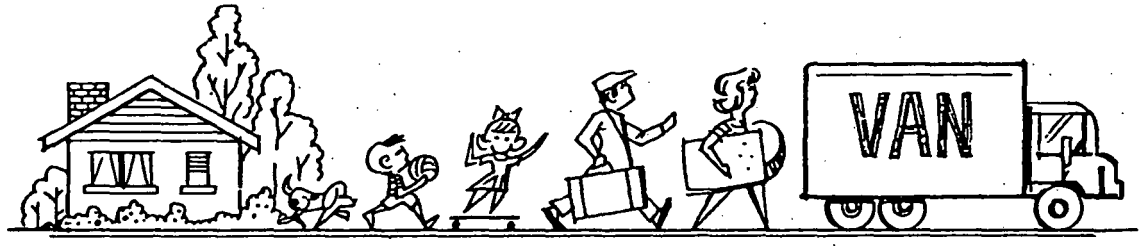
WHAT IF I MOVE?

If you move within the City of Los Angeles, the trial electricity rate will move with you under most circumstances. The only exceptions involve cases if you move to a mastered-metered building where you don't pay for your own electricity or if members of the household move into separate homes. See section IV of your *Rules of Operation* for details. If you plan a move, contact Mr. Hooper as soon as possible so that your meter and participation payment, if needed, can be transferred to the new address without interruption.

QUE PASA SI ME MUDO?

Si usted se muda dentro de la Ciudad de Los Angeles, el experimento de la tarifa eléctrica se moverá con usted bajo la mayoría de las circunstancias. Las únicas excepciones envuelven casos relacionados con traslados a edificios con medidores-maestros donde usted no tiene que pagar por la electricidad, o si los miembros de una casa se mudan a diferentes hogares. Vea la seccion IV de sus *Reglas de Operación* para mas detalles.

Si tiene pensado mudarse comuniquese can el Sr. Hooper tan pronto como sea posible para que su medidor, asi como su pago de participación, si fuera necesario, puedan ser transferidos a su nueva dirección sin interrupción alguna.



WHAT IF I WANT TO LEAVE THE STUDY?

Anyone who wishes to do so, may withdraw his or her household from the Electricity Rate Study at any point by contacting Mr. Hooper above. If you wish to leave the study, you will return to the standard elecricity rate that applies when you terminate.

However, it will generally not be in your financial interest to withdraw. The rates are designed so that most households will receive bills no higher than they would otherwise pay.

Further, by withdrawing from the study, a household will no longer have the benefit of exemption from the fuel adjustment charge and other rate increases.

QUE PASA SI QUIERO ABANDONAR EL ESTUDIO?

Cualqulera que desee hacerlo puede retirarse del estudio de tarifa eléctrica en cualquier momento mediante comunicación con el señor Hooper. Si usted desea abandonar el estudio volverá a recibir la tarifa normal de electricidad que pagaba anteriormente, o la que se halle en vigor al terminar usted el estudio.

No obstante, no será generalmente para su beneficio financiero que se retire del estudio. Las tarifas han sido designadas de forma que la mayoría de los participantes recibirán cuentas no mayores a las que tendrían que pagar de otra forma.

Ademas de eso, al retirarse del estudio, el participante no continuará recibiendo la excepción de beneficios del ajuste de precios de combustible y los aumentos de las tarifas.

WHAT HAPPENS WHEN THE STUDY ENDS?

The study runs for 30 months. At the end of that period, households will resume paying for electricity under normal electricity rates that apply at that time.

QUE SUCEDE CUANDO TERMINA EL ESTUDIO?

El estudio funcionara 30 meses. Al final de ese periodo de tiempo, el participante volverá a pagar por el uso de la electricidad de acuerdo a las tarifas normales que estén en vigor para esa fecha.

TIME-OF-DAY HANDBOOK

HOW CAN I SAVE MONEY WITH MY NEW ELECTRICAL RATE?

The purpose of the study is to see how well households can adapt to these new methods of pricing electricity. Your trial electricity rate gives you an opportunity to lower your electricity bill by taking advantage of times when it is cheaper to supply electricity. Obviously, each household's success will depend on particular facts about their current use of energy, which appliance they have, and other factors.

However, there are some general hints that will help most people save money with their trial rates. You can probably think of some other things that will work especially well for your household. The most important thing is to *think* about the *time of the day* when electricity is being used.

IN GENERAL...

For all households, the most effective way to save money is by reducing the use of electricity during the PEAK CHARGE HOURS, listed in your *Rules of Operation*. This can include *shifting* optional uses of electricity to other hours and *watching carefully* other uses of electricity during peak charge hours. Some households will find it helpful to use *timers* to help control appliance use during peak charge hours. Here are some examples of each kind of change that can help you save money.

COMO PUEDO AHORRAR DINERO CON MI NUEVA TARIFA ELECTRICA?

El propósito del estudio es ver si el consumidor puede adaptarse a estos nuevos métodos en las tarifas eléctricas. Su precio experimental le dará oportunidad para reducir su cuenta de energía eléctrica al tomar ventaja de los momentos en que resulta mas económico suministrar electricidad. Obviamente, el éxito de cada consumidor dependerá de factores particulares, como la forma en que usa la energía, los utensilios eléctricos que posee y otras causas.

Sin embargo, hay algunas sugerencias generales que ayudarán a muchas personas al ahorro de dinero con sus nuevas tarifas experimentales. Usted posiblemente pensará en otras cosas que funcionarán bien para su casa. Lo mas importante es *pensar* las horas del dia en que la electricidad está siendo usada.

EN GENERAL...

Para todos, la forma mas efectiva de ahorrar dinero es reduciendo el uso de electricidad durante las HORAS DE MAYOR COSTO, señaladas en sus

REGLAS DE OPERACION. Esto puede incluir el cambio del uso opcional de electricidad hacia otras horas y, *vigilar cuidadosamente* otros usos de la electricidad durante las horas de mayor recargo. Algunos consumidores hallarán valioso y útil hacer uso de *medidores de tiempo* para ayudarse a controlar el uso de utensilios eléctricos durante las horas de mayor pago en el consumo. He aquí algunos ejemplos de los diversos cambios que pueden ayudarle a salvar dinero.

SHIFTING OPTIONAL USES

The average household uses a significant amount of electricity for tasks that might be shifted to OFF PEAK hours of the day. If convenient, shifting these uses of electricity from PEAK CHARGE hours to OFF PEAK will lower your electricity bill.

- **LAUNDRY** — save washing and drying for OFF PEAK hours.
- **DISHWASHER** — as much as possible use it in OFF PEAK hours.
- **CLEANING** — In running the vacuum cleaner and other household appliances, *avoid* PEAK CHARGE hours as much as possible.
- **COOKING** — If you use electricity for cooking, (such as electric stove, oven, toaster-oven, electric frypan), try to do major cooking during OFF PEAK hours. Heat up food quickly during PEAK CHARGE hours. Make sure the self-cleaning oven works only during OFF PEAK hours.

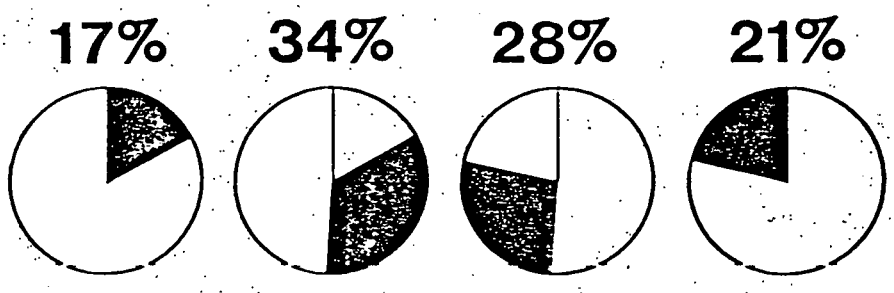
TURNOS OPCIONALES DE USOS

El consumidor promedio utiliza una gran cantidad de electricidad para fuerzas que podrían ser trasladadas hacia las horas de menos gasto en el día. Si es conveniente, combie esos usos de energía hacia las horas de *menos cargo en el consumo* en vez de las horas DE MAYOR CARGO, y así podrá reducir su cuenta de electricidad.

- **LAVANDERIA** — deje el lavado y secado para horas de MENOS GASTO.
- **LAVAPLATOS** — úselo mayormente en horas de MENOS GASTO.
- **LIMPIEZA** — Al usar la aspiradora y otros utensilios eléctricos, *evite* las horas de MAYOR GASTO todo lo mas que pueda.
- **COCINA** — Si hace uso de la electricidad para cocinar, (ya sea con estufa eléctrica, horno, tostadora, sartén eléctrico, etc) trate de hacerlo lo mas que pueda en las horas de MENOS GASTO. Caliente los alimentos rapidamente en las horas de MAYOR GASTO. Esté seguro de que la limpieza automática del horno funcione en horas de MENOS GASTO.

PERCENTAGE OF ELECTRIC BILL

Gas and Electric Home



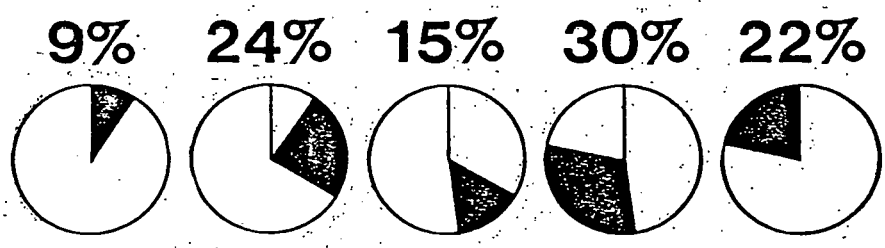
Lighting, Small Appliances

Dishwasher, Washer, Dryer, TV

Refrigerator, Freezer

Air Conditioning

All Electric Home



Lighting, Small Appliances

Dishwasher, Washer, Dryer, TV, Cooking

Refrigerator, Freezer

Air Conditioning, Heating

Water Heater

WATCH CAREFULLY OTHER USES

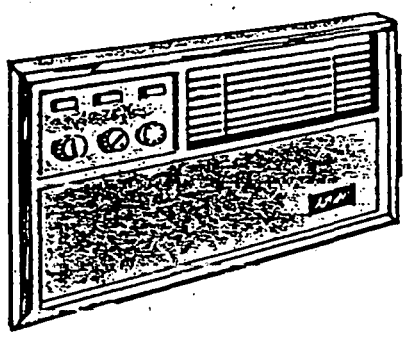
For many uses of electricity, it may not be easy to shift to OFF PEAK hours of the day. The best way to save money on these uses is to watch carefully the amount of electricity used. Even if some of the ways your household uses energy seem to be almost "automatic" and beyond your control, there are usually some ways you can assure greater economy.

VIGILE CUIDADOSAMENTE OTROS USOS

Para muchos usos eléctricos puede que no sea fácil cambiarlos hacia las horas DE MENOS GASTO en el día. La mejor forma de ahorrar dinero en estos usos es vigilando cuidadosamente el empleo de la electricidad. Aun cuando en algunas formas el uso de energía en su casa es mediante sistemas automáticos y fuera de su control, aún así hay algunos modos de que usted asegure una gran economía.

AIR CONDITIONING —

Watch the thermostat setting — a few degrees higher can save a lot of electricity. Do not run the air conditioner if no one is there to be cooled off. Think of ways you can cool rooms down during OFF PEAK hours — then turn the air conditioner down or off and conserve the cool air during PEAK CHARGE hours.



AIRE ACONDICIONADO

Vigile el termostato, unos cuantos grados altos pueden salvar mucha energía. No haga funcionar el equipo si no hay personas en la casa para disfrutarlo. Piense en la forma de enfriar las habitaciones durante las horas de MENOS GASTO, y despues bájelo, o apáguelo y conserve el aire frío durante las horas de MAYOR GASTO.

ELECTRIC HEATING –

If you have electric heating, the same sort of ideas work here as for air conditioning. Set the thermostat a few degrees lower — it can save a lot of electricity. Turn it off when no one is in the house. Warm the house up during the OFF PEAK hours and then lower the thermostat or turn it off for PEAK CHARGE hours.

CALEFACTOR ELECTRICO –

Si usted tiene calefactor eléctrico la misma teoría funciona igual que con el aire acondicionado. Fije el termostato unos grados bajos y ahorrará cantidad de energía. Desconéctelo cuando no hay nadie en casa. Caliente la casa durante las horas de MENOS GASTO y despues bájelo, o apáguelo en las horas de MAYOR GASTO.

LIGHTS –

Turn them off when not needed, especially during PEAK CHARGE hours. Some households may want to take advantage of OFF PEAK hours to have a few extra lights on for security or for outdoor activities.

LUCES –

Desconéctelas cuando no sean necesarias, especialmente en las horas de MAYOR GASTO. Algunos consumidores quizás tomen ventaja de las horas de MENOR GASTO PARA TENER ALGUNAS LUCES ADICIONALES para su propia seguridad o para actividades en el exterior de la casa.

REFRIGERATORS AND FREEZERS —

Check the temperature setting — does it need to be as cold as it is now? Be careful about leaving the door open for long periods of time during PEAK CHARGE hours. Do not put hot food into the refrigerator during PEAK CHARGE hours — the unit will have to work hard to cool it down.

REFRIGERADORES Y CONGELADORES —

Vigile la temperatura fijada. Es necesario que estén tan frios como están ahora? Tenga cuidado con dejar la puerta abierta por largos periodos de tiempo durante las horas de MAYOR GASTO, la unidad tendrá que trabajar extra para enfriar si coloca comidas calientes. No haga eso.

WATER HEATERS —

If you have an electric water heater, check its temperature setting. You may find out you could get along fine with a lower setting. Do not do the laundry or take a long shower during PEAK CHARGE hours — the water heater will have to work hard using more expensive electricity. Best of all, think about setting a timer on your water heater — as discussed next.

CALENTADORES DE AGUA —

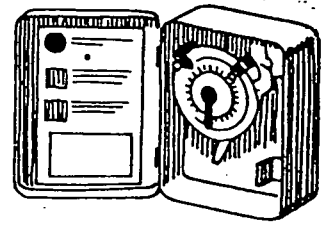
Si usted tiene un calentador de agua eléctrico vigile la temperatura. Puede que descubra que se conforme con una graduación baja. No lave la ropa o tome un baño durante las horas de MAYOR GASTO, el calentador tendrá que trabajar más y usara mayor electricidad en horario costoso. Lo mejor sería instalar un medidor de tiempo a su calefactor de agua, como discutiremos a continuación.

USE TIME SWITCHES

Electric timers that switch appliances off during PEAK CHARGE hours and back on during OFF PEAK hours can help you lower your electricity bill. In most cases, you can use relatively inexpensive timers that are most often sold for turning lights on and off automatically. But you can use them for any of your appliances to make sure they are used when electricity is less expensive. These timers generally plug into a normal wall outlet and then the appliance plugs into the timer.

Check your *Rules of Operation* to see which are PEAK CHARGE hours for your household. Then set the timer to turn off a little bit ahead of the beginning of PEAK CHARGE hours (say 15 minutes to be safe). Set it to go back on when OFF PEAK hours start again for your house.

EL USO DE CONMUTADORES DE TIEMPO

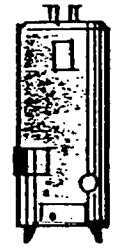


Conmutadores electricos que desconectan los utensilios eléctricos durante las horas de MAYOR GASTO ye los conectan de nuevo en las horas de MENOR GASTO, pueden ayudarle a usted a rebajar su cuenta de electricidad. En la mayoría de los casos, usted puede usar dispositivos económicos que generalmente se venden para encender y apagar luces. Pero usted los puede usar en cualquiera de sus utensilios para estar seguro de que los mismos funcionarán solamente cuando la electricidad es menos costosa. Estos conmutadores generalmente se instalan en los toma corrientes de pared y despues el artefacto se instala dentro del mismo.

Revise sus *Reglas de Operación* para saber cuales son las horas de MAYOR GASTO para su casa. Despues de eso instale el medidor para que desconecte un poco antes de comenzar la horas de *mayor gasto,* (digamos 15 minutos, para seguros). Marquelo para que vuelva a funcionar al comienzo de las horas de MENOR GASTO en su casa.

ON WATER HEATERS –

For households with electric water heaters, a timer can help save a lot of money. By setting the timer to only supply electricity to the heater during OFF PEAK hours, you will guarantee that economical electricity is used for your water heating needs. In other places where these pricing methods have been used, a timer on the water heater is enough to assure that the household saves money on his electricity bill.



It is likely that you will want to raise the temperature setting on your water heater if you install a timer so that the hot water will "go farther" during PEAK CHARGE hours. A little trial and error with the setting will enable you to find the correct setting to give you enough hot water to last through the hours when your water heater does not draw additional electricity.

For some homes, you can use a plug-in timer on your water heater. (Just be sure it is rated to handle the size of your unit). For other water heaters, the timer must be wired into the circuit. This will not be difficult, but will require correct electricial wiring. Your Deparament of Water and Power representatives can help advise you if you have any questions about your own home. Contact the ELECTRICITY RATE STUDY at (213) 481-5800; There is no charge for this advice.

In any case – a timer on your electric water heater will lower electricity bills and pay for itself within a few months.

EN CALENTADORES DE AGUA –

Para casas con colentadores de agua eléctricos, un medidor de tiempo o cronómetro, puede ayudar a salvar mucho dinero. Al instalarlo de manera que la electricidad funciona solo durante horas de MENOR GASTO USTED tiene la garantia de que una electricidad económica es empleada para las necesidades de su calentador. En otros sitios donde estos métodos de precios han sido empleados, el medidor de tiempo en su calentador de agua es suficiente para asegurar que el consumidor ahora dinero en su cuenta de electricidad.

No sería extraño que usted quiera subir la temperatura en su calentador si instala un medidor de tiempo de manera que el agua caliente no se despilfarre durante las horas de MAYOR GASTO. Un pequeño estudio de la graduación de temperatura le permitirá a usted hallar la medida correcta para darle sufiente agua durante las horas en que el calentador no está recibiendo electricidad adicional.

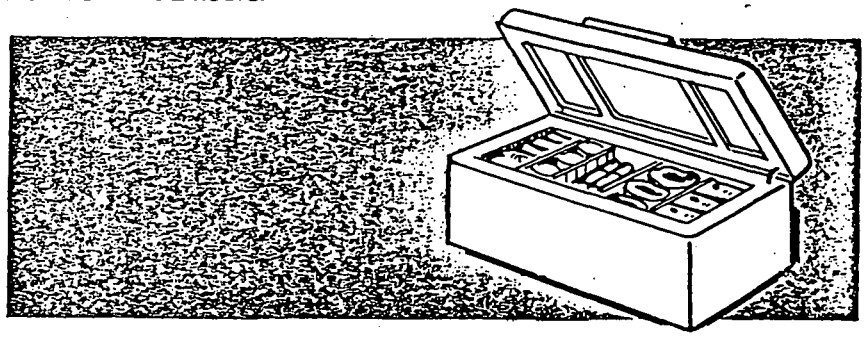
En algunas casas, usted puede utilizar un medidor de enchufe interior en su calentador de agua. (Solo necesita cerciorarse de que está adaptado para la medida de su unidad). Para otros calentadores, el medidor debe estar conectado al circuito. Esto no es difícil, pero sí

requiere que se utilicen los cables eléctricos correctos. Su Departamento de Agua y Electricidad tiene representantes dispuestos a servirle si tiene preguntas sobre su propia casa. Llame a su representante al ESTUDIO de la TARIFA ELECTRICA al numero (213) 481-5800 sin costo alguno para usted.

En todo caso, un reloj-medidor en su calentador de agua le rebajara la cuenta de la electricidad y se paga él mismo en solo unos cuantos meses.

FOOD FREEZER —

If you have a food freezer, you may want to plug it into a timer to save electricity during PEAK CHARGE hours. By putting the temperature setting a few degrees colder, your food can be kept frozen without using electricity during PEAK CHARGE hours. In addition, you should be careful not to leave the freezer open for long periods of time during PEAK CHARGE hours.



CONGELADORES DE ALIMENTOS —

Si usted tiene un congelador, usted querrá conectarlo a un medidor para salvar electricidad durante las horas de MAYOR GASTO. Graduando la temperatura un poco mas fría, sus alimentos se mantienen congelados sin usar electricidad durante las horas de *mayor gasto*. Ademas, usted debe tener cuidado de no dejar el con gelador abierto durante largos períodos de tiempo mientras perduren las horas DE MAYOR GASTO.

APPENDIX 2

List of Electric Utility Demonstration and Pilot Implementation Project Participants

and

List of Persons Interviewed

TABLE 2A

Electric Utility Demonstration and Pilot Implementation Project Participants

Project Location	Participants	Performance Period	Key Project Personnel
Arizona	Solar Research Commission (s) Arizona Public Service Co. (u)	6/75-12/76[a]	James F. Warnock (SRC) Doug S. Windes (DOE)
Arkansas	Public Service Commission (s) Arkansas Power & Light Co. (u)	6/75-9/77	James F. Herden (APUC) Ralph Teed (AP&L) Doug S. Windes (DOE)
California	Energy Resources Conservation & Development Comm. (s) Public Utilities Comm. (s) Pacific Gas & Electric (u) San Diego Gas & Electric (u) Southern California Edison (u) Sacramento Municipal Utility District (u)	7/76-P	Richard Hairston (ERCDC) Roger Levy (ERCDC) John Flory (ERCDC) Jackalyne Pfannenstiel (Smith) (CPUC) formerly of Connecticut PUCA Doug S. Windes (DOE)
Connecticut	Public Utilities Control Auth. (s) Connecticut Light & Power (u)	6/75-3/77	Jackalyne Pfannenstiel (Smith) (PUCA)
Edmond, Oklahoma	City of Edmond (s) Edmond Municipal Electric Co. (u)	12/76-6/78	Paul Buntz (EO) Doug S. Windes (DOE)
Los Angeles, California	Department of Water & Power (u)	6/75-9/79	Dennis Whitney (LADWP) Doug S. Windes (DOE)
Michigan	Public Service Commission (s) Detroit Edison (u)	8/75-12/77	Robert Benko PSC Jane Christophersen (DOE)

(continues)

TABLE 2A (continued)

Location	Participants	Performance Period	Key Project Personnel
New Jersey	State Energy Office (s) Jersey Central Power & Light (u)	6/75-5/80	Charles Rickman (SEO) Paul Johnson (DOE)
New York	Public Service Commission (s) Consolidated Edison (u)	1/76-6/77	Joseph Rizzuto (PSC) Doug S. Windes (DOE)
North Carolina	Utilities Commission (s) Carolina Power & Light (u) Blue Ridge Electric Membership Corporation (u)	7/76-8/79	Antoinette Wike (NCUC) Jane Christophersen (DOE)
Ohio	Public Utilities Commission (s) Dayton Power & Light Co. (u) Toledo Edison Co. (u) Buckeye Power Co., (u)	6/75-3/78	Robert Wayland (PUC) Jane Christophersen (DOE) Joseph Wathen (PUC)
Puerto Rico	Commonwealth (s) Water Resources Authority (u)	7/76-7/80	Alberto Bruno-Vega (C) Paul Johnson (DOE)
Rhode Island	Public Utilities Commission (s) Blackstone Valley Electric Co. (u)	7/76-10/78	Thomas Chmura (PUC) Lewis Bailey (BVEC) Christina VanSickle (DOE)
Vermont	Public Service Board (s) Green Mountain Power Co. (u)	11/74-1/77	Wayne Foster (PSB) Charles Elliott (GMPC) Larry Kaseman (DOE) Doug S. Windes (DOE)

(continued)

TABLE 2A (continued)

Project Location	Participants	Performance Period	Key Project Personnel
Washington	State Energy Office (s) Seattle City Light (u) Clark County PUD Puget Sound Power & Light Co. (u)	9/76-10/78	Jacob Fey (SEO) Nancy Tate (DOE)
Wisconsin	Public Service Commission (s) Wisconsin Public Service Corp. (u)	9/75-11/80	James Simpson (PSC) Richard E. James (WPSC) Jane Christophersen (DOE)
	PILOT IMPLEMENTATION PROJECTS		
California	Energy Resources Conservation and Development Commission (s)	10/77-12/82	Richard Hairston (ERCDC) Doug S. Windes (DOE)
Connecticut	Public Utilities Control (s)	10/77-9/82	C. T. Caprina (PUCA)
Grand River Dam Authority	Grand River Dam Authority (u)	10/77-9/79	Jerry Taylor (GRDA) Jame Christophersen (DOE)
Iowa	Iowa State Commerce Commission (s)	10/77-9/80	Robert J. Latham (ISCC) Jane Christophersen (DOE)
Minnesota	Department of Public Service (s)	10/77-9/82	Larry Anderson (DPS) Paul Johnson (DOE)
Springfield, Missouri	City Utilities of Springfield (u)	10/77-1/80	John L. McMahan (CU) Jane Christophersen (DOE)

(continued)

TABLE 2A (continued)

Project Location	Participants	Performance Period	Key Project Personnel
North Carolina	North Carolina Utilities Comm. (s)	10/77-10/82	Andrew W. Williams (NCUC) Jane Christophersen (DOE)
Ohio	Public Utilities Commission (s)	10/77-3/81	John Borrows (PUCO) Jane Christophersen (DOE)
South Dakota	South Dakota Public Utilities Commission	10/77-3/78[d]	Joe Norton (SDPUC)
Seattle, Washington	Seattle City Light (u)	10/77-9/82	Robin Calhoun (SCL) Nancy Tate (DOE)

Source: Compiled from Electric Utility Demonstration and Pilot Implementation Project Reports and documents and interviews, 1975-1980.

[a]Project was completed as far as DOE involvement was concerned. The experimental TOU rates have continued to date.

[s]Participating state or city agency.

[u]Participating utility.

[d]Project terminated.

TABLE 2B

List of Persons Interviewed

Name	Address
Department of Energy Personnel	
M. Larry Kaseman	U. S. Department of Energy Economic Regulatory Administration Division of Regulatory Assistance Washington, D.C.
Steven Mintz	"
Gary Selnow	"
Project Participants and Consultants	
Richard H. Brown	Connecticut Light and Power Hartford, Connecticut
Neil Dikeman	University of Oklahoma Norman, Oklhoma
Charles Elliott	Green Mountain Power Company Burlington, Vermont
Paul Hart	Arizona Public Service Company Phoenix, Arizona
Upton Henderson	Central State University Edmond, Oklahoma
Richard E. James	Wisconsin Public Service Corporation Green Bay, Wisconsin
John Keene	Green Mountain Power Company Burlington, Vermont
Robert J. Kohlenberg	University of Washington Seattle, Washington
Peter Lazare	Minnesota Department of Public Services St. Paul, Minnesota
Cathleen F. Meyer	City Utilities Springfield, Missouri
Mimi Sheridan	Seattle City Light Seattle, Washington
Jerry Taylor	Grand River Dam Authority Vinita, Oklahoma
David Thompson	Jersey Central Power and Light Morristown, New Jersey
Billy J. Yarborough	Carolina Power and Light Raleigh, North Carolina
Paul Zins	Minnesota Department of Public Services St. Paul, Minnesota

☆U.S. GOVERNMENT PRINTING OFFICE: 1981— 341-060:380

United States
Department of Energy
Washington, D.C. 20585

Postage and Fees Paid
U.S. Department of Energy
DOE-350

THIRD CLASS MAIL

Official Business
Penalty for Private Use, $300