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NEIGHBORHOOD ENERGY EFFICIENCY
AND REINVESTMENT

Energy Task Force
of the Urban Consortium
for Technology Initiatives

Conducted by:

The Office of the Supervisor of Public Utilities
San Antonio, Texas


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MASTER

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PREFACE

The Urban Consortium for Technology Initiatives was formed to pursue technological solutions to pressing urban problems. The Urban Consortium conducts its work program under the guidance of Task Forces structured according to the functions and concerns of local governments. The Energy Task Force, with a membership of municipal managers and technical professionals from eighteen Consortium jurisdictions has sponsored over 120 energy management and technology projects in thirty-four Consortium member jurisdictions since 1978.

To develop in-house energy expertise, individual projects sponsored by the Task Force are managed and conducted by staff of participating city and county governments. Projects with similar subjects are organized into *Units* of four to five projects each, with each Unit managed by a selected Task Force member. A description of the Units and projects included in the Seventh Year (1985-86) Energy Task Force program follows:

UNIT -- LOCAL GOVERNMENT OPERATIONS

Energy used for public facilities and services by the nation's local governments totals about 1.5 quadrillion BTU's per year. By focusing on applied research to improve energy use in municipal operations, the Energy Task Force helps reduce operating costs without increasing tax burdens on residents and commercial establishments. This Seventh Year Unit consisted of five projects:

- o **Baltimore, Maryland** -- *The Activated Sludge Oxygen-Air Aeration Process: Improved Technology for Wastewater Treatment Efficiency*
- o **Boston, Massachusetts** -- *Ground Source Heat Pumps for Commercial Application in an Urban Environment*
- o **Detroit, Michigan** -- *Computer Assisted Control for a Municipal Water Distribution System: Phase II - Testing and Implementation*
- o **Kansas City, Missouri** -- *Water Supply System Energy Conservation through Computer Control*
- o **Phoenix, Arizona** -- *Energy Use Reduction through Wastewater Flow Equalization*

UNIT -- COMMUNITY ENERGY MANAGEMENT

Of the nation's estimated population of nearly 240 million, approximately 60 percent reside or work in urban areas. The 543 cities and counties that contain populations greater than 100,000 consume 50 quadrillion BTU's annually. Applied research by the Energy Task Force helps improve the economic vitality of this urban community by aiding energy efficiency and reducing energy costs for the community as a whole. This Year Seven unit consisted of four projects:

- o **Memphis, Tennessee** -- *Technology Transfer for Energy Management in Cooperation with Regional Energy Providers*
- o **New Orleans, Louisiana** -- *An Incident Prevention and Response System for Hazardous Energy Resource Materials: Phase 2*
- o **New York, New York** -- *A Management Approach for Reducing Business Energy Costs: Joint City/ Utility Actions*
- o **San Antonio, Texas** -- *Neighborhood Energy Efficiency and Reinvestment*

UNIT -- ALTERNATIVE AND INNOVATIVE TECHNOLOGIES

Effective use of advanced energy technology and integrated energy systems in urban areas could save from 4 to 8 quadrillion BTU's during the next two decades. Urban governments can aid the capture of these savings and improve capabilities for the use of alternative energy resources by serving as test beds for the application of new technology. This Year Seven unit consisted of four projects:

- o **Albuquerque, New Mexico -- *On-Site Municipal Fuel Cell Power Plant: A Feasibility and Applications Guide***
- o **Atlanta, Georgia -- *Atlanta District Heating and Cooling Project***
- o **Denver, Colorado -- *Disposal Techniques with Energy Recovery for Scrapped Vehicle Tires***
- o **Philadelphia, Pennsylvania -- *High Efficiency Gas Furnace Modifications for Low-Income Residents***

UNIT -- PUBLIC/PRIVATE FINANCING AND IMPLEMENTATION

City and county governments often have difficulty in carrying out otherwise sound energy efficiency or alternative energy projects due to constraints in the acquisition of initial investment capital. Many of these constraints can be overcome by providing means for private sector participation through innovative financing and financial management strategies. This Year Seven Unit consisted of five city/county projects plus a combined effort supported by USHUD to define effective strategic planning guidelines:

- o **Chicago, Illinois -- *A Neighborhood Energy Conservation Program: Phase 2***
- o **Columbus, Ohio -- *Development of a District Heating System: Organizational and Financial Strategies***
- o **Hennepin County, Minnesota -- *Technology Transfer for Residential Energy Programs in New Construction and Existing Housing* (Joint project with St. Louis)**
- o **St. Louis, Missouri -- *Technology Transfer for Residential Energy Conservation in New Construction and Existing Housing* (Joint project with Hennepin County)**
- o **San Francisco, California -- *A Commercial Building Energy Retrofit Program***
- o **Public Technology, Inc. -- *The Hidden Link: Energy and Economic Development -- Phase I: Strategic Planning***

Reports from each of these projects are specifically designed to aid the transfer of proven experience to staff of other local governments. Readers interested in obtaining any of these reports or further information about the Energy Task Force and the Urban Consortium should contact:

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Designing and retrofitting homes to be energy efficient can have a major economic impact on the community by saving the cost of purchasing fuel and building new power plants. Exploring new strategies in "marketing" energy efficiency to homeowners has taken the effort and commitment from many members of San Antonio's neighborhood community. This project had valuable assistance from City Public Service, Rogers Cable-TV, Texas A&M Energy Extension Office, Weather-Rite, Alamo Area Council of Governments and the San Antonio Neighborhood Associations.

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CONTENTS

	<u>Page</u>
CHAPTER 1 -- OVERVIEW	
Abstract	1
Project Purpose	2
Report Organization	3
 CHAPTER 2 -- STRATEGIC PLANNING AND NEIGHBORHOOD ENERGY EFFICIENCY	
Introduction	5
Organizational Structure	5
The Municipality	
The Utility	
Community Agencies	
Neighborhood Organizations & the Planning Process	
Technical	10
Marketing/Communications	11
Budgetary/Economics	13
 CHAPTER 3 -- ESTABLISHING AN ENERGY PROGRAM IN SAN ANTONIO'S NEIGHBORHOODS	
Introduction	15
Organizational	17
Municipal, Utility and Other Public Programs	
San Antonio Neighborhood Planning Process	
Neighborhood Identification Selection Process	
Neighborhood Summary	
Community Agencies	
Technical Research	32
Questionnaire Analysis	
Housing Stock Analysis	
Computer Programs	
Marketing/Communications	37
Energy Guidelines	
Workshop/Seminars	
Multi-Media Videos	

Contents (Cont'd)

	<u>Page</u>
Budgetary/Economics	42
Demand Side Management	
The Results	
Economic "Best Set"	
Alternative Program Costs & Savings	
Summary	54
CHAPTER 4 -- A MODEL NEIGHBORHOOD PLAN	
Introduction	57
Organizational	
Technical	
Marketing/Communications	
Budgetary/Economics	
Neighborhood Planning Process	62
Conclusion and Recommendations	65
REFERENCES AND NOTES	69
BIBLIOGRAPHY	71
APPENDICES	
A - Neighborhood Portfolio	73
B - Neighborhood Correspondence	75
C - Neighborhood Energy Questionnaire	79
D - Energy Economics of Design Options	81
Home Retrofit Alternatives	
E - Stratum 3 Energy Conservation Analysis	84
ILLUSTRATIONS	
Figures	
1 - The Strategic Process	6

CONTENTS (Cont'd)

	<u>Page</u>
2 - San Antonio Strategic Process	16
3 - Neighborhood Map	27
4 - Peak MW Saved in 1995 If Different Programs are Implemented	50
5 - Total Present Value Dollar Savings to Utility If Different Programs Are Implemented	51
6 - Total Present Value Dollar Savings to Participant If Different Programs Are Implemented	52
7 - Total Dollar Cost to Utility in 1986 If Different Programs Are Implemented	53

TABLES

1 - Air Conditioner Rebate	21
2 - Preferred Energy Measures	34
3 - Sample Neighborhood Home Energy Guideline	39
4 - Residential Energy Conservation Programs	46
5 - All Stratum 5% Participation Level	48

CHAPTER 1

OVERVIEW

ABSTRACT

This project involved the development of a "Neighborhood Energy Efficiency and Reinvestment Concept Plan" to promote residential energy efficiency in San Antonio. The "Neighborhood Energy Plan" concept involved coordinating several technical, organizational and marketing tasks. A neighborhood housing stock evaluation was conducted to determine a "best-set" of cost effective energy conservation measures for San Antonio homes. The results were then presented in the form of "Home Energy Guidelines" that were designed to match specific local neighborhoods. Each guideline described homes similar to those found in the neighborhood and listed the estimated cost and savings for selected energy conservation measures. Concurrently, a videotaped "how-to" series on energy conservation was also produced with the cooperation of various City agencies and neighborhood associations to provide energy efficiency.

During the past three years the City of San Antonio, through its municipally owned utility, City Public Service, has implemented a number of energy conservation programs for the single-family residential market. These programs have included a rebate on the purchase of energy efficient air conditioners, low interest loans, home audits, and free "weatherization" kits. However, the economic and social impacts of these residential energy programs are largely unknown.

Several problems have existed in measuring the impact of residential energy conservation programs. First residents have never been surveyed

regarding their energy needs or how they feel about Public sponsored energy conservation programs. Second, these programs were developed regionally and were not necessarily developed specifically for San Antonio homes. A further problem existed when residents failed to implement an energy conservation program such as not installing the weatherization kit until many months after they received it, or not at all. Reasons for this included: (1) kits weren't designed for their home; (2) residents did not have the time and/or the knowledge to install the equipment; and (3) the kits were simply forgotten and left unused.

A potential solution and the approach examined in this project was to develop and implement a neighborhood energy efficiency and reinvestment plan that would encourage efficient energy usage in local homes. The plan was based on using the resources of neighborhood associations to promote appropriate energy conservation measures. Neighborhood associations were to serve as a marketing resource for energy efficiency. In its Year VI project, San Antonio had performed a computer analysis of various energy efficiency measures to determine the most cost-effective measures for the climate and weather conditions of San Antonio. This analysis was the foundation used to develop and promote efficient and cost-effective conservation programs for San Antonio's neighborhoods.

PROJECT PURPOSE

The purpose of this project was to determine if neighborhood associations could be effectively used to market and promote residential energy efficiency. The project design developed a process for neighborhoods to identify energy efficiency measures that were appropriate for each of the City's neighborhoods. This could only be done with the support and active cooperation and involvement

of neighborhood associations. Energy consumption data would be analysed to determine if the homeowner could benefit by purchasing and implementing the energy conservation measures. Homeowners would save on their utility bills and help reduce the need for significant electric capacity capital costs to the City and City Public Service over the next decade if an energy conservation program could be implemented.

This report describes the process used to develop and implement the program and provides a guide for local governments that includes (1) an analysis of residential energy conservation strategies; and (2) a "how to" marketing strategy that utilizes neighborhood associations.

REPORT ORGANIZATION

The balance of this report is organized to allow the reader to gain information on San Antonio's experience in developing a neighborhood energy efficiency plan, the energy strategies involved and the methodology developed and used during this project.

Chapter 2 describes the "strategic planning" process that was used in developing and marketing the neighborhood energy conservation program.

Chapter 3 shows how the strategic planning process was established in San Antonio. The chapter describes the four principal strategies used to promote energy conservation in residential markets and how neighborhoods associations were involved in the "marketing" of energy conservation. The chapter also highlights the "Best set" of residential energy measures and their economic impact on the community.

Chapter 4 reviews the effectiveness of the planning model and the results from its implementation. Lessons learned and conclusions are discussed.

CHAPTER 2

STRATEGIC PLANNING AND NEIGHBORHOOD ENERGY EFFICIENCY

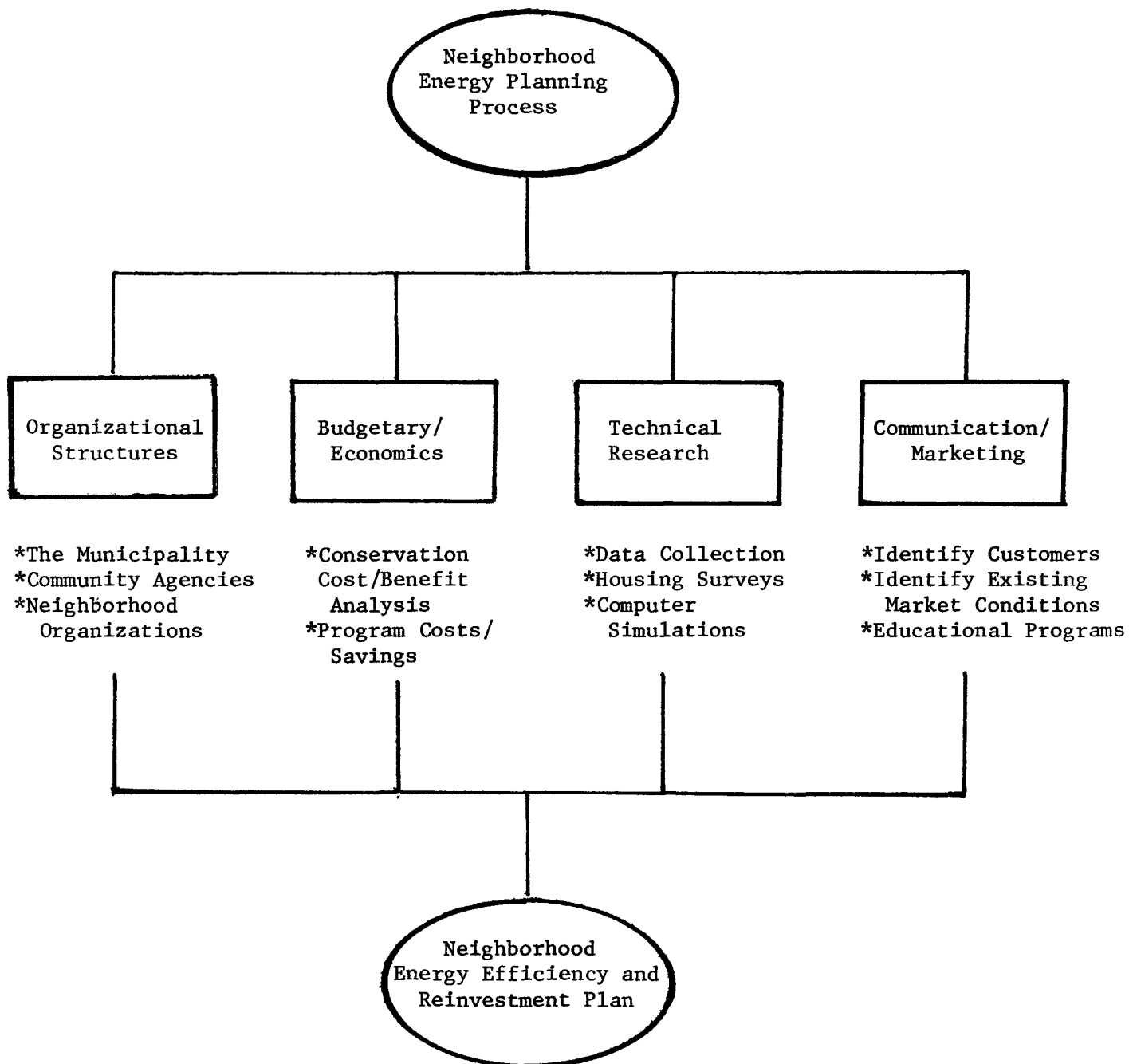
INTRODUCTION

This chapter describes the processes used in developing, marketing and implementing the neighborhood energy conservation program. The project purpose was to use neighborhood associations to act as a major resource in the development and marketing of residential energy conservation programs. The major thrust of this project was to anticipate future neighborhood energy issues and to develop strategies that will respond to the issues. Some strategies will better resolve the neighborhood energy issue than others. It is this flexibility that is desirable and leads to the development of a planning methodology from four perspectives that include organizational structures, technical research, marketing and local budgetary/economics as shown in Figure 1. The goals and objectives of the "Neighborhood Energy Efficiency and Reinvestment Project" focus on the "process of planning", not the actual plan produced. Strategic planning is the process by which an organization envisions its future and develops the necessary procedures and strategies to achieve that future.¹

ORGANIZATIONAL STRUCTURE

Before developing and implementing any program it is important to understand how the organization, whether it is a community or governmental entity, is structured and how it solves problems. It is also pertinent to examine how various organizations, associations or governmental offices interrelate. Identifying the "who" in the terms of what organizations exist and the "what"

FIGURE 1. THE STRATEGIC PROCESS



function of the organization is the first concern of the planning process. No organization, can meet all the needs of the community. It is essential, therefore, to identify the mission of each organization. In this project, there were four principal groups: (1) the municipality; (2) the municipally-owned utility City Public Service; (3) community agencies; and (4) neighborhood associations. Despite their differing roles these four functional entities, individually or together, can be catalysts in promoting residential energy programs because of their ongoing contact and recognized status with homeowners.

The Municipality

Most municipalities and/or county have a Neighborhood Planning, Economic Development or an Energy Management Department. Although one or more of these departments is likely to be involved in implementing community goals and objectives, interdepartmental coordination is usually lacking. A goal of this project was to examine if interdepartmental coordination and cooperation could be facilitated. Another was to examine how programs such as the Community Development Block Grant (CDBG) program can be used as a resource for energy conservation rehabilitation. The municipality does provide an advantage to the homeowner that a community agency or private company (except investor-owned utilities) may not offer -- community-wide energy conservation assistance programs. A municipality or its local utility can provide energy conservation programs for all homeowners such as rebates on air conditioners and the distribution of free weatherization materials. Neighborhood Associations can provide community wide programs if they had adequate resources.

In the City of San Antonio, energy conservation programs are currently managed and evaluated by City Public Service, a municipally owned utility.

Energy conservation programs, however, programs are also developed, and evaluated by the City of San Antonio's Office of Public Utilities. The Office of Public Utilities also provides a regulatory review of energy programs conducted by City Public Service.

The Electric and Gas Utility

City Public Service is one of the largest municipally owned utilities in the nation. It provides electric service throughout its 1,566 square mile service area located within the San Antonio Standard Metropolitan Statistical Area. The gas system supplies the San Antonio urban area.

The City of San Antonio purchased CPS in 1942, and receives 14% of the utility's annual gross revenues. The city's ownership also dictates CPS's regulatory process. As a municipally owned utility, CPS does not fall under the Texas Public Utility Commission's jurisdiction; instead, the City of San Antonio City Council regulates CPS.

Community Agencies

Community based agencies often sponsor home weatherization rehabilitation and utility assistance programs. In this project, community based agencies include any organization that provides a service to the Community and is not directly funded by the government. In San Antonio, the Avienda Guadalupe Revitalization Association sponsors community programs for a specific area on the City's West side in an effort to promote redevelopment and growth for the neighborhood. Community based agencies can include non-profit organizations that even have some municipal or federal funding. One San Antonio organization Neighborhood Housing Service (NHS) of San Antonio, works closely with several local neighborhoods and receives both federal and local funding assistance. Community based agencies or associations were initially

established to meet the needs of the local neighborhoods. Unfortunately, neighborhood homeowners are often unaware of the existence or availability of these services. Therefore, the community may not be receiving the advantages of these agencies to the fullest extent.

Neighborhood Organizations and The Planning Process

Historically, neighborhood associations have developed because of dissatisfaction with physical and/or social conditions in the community or because of a single issue that is of major concern to the neighborhood. Currently, three forms of Neighborhood planning are practiced in United States. The first form involves independently organized efforts sponsored by neighborhood associations aimed to address a perceived problem or set of problems in the neighborhood through self-help efforts. The second form of neighborhood planning consists of government sponsored programs requiring community improvements in selected neighborhoods. In such a program citizens involvement is limited. The third form of neighborhood planning, includes locally sponsored city-wide neighborhood planning programs in addressing public planning and municipal issues. Issues of concern involve zoning changes, evaluation of local service delivery, comprehensive planning and local problem solving. This also includes neighborhood associations' involvement in several types of neighborhood planning activities. These include the review of community plans which may affect the neighborhood "well-being," as well as the neighborhood's own planning process. In some cities, including in San Antonio, neighborhood plans become part of the municipality's comprehensive plan. Neighborhood associations interested in promoting a neighborhood improvement activity in their community may be able to receive technical assistance or partial funding.

More than 50 locally sponsored neighborhood planning programs have been adopted in the U.S. during the last two decades. These programs have been found to be most effective in middle and large cities as potential vehicles in solving many of the urban problems facing American cities and to help avoid future problems.² The following are principal societal forces contributing to neighborhood planning:

- Many citizens and citizen groups are demanding a greater role in the public planning process;
- Requirements for citizen participation in many federal programs have established a norm of citizen involvement in the planning of social services;
- Public officials are seeking a better means of communication with citizens; and
- Many planners now recognize limitations in traditional comprehensive planning strategies.

TECHNICAL RESEARCH

One of the major purposes of the neighborhood energy efficiency and reinvestment plan was to encourage efficient energy usage in single family residential buildings. To accomplish this objective appropriate energy conservation measures had to be evaluated for houses in participating neighborhood associations. The results were a "best set" of conservation measures. To develop this "best set" a series of analytical steps had to be taken as follows:

- 1) Conduct a Housing Stock Survey and Evaluation
- 2) Simulate the Building Energy Usage.
- 3) Analyze and select appropriate Energy Conservation Measures.

The first step, the Housing Stock Survey and Evaluation, required both the assessment of general housing characteristics in the selected neighborhoods and by conducting energy audits on specific homes. The information gathered from the housing audits formed the data base for the Building Energy Simulation program. The simulation program provided a detailed economic and energy analysis resulting in a "best set" of energy cost-effective measurements with their respective cost and savings. After the first two steps were completed project staff can then determine, for each neighborhood, the specific energy measures that would be the most beneficial for homeowners and form the basis for the neighborhood based program.

MARKETING / COMMUNICATIONS

It is important to recognize that "marketing" is more than just simple advertising. Marketing/communications involves a much more complex set of ideas and strategies that balances product development, service, price and distribution by describing: a) how consumers make energy conservation decisions; b) the characteristics of existing markets; and c) how those markets can be reached by identifying the motivators or barriers to consumer conservation.³ The fact that homeowners accept the "energy crisis" as serious or real does not mean that the situation is understood,⁴ nor does it mean that behavioral patterns will change with changes in fuel costs. Nonetheless, the majority of people are willing to endorse energy conserving policies and programs which will cost them the least in the way of personal inconvenience or expense.⁵

Consumers however, vary on how they obtain their energy conservation information. In a energy conservation marketing study conducted by Montgomery and Leonard-Gaxton (1977) mass media was ranked high in terms of its function of providing an overall "knowledge" of the subject, while word of mouth was ranked low for obtaining information: however, interpersonal channels were determined to be relatively important for the persuasion function.⁶ Research has shown that a) people don't properly integrate all information relevant to any given decision; b) don't assign weight in strict accordance with its economic cost/benefits; c) tend to weigh information in proportion to its vividness; and d) people are frequently convinced more by a single individual than by a comprehensive data summary.⁷

To effectively promote energy awareness and efficiency to homeowners, the project developed a marketing approach which included several strategies. These strategies included the production of a Cable TV series, presentation of "Energy Seminars", and the publication of "Neighborhood Energy Guidelines." This marketing approach was necessary in order to provide home energy information to homeowners and to expand and promote energy-related activities in neighborhoods. The "marketing" process was also necessary to match the technical, organizational and budgetary components of the neighborhood energy plan. It is essential that homeowners understand what energy conservation options are available and which energy conservation measures are cost-effective. If this step is ignored the program will be ineffective and costly for the ratepayers.

Implementing the above marketing activities involved working closely with selected associations and public/private agencies. Chapter 3 will discuss the strategies developed in San Antonio.

BUDGETARY / ECONOMICS

Since the early 1970's gas and electric utilities have been marketing residential energy conservation either through informational/educational programs or by providing financial subsidies programs. Information programs have typically included "bill insert" and mass media public service announcements. Financial subsidy programs have typically included home energy audits, rebates, low or no-interest loans and free energy saving materials. Providing these services includes at a minimum costs for product development, distribution, implementation, marketing, and utility construction and fuel. Each of the utility cost factors must be examined to determine energy conservation cost-effectiveness.

Evaluating the economic impacts of energy conservation efforts has become a recent criteria in several states, with the adoption of the Standard Practice Evaluation Model or a variation of the analysis model. The purpose of evaluating programs has been to determine if the benefits of the program are consistent with the costs. Utilities look at energy and demand management as a cheaper option than the construction of a new power plant.⁸ Ratepayers benefit through lower utility charges. The community benefits with the increase of dollars that stay within the community for local goods and services. However, the extent of savings and benefits depends on the utility, the market, and ultimately ratepayer participation in the energy conservation efforts. Whatever the reason, financing energy programs must be structured to adapt to the local circumstances of the utility and the participant. In any city, utility or third party, there are principally only four options for obtaining the money necessary to finance energy conservation programs: (1) bond financing; (2) general revenues; (3) state and federal grants, and (4) combinations of indirect financing such as foundations, community development

corporations and other unconventional financing means. Incentive payments to the participator, however, typically occurs in only four ways (1) shared savings; (2) loans, (3) rebates; and (4) cash discounts on certain current goods or services. If an energy conservation strategy is uneconomical for the utility to finance but cost-effective to the utility or the ratepayer if a "third party" finances it, then either the municipality or a separate public or private service should be encouraged to fund the program. As with all investments, the costs and benefits must be examined for each proposed energy program and matched with priorities set by the community or the local neighborhood.

CHAPTER 3

ESTABLISHING AN ENERGY PROGRAM IN SAN ANTONIO'S NEIGHBORHOODS

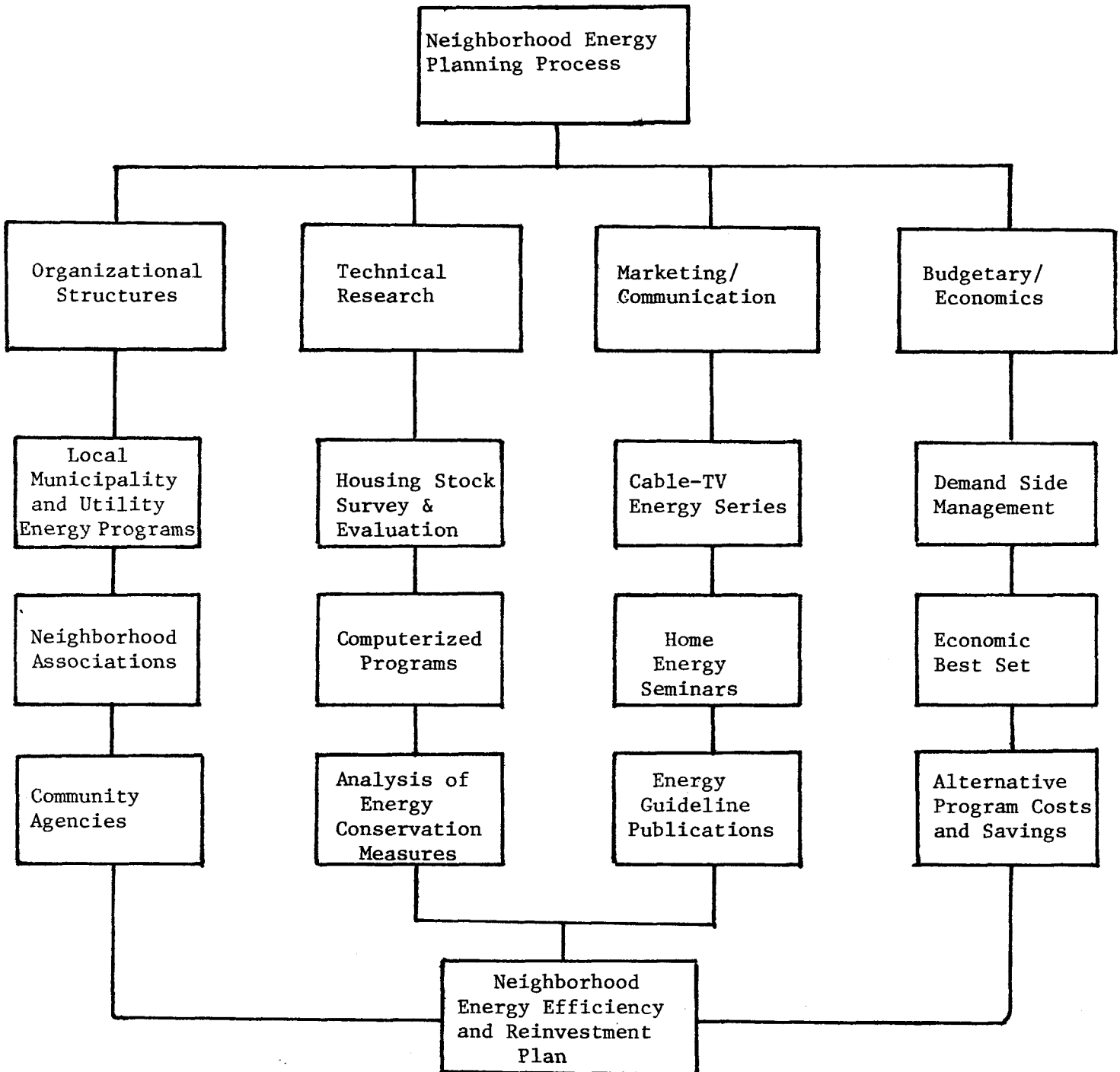
INTRODUCTION

This Chapter discusses the neighborhood energy and reinvestment planning process as applied to the City of San Antonio. This assessment involved the evaluation of neighborhood associations, community agencies, marketing strategies and the analysis of energy conservation costs and benefits. This chapter reviews the strategies that were developed to pursue the three principal objectives of the project:

- (1) Can neighborhood associations be effectively used to "market" energy conservation to the community?
- (2) How can neighborhood associations become involved in community energy programs?; and
- (3) What cost-effective policies and strategies can a community develop to promote and enhance energy conservation and will they have long term economic impact?

Finally, can the project objectives be intertwined in a manner that will produce a "process" that is self-sufficient and self-promoting and that can be administered by neighborhood associations? Figure 2 illustrates the neighborhood energy and reinvestment planning process used in this project.

FIGURE 2. STRATEGIC PROCESS CHART



ORGANIZATIONAL STRUCTURES

Municipal, Utility and Other Public Programs

The City Council of the City of San Antonio initially allocated funds for the development of an Energy Management Office in 1982. In 1984, the Energy Management Program Office was incorporated within the Office of the Supervisor of Public Utilities. The office evaluates and develops effective energy-related programs for municipally owned facilities and assists City departments in the application of basic energy management principles. The office also evaluates community energy programs. City energy activities can be categorized as follows:

- Municipal Management: sponsor activities which provide opportunities to address local energy needs through local government practices, regulations, and policies.
- Community Management: develop energy programs that impact the citizens of the City of San Antonio and initiate community activities which directly assist citizens in energy conservation.

The Office of Public Utilities is designated as the primary contact with City Public Service and the City Water Board for all energy conservation programs, and service connections, disconnects, and billing for City facilities. In addition, the Office of Public Utilities provides regulatory review of public utilities for cost of service determinations, rate setting, and assurance of the equity of utility rates.

San Antonio is the tenth largest city in the nation by population with an estimated July 1986 population of 908,400 and the third largest in Texas in area population. As of January 1986, the City of San Antonio had 212,848

single family housing units and 117,860 multifamily housing units.⁹ As of 1980, 116,075 family units had central air conditioning 92,348 had window air conditioners, and 50,466 had no cooling.¹⁰

The most commonly used energy forms are electricity and natural gas. For the year ending September 1986, the cost of electricity for commercial and industrial users averaged about \$0.061 per kwh, and \$0.071 per kwh for residential users.¹¹ Gas prices were approximately \$4.66 per MCF for commercial users, \$4.35 per MCF for industrial users, and \$5.61 per MCF for residential users.¹²

During CPS's fiscal year 1985-86:¹³

- o Peak demand for electricity crested at 2,350 megawatts.
- o 10,607,972,000 kilowatt hours of electricity were sold.
- o Gross revenues totalled \$868,833.
- o Net construction costs totaled \$435.1 million. A major part of the total, \$321.6 million was for the South Texas Nuclear Project (STNP) construction. CPS owns 28 percent of the 2500 MW plant that has an overall cost forecast of \$5.495 billion.
- o The City received \$103,972,000 in payment from CPS.

Utility Sponsored Energy Conservation Programs

City Public Service conducts three main residential energy conservation programs as well as sponsoring an energy conservation booth and programs for schools, professional, and community groups. The first program, Residential Conservation Service (RCS), is a state-mandated conservation audit program. Through the RCS program, City Public Service customers receive, on request, a free comprehensive audit of their residence performed by a certified auditor. The customer benefits from the audit in several ways. First, their home is

inspected for energy efficiency and the auditor points out inefficiencies and ways to correct them. Some recommended measures include ceiling and wall insulation, weatherstripping, caulking, window treatment, water heater insulation, and attic ventilation. Second, the auditor gives the customer some of the needed weatherization materials including caulking, door weatherstripping, and water heater jackets. Finally, the customer receives a cost-benefit analysis for the more expensive energy saving measures such as ceiling insulation and storm windows.

The actual disbursement of weatherization material through the RCS program did not begin until February 1985. Prior to that time, CPS had a program that distributed weatherization kits through a different outlet. CPS believed that its other conservation programs, discussed below, were reaching the mid to upper income level customers and it wanted a program for low income customers. Therefore, CPS staff took these free weatherization kits to neighborhood and church meetings to reach its target market. After less than one year, CPS staff believed it had saturated the low-income market. An evaluation of this distribution effort found, however, that many of the kits lay idle with few or none of the measures having been implemented. As a result, CPS terminated this program and began distributing materials during the RCS audits.

CPS's two other main energy conservation programs benefit mostly middle and upper income customers because the programs require large capital expenditures by the participant. Both programs use incentives. They are called, collectively, the CPS Conservation Incentive Program; individually, they are named the Home Energy Improvement Loan Program and the Appliance Efficiency Incentive Program. A description of each program follows.

Home Energy Improvement Loan. This program makes loans available for installation of insulation, caulking/weatherstripping, storm windows, reflective film on windows, heat absorbing glass, glass shading (awnings), water heater insulation, clock thermostats, and other cost effective energy-saving measures that are determined to have a payback to the customer of seven years or less. Either the customer or a contractor chosen by the customer can do the installation. The customer may borrow up to \$2500 at a guarantee interest rate of 8 percent.

To obtain a loan, a residential customer must request that CPS perform an audit to identify needed weatherization improvements for the customer's home. Next, the customer submits a loan application based on the audit's findings. After approval of the loan and completion of the measures' installation, CPS perform a post-installation inspection to assure implementation of the energy efficiency measures at the customer's residence.

Appliance Efficiency Incentive Program. In this program CPS will pay cash rebates to customers who install high Energy Efficiency Ratio (EER) central air conditioning, central heat pumps, window air conditioners, and window heat pump units. Cooling units of up to 60,000 BTUs (5 tons) qualify for rebates. Although the program is primarily designed for residential customers, any other customers may participate providing the unit does not exceed the 60,000 BTU maximum allowable rating. The program also limits participants to two units per CPS account.

CPS will provide rebates to customers installing new cooling equipment according to the schedule shown in Table 1.

TABLE 1. AIR CONDITIONER REBATE

	<u>SEER/EER</u>	<u>AMOUNT</u>
Central A/C	9.0-9.5	\$100
	9.51-9.99	\$125
	10.0+	\$150
Central H/P	8.5-9.0	\$100
	9.01-9.49	\$125
	9.5+	\$150
Window A/C	9.0+	\$75
Window H/P	8.5+	\$75

In addition to customer rebates, CPS pays air conditioning equipment dealers \$20 for each qualified cooling unit sold, up to 5 tons or 600,000 BTUS.

Existing Public Resources

In San Antonio there are several public agencies that sponsor housing and neighborhood retrofits that include energy efficiency measures. As mentioned before, a major task of this project was to work in conjunction with these agencies to promote energy efficiency and reinvestment. These public agencies and their respective programs are:

City of San Antonio Department of Human Resources - Community Development

Senior Citizen Utility Relief Program. This program provides winter rate relief to Senior Citizens aged 65 or older. Rate relief is in the form of a credit of \$21.66 for the months of December, January and February. Rate relief is provided only to residents of the City of San Antonio and only to CPS customers. A total of 30,000 senior citizen are provided rate relief annually. Total annual funding for this program is \$2,000,000.¹⁴ In fiscal year 1986-87 this program was cut back for municipal budget reductions to \$1,377,365.

Project Warm (Winter Assistance Relief Mobilization). This program provides utility assistance to low-income families who are experiencing difficulty in paying their winter bills. Applicants must meet the poverty income guidelines and be CPS customers. Funds are made available through private donations. Both individuals and corporations contribute to this program. The average amount of assistance is \$35. The number of families assisted depends on the amount of money contributed. Approximately \$100,000 per year is raised for this program.¹⁵

Energy Crisis Intervention Program. This program provides assistance to low income individuals experiencing an energy crisis. In order to qualify for this program an individual must have received a termination or final notice from a utility company. An individual whose utilities have been cut-off receives first priority. The program is funded by the State of Texas. To qualify an individual must have received a termination notice from the utility company. Applicants must meet poverty income guidelines. Residents of San Antonio and Bexar County are eligible to apply. A person may receive a grant of up to \$400 payable to the utility to alleviate their energy related crises. Presently, \$86,000 has been set aside for this program. It is possible that additional funds will be made available during the summer months in the future.¹⁶

Emergency Utility Assistance. This is a year-round program provided by the Community Action Programs using Community Services Block Grant funds. A one time cash assistance amount of \$35 is rendered to persons experiencing financial hardship with the payment of their utility bills. Applicants must meet poverty income guidelines and be a residents of San Antonio. Limited funds are available for this program and each case is evaluated individually.¹⁷

San Antonio Development Agency (SADA)

Rehabilitation Loan Program. This a home repair program that provides loans at a interest rate of 6.9%.¹⁸ Applicants must meet one or more of the following criteria: be physically handicapped, 65 or older, live within a selected housing target area, or meet the poverty income guideline. Eligible repairs can include fixing a leaking roof, leveling a deteriorated foundation, rewiring a faulty electrical system, and modifying a home for a handicapped family member. Purchases of insulation; storm windows/doors, or other energy conservation materials can also be financed through this program.

Alamo Area Council of Governments (AACOG)

Weatherization Program. This program is designed to provide funds for weatherizing homes in San Antonio and Bexar County. Applicants must meet one or more of the following criteria: 65 or older; handicapped; and/or meet the poverty income guideline.¹⁹ The energy conservation services provided include caulking, weatherstripping doors and windows and insulation of attics. A maximum of \$1500 can be spent on weatherization for each home. Therefore, the measures installed are assigned a priority according to their expected cost and savings.

Neighborhood Housing Services

Home Rehabilitation Program. This is a network of locally-funded and operated self-help programs whose goal is revitalizing declining neighborhoods. A locally initiated and funded non-profit corporation administers the program. The Board includes residents, business and local government representatives. The primary objective of this program is to provide home repair loans at interest rates ranging from zero to prime rate, depending on an applicant's ability to pay. A Home Repair loan can be used for foundation leveling,

painting, electrical wiring, adding insulation and other weatherization measures.

San Antonio Neighborhood Planning Process

The "Neighborhood movement" in San Antonio really began to emerge as a major political force in the late 1970's. Today, there are more than 45 active neighborhood associations in San Antonio. The associations range from very active coalitions of interest groups with sophisticated organizations to ad hoc groups of concerned individuals; some being better organized and politically aware than others.

Many of San Antonio's neighborhood associations are located within the inner city and represent a broad range of income classes. Some neighborhood associations are located in historical districts. These associations are primarily concerned with the neighborhood preservation and beautification. The associations in low-income areas of the city are usually coalitions of parties that concentrate on being politically aware and active. Other associations are principally oriented working to keep their neighborhood socially and economically attractive. Almost every neighborhood association is interested in guiding the type of development that occurs in their community.

Despite the varying concerns and degrees of sophistication in the neighborhood associations, their underlying purpose is to accomplish "neighborhood control": They're homeowners who have voluntarily banded together in associations to protect their neighborhood. They have battled with City Hall, local school districts, powerful developers, bar owners and a Church.

In 1979, the San Antonio Coalition of Neighborhood Associations, was formed. Since then three other coalitions have been created: the Southeast

Neighborhood Coalition, Northside Neighborhoods for Organized Development, and Northside Coalition of Neighborhoods. Neighborhood association leaders are hoping that a powerful city-wide coalition will rise out of the existing separate coalitions, which already represent most of the neighborhoods in San Antonio. The Southeast Neighborhood Coalition and Northside Neighborhood for Organized Development have already joined in San Antonio Coalition of Neighborhood Associations. The Coalition has succeeded in placing some of its advocates on city boards and commissions.

Neighborhood Identification Selection Process

To develop and implement a Neighborhood Energy Efficiency and Reinvestment Plan the project's first task was to approach the neighborhood associations and enlist their participation in the energy project. For initial project involvement, the neighborhood association must have a strong, active and well organized association with good leadership. Secondly, the associations collectively must represent a demographic cross-section of the City's economic, geographic and political composition; insuring inclusion of low, medium and upper income residents. Due to a deadline associated with the project and the criteria for selection, not all neighborhood associations were able to participate in the development stages of project.

To ascertain which neighborhoods best met the established criteria, a neighborhood portfolio was developed on 15 potential neighborhoods. Data was gathered from two principal resources, the Neighborhood Initiatives Department and the 1980 U.S. Census Neighborhood Statistics. The neighborhood portfolio included data on neighborhood geographic location, total population, race of origin, family income average and number of owner-occupied and rental housing units.

The next step of the selection and identification process was to establish contact with the neighborhood associations. This involved approaching representatives of potential neighborhoods and obtaining their interest by providing information on the project and the potential benefits for their neighborhood. Representatives were also briefed on the liaison role they would play by assisting city staff in the coordination of energy-related activities.

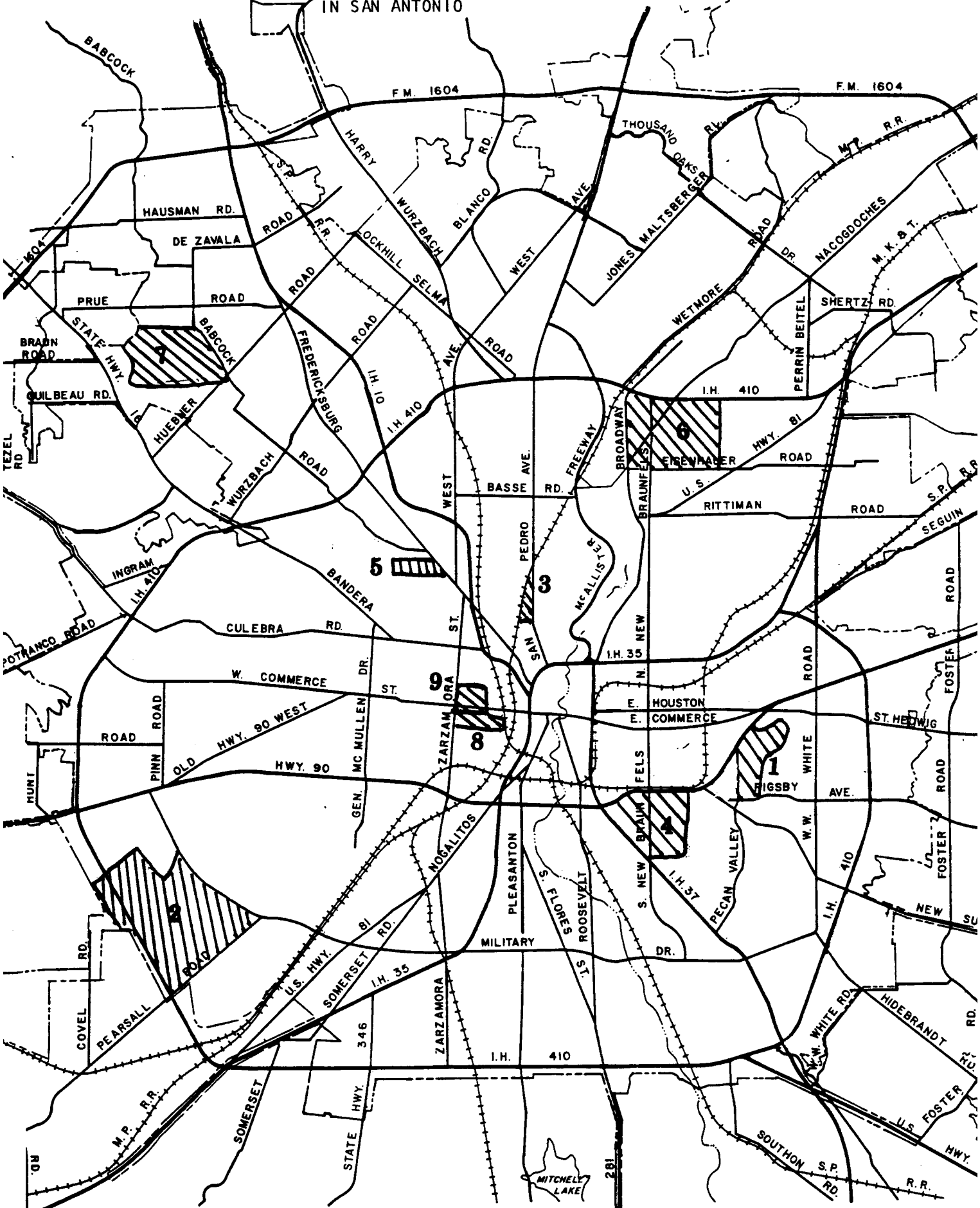
It was decided that a maximum of 10 neighborhood associations would participate in the project. After determining which neighborhoods would participate, a more detailed data sheet was formulated concerning selected residential and housing characteristics on each neighborhood. Nine of the 10 neighborhood associations contacted, indicated that they were willing to take part in the project. Commitment from neighborhoods was obtained through letters from neighborhood associations presidents. Appendix A gives a brief demographic overview of each selected neighborhood association and Figure 5 shows the location of participating associations within the City. The following is a summary of the general characteristics of the project's participating neighborhood associations. Numbers correspond to Neighborhoods shown in Figure 3:

Neighborhood Summary

1. Wheatley Heights

This neighborhood is located on the City's eastside adjacent to Salado Creek. Residents in this neighborhood are predominately low income and black. The majority of the houses in this neighborhood were built by one builder and are one-story wood-frame housing. Residents established a neighborhood association principally to form a Neighborhood Housing Service program that would provide low interest loans for housing rehabilitation.

FIGURE 3. LOCATION OF PARTICIPATING NEIGHBORHOOD ASSOCIATIONS IN SAN ANTONIO



2. People Active in Community Effort (PACE)

This neighborhood is larger than most others and is located on the peripheral part of San Antonio's southwest region. This neighborhood is surrounded by two military installations, Lackland AFB and Kelly AFB, and has a high concentration of military households. White and hispanics are equally represented in the PACE neighborhood. PACE is a very active and issued oriented association.

3. Alta Vista

Alta Vista, is located in the north central area of the City just minutes away from downtown San Antonio. It's bounded by historic San Pedro Park, the second oldest municipal park in the nation; San Antonio College; and a historical district. Residents in the neighborhood are predominately middle to low income hispanic. A majority of the houses in this neighborhood are wood frame and over 40 years old. The neighborhood has a high percentage of rental occupants because many of the homes in the area have been converted into rental units. However, this neighborhood is beginning to change with many new homeowners renovating their older and often architecturally attractive homes. Alta Vista is basically an informational type organization.

4. Highland Park

Highland Park is located in the Southeast section of the city. Over 50% of residents are hispanic and 30% anglo. In the past few years this neighborhood has become fairly active and sophisticated, and has recently competed for its first CDBG application.

5. Monticello Park

The Monticello Park Neighborhood is located near the Northwest area of San Antonio just minutes away from IH-10 and the downtown area. The neighborhood is predominately hispanic and middle-income neighborhood. This neighborhood association is more of a informational and social type of organization, but is also issue-oriented.

6. Oak Park/Northwood

The Neighborhood is predominately a white upper-middle class neighborhood located on the northside of San Antonio. In recent years, the Oak Park/Northwood neighborhood has become very attractive to retired military households. This neighborhood includes a mix of newer wood and stone structures. This association is issue oriented.

7. Alamo Farmsteads

Alamo Farmsteads, one of San Antonio's oldest neighborhood associations, is located in the Northwest area. The overwhelming majority of its residents are white and upper income. The neighborhood includes large areas of undeveloped land. The Alamo Farmsteads Association is very dynamic and sophisticated, particularly in regards to the zoning and the development process.

8. Prospect Hills (NHS)

Prospect Hill is located in the heart of San Antonio's westside just minutes away from Downtown San Antonio. Over 90% of the residents are hispanic and low income. This westside group was originally formed principally to redevelop its area and improve living conditions in the neighborhood. Prospect Hills is one of two Neighborhood Housing Service (NHS) neighborhoods in San Antonio.

9. Guadalupe (NHS)

Guadalupe association is located on the City's westside near the historic landmark Our Lady of Guadalupe Church. Over 90% of population is hispanic. Like their neighboring association, Prospect Hill residents originally organized to promote revitalization efforts. It is also a NHS neighborhood.

Once commitment was obtained from a neighborhood association, project staff attended a neighborhood meeting. At the neighborhood meeting, project staff explained the project purposes and objectives to the association's membership. At some meetings an energy specialist from Texas A&M presented a slide show on "Home Energy Conservation" and then led a general discussion on energy concerns with the local residents.

Project staff found that it was not necessary to make presentations at all neighborhoods because of prior presentations by CPS representatives. In these cases, neighborhood representatives were held responsible for informing their membership of the project through their own neighborhood resources, whether it be at neighborhood meeting or through a neighborhood newsletter.

This project was first originated with the idea that the programs would be transferred to the new Department of Neighborhood Initiatives created by the City in 1985. This department was created primarily to assist, stabilize or provide revitalization incentives for City neighborhoods and to act as a focal point in coordinating the activities of current city services, volunteers, neighborhood organizations the private sector. The departments responsibilities included the development and promotion of neighborhood revitalization programs, monitoring all CDBG funded programs, providing

technical assistance to neighborhood residents with self-help/volunteer programs and neighborhood plan development.

During the implementation of the Year VII project, the City eliminated the Neighborhood Initiatives Department because of a financial shortfall. As a result, the project staff received minimal interest and staff support from Neighborhood Initiatives Department. Currently, the City has only one neighborhood planner, within the Department of Planning.

Community Agencies

To effectively encourage energy efficient residential housing in San Antonio two objectives were established for the project: first, encourage a cooperative working network between local agencies with energy-related programs; and secondly, recommend appropriate conservation measures to these agencies for use in home energy retrofits.

Agency programs included home weatherization, loans for home repair, and utility relief assistance. Despite the wide-range of services, neither the City nor CPS have performed a cost/benefit analysis to measure the economic impact of these programs in San Antonio. In addition, homeowners had never been surveyed on the type of energy programs they desired.

To promote residential energy efficient measures, the Office of Public Utilities acted as a facilitator for marketing and promoting energy related programs and activities. This involved the following:

- Meeting with local agencies.
- Coordinating energy-related "marketing" activities.
- Reviewing local "weatherization" program guidelines.

The project staff also met with the agencies to review work procedures and determine how recommended energy guidelines can be incorporated. Also, a review of program implementation and marketing to potential applicants was conducted.

This type of approach was principally directed at establishing a cooperative working relationship (network) between local community agencies with energy-related programs. The desired result would be a continuing and comprehensive support system for promoting energy efficiency.

TECHNICAL RESEARCH

Questionnaire Analysis

Two similar questionnaires were developed to determine the type of energy conservation measures homeowners and neighborhood associations "knew about" or "didn't" and which measures they would implement themselves. The questionnaire was distributed early in the project before any "neighborhood energy guidelines" were developed. The questionnaires were distributed through neighborhood meetings, by mailings to neighborhood association members and random mailings to non-members, and through neighborhood block walks. Representatives of neighborhood associations actively participated in the distribution of the questionnaires. The presidents of participating associations provided letters of endorsement which were attached with distributed questionnaires. Examples of these letters are provided in Appendix B. The second questionnaire which asked similar questions was again sent out at the end of the project in conjunction with the final "Neighborhood Energy Guidelines" as described in the marketing section of this Chapter.

Besides the questions relating to energy conservation as provided in Appendix C the questionnaires also requested information on selected housing characteristics such as the type of heating and cooling equipment used, and the square footage of the home. Due to a high concentration of Spanish speaking residents in particular neighborhoods in San Antonio a questionnaire was also written in Spanish and distributed.

Despite the wide distribution of questionnaires, response was minimal to the first questionnaire. The response rate ranged from 3 to 20 percent among individual neighborhoods. Total percentage response rate for all neighborhoods was only 9 percent. A total of 1600 questionnaires were distributed with only 144 returned.

The second questionnaire also received a 9 percent return response out of 880 questionnaires distributed. However, three neighborhood associations, PACE, Monticello and Monta Vista each increased their response participation as compared to the first mailer nine months earlier.

After a complete analysis of the questionnaire several conclusions were established of the respondents. They are:

1. The majority of neighborhood respondents were familiar with the concept "energy conservation", however 50 percent weren't familiar with energy conservation programs sponsored by CPS. This was the consensus with the majority of neighborhoods despite their varied difference in socioeconomic status, race or geographic location.
2. Respondents overwhelmingly would implement attic or wall insulation in their houses if they could. This response may indicate that many houses have little or no insulation.

3. One-fourth of the neighborhood respondents have added attic insulation to their homes.
4. The most-preferred energy measurements included a home energy audit, home weatherization, rebates on air conditioning units, and attic insulation. Table 2 prioritizes measures most preferred by respondents.

**TABLE 2
PREFERRED ENERGY MEASURES**

1. CPS Audit	= 48%
2. Weatherization	= 46%
3. Rebate on A/C	= 23%
4. Attic Insulation	= 21%
5. Water Heater Blanket	= 18%
6. Reflective Film	= 16%
7. Loan S	= 16%
8. Clock Thermostats	= 14%
9. Storm Windows	= 12%
10. Rebate Heat Pumps	= 3%

Home Energy Audits

Due to the high interest in home energy audits, displayed by the respondents, the project, with the assistance of City Public Service (CPS), coordinated neighborhood energy audits by blocks. This was an involved process which relied heavily on the assistance and support from neighborhood leaders. Neighborhood leaders were required to have interested residents fill out CPS audit registration forms, return them to project staff, and schedule the energy audits. Project staff was then required to deliver completed forms to the CPS Energy Conservation Office. CPS then performed energy audits at no cost and provided free needed weatherization materials including caulking, weather-stripping and a water heater blanket.

Housing Stock Analysis

An analysis of the residential housing stock was performed within each of the participating neighborhoods to provide energy efficiency recommendations to the associations. This assessment generated a list of energy efficient measures homeowners should implement, and also indicated which measures were the most likely to be cost-effective.

Two primary sources of information were used in this evaluation and analysis. First, data from the 1980 Neighborhood Census was reviewed. This data included poverty level, average size of family, race, total population, housing characteristics, and home heating and cooling equipment. Data was also collected by "neighborhood walks" with neighborhood representatives. This data collection effort gave an accurate assessment on the type of housing stock for each neighborhood. The results of the housing stock analysis were then used as an input for a computer energy simulation program to determine the cost-effectiveness of energy measures for the housing units.

These measurements were used to establish a "best set" of retrofit measurements by housing type can be developed for each neighborhood. The resulting information on cost effective measures was communicated to the membership of the participating neighborhood association.

Computer Programs

After the necessary housing data was compiled on the neighborhoods a two step analytical process was used to determine the cost-effective energy conservation measures for San Antonio. First, project staff utilized the City's Project VI Measures and Investment Options for Community Energy Conservation, "best set" of residential energy conservation and efficiency strategies for the City of San Antonio. The Year VII project involved

evaluating and determining the costs and benefits of residential energy conservation strategies in San Antonio and their financial impact upon the municipal utility, the ratepayers, and the City. This process required the identification of energy conservation strategies and their impact on local single family housing kilowatt (KW) and Kilowatt-hours (KWH) consumption. Two computer programs, Predesign Energy Simulation Program (PREP) and Demand Side Planner (DSP), were used to estimate energy consumption and to produce dollar costs and savings associated with individual energy conservation measures.

For a more direct analysis of San Antonio homes, project staff used the computer program Energy Economics of Design Options (EEDO). EEDO is a user-friendly program developed to calculate an economic and energy analysis of a given house based on the constraints of a given budget. This program is an IBM-PC microcomputer version of CIRA (Computerized Instrumented, Residential Audit), from the Lawrence Berkeley Laboratory, University of California, Berkeley, California.

The types of entries for the program included a wide variety of house components and related features.

- walls, windows, floors
- roof and subfloor
- heating and cooling system
- occupant behavior related to energy use

The data used in the computer analysis, such as total square footage of windows, walls, doors, HVAC equip. etc., was gathered during the housing audits performed by project teams. EEDO determines and assigns priorities to the best combination of retrofits for the whole house within the constraint of a given

budget and/or for which the dollar savings still exceed the expenditures. This process involves multiple yearly energy calculations and takes about ten minutes. Dollar and energy savings in several different economic formats are shown for each retrofit based on the expected period of occupancy for the house under consideration. Appendix D shows a typical printout for a home in the Monticello neighborhood. EEDO results were used to provide energy efficient information to homeowners of each neighborhood association.

MARKETING / COMMUNICATIONS

A major objective of the project was to develop a marketing approach and process that would encourage energy conservation in residential neighborhood. The result would provide San Antonio homeowners information on which energy improvement were cost-effective for their houses.

The project's marketing plan involved three strategies:

1. Produce and distribute Home Energy Guidelines publication.
2. Conduct home weatherization seminars.
3. Produce a Cable-TV energy series.

All three strategies strongly relied on the assistance and participation of both community organizations and neighborhood associations. It was the intent of the project that the "marketing" strategies be continued after the completion of the project at little cost to the community. The strategies pursued effectively met this objective.

Energy Guidelines

As part of the marketing plan the project developed and recommended general cost-effective guidelines to be used by locally based community

agencies and selected neighborhood organizations to encourage efficient energy usage in neighborhood single family residential buildings.

Project staff is currently reviewing the energy conservation measures that were being sanctioned by agencies and is also developing a general standardized list of energy efficient measures for use by the various community agencies in San Antonio.

When the survey is complete, recommended energy guidelines will be issued to agencies for implementation. These recommended measures are principally based on the Year 6 results, an economic "best set" of energy conservation programs for residences in San Antonio with respect to cost and savings, as well as payback in years.

Selected neighborhoods associations have been provided with a very similar list that is based on Year 6 results and the results from the project's own housing audits. This information has been distributed "door to door" and through neighborhood meetings to neighborhood residents. Table 3 is an example of the type of information has been provided to neighborhoods.

At present, Neighborhood Energy Guidelines have been distributed to the Monticello, Alta Vista, PACE, Wheatley Heights, and NHS neighborhood organizations. NHS, as described earlier in project, is an organization that works closely with two westside neighborhoods, in neighborhood economic revitalization and reinvestment and will act as project facilitator for both the Guadalupe and Prospect Hill neighborhoods.

Workshop / Seminars

Energy Efficiency Seminars were developed as a means to educate and promote retrofit measurements appropriate in San Antonio to homeowners and to



ALTA VISTA NEIGHBORHOOD ASSOCIATION

HOME ENERGY GUIDELINES

This information was made possible by the City of San Antonio Office of Public Utilities by conducting energy audits of selected homes in your neighborhood. These guidelines will provide recommended "generic" energy saving ideas for homes of the Alta Vista Neighborhood.

To find out what you can do in your particular home to save on energy costs just match your house to the housing type & characteristics that best resembles your home.

For additional information you can contact our office at 299-8495 or your neighborhood association.

Does your house resemble these characteristics? If not go to next housing type.

Characteristics of Your Home

Sq. ft. 1900 Sq. Ft.
 Heating gas
 Cooling electric/window A/C units
 Water heater electric

Housing Type A

1 story wood frame



Recommended Energy Saving Ideas

<u>Type</u>	<u>Initial Cost</u>	<u>1st yr. Savgs.</u>	<u>Annual Maint.</u>	<u>Net Life Savings</u>
1. Lower htg. thermostat by 3F	\$ 0.00	\$ 39.00	\$0.00	\$ 387.00
2. Set water heater to 120F	\$ 0.00	\$ 13.00	\$0.00	\$ 124.00
3. Install R-6 water heater Blanket*	\$ 8.00	\$ 15.00	\$0.00	\$ 72.45
4. Add caulking & weather-stripping*	\$ 68.00	\$ 22.00	\$0.00	\$ 220.00
5. Increase ceiling insulation to R-25	\$385.00	\$154.00	\$0.00	\$1540.00
6. Auto. 5F Htg. & Clg Night Setback	\$120.00	\$ 31.98	\$0.00	\$ 185.00

create a cooperative and coordinated approach among community agencies, a major objective of the project.

A Home Energy Efficiency and Reinvestment Seminar was coordinated in conjunction with Alamo Area Council of Governments (AACOG). Topics of discussion were energy efficiency, retrofit measurements and the availability of local energy-related guidance to all San Antonio homeowners. Representatives from local community agencies explained the type of services they provided, and distributed printed materials and demonstrated applications. Guest speakers also presented ways in which neighborhood associations can develop their own neighborhood energy programs and in which home energy efficiency can stimulate economic development. A Public Service Announcement (PSA) announcing the availability of the seminar was produced and aired on all local television stations. The City also provided the impetus for a workshop provided by AACOG and by the Texas Public Utility Commission on Home Energy Conservation. Future workshops and Seminars are planned throughout the City, with the principal planning provided by different neighborhood associations.

Multi-Media Videos

A Cable-TV video series on Energy and Housing was produced and directed by the Office of Public Utilities with production assistance provided by Rogers Cable System of San Antonio. Two primary objectives were established for the video production; the first objective was to involve community agencies, private companies and neighborhood associations in an energy efficiency awareness program. A second objective was to develop an easy to understand educational tool for homeowners that provide information on appropriate energy measures for San Antonio and how to install such measures. The first two programs, Energy and The Home, Parts I and II, explained the costs and savings

associated with energy efficient housing retrofit measures. The first program demonstrated a home energy audit and the second program demonstrated a "how to" for homeowners implementing energy conservation measures. The third program informs the homeowner about the different community agencies that provide home weatherization or utility assistance in San Antonio. The fourth program titled "From Coal to Kilowatts" explains how electricity is generated and what it means to the homeowner. The fifth program is a new home buyers guide for energy efficient housing. Additional programs are being produced on energy efficient homes and other energy topics.

ACCOG provided one of their energy retrofit homes as a demonstration for the video production. The home was located in one of the projects neighborhoods, Highland Park. Weather-Rite, a principal contractor for ACCOG, participated in the production by performing the actual retrofit measures on the home. Texas A&M's Energy Division in San Antonio provided an energy specialist to perform the home energy audit. Ray Ellison Homes, a local home construction company provided the home for the fourth program and will assist in future programs. All five programs have been shown on the City's access cable channel for all homeowners to view, twice a day Monday-Thursday and once on Saturday for approximately two weeks. The programs are between 15 and 30 minutes in length and feature houses from the participating neighborhoods. All five programs are now being distributed to participating neighborhood associations and community agencies. A majority of the taping and editing was done "in-house" with technical assistance provided by Rogers Cable TV and as a result, the costs for each program averaged less than \$500.00.

BUDGETARY / ECONOMICS

In 1985, the City of San Antonio's Year VI Project analyzed the potential for energy conservation and its relationship to meeting the community's economic growth objectives. The project evaluated the municipally owned utility's energy conservation goals and objectives, current and future programs, and its forecasting and generation plans. Emphasis was placed on evaluating and developing a "best-set" of cost-effective residential energy conservation programs designed for the San Antonio area.

Appendix E provides the results of energy conservation analysis that details the KWH, KW, and MCF savings and payback for a typical wood frame house of 1775 square feet. This analysis was conducted using the Predesign Energy Program (PREP) designed by the Bickle Group. PREP calculates these KW, KWH, and MCF savings for each energy conservation measure studied. This same analysis was conducted for smaller and larger houses that used varying amounts of electrical consumption. The results of these analysis became an input to the cost/benefit model used to determine the cost-effectiveness of various energy conservation measures.

The Results

The selection of the "best set" of energy conservation measures for San Antonio followed a three step process of evaluation and elimination. First, the cost/benefit ratios, actual dollar impact on rate level, payback years to the participant, cost of the measures, financing options, and non-economic considerations were calculated for each measure. Next, a best set of programs was determined using only the economic issues as criteria, as calculated by the DSP computer model. Finally, this initial best set received further analysis, looking at their combined dollar impact and resulting combined KW and KWH

savings. All dollar amounts in this chapter were calculated based on a participation level of 5% of the customers entering the program each year of the 10 years the program is in place, a level much higher than that which City Public Service now experiences. Other participation levels were also tested and the costs and benefits of these alternatives levels are presented at the end of this Chapter. The City hopes to expand participation in conservation programs and therefore wanted to evaluate the dollar impact at a higher participation level than currently occurs. Also, the annual dollar impact for one customer's bill was calculated based on City Public Service's current number of customers. As the customer base expands, the dollar impact will drop. City Public Service expects their number of customers to double in the next 25 years. So, the dollar impact is a conservative estimate which will likely drop as the number of customers increases.

A few general comments pertain to the majority of the measures. First, the proposed programs (those not already offered by CPS) assume the same operating and maintenance costs as CPS's similar, already functioning programs. Second, loan programs, present and proposed, experience high operating and maintenance costs due to bank processing fees and the number of customers processed but never approved. These two factors make the unit cost of loans very high compared to rebates. Finally, CPS loans money through its programs with a seven year payback schedule. This study assumed a five year payback, necessitated by the limitations of the DSP computer program. The difference in cost between five and seven year loans was not significant to the study when tested.

Economic Best Set

As stated, the "best set" of energy conservation measures for San Antonio was chosen based solely on economic criteria. If a measure proved cost-effective under a certain financing strategy, it was included in this economic best set. For example, rebates on high efficiency air conditioning units have positive cost/benefit ratios; loans do not. Therefore, rebates on high efficiency air conditioners became part of the best set; loans did not. The following list briefly describes each program in the best set of measures.

- A 15% rebate on retrofit attic insulation over a certain R value, paid by CPS. The program would function like CPS's present air conditioner rebate program.
- A 15% rebate on retrofit wall insulation paid by CPS. This program would also function like present CPS's rebate programs.
- A 20% rebate on retrofit weatherization materials, paid by CPS. Caulking, weatherstripping, water heater insulation wraps, and outlet insulators would qualify for rebates. The participant would have to spend a minimum dollar amount to receive the rebate.
- A 5% rebate on retrofit or new home high efficiency window or central air-conditioner units of EER 9 and above, paid by CPS. This replaces CPS's \$150 rebate program. Dealers would continue to receive a \$25 incentive payment.
- A mail-in audit performed by CPS. The participant answers a questionnaire; CPS inputs their answers into a computer program which calculates cost/benefit ratios and payback time. CPS mails the analysis back to the participant.

- A Residential Conservation Service (RCS) audit offered by CPS. CPS currently does RCS audits on request and hands out free weatherization materials. The only change recommended is for CPS to discontinue giving away material.

In addition to the above programs sponsored by CPS, two programs proved cost-effective for a third party to finance and are therefore recommended.

- A free weatherization kit. The kit would contain caulk, weather-stripping, outlet insulators, and a water heater wrap. The entity donating the kit would have to absorb the total cost of the materials. The program would, therefore, have to be promoted as a community service or as an aid to low income consumers.
- Loans at below market interest rates for energy conservation measures. Loans would be issued for high efficiency air conditioners, weatherization, and attic insulation.

Alternative Program Costs and Savings

While a "best-set" residential energy conservation program was determined, it is unrealistic to believe that all participants would implement all of the measures. Therefore, the "best-set" is divided into four subsets which reflect different groupings of programs and different levels of participation in the tested energy conservation programs. Each subset has its own annual utility costs and MW savings. The first three subsets represent realistic possibilities of combinations of measures implemented by a household. The last subset shows what would happen if all programs in the best set had good participation, an ideal maximum. Table 4 lists the four principal residential energy conservation subsets that achieve a minimum, mid-range, household

TABLE 4
RESIDENTIAL ENERGY CONSERVATION PROGRAMS

A. Minimum Level

- 20% Rebate on Weatherization
- 15% Rebate on Attic Insulation

B. Mid-Range Level

- 20% Rebate on RCS Audit
- Weatherization
- 15% Rebate on Attic Insulation
- EER 9 Air Conditioning

C. Household Maximum Level

- RCS Audit
- 15% Rebate on Attic Insulation
- 15% Rebate on Wall Insulation
- 20% Rebate on Weatherization
- 5% Rebate on EER 10 Air Conditioning
- Increase Exterior Shading
- Decrease Solar Absorbability of Exterior House Color

D. Maximum Total Participation

- 15% Rebate on Attic Insulation
- 15% Rebate on Wall Insulation
- 20% Rebate on Weatherization
- 5% Rebate on EER 9 Air Conditioning
- 5% Rebate on EER 10 Air Conditioning
- Mail-In Audit
- RCS Audit
- Increased Exterior Shading
- Decreased Exterior Solar Absorbability of Exterior House Color

maximum, and, lastly, a total maximum level of energy conservation participation if all programs were implemented throughout the service area. This last category assumes all programs gain a certain participation level, regardless of how many measures an individual household implements. Each of the subsets except the maximum level were evaluated for participation levels of 1, 5, and 10 percent. The maximum level was only evaluated with participation levels of 1 and 5 percent. A 10% participation level in every measure was believed to be an unlikely possibility.

Table 6 details pertinent information for each of the four subsets of the "economic best set" at a 5 percent participation level. Specifically, it shows the total number of participants, the cumulative total annual cost to the utility to run the program (calculated by adding the total annual operating and maintenance expense and the total rebates paid), the present value of the net dollar savings to the utility and to the participants over the 30 year life of the program, the annual MW savings - total and peak, and the annual MWH savings.

Figures 4, 5, 6, and 7 at the end of the chapter summarize the results for all stratum levels. The graphs depict the total peak MW saved in 1995, the total present value dollar savings to the utility, the total present value dollar savings to the participant, and the dollar cost to the utility in 1986. Each graph contains the values for all the program and for all participation levels in all four subsets.

The results demonstrate the definite economic benefits to the utility and the customer through energy conservation. For example, if the utility implements a weatherization and attic insulation program and 1 percent of its customers participate, there is a potential to save 56 MW in 1995. By

TABLE 5

ALL STRATUM
5% PARTICIPATION LEVEL

<u>Program</u>	<u>Total Number of Participants</u>	<u>Annual Cost to Utility for Implementation</u>	<u>Present Value Net Dollar Savings to Utility Over 30 Years</u>	<u>Present Value Net Dollar Savings to Part. Over 30 Years</u>	<u>Annual MW Savings** Peak</u>	<u>Annual MWH Savings Total</u>
Total - Minimum Level of Energy Conservation Measures (ECM)*						
1986	12,411	\$ 1,300,800			13	22
1990	72,395	1,885,696			78	140
1995	157,683	2,874,090			173	282
2000	157,683	0			132	208
2005	157,683	0			89	123
2010	85,288	0			48	67
2015	0	0	\$ 351,746,500	\$ 200,159,096	0	0
Total - Mid-Range Level of ECM's***						
1986	12,411	\$ 3,787,123			25	39
1990	72,395	5,509,157			140	231
1995	157,683	8,397,006			308	482
2000	157,683	0			267	408
2005	157,683	0			162	231
2010	85,288	0			48	67
2015	0	0	\$ 514,226,673	\$ 302,602,631	0	0

*See Table 14 for a listing of energy conservation measures under Minimum, Mid-Range, Household Maximum and Maximum Levels

**Savings decrease even through the number of households participating stays constant because weather-stripping wears out faster than insulation.

***Costs include audit and rebates on weatherization and insulation. MW, MWH savings, and net dollar savings counted only for weatherization, insulation, and EER 9 - nothing for audit.)

TABLE 5

ALL STRATUM
5% PARTICIPATION LEVEL (Cont.)

<u>Program</u>	<u>Total Number of Participants</u>	<u>Annual Cost to Utility for Implementation</u>	<u>Present Value Net Dollar Savings to Utility Over 30 Years</u>	<u>Present Value Net Dollar Savings to Part. Over 30 Years</u>	<u>Annual MW Savings**</u>		<u>Annual MWH Savings</u>
					<u>Peak</u>	<u>Total</u>	
Total - Household Maximum Level of ECM's							
1986	12,411	6,150,415			42	56	63,145
1990	72,395	8,371,749			186	325	356,318
1995	157,683	10,825,307			508	686	784,652
2000	157,683	0			463	612	713,409
2005	157,683	0			344	413	519,071
2010	85,288	0			138	151	205,626
2015	333	0	\$ 759,565,287	\$ 345,072,042	0	0	3,165
Total - Maximum Level of ECM's							
1986	94,231	\$ 7,709,905			79	111	157,584
1990	510,222	10,656,334			431	618	829,320
1995	961,049	14,305,224			928	1,327	1,869,467
2000	994,928	0			833	1,169	1,663,427
2005	592,766	0			516	660	931,969
2010	187,761	0			138	151	205,626
2015	1,558	0	\$ 1,638,744,179	\$ 916,882,284	0	0	2,231

FIGURE 4

PEAK MW SAVED IN 1995

IF DIFFERENT PROGRAMS ARE IMPLEMENTED

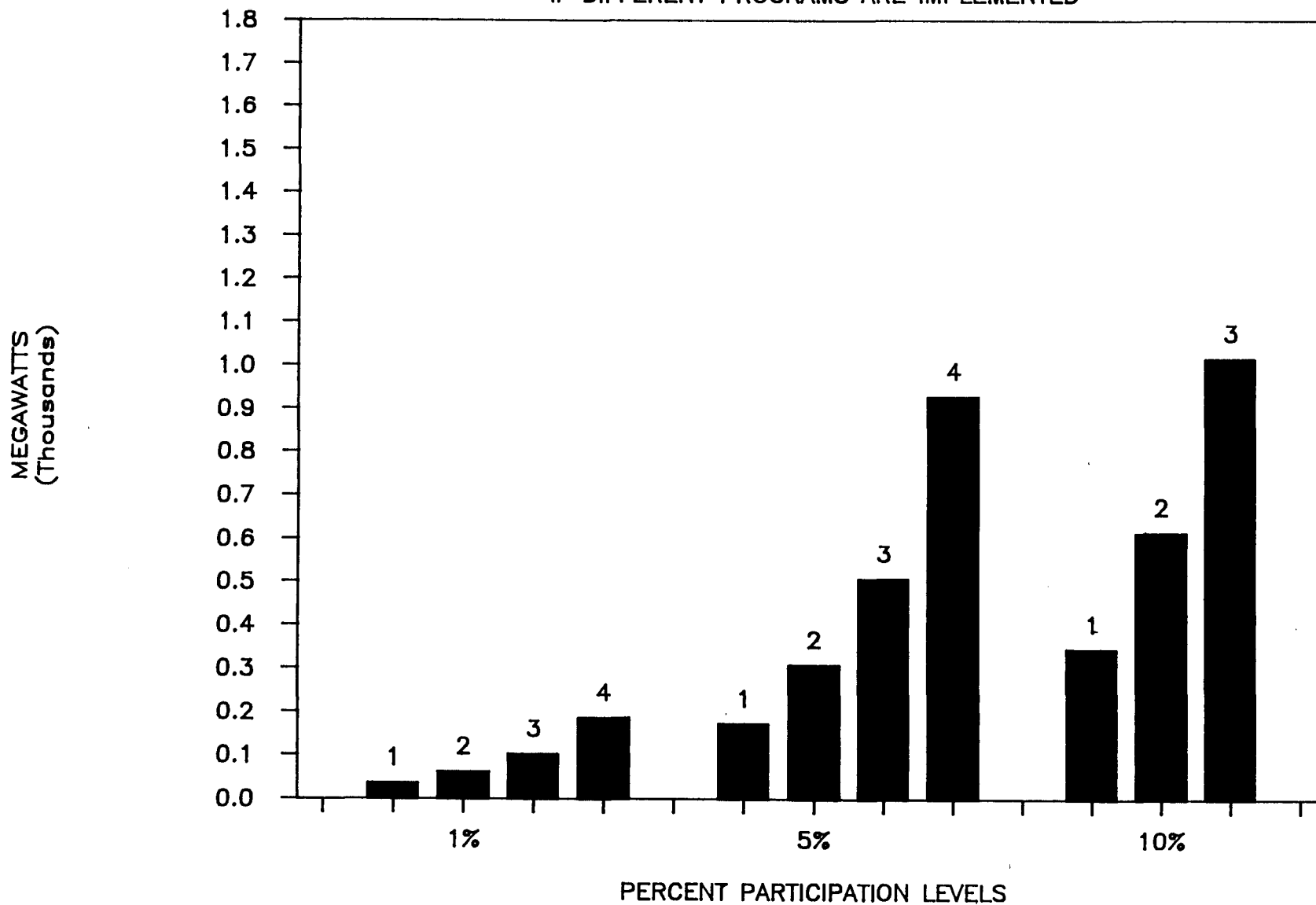


FIGURE 5

TOTAL PV \$ SAVINGS TO UTILITY IF DIFFERENT PROGRAMS ARE IMPLEMENTED

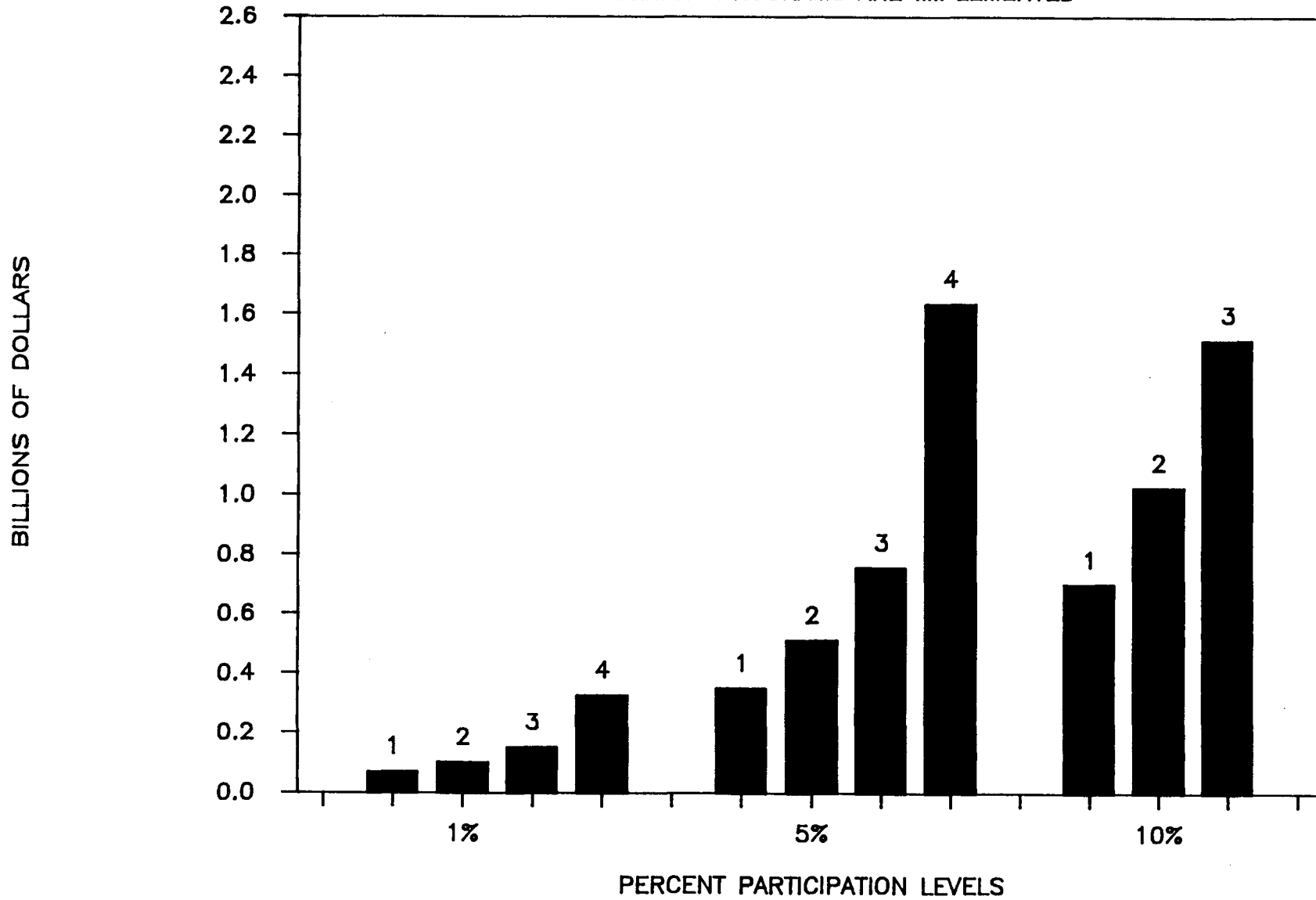


FIGURE 6

TOTAL PV \$ SAVINGS TO PARTICIPANT IF DIFFERENT PROGRAMS ARE IMPLEMENTED

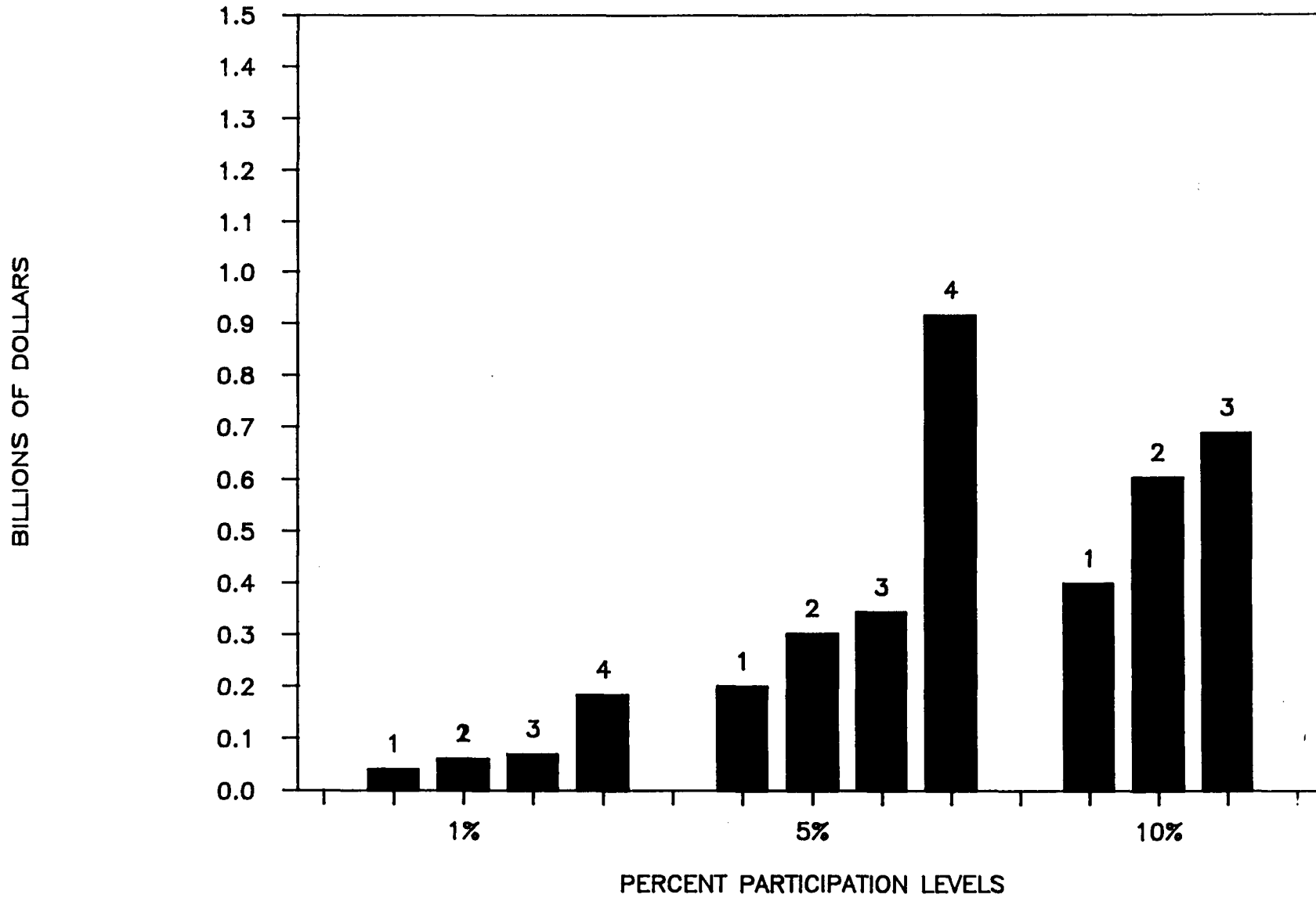
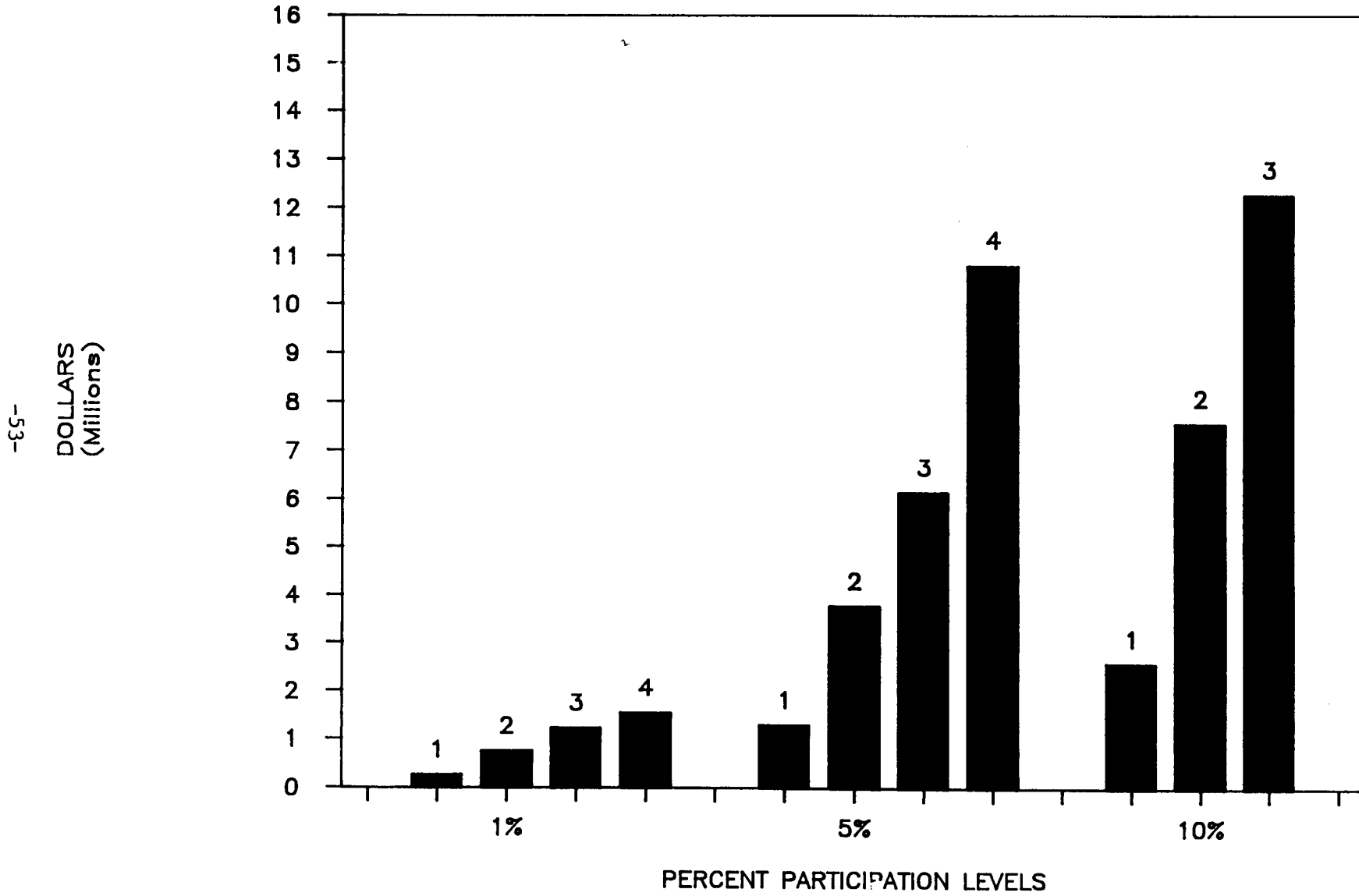


FIGURE 7

TOTAL DOLLAR COST TO UTILITY IN 1986

IF DIFFERENT PROGRAMS ARE IMPLEMENTED



increasing air conditioning and appliance energy efficiency at the same time, the savings could increase to 96 MW. A 5 percent participation level for the weatherization and attic insulation programs has the potential to save 282 MW in 1995, 482 MW when efficient air conditioning and appliances are added. For both participation levels, the present value net dollar savings to the utility and the participants over 30 years is significant. For a cost to the utility of approximately \$3.5 million to implement the weatherization, insulation, and air conditioning measures, the 1 percent participation level generate \$102.8 million in savings to the utility and about \$60.5 million to the participants.

The goal of the study was to establish empirical data regarding energy conservation activities, both current and potential, in San Antonio. The evaluation methodology identified a range of "best-set" scenarios, each with their respective costs, MW and MWH savings, and participation levels. The minimum range with 1 percent and 10 percent participation resulted in a MW savings in 1995 of 35 and 346 respectively and present dollar savings to the utility of \$70 million and \$703 million respectively. The total maximum range with 1 percent participation and the household maximum with 10 percent participation resulted in a MW savings in 1995 of 186 and 1,016 respectively, and present dollar savings to the utility of \$328 million and \$1.5 billion, respectively. (1995 is the year in which the maximum annual MW savings is realized.)

Summary

As was shown in figure 2 developing and sustaining a neighborhood energy conservation program depends on several coordinating strategies. The most important concern is simple "economics", it must be shown that energy efficiency saves money. Next, homeowners and neighborhood associations need to

be shown that energy efficiency saves money and this can be done through a variety of means as describes in the chapter. However, this process or series of events is not easily accomplished. Programs need to be coordinated, energy companies need to be notified, volunteers are required from the neighborhood to help distribute information or to help implement a program. The result is that neighborhood associations are a viable resource in which to "market" energy efficiency to homeowners but it requires extreme attention and support from staff and other sources. Marketing energy efficiency through neighborhood associations becomes an important but only one of several strategies a local government or utility should undertake to advertise and educate homeowners on home energy efficiency.

CHAPTER 4

LESSONS LEARNED

INTRODUCTION

The San Antonio study was a strategic planning approach to examine how to develop, market and implement residential energy conservation programs in order to encourage efficient energy usage in residential neighborhoods. The study had four principal objectives:

- (1) determine if neighborhood associations can effectively market and "test" residential energy conservation programs;
- (2) evaluate and develop innovative marketing strategies;
- (3) provide energy awareness information and training to the homeowner, consumer, ratepayer; and
- (4) develop an "on-going process that could increase residential participation without the increase of governmental funding support.

ANALYSIS OF THE STRATEGIC PLANNING ELEMENTS STRUCTURES

As stated in Chapters 2 and 3 the study involved four functional areas of concern: organizational, technical, marketing and budgetary strategies. To effectively market residential energy conservation a series of strategies and organizational structures need to be developed and implemented. This may be a time-consuming and complex activity because of the nature or with neighborhood associations but it can be accomplished at relatively low costs.

Organizational

Developing an neighborhood/community energy plan takes time, patience and committees individual who are willing to work with their neighborhoods. There are however, two simple suggestions that can help your jurisdiction to "kick-off" a local project:

- o Limit the number of participating neighborhood associations in the first year to about 5 and 7. This would assist in eliminating a juggling of time of effort between associations.
- o From the beginning of the project provide neighborhood associations a strict project schedule that briefly outlines activities and target dates to complete objectives. Involve the neighborhood in all steps since its them you want to run the project.

The project required a continual commitment from the participating neighborhoods, and the project staff. Initially, staff worked with 10 neighborhood associations. Later this group was reduced to seven. This was done because the level of commitment from each neighborhood varied, and it allowed project staff to concentrate their efforts on providing each neighborhood with more assistance. It was common to have some neighborhood associations respond to the project objectives quickly and eagerly while others took 1 to 2 months to respond or provide information to their memberships. Any planned activity required continuing contact with the associations' that included phone calls, letters and home visits. If the neighborhood association had a active president then some of the project's administrative tasks could be shared. Otherwise, City staff had to plan, initiate and promote any neighborhood energy activity. Personal contact among neighborhood residents is however a very effective way to promote energy awareness. This type

of "neighborhood" action included door-to-door greetings, neighborhood newsletters simple word-of-mouth and neighborhood meetings. While not many residents attended neighborhood meetings, information was often disseminated throughout the neighborhood through "word-of-mouth." However, because of the involved and complex working relationship with neighborhood associations no "pre-determined" time schedule could be kept.

The study found that local public and non-profit agencies do sponsor many energy conservation programs. These programs are typically designed for low-income families, senior citizens and the physically handicapped. Programs designed for families earning more than a "low income" criteria were non-existent except for the energy conservation programs provided by City Public Service. All programs offered by the utility or by other agencies are easily obtainable but most homeowners are not aware of the availability of the programs.

In an effort to resolve this level of community energy awareness the project recommends that all public and non-profit agencies join together and adopt a uniform marketing strategy which would make homeowners aware of their programs. They can start by working through Neighborhood Associations which can lead to the doorsteps of homeowners. A referral system has been initiated by some agencies, as the first step toward achieving this goal.

Technical

The results of the City's Year VI energy conservation analysis and current EEDO retrofit printouts were used to matching appropriate energy conservation measures to specific neighborhoods. Participating neighborhood associations were very helpful and assisted project staff with obtaining necessary housing data. The EEDO program was used to determine appropriate Energy Conservation

measures but required a tremendous amount of data input, current utility costs, and product cost and savings. This prompted use of the Year VI's energy conservation cost/ benefit results. The result is a significant amount of data that is subjective to decisions to determine an accurate assessment of a home's energy needs. The 1980 U.S. Census Neighborhood Statistics can provide neighborhood based data but must be taken to ensure that the geographic boundaries involved have remained consisted. Changes that had occurred in some of San Antonio's boundaries resulted in statistical inaccuracies for several of the neighborhood associations.

Marketing / Communication

The third functional strategy was the most visible and involved developing methods to inform and educate homeowners on energy conservation measures, energy savings and local assistance programs for associations interested in developing their own energy programs. Marketing takes a great deal of time and commitment from both staff and neighborhood residents. One of the biggest problems with marketing is how the residents perceive it. In San Antonio, it was a question of whether there was an energy problem? And if so, how did it impact the lives of the residents? In marketing, you want to provide a positive but "realistic" image. In this project it was important to determine "why" we are doing it and then be prepared to back-up any information we provided to the neighborhoods. Printing energy data within the neighborhood newsletter was an effective way to distribute information that was usually not only read but "saved" until the next newsletter. Many neighborhoods were anxious to receive information including advertising for goods and services for their newsletter. Private companies such as Builder Square were willing to place ads offering discounts on energy efficiency materials in local neighborhood newsletters. However, it was felt by project staff that each

individual Neighborhood should approach the Company or vice versa instead of the City. The development of Cable-TV videos were also very successful with all the neighborhoods when the programs were shown at local neighborhood meetings. The programs are also shown on the local governmental and public access channels. Neighborhood leaders have also informed their membership that the information is important and may save them money by watching the programs. The videos utilized neighborhood resources as much as possible by filming neighborhood homes, using local volunteers and giving credit to participating neighborhood associations. The City and CPS have initiated discussions to combine efforts to produce additional programs and public service announcements that will provide useful information to homeowners.

Budgetary/Economics

There are two principal monetary items to be considered in this project. First, the cost/benefits associated with conservation. The second concern is the cost benefits of developing and sustaining a neighborhood energy program.

In regards to residential energy conservation, City Public Service has initiated a goal to save between 400-700 MW by the year 2000. These energy savings can only be achieved through a maximum level of participation from local residents to use energy efficiently in order to guarantee success. Based upon the results of the City's Year VI study a 400-700 MW savings will produce a present value net dollar savings over 30 years to the utility and ratepayers approximately \$500 million and \$300 million respectively, for utility total dollar costs of \$16 million. Obviously, this goal is justifiable and should be initiated to its maximum potential.

In regards to sustaining a neighborhood program, the cost to the city to provide staff and supplies to initiate the project during the first few years would cost approximately 85,000 per year. This is for two full-time staff to assist neighborhood associations and other neighborhood organizations begin their own energy programs and to provide technical assistance to homeowners.

NEIGHBORHOOD PLANNING PROCESS

For a neighborhood association to be successful in identifying and solving their home energy needs the project developed the following "simplified" home energy efficiency strategy. This strategy includes a step-by-step implementation process that assists the neighborhood association in selecting actions that would alleviate home energy problems.

- 1) The first basic step is to do an "environmental scan" of Neighborhood residents and establish possible and practical courses of action.
 - o Find out if residents are concerned about utility bills and/or implementing any type of energy conservation measurement.
 - o Find out if residents may be interested in participating in neighborhood block home energy audits.
 - o Meet regularly with a small group of interested residents to define your goals and objectives, and establish practical courses of action.
 - o Determine if the local utility has conducted any special energy programs in your neighborhood in the past.

- 2) The next step is to prepare for a general neighborhood meeting evolving around identifiable concerns.
 - o Select a central, well-known meeting place in the neighborhood with adequate parking.

- Distribute leaflets door-to-door announcing the meeting and why you are meeting (a helpful strategy is to have the meeting in association with a regular set neighborhood meeting).
 - Contact neighbors and friends personally regarding the meeting to assure a good turnout.
- 3) The third step is the meeting itself. Have an organized agenda, explain why you are holding the meeting and solicit other people's thoughts on the issue. You may want everyone present to fill out a questionnaire giving their ideas/interest on home energy needs.
- Get an official consensus of the group and set up a committee to oversee development of a neighborhood energy plan.
 - Get the names, addresses and phone numbers of individuals who at the meeting expressed interest.
- 4) This committee should develop an energy plan which would:
- Define goals and objectives of plan.
 - Describe utility-related conditions in the neighborhood.
 - Prepare recommendations to achieve these goals and objectives.
- These recommendations should be implemented first according to their order of importance to Energy committee.
- 5) In developing a neighborhood energy plan, the committee should consider the following areas:
- **Housing.** Determine condition of neighborhood housing, construction materials, when the homes were built, heating and cooling systems in place.

- **Utility Services.** Assess the adequacy of utility services to include electric, gas and water. Who provides the services and is the neighborhood provided for adequately? Does one or more utility provide the electricity and gas?
 - **Energy Assistance Programs.** Does the local utility provide energy assistance programs that may include residential and commercial energy audits, loans, grants and neighborhood energy conservation/efficiency educational programs.
 - **Public/Private Assistance.** Identify local agencies, associations or public/private energy assistance programs. This can include the Utility, City Departments, weatherization and/or home rehab programs. Who can qualify and what are the costs?
 - **Marketing.** Determine how you plan to present information or neighborhood policies to be neighborhood, city or local utility. What do you want to accomplish and why?
- 6) The Neighborhood begins by appointing individuals or teams to implement the suggested recommendations. The Neighborhood Association should require biweekly or monthly status reports on all ongoing activities. Listed below are a few necessary steps to collect and present data to the neighborhood.
- Conduct a housing stock survey and evaluation, assess neighborhood utility housing characteristics. Utilize Neighborhood census data to gather appropriate information.
 - Coordinate with the local utility to conduct selected home energy audits.
 - Develop and distribute Neighborhood Energy Questionnaires to members/residents to determine their energy needs and housing characteristics in

the Neighborhood. This can include the type of heating and cooling equipment, the square footage of house and any other pertinent data.

- o Arrange for energy-related agencies to attend neighborhood meetings. Local agencies can provide information on types of energy assistance, as well as, distribute and take applications.
- o Coordinate Neighborhood Energy Conservation Workshop/Seminar(s) sponsored by energy-related agencies and/or the city.
- o Coordinate with a local hardware store or other private industries regarding coupons/discounts or materials. Discounts can be "advertised" directly through neighborhood Newsletters or at neighborhood meetings, and by door-to-door.
- o Contact individual local energy public/private agencies and find out how they can assist your neighborhood in implementing a Neighborhood Plan i.e., workshops/seminars, presentations at neighborhood meetings, distribution of free materials, establish an Energy Efficiency awareness week or day.
- o Arrange for audio visual presentations to the neighborhood to provide updated energy assistance and "how-to" home weatherization programs.
- o Contact local news agencies, TV stations and local cable operators to identify services. Local cable operators usually provide free video equipment for non-profit organizations.

CONCLUSIONS AND RECOMMENDATIONS

This project focused, on using 10 local neighborhood associations as resources to encourage efficient energy usage in residential homes. As noted in the narrative, associations expressed support and interest in the project during the developing stages. However, participation levels varied dramatically when implementation began. With some neighborhoods there were

continuous delays with planned activities, sometimes caused by a change in association leadership. As a result, project staff had to establish new relationships. Planned activities were often delayed or cancelled. In conclusion, maintaining association interest and trying to get them involved consumed more effort and time than anticipated. The project, however, did find neighborhood associations valuable in transferring and disseminating information. Door knocking, word-of-mouth, newsletters, and neighborhood meetings were very helpful in promoting activities and educating citizens on energy conservation measures.

As part of the project's strategic planning process the potential for San Antonio developing an "out-reach" energy program was examined. In San Antonio there is no centralized office or department that could act as a facilitator for homeowners regarding information on types of energy programs. Local community agencies however, have demonstrated interest in a on-going comprehensive energy program. Yet, this would require the continual monitoring of one entity, necessitating a substantial cost and program commitment. It is important to note that the project staff did receive neighborhood assistance while conducting energy audits, developing news releases and public service announcements.

Project Results

The result of the tasks completed include:

- o Home Energy Guidelines, a list of appropriate energy efficiency measures designed for a specific neighborhood association.
- o "How-to" videotapes on residential energy conservation are available free to neighborhood groups

- o A more efficient coordinated effort among local agencies, the City and other non-profit groups to offer energy conservation services.
- o Energy standards and recommendation for residential energy efficiency are included within the City's Neighborhood Planning Process handbook.
- o Energy workshops and seminars were held as well as over a dozen presentations to local neighborhood associations on the subject of residential energy conservation were conducted.
- o Participation by neighborhood groups regarding their interest and support for specific energy efficient measures.

Indirect Project Results

- o Support from private companies to provide home energy materials at a discount to neighborhood associations.
- o A Cable-TV series on energy issues. Expanded educational coordination between the City and the local utility.
- o The enactment of a Demand Side Management Committee staffed by public appointees from the local utility and the City. The Committee is to make recommendations regarding the promotion of energy conservation strategies.
- o The local utility and the City agree to save between 400-700 MW by the year 2000.
- o Completed preliminary review of new residential building energy codes.
- o Excluded loans for air conditioners. Increased the required energy efficiency ratios for necessary air conditioners to obtain a rebate from the utility.

It is important to realize that "energy planning" will not be a major issue for a neighborhood. Its certainly more important to provide residents

with electricity, water, streets and trash pick-up. But society is changing, how we live and use our resources can and will have an impact on the costs to provide gas and electricity in the future.

Neighborhood Associations have the capability to play an important role in directing local energy policies and how future energy needs shall be provided and paid for. Neighborhood input from individual ratepayers and homeowners is vital to any successful energy conservation strategy. Neighborhoods, however must be organized to make any statement towards directing such policy. And the first simple step forward is to provide neighborhood associations with accurate information and to request their involvement in the growth of their city.

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APPENDIX A

TABLE I: NEIGHBORHOOD PORTFOLIO OF PARTICIPATING NEIGHBORHOODS

1. ALAMO FARMSTEADS

- a. Geographical Location
Northwest
- b. Total Population
849
- c. Race Origin
85% Anglo
- d. Family Avg.
\$29,032
- e. Participation Level
Active
- f. No. of Owners Housing Units/
Rental Units
Owner - Occupied = 223
Renter - Occupied = 52

2. OAK PARK NORTHWOOD

- a. Geographical Location
Northeast
- b. Total Population
11,062
- c. Race Origin
Over 90% Anglo
- d. Family Avg.
\$36,016
- e. Participation Level
Active
- f. No. Of Owners Housing Units/
Rental Units
Owner - Occupied = 3080
Renter - Occupied = 2238

3. PROSPECT HILL

- a. Geographical Location
West
- b. Total Population
6,285
- c. Race Origin
73% Hispanic
- d. Family Avg.
\$14,044
- e. Participation Level
Active
- f. No. of Owners Housing Units/
Rental Units
Owner - Occupied = Unavailable
Renter - Occupied = Unavailable

4. ALTA VISTA

- a. Geographical Location
North
- b. Total Population
4,205
- c. Race Origin
63% Hispanic
- d. Family Avg.
\$15,661
- e. Participation Level
Active
- f. No. Of Owners Housing Units/
Rental Units
Owner - Occupied = 580
Renter - Occupied = 1212

5. RIVER ROAD

- a. Geographical Location
North
- b. Total Population
609
- c. Race Origin
64% Hispanic
- d. Family Avg.
\$16,115
- e. Participation Level
Active
- f. No. of Owners Housing Units/
Rental Units
Owner - Occupied = 150
Renter - Occupied = 129

6. WHEATLEY HTS.

- a. Geographical Location
East
- b. Total Population
8,355
- c. Race Origin
90% Black
- d. Family Avg.
\$11,000
- e. Participation Level
Active
- f. No. Of Owners Housing Units/
Rental Units
Owner - Occupied = 1688
Renter - Occupied = 725

7. HIGHLAND PARK

- a. Geographical Location
South
- b. Total Population
11,716
- c. Race Origin
51% Hispanic, 30% Anglo
- d. Family Avg.
\$17,398
- e. Participation Level
Active
- f. No. of Owners Housing Units/
Rental Units
Owner - Occupied = 3382
Renter - Occupied = 1236

8. GUADALUPE

- a. Geographical Location
West
- b. Total Population
4,662
- c. Race Origin
98% Hispanic
- d. Family Avg.
\$10,255
- e. Participation Level
Active
- f. No. Of Owners Housing Units/
Rental Units
Owner - Occupied = 491
Renter - Occupied = 857

9. PACE

- a. Geographical Location
South
- b. Total Population
46,535
- c. Race Origin
40% Hispanic, 37% Anglo
- d. Family Avg.
\$13,378
- e. Participation Level
Active
- f. No. of Owners Housing Units/
Rental Units
Owner - Occupied = 8710
Renter - Occupied = 5166

10. MONTICELLO PARK

- a. Geographical Location
Northwest
- b. Total Population
1,269
- c. Race Origin
58.2% Hispanic
- d. Family Avg.
\$22,072
- e. Participation Level
Active
- f. No. Of Owners Housing Units/
Rental Units
Owner - Occupied = 1010
Renter - Occupied = 1578

Sources: 1980 Decennial Census Neighborhood Statistics Program Geographic Definition of Neighborhoods.

Department of Planning, Data Management Division.

APPENDIX B

COMMUNITY NEWSLETTER



ALTA VISTA NEIGHBORHOOD ASSOCIATION

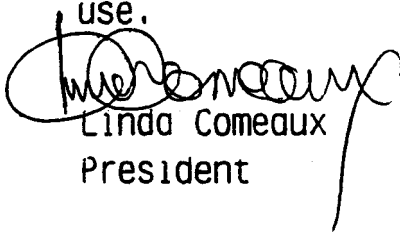
January 29, 1986

Dear Neighbors,

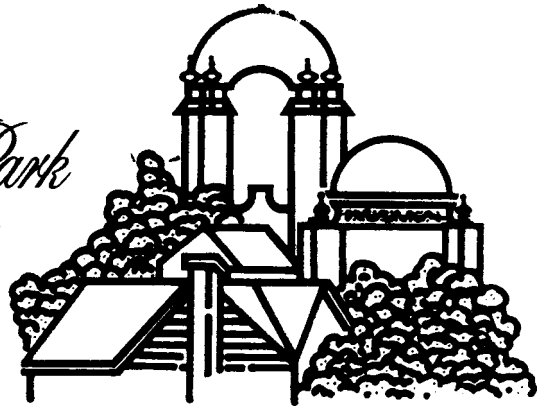
At a recent meeting of our neighborhood association, several of us participated in an Energy Conservation survey. The purpose of the survey is to help us learn more about the efficiency of our home heating and cooling and to save money on our utility bills.

Enclosed is a copy of the survey, so you too can participate. This information can be mailed to the City of San Antonio, Office of Public Utilities, P. O. Box 9066, San Antonio, Tx. 78285.

Thank you for your help in improving our knowledge of energy use.


Linda Comeaux
President

*Monticello Park
Neighborhood
Association*



February 7, 1986

Dear Members:

The Office of Public Utilities is conducting an Energy Conservation project working closely with Neighborhood Associations throughout San Antonio. Our neighborhood was selected to participate in this project and was given my full support. Attached is a questionnaire concerning neighborhood energy needs and wants. Please complete and return at following address, City of San Antonio, Office of Public Utilities, P.O. Box 9066, San Antonio, Texas 78285 or turn-in to our association officers.

If you are interested in participating in this neighborhood energy conservation project please write your name, address, and telephone number on questionnaire where indicated or contact Helen Javan, Project Manager at 299-8499.

Thank you,

Hector Cardenas
President of Monticello
Park Neighborhood Assoc.

HC

Enclosure

APPENDIX C

NEIGHBORHOOD QUESTIONNAIRE

La oficina de Utilidad Publico de la Ciudad de San Antonio dirige un proyecto de conservación de energía con las asociaciones de vecindad y dueños de casas. El propósito de este proyecto es para informa/guiar en las medidas eficientes de conservación de energía. Para Usted, dueño de casa, esto puede reducir su cuenta de utilidades. También este proyecto proveera cuerda de guía y asistencia en obtener intervencion de energía y asistencia financiera local.

Para mejor comprender sus necesidades y problemas de conservar energía en su comunidad, por favor, conteste las preguntas siguientes:

1. Sabe usted lo que es el programa de conservación de energía?
2. Esta usted familiarizado con programas de conservación de CPS?
3. Ha participado usted en programas de conservación patrocinados por CPS? Cuales?
4. Que clase medidas de conservación de energía utiliza usted en su casa?
5. Ha instalado medidas de conservación de energía en su casa? Cuales?
6. Le interesa a usted que CPS haga una intervencion de energía en su casa gratis?
7. Que es el aproximado pie cuadrado de su casa?

Para las siguiente preguntas, por favor, forme un circulo en la letra apropiada.

8. Que clase de aire acondicionados usa su casa?
 - a. Aire Acondicionados central
 - b. Una o mas aire acondicionados puesto en las ventanas
 - c. Ninguno

9. Que equipo de calefaccion tiene su casa?
- a. Calefaccion central
 - b. Calentador de bomba
 - c. Calentador electrico (portatil)
 - d. Chimenea/calentador de estufa
 - e. Calentador de pared
 - f. Ninguno
10. Que clase de combustible usa su casa para calentar?
- a. gas natural
 - b. electricidad
11. Que clase de combustible usa para cocinar?
- a. gas natural
 - b. electricidad
12. Que clase de combustible usa para cocinar?
- a. gas natural
 - b. electricidad
13. De los programas siguiente, cual le interesar a usted?
- a. Rebaja en aire acondicionado de alto eficacia
 - b. Rebaja de calentador de bomba
 - c. Prestamo para conservacion de energia en su casa
 - d. CPS intervencion de energia
 - e. Weatherization
 - f. Aislacion de desvan
 - g. Aislacion de pared
 - h. Peliculas reflectante para ventanas
 - i. Ventanas conservadora de energia
 - j. Aislador para el calentador de agua caliente
 - k. Regalmentacion de reloj (atrasar)

Si usted mostrar interes de participar en una proyectar que incluir intervencion de energia y cinematografiar para unos talleres en el futuro, por favor de escribir su nombre, direccion y numero de telefono abajo de esta pagina. Gracias

Nombre _____

Direccion _____

Numero de Telefono _____

CITY OF SAN ANTONIO

NEIGHBORHOOD HOME ENERGY QUESTIONNAIRE

The Home Energy Guidelines was developed by the City of San Antonio's Office of Public Utilities to provide your neighborhood with home energy efficient information. Please fill out the below questionnaire and return to the Office of Public Utilities in the enclosed envelope.

1. Do you have home insulation in the following areas?

Attic:	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Not Sure	
Walls:	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Not Sure	
Basement:	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Not Sure	<input type="checkbox"/> No Basement
Crawl Space:	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Not Sure	<input type="checkbox"/> No Crawl Space

2. What is the approximate square footage of your house?

A. Less than 1000 sq. ft.
B. 1000 - 1500
C. 1600 - 2000
D. 2100 - 2500
E. Over 3000

3. What type of Air Conditioning System does your house use?

A. Central System
B. 1 or more A/C window units
C. None

4. What type of Heating equipment does your house use?

A. Central air furnace
B. Heat Pumps
C. Electric portable heaters
D. Fireplaces and/or stoves
E. Wall heaters
F. None

5. What type of Heating Fuel does your house use?

A. Natural gas
B. Electricity

6. What type of Water Heating Fuel?

A. Natural gas
B. Electricity

7. What type of Cooking Fuel?

A. Natural gas
B. Electricity

8. Did you find "The Wheatley Heights Home Energy Guidelines" handout to be informational? Yes No
9. Would you be interested in taking advantage of coupons or discounts on energy saving materials provided by a local hardware store? Yes No
10. Would you like to see your neighborhood association develop a home energy program that would enable you to purchase energy materials at a discount? Yes No
11. Are you familiar with any conservation programs sponsored by CPS? Yes No
12. Have you participated in any conservation programs sponsored by CPS?
 Yes, Which ones? _____
 No

COMMENTS:

Optional: Name _____
Address _____

WH

APPENDIX D

ENERGY ECONOMICS OF DESIGN OPTIONS PRINTOUT SHEETS

The following are examples of Energy Economics Design Options Building Simulation Program Data sheets after the appropriate housing data from an individual house is inputted.

The printout sheets incorporated here are the results from an actual house audited by project staff in the Guadalupe Neighborhood. This includes a design energy analysis of the building, ie, data on monthly heating and cooling loads, energy usage, infiltration rates, and a retrofit options. The retrofit package is the set of retrofits for the building under consideration, given the investment limit, interest rate, etc. that the user has chosen.

'Guadalupe#1' house in SANANT at 794 feet.

Seasons:

The HEATING season is from November thru March.

The COOLING season is from April thru October.

Physical:

Floor AREA (sqft):	1289	House VOLUME (cuft):	10953
Real DISCOUNT rate (%):	3.00	Real MAINT ESC rate (%):	4.00
Azimuth of NORTH face:	due NORTH	Economic HORIZON (yr):	10

	Heating	Cooling			
Seasonal INFILTRATION (cfm) :	93.2	55.3			
AIR EXCHANGE RATE (ach) :	0.51	0.30			
	Overall	Ceiling	Wall	Floor	
UA value (Btu/hr/degF) :	1010.7	440.0	379.8	190.9	
Leakage area (sqin) :	135.1	45.1	49.4	40.6	
	North	East	South	West	Horizontal
Heating SOLAR APERTURE (sqft) :	26.93	58.57	30.68	44.16	114.90
Cooling SOLAR APERTURE (sqft) :	26.93	58.57	30.68	44.16	114.90

System & Economics:

	Heating	Cooling	Water	Electric
Type of EQUIPMENT :	Unit Gas	Room AC	Gas	-na-
Day/night THERMOSTAT (deg F) :	75 / 75	80 / 80	0	-na-
Fuel PRICES (\$/MBtu) :	5.00	21.97	5.00	21.97
Real ESCALATION rate (%):	5.00	4.00	5.00	4.00

'Guadalupe#1' house in SANANT at 794 feet

Spent: \$985.33

Limit: \$5000.00

Real DISCOUNT rate (%): 3.00

Real MAINT ESC rate (%): 4.00

	Heating	Cooling	Water	Electric
Type of EQUIPMENT	Unit Gas	Room AC	Gas	-na-
Fuel PRICES (\$/MBtu)	5.00	21.97	5.00	21.97
Real ESCALATION rate (%)	5.00	4.00	5.00	4.00

Retrofit DESCRIPTION	NAME & LOCATION	Initial COST	1st Year SAVINGS	Annualized MAINTENANCE	Net SAVGS to COST R
1 Install 4 inches of loose fiberglass	Roof ROOF-CEI	\$406.58	\$390.49	\$0.00	10.4
2 Install LOW FLOW SHOWERHEAD	Guadalupe#1 APPLIANC	\$30.00	\$24.61	\$3.13	8.0
3 Install R-6 water htr. blanket	Guadalupe#1 APPLIANC	\$30.00	\$15.09	\$3.13	4.4
4 *Install 5 inches of cellulose	Roof ROOF-CEI	\$138.86	\$43.46	\$0.00	2.8
5 Hang inside DRAPES - close in summer	E.1 WINDOWS	\$174.60	\$44.32	\$4.56	2.4
6 Weatherstrip attic hatch	Roof ROOF-CEI	\$12.00	\$1.52	\$0.00	1.4
7 *Install 8 inches cellulose	Roof ROOF-CEI	\$193.29	\$26.52	\$0.00	1.2

Retrofit DESCRIPTION	NAME & LOCATION	Discounted PAYBACK	Cost CONSV FUEL (/MBtu)	Int RATE of RETURN	Net LIFE SAVINGS
1 Install 4 inches of loose fiberglass	Roof ROOF-CEI	1.0yr	\$0.70	104.7%	\$3821.38
2 Install LOW FLOW SHOWERHEAD	Guadalupe#1 APPLIANC	1.4yr	\$1.35	80.1%	\$210.98
3 Install R-6 water htr. blanket	Guadalupe#1 APPLIANC	2.4yr	\$2.44	44.9%	\$101.32
4 *Install 5 inches of cellulose	Roof ROOF-CEI	3.1yr	\$2.17	34.5%	\$256.20
5 Hang inside DRAPES - close in summer	E.1 WINDOWS	4.2yr	\$3.37	23.8%	\$252.82
6 Weatherstrip attic hatch	Roof ROOF-CEI	7.4yr	\$5.05	9.4%	\$4.62
7 *Install 8 inches cellulose	Roof ROOF-CEI	6.9yr	\$4.98	10.9%	\$42.54

* - This replaces a previous retrofit on this component. Savings and costs are in addition to those of the replaced retrofit.

APPENDIX E. A STRATUM 3 HOUSE

CASE DESCRIPTION	KWH'S USED	KWH'S SAVED	PERCENT SAVED	KWH DOLLARS SAVED	PEAK KW'S USED	PEAK KW'S SAVED	MCF'S USED	MCF'S SAVED	GAS DOLLARS SAVED	TOTAL DOLLARS SAVED	COST OF MEASURE	PAYBACK PERIOD IN YRS
BASE CASE	8633	--	--		6.6	--	38.4	--				
CHG EER 7 A/C TO EER 8	7977	656	8%	\$50.51	5.9	0.7	38.4	0	\$0.00	\$50.51	\$1,190	
CHG EER 7 A/C TO EER 9	7450	1183	14%	\$91.09	5.3	1.3	38.4	0	\$0.00	\$91.09	\$165	1.8
CHG EER 7 A/C TO EER 10	7043	1590	18%	\$122.43	4.9	1.7	38.4	0	\$0.00	\$122.43	\$1,175	9.6
ZERO WALL INSULATION	9539	-906	-10%	(\$69.76)	8.0	-1.4	69.5	-30.1	(\$165.25)	(\$235.01)	\$946	4.0
INCR CEILING INSULATION TO R19	7455	1178	14%	\$90.71	6.0	0.6	28.8	9.6	\$52.70	\$143.41		
INCR CEILING INSULATION TO R25	7372	1261	15%	\$97.10	5.9	0.7	28.1	10.3	\$56.55	\$153.65	\$385	2.5
COMBINE R19 INSULATION AND EER 9 A/C	6535	2098	24%	\$161.55	4.9	1.7	28.8	9.6	\$52.70	\$214.25		
COMBINE R25 INSULATION AND EER 9 A/C	6470	2163	25%	\$166.55	4.8	1.8	28.1	10.3	\$56.55	\$223.10	\$550	2.5
ADD REFLECTIVE FILM TO SINGLE PANE WINDOWS	8004	629	7%	\$48.43	6.4	0.2	39.6	-1.2	(\$6.59)	\$41.84	\$50	1.2
ADD DOUBLE PANE WINDOWS	8559	74	1%	\$5.70	6.3	0.3	33.9	4.5	\$24.71	\$30.41	\$810	26.6
ADD REFLECTIVE FILM AND DOUBLE PANE WINDOWS	8021	612	7%	\$47.12	6.2	0.4	35.3	3.1	\$17.02	\$64.14	\$860	13.4
ADD WATER HEATER JACKET	8412	221	3%	\$17.02	6.5	0.1	38.7	-0.3	(\$1.65)	\$15.37	\$8	0.5
ADD CAULKING AND WEATHERSTRIPPING	8444	189	2%	\$14.55	6.4	0.2	37.1	1.3	\$7.14	\$21.69	\$68	3.1
CUT INFILTRATION RATE IN HALF	7813	820	9%	\$63.14	5.9	0.7	33.0	5.4	\$29.65	\$92.79	\$68	0.7
CUT INFIL RATE IN HALF AND ADD R25 INSULATION	6558	2075	24%	\$159.78	5.2	1.4	22.7	15.7	\$86.19	\$245.97	\$453	1.8
ADD CAULKING, WEATHER-STRIPPING, AND R25 INSUL	7175	1458	17%	\$112.27	5.7	0.9	26.7	11.7	\$64.23	\$176.50	\$453	2.6

APPENDIX E. A STRATUM 3 HOUSE (Cont.)

CASE DESCRIPTION	KWH'S USED	KWH'S SAVED	PERCENT SAVED	KWH DOLLARS SAVED	PEAK KWH'S USED	PEAK KWH'S SAVED	MCF'S USED	MCF'S SAVED	GAS DOLLARS SAVED	TOTAL DOLLARS SAVED	COST OF MEASURE	PAYBACK PERIOD IN YRS
COMBINE R25 INSL, EER9 A/C, REFLECTIVE FILM, WATER HEATER JACKET, CAULKING AND WEATHERSTRIPPING	5718	2915	34%	\$224.46	4.2	2.4	28.6	9.8	\$53.80	\$278.26	\$676	2.4
COMBINE R25 INSL, EER9 A/C, REFLECTIVE FILM, WATER HEATER JACKET, AND INFILTR RATE CUT IN HALF	5260	3373	39%	\$259.72	3.8	2.8	24.6	13.8	\$75.76	\$335.48	\$676	2.0
REPLACE GAS HEAT WITH ELECTRIC HEAT	17077	-8444	-98%	(\$650.19)	9.7 (winter)	-3.1	0.0	38.4	\$210.82	(\$439.37)		
EER 7 AIR CONDITIONER VS HEAT PUMP (\$ VS EER 9)	11089	-2456	-28%	(\$189.11)	5.6	1.0	0.0	38.4	\$210.82	\$21.71	\$1,950	89.8
EER 7 AIR CONDITIONER VS HEAT PUMP (\$ VS EER 10)	11089	-2456	-28%	(\$189.11)	5.6	1.0	0.0	38.4	\$210.82	\$21.71	\$1,300	59.9
VERY LIGHT OUTSIDE WALLS	7037	1596	18%	\$122.89	6.3	0.3	42.8	-4.4	(\$24.16)	\$98.73	\$45	0.5
VERY DARK OUTSIDE WALLS	11264	-2631	-30%	(\$202.59)	6.5	0.1	33.0	5.4	\$29.65	(\$172.94)	\$45	-0.3
MINIMUM SHADING	9022	-389	-5%	(\$29.95)	6.6	0.0	36.2	2.2	\$12.08	(\$17.87)		
MAXIMUM SHADING	7888	745	9%	\$57.37	6.5	0.1	42.3	-3.9	(\$21.41)	\$35.96		

REPORT AND INFORMATION SOURCES

Additional copies of the report, "Neighborhood Energy Efficiency and Reinvestment" are available from:

Publications and Distribution
Public Technology, Inc.
1301 Pennsylvania Avenue, NW
Washington, DC 20004

For additional information on the methods, results and uses of the information contained in this report, or for information on other energy management activities in the City of San Antonio, please contact:

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P.O. Box 9066
San Antonio, Texas 78285
(512) 299-8495