

ENERGY AND ECONOMIC DEVELOPMENT

PHASE II – MARKETING AND FINANCING

U.S. Department of Housing and Urban Development
Office of Community Planning and Development

Office of Environment and Energy
Energy Division



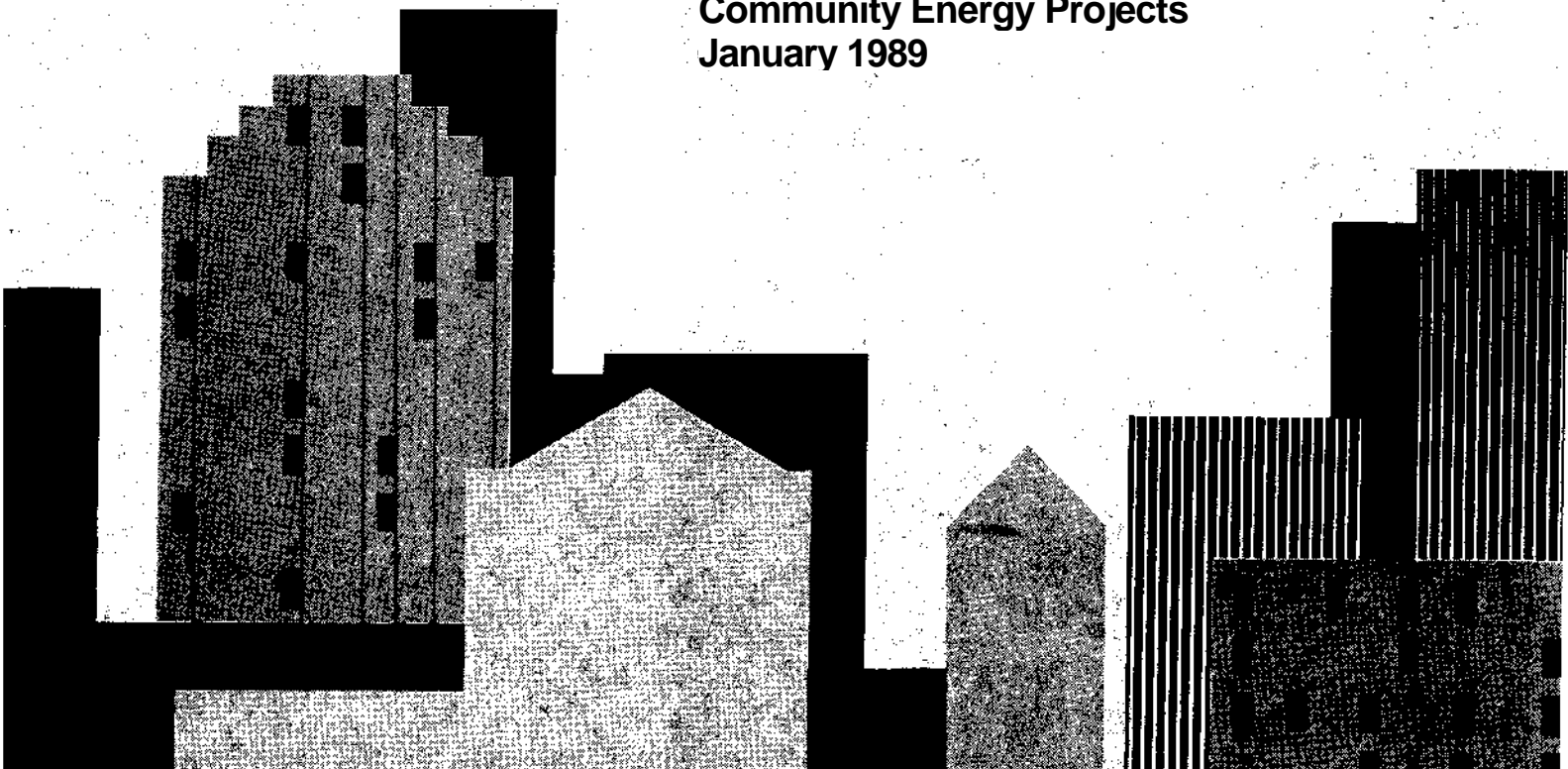
Energy in Housing and Community Development

The Hidden Link:

Energy and Economic Development

**Phase II: Marketing and Financing Strategies for
Community Energy Projects**

January 1989



Public Technology, Inc. (PTI), is the nonprofit, research and development arm of the National League of Cities and ICMA, and an association of local governments dedicated to improving services and increasing efficiency through the use of technology and management systems.

PTI works with and supports its members in solving widespread and urgent problems facing local governments. This support is handled through a four-tier, interconnected series of service centers, which provide state-of-the-art information, electronic and personal networking with local governments and technical specialists, direct consultation and training with PTI staff experts, and practical research.

To ensure that its programs and research have the widest possible benefit, PTI is guided by a strategic plan that emphasizes partnerships with private industry, expertise in multi-disciplinary technologies, training in the art of change management, and participation in the international arena of local government to further the search for technological and management solutions.


Member cities and counties provide PTI's core financial support. Grants and contracts from foundations, Federal agencies, and corporations also support PTI activities.

PTI's activities are carried out from offices located in Washington, D.C. and Long Beach, California. International coordination is handled through an affiliate in London England. PTI was founded in 1971 by the major associations of state and local governments.

Costis Toregas, President

Public Technology, Inc.
1301 Pennsylvania Avenue, NW
Washington, DC 20004
202/626-2400

West Coast Office
Center for Public Policy
CA State University/Long Beach
1250 Bellflower Blvd.
Long Beach, CA 90840



**THE HIDDEN LINK:
ENERGY AND ECONOMIC DEVELOPMENT
Phase II: Marketing and Financing Strategies for
Community Energy Projects**

A Guidebook for Local Governments

Prepared by

**Public Technology, Inc.
1301 Pennsylvania Avenue, NW
Washington, DC 20004**

Prepared for

**U.S. Department of Housing and Urban Development
Office of Community Planning and Development
Washington, DC 20410**

January 1989



TABLE OF CONTENTS

Acknowledgements	v
Preface	vii
Executive Summary	ix
CHAPTER 1. THE NEED FOR EFFECTIVE MARKETING AND FINANCING STRATEGIES	1
The Challenge	
Overview of Previous Work	
Project Purpose	
Organization of the Guidebook	
CHAPTER 2. PUBLIC/PRIVATE MARKETING AND FINANCING STRATEGIES	5
Introduction	
Technical Assistance Needs of Participating Local Government Energy Projects	
Marketing Energy Management	
Basic Marketing Principles	
Public/Private Support and Financing for Community Energy Management	
CHAPTER 3. CASE STUDIES	19
Introduction	
Hennepin County, Minnesota,	
Kansas City, Missouri,	
New York, New York,	
San Francisco, California	
CHAPTER 4. PROGRAM ANALYSIS	37
Introduction	
Problems and Successes	
Recommendations	
REFERENCES	43
APPENDIX A. The Energy Task Force of the Urban Consortium	47
APPENDIX B. Public/Private Financing Workshops	49

APPENDIX C. Technical Assistance	59
APPENDIX D. Hennepin County Brochure	71
APPENDIX E. Energy Conservation Loan Program Proposal	75

ACKNOWLEDGMENTS

This guidebook is a product of a cooperative effort between the United States Department of Housing and Urban Development (USHUD), the United States Department of Energy (USDOE), the Energy Task Force of the Urban Consortium, and Public Technology, Inc. (PTI). The guidebook is one element of a larger technical assistance project to define effective energy strategies for community and economic development.

The project was supported by Technical Assistance funds from USHUD which were transferred to USDOE. USDOE in turn, funded PTI to conduct and coordinate necessary technical assistance and other project activities. Staff from four local governments funded by USDOE throughout the Energy Task Force program were participants in this project and their experiences were integrated into this guidebook. They are: Hennepin County, Minnesota; Kansas City, Missouri; New York, New York; and San Francisco, California. The interests and goals of USHUD, USDOE, the Energy Task Force, and PTI coincided on this project, which examined the linkage of energy management and community/economic development and

enabled technical assistance to be provided to the participating localities. All four organizations were interested in further exploring that linkage and transferring the experience by developing an aid for local officials to apply at the local level.

There were many persons who participated in this project, and without whose support this project would not have been possible. We would like to acknowledge the following persons for their support and participation:

Bernard Manheimer, Energy Division, Office of Environment and Energy, U.S. Department of Housing and Urban Development, who was the Government Technical Representative for this project; Robert D. Miller, Michael K. Brandt, and Lynnette F. Brouwer, Hennepin County; Joseph Gentile, Kansas City; Richard P. Kuo and Peter Fusaro, New York; and John F. Deakin and Terrence O'Sullivan, San Francisco. We would also like to thank Herbert Fivehouse and Dewayne Huckabay, immediate past and current chairs of the UCETF, for their continuing leadership and support.

Diane Rooney
and

Richard W. Zelinski
Public Technology, Inc.
Washington, DC



PREFACE

Cities and counties must continue to focus on making homes, businesses, and industries energy efficient despite the low-to-moderate fuel prices currently prevalent in many areas of the country. The reasoning behind the continued focus may be found at two levels: the impact of increasing energy consumption on the nation as a whole and on most local economies.

On a national level, the growing dependence of the U.S. on foreign oil is a serious concern. Our current low fuel prices, which have provided consumer benefits while easing inflation and interest rates, have caused domestic oil production to drop and energy consumption to increase. According to the U.S. Department of Energy, domestic output plummeted by 9 percent between February and December 1986. The result of these combined trends is an increased dependence on foreign oil. The U.S. now imports 38 percent of its oil. It is predicted that by 1995 American dependence will reach 60 percent. "See you in line in '89" is the new slogan being used to describe the future energy situation. Many energy officials are concerned that this increased dependence will lead to an energy crisis in the 1990's, similar to that of the 1970's. ("U.S. Oil Shortages Seem Unavoidable to Many Analysts", New York Times, February 17, 1987.) In addition to fuel availability, the current artificially low price of oil is also a concern. We have no assurance of continued price moderation; in fact, many predict steep rises during the next decade.

On a local level, millions of dollars are being exported out of U.S. cities and counties to pay for energy. This exodus of dollars has very real effects on local economic vitality. City and county leaders across the U.S. often fail to realize that the dollars being spent on energy by

their residents, businesses, and industries drain their local economies and would be better spent on public works, consumer goods, industrial site development, and new plants and machinery. These are dollar expenditures that keep an economy strong and vital. As one example of how energy costs can affect a local economy, energy officials in New York City found that in 1984 industrial and commercial establishments spent \$3 billion for energy. Businesses in New York City pay among the highest energy costs in the nation, and 60 percent of retail and wholesale establishments consider energy costs to have a severe impact on their operations.

Other harmful effects of high energy costs include the increased public assistance costs for fuel payments by low-income persons and the abandonment of multifamily buildings by owners who can no longer pay high heating costs. In Hartford, Connecticut, it is estimated that low-income people spend as much as half their incomes to pay for heating fuel in cold winters. In Chicago, six hundred multifamily building owners have been abandoning their buildings each year because of high heating costs.

Some states and local governments, however, have already begun to study the multiplier effect of energy versus non-energy dollars. The Nebraska Energy Office has estimated that for each dollar spent on energy by the residential, commercial, and industrial sectors, \$.80 will leave the state; for typical consumer purchases, only \$.34 leaves the state economy. That \$.66 remaining in the economy will create a multiplier effect, being spent again and again, increasing the demand for the local economy's goods and services.

Once the hidden links between energy and community/economic development

become apparent, the question becomes, how can local government officials develop energy programs to halt the drain of energy dollars from their cities and counties? Also, how can local government officials use lowered energy costs as an economic development tool to retain and attract industry and commerce? One entrepreneurial response that combines public/private resources has been developed by New York City's Energy and Telecommunications Office in concert with the local electric utility, Consolidated Edison. In a five part strategy for business retention and expansion, this program includes elements of utility rate reduction, energy sales, tax credits, access to lower-cost hydropower, and "distressed area" discounts. This initiative is recognized as one of the nation's leading energy-based economic development programs.

To identify and support similar efforts in other localities, the U.S. Department of Housing and Urban Development (USHUD) and the U.S. Department of Energy (USDOE) provided financial assistance to Public Technology, Inc. (PTI) for the provision of technical assistance to a group of localities on marketing techniques and establishment of public/private partnerships. The technical assistance was focused on ways to support energy projects related to community and economic development which were being conducted by the localities. These energy projects are currently being supported -- or could be supported -- by the USHUD Community Development Block Grant (CDBG), and for Urban Development Action Grant (UDAG) paybacks, or by other USHUD programs.

The enabling legislation for tDBG was amended in 1974 specifically to allow its use to support energy projects that mitigate

...increasing energy costs which have seriously undermined the quality and overall effectiveness of local community and housing development activities. (Title 1 of the Housing and Community Development Act of 1974)


This project was conducted in conjunction with the Energy Task Force of the Urban Consortium, a group of 19 officials representing the largest cities and counties in the U.S. The Energy Task Force has sponsored over 100 energy projects in cities and counties over the past 15 years, ranging from energy conservation in water treatment plants to onsite cogeneration for office buildings. Of recent particular interest to the Energy Task Force has been the building of partnerships in local jurisdictions between various actors, such as utilities, developers, and cities, to support community energy management projects. Additionally, cities and counties supported by the Energy Task Force have become interested in learning how to market their projects professionally to the residential and commercial sectors.

The work presented in this guidebook combines USHUD's interest in providing technical assistance to mitigate the impact of energy costs and consumption on community and economic development activities with the Energy Task Force's interest in supporting innovative approaches for community energy management.




EXECUTIVE SUMMARY

Energy costs and community and economic development are closely linked in many ways, and this fact is becoming increasingly apparent to many urban leaders. Energy costs and supply can have a major impact on business and industry in a city or county, as well as on community development and housing rehabilitation strategies. Additionally, energy costs siphon dollars out of a local economy as residents, businesses and industry pay for heating and cooling, and as industries pay for the operation of industrial machinery.



To counter the effects of high energy costs, many local government leaders are developing programs to help the energy-using sectors in the economy find ways to better manage their energy usage, and to provide more reliable and cheaper forms of energy to these same sectors. These energy management programs are then used as tools to help local business and industry reduce their operating costs, and therefore increase their profitability. The energy management programs can also help residents to lower their energy bills, and therefore increase the amount of money spent on other essentials.



This guidebook presents the experiences of four local governments which used energy management as an economic development tool to retain and attract businesses within city limits, to maintain the viability of urban downtowns, to lower housing costs for the residential sector, and to increase the viability of commercially redeveloped urban areas. The four local governments participating in this project were Hennepin County, Minnesota; Kansas City, Missouri; New York, New York; and San Francisco, California. Each of these localities had received a grant from the Urban Consortium Energy Task Force to conduct an applied energy research project. Addi-

tionally, the United States Department of Housing and Urban Development (USHUD) transferred funds to the Energy Task Force to supplement the grant awarded by the latter to the four participating local governments. The USHUD funds made it possible to provide special technical assistance to the four localities.

This project was the second phase of a two-part project. In Phase I, which was conducted in 1986, PTI developed a strategic planning model to help cities and counties identify the key activities where energy management can be linked to economic development. Phase I also briefly examined innovative public/private financing sources as a possible support for community energy projects.

The Phase II project, described in this guidebook, had as its objectives (1) to encourage public entrepreneurial activity in community energy management, including examining creative financing, public/private partnerships and private sector marketing principles for applicability to community energy management; and (2) to further the linkage at the local level between energy management and community development activities.

Several themes emerged from these two objectives during the project. Under the public entrepreneurial objective: partnerships with utilities, third-party financing, oil overcharge financing; the need to market energy efficiency to top-level officials at the local level, and the need to design energy projects to adequately address the needs of the target market. Under the second objective, the theme of encouraging more cooperation between the energy management departments and the community/economic development

departments in local government emerged as an area needing greater attention.

The four local governments mentioned above which participated in the Phase II project conducted the following projects:

Hennepin County -- "Energy Enhancements in New Residential Construction"

Kansas City -- "Assessment of Downtown Steam District Heating: Retention, Renovation, and Ownership Options"

New York -- "Joint City Government/Utility Partnerships to Reduce Business Energy Costs: Energy Conservation Implementation"

San Francisco -- "Energy Plan For Mission Bay"

To achieve the objectives of the Phase II project mentioned above, technical assistance was provided to the staff of the participating localities through several workshops on financing and marketing of community energy management projects. In addition, each of the localities above received individualized technical assistance, either by visits from resource experts or through field trips by project staff to gather information applicable to their projects. The technical assistance was made possible by technical assistance funds provided by USHUD.

Three workshops were held for the staff of the above projects on public/private financing, and one on marketing. In the first workshop held on public/private financing, the energy staff from the four localities were requested to bring community development or finance staff from their local governments to a workshop which featured a utility representative, a third-party financing expert, and USHUD representatives. The purpose of including energy and community development/finance staff in the workshop was to establish open lines of communication and cooperation between

the energy and community development departments in each local government. A discussion was held during the workshop on ways that the community development/finance offices and the energy management offices could work together on the above described projects, as well as on other projects. Staff from both the energy management and community development/finance offices were asked to continue working together after the workshop on projects of mutual interest.

Additionally at the workshop, utility conservation programs were discussed, as well as how local governments can best work with their utilities to develop and implement energy efficiency programs for the commercial sector. The third-party financing expert and USHUD representatives discussed creative methods for financing energy management programs.

Two additional workshops were held in which utility representatives and financing experts presented information on creative partnerships with utilities, third-party financing, USHUD funding of energy projects, and other public/private financing methods for energy projects.

A fourth workshop was held on marketing energy efficiency. The workshop addressed the concern that the participating localities expressed about the need to effectively reach their intended markets with energy products and services, whether that be the residential, commercial, or industrial sectors. Marketing experts from utilities, professionals from marketing firms, and marketing experts from public energy programs discussed marketing principles that could help the participating localities better address the needs of the intended audience for their energy services.

In each of the above workshops, each locality discussed the challenges they faced with the resource experts present at the workshop, and discussions were held

to address how those challenges could be solved.

Individualized technical assistance in the form of field trips and on-site resource experts was also available to the participating local governments in the Phase II project. Energy staff in Hennepin County visited Austin, Texas to learn the marketing principles employed by Austin energy staff in the Austin "Star" marketing program for newly constructed energy-efficient housing. Kansas City energy staff invited several nation-wide resource experts on district heating and cooling to present information to steam customers presently obtaining heating and cooling from a downtown district heating system. (The district heating system was about to be abandoned by the utility Kansas City Power and Light.) In New York City, a financing expert made an on-site visit to review New York City's loan program for energy retrofits for small businesses. And in San Francisco, nation-wide resource experts presented information on district heating and cooling to the developers and city planners involved in the Mission Bay redevelopment project. In each of these, technical assistance was provided to assist the participating locality to better finance or market their energy project.

Positive results occurred in each of the participating localities as a consequence of the technical assistance presented both in the group workshops and in the individualized technical assistance. In Hennepin County, energy staff developed a brochure for home buyers on energy efficiency which incorporated many of the marketing principles learned from the Austin Star program and from the marketing experts at the technical assistance workshops. Hennepin County energy staff also held several informational and training sessions for builders on marketing energy efficient homes.

In Kansas City, as a result of the workshop for steam customers and the ef-

forts of the energy staff in marketing the steam system, a buyer has been found for the steam system. In New York City, knowledge of marketing principles enabled energy staff to start a "focus" group of business executives to determine their interest in energy efficiency. This information will help New York City energy staff to design their small-to-medium sized business assistance programs to better meet the needs of the small business sector. Additionally, the information obtained on the loan program aided City staff to structure the energy conservation loan program for the small business sector.

In San Francisco, the marketing information presented in the technical assistance workshops and the district heating and cooling workshop aided staff in developing a marketing plan to persuade City Planning and developers to incorporate energy measures into the Mission Bay redevelopment project.

Several conclusions were reached by the staff of the participating localities as they conducted their energy/economic development projects. These are described as follows.

First, there is a need for energy professionals to look beyond the technical advantages of energy projects towards the behavioral factors that motivate businesses, industries, residents, and public officials to undertake energy actions. The technical "know-how" of energy retrofit is available; however, the motivations for undertaking energy actions goes unexamined by energy professionals, and as a result, many energy programs fail at achieving their desired goals because of lack of interest by the intended audience.

Second, professional marketing techniques need to be used by energy professionals in developing and implementing their energy-efficiency programs. If an energy-efficiency program is aimed at the

small business market, the motivations and decision-making process of the small business sector must be examined and it must be determined how an energy investment will fit into that process. The energy-efficiency program should address the goals and motivations of the small business sector.

Third, there is a need to develop top-level political support for energy activities at the local level. Energy programs need to be linked to other high-priority community and economic development programs, such as attracting and retaining business and industry; rehabilitation of downtown urban areas; and providing low-cost housing to residents. Energy professionals need to "scan the environment" and find those city or county programs that have high-level political support, and determine how energy efficiency can support those programs.

Fourth, energy professionals need to be pro-active in getting the local private sector, such as utilities, banks, and developers to invest in energy projects which benefit the commercial and industrial sector.

Fifth, there is a need to have stronger communications between the community/economic development office and energy offices at the local level. Not only in terms of using CDBG dollars for energy projects related to community

development goals, but also in terms of understanding the linkages between energy and economic development and cooperating to achieve common goals in those areas.

Finally, follow-up and program evaluation needs to be emphasized more strongly in energy efficiency projects. There is a need to ensure that savings have been achieved that customers are happy with the services and information received. The energy efficiency program also needs to be re-examined after implemented to determine how the design and marketing of the program could be improved.

The participants in this project believe that cities and counties are on the brink of an upswing in concern for energy and how it impacts our local economies. After many years of low interest level, mayors, city and county managers, utilities, and business and industry leaders are expressing interest in the interrelationship between energy use and jobs, between energy costs and the disposable income of residents, and between energy costs and the health of downtown areas. So basic is this link that it will spark unlikely partnerships between governments, the private sector, public interest groups and utilities. As these groups come together, they will create integrated programs to better achieve energy management and economic development goals.

THE NEED FOR EFFECTIVE MARKETING AND FINANCING STRATEGIES

THE CHALLENGE

With the current lessening of emphasis on energy conservation and energy management, local government energy managers face a great challenge: to design community energy programs that will effectively reduce energy consumption and costs; that will be positively received by the intended "market"; and that will be creatively financed. As part of that challenge, local governments also need to identify the linkages between energy management and community and economic development. It is necessary to understand how energy and economic development are interlocked in many different ways and, in fact, how energy management can be a tool to promote economic development. What are the ways to create such programs? This is the question that four local governments sought to answer with United States Department of Housing and Urban Development (USHUD) technical assistance funds in a project entitled Phase II: Marketing and Financing Strategies for Community Energy Projects. The local governments participating in the project were Hennepin County, Minnesota; Kansas City, Missouri; New York, New York; and San Francisco, California.

Each of these local governments conducted a community energy project in 1987 focusing on the energy management needs of the commercial or the residential sector. Each local government was also a member of the Energy Task Force of the Urban Consortium, a group that strongly supports applied energy research. (For more information on the Energy Task Force, see Appendix A.) Their projects were as follows:

- Hennepin County, Minnesota -- "Energy Enhancements in New Residential Construction"
- Kansas City, Missouri -- "Assessment of Downtown Steam District Heating: Retention, Renovation, and Ownership Options"
- New York, New York -- "Joint City Government/Utility Partnerships To Reduce Business Energy Costs: Energy Conservation Implementation"
- San Francisco, California -- "Energy Plan for Mission Bay"

USHUD-funded technical assistance aided these four local governments to apply new concepts and techniques to their projects. As part of the assistance, several workshops on marketing and public/private financing of energy projects were held in 1987. Marketing experts from organizations such as the Tennessee Valley Authority (TVA), the Illinois Department of Energy, and the City of Austin, Texas, made presentations on marketing and assisted in developing marketing solutions for the participating projects. Experts in utility financing, USHUD financing, oil overcharge funds, and third-party financing, provided information and individual attention to the financing needs of the energy projects. Additionally, individualized technical assistance, including site visits by energy resource experts to some of the individual projects to address specific problems, was

made possible by USHUD support.

This guidebook is intended to transfer results and lessons learned to other localities with similar problems and opportunities. It summarizes the objectives, methodology, and results of the Phase II project. The message of this guidebook is aimed at local government energy and community/economic development leaders: those who make decisions about incorporating energy efficiency into community and economic development strategies. The message is twofold: first, energy management should be a key part of any community and economic development strategy in both cities and counties; and second, local government energy decision-makers must creatively design, market, and finance energy projects so that they successfully reach their intended goals. This process includes working with utilities and other private partners to market energy projects effectively.

This guidebook focuses heavily on the projects of the three cities and one county participating in the project, as well as on the technical assistance provided them on marketing strategies and public/private financing for energy management. The observations and recommendations of the participating energy managers are also included to make energy management a more viable activity at the local level.

OVERVIEW OF PREVIOUS WORK

This guidebook is part of a two-phase project supported by the U.S. Department of Housing and Urban Development (USHUD), and conducted in 1986 and 1987. In Phase I, Public Technology, Inc. (PTI), developed a strategic planning process that local government officials could use to link energy management to key economic and community development programs. The strategic planning process was developed in conjunction with several cities and counties which were members of the Energy Task Force of the Urban Consortium. In a guidebook entitled The Hidden Link: Energy and Economic Development. Phase

I: A Strategic Planning Process, this process

was presented, as well as several innovative financing sources that could be used to support community energy management programs. Case studies of energy projects conducted by the Energy Task Force members were also included, as well as summaries of the technical assistance provided during the project.

PROJECT PURPOSE

The goal of the Phase II Marketing and Financing project described in this guidebook was to provide technical assistance to several local governments that are members of the Urban Consortium Energy Task Force. Objectives included the following:

- o to encourage public entrepreneurial activity in community energy management, including applying private sector marketing principles to energy management activities;
- o to identify creative ways to support energy management projects financially;
- o to transfer the lessons learned and experiences of the cities and counties participating in this project to other Community Development Block Grant (CDBG) localities by presenting this report at appropriate seminars, workshops, and in publications sponsored by the National League of Cities, the International City Management Association and PTI.

One strategy to achieve those objectives was to examine the consumer investment decision-making process for energy investments and to determine the most appropriate marketing measures to influence that process. A second strategy was to identify measures to foster public/private investment in community energy management, with a special emphasis on exploring opportunities for leveraging the CDBG,



Urban Development Action Grant (UDAG) paybacks and other USHUD funds.

ORGANIZATION OF THE GUIDEBOOK

This guidebook is organized to present an overall picture of the energy problems and obstacles faced by several local government energy staffs in conducting energy projects in their localities and of the technical assistance provided them with the support of USHUD to address those problems and obstacles. It is also designed to offer advice and guidance to others undertaking similar projects.

Chapter 2 contains a brief overview of the technical assistance needs of the four localities participating in the project and a description of the information presented

during the workshops, with particular focus on the marketing aspects of energy conservation measures. A full description of each of the projects, including the challenges they faced, the strategies they used to overcome their challenges, and how they used the technical assistance offered through the USHUD Phase II project, is included in Chapter 3. Chapter 4 contains the analysis and observations of the participating local governments concerning energy conservation at the local level. It describes problems, successes, and recommendations for other cities and counties in conducting energy conservation projects. The Appendices contain a description of the Energy Task Force, detailed descriptions of the several workshops held during this project, and descriptions of the technical assistance received by each project.



CHAPTER 2

PUBLIC/PRIVATE MARKETING AND FINANCING STRATEGIES

INTRODUCTION

Developing a marketing plan and identifying financing sources are two of the most difficult tasks in creating a successful energy project. Identifying and designing an energy program to meet the needs of a particular "market," whether it be small business owner, single-family home buyers, or district heating customers, means careful focus on the decision-making process for energy "investments" by those sectors. Careful review of the successful and not-so-successful commercial or residential energy programs to identify the right marketing technique is a must in designing a new program.

Additionally, developing financial or other private sector support for energy projects is equally difficult. Identifying sources of financial support for an energy project can be very challenging, especially with (1) changes in the tax laws that now reduce or eliminate tax benefits for third-party investment in energy conservation; (2) comparatively low fuel prices; and (3) reduced interest by public officials with the end of the energy "crisis" period. In addition, energy projects based on "paybacks" may find it difficult to be self-supporting in areas where energy prices (such as natural gas) are at relatively low levels or are decreasing.

TECHNICAL ASSISTANCE NEEDS OF THE PARTICIPATING LOCAL GOVERNMENT ENERGY PROJECTS

The four local governments participating in the Phase H project -- Hennepin County, Kansas City, New York City, and San Francisco -- all had technical assistance

needs centered around marketing and financing their projects. The needs that they identified follow.

Technical Assistance Needs in Marketing Techniques

- Finding cost-effective methods of persuading builders and contractors to incorporate energy efficiency into their construction programs to lower housing costs for new home buyers;

Giving information on marketing energy efficiency to new home buyers to enable them to choose a more energy-efficient home wisely;

- Marketing district heating to public officials and potential district heating customers to permit energy efficiency in buildings where heating costs can be aggregated;
- Identifying the factors that will motivate a small to medium-sized business to make an energy investment, thereby lowering business energy costs and preventing the flight of commerce and industry from a locality;
- Distributing information on market penetration of energy conservation programs in the commercial sector to help lower energy costs for small businesses in urban areas, thereby retaining them within a locality;
- Determining how to market energy

— conservation measures to city and

county leaders and developers so that the former can adopt policies to stem the flow of energy dollars from their localities.

Technical Assistance Needs in Public/Private Financing

- Identifying public/private support of residential energy efficiency programs to lower energy costs for low-and moderate-income persons and to reduce building abandonment;
- Identifying public/private financing and support for the renovation of older district heating systems to provide a long-term, steady supply of low-cost energy to downtown businesses;
- Obtaining financial support for a feasibility study of district heating to determine how district heating could provide heating and cooling needs to a low-and moderate-income housing and commercial redevelopment project;
- Determining how to structure financial support and technical assistance for energy improvements for small to medium-sized commercial and industrial firms in older urban areas;
- Determining how USHUD funding, including CDBG, could be used to support energy projects that support housing and community development goals in USHUD;
- Determining what the utility interests and incentives are for participation in an energy conservation program for small businesses.

To meet these technical assistance needs, several workshops were held during 1987 for the four participating local governments. Energy marketing and financing experts from utilities, other cities, private development offices, USHUD offices, and

state government offices provided a wide range of information.

This chapter presents much of the technical assistance provided at those workshops, as well as additional background material provided during the project. The marketing information obtained during the project is heavily emphasized, since much background information on financing measures was discussed in the Phase I guidebook.

MARKETING ENERGY MANAGEMENT

Energy planners realize that the most carefully designed and financed energy program will be a failure if the intended audience, or "market," does not participate in it. Many energy projects, although technically well-designed, have failed to gain customer acceptance because they are not perceived as meeting the needs of the "customer." Project designers have assumed that the customer makes investment or purchase decisions on a rational economic basis -- from an analysis of quantifiable costs and paybacks. While this is true in many cases, an investment decision normally also includes a variety of less analytical criteria, such as attitudes, feelings, needs, desires, and goals. A program that is not based on the knowledge of how the intended "customer" makes investment decisions, what preferences and attitudes are, will have difficulty in achieving its goals.

Participants in the project decided that it was necessary to learn how to reach and motivate their intended markets, whether in the commercial, residential, or industrial sectors. That meant examining the energy investment decision-making process (or purchasing behavior) of those three sectors; determining where and how to intervene in the investment decision-making process; and incorporating that knowledge into the design of individual energy projects. To learn more about marketing to the energy consuming market, a workshop on market-

ing principles was held for project participants in the summer of 1987. Experts from utility programs and city and state energy programs discussed marketing principles and techniques. The following section presents highlights of the technical assistance provided at the workshops. It includes a discussion of basic marketing principles and an outline of the consumer investment decision-making process for the commercial and industrial sectors. Marketing techniques will be presented, as well as examples of how these techniques have been applied in programs around the country.

BASIC MARKETING PRINCIPLES

General marketing principles that should be applied to energy projects in the commercial, industrial, or residential sectors include:

- Know Your Product. Treat your program as a "product" that you must sell. Be able to define it in simple, concrete terms to your target group.
 - Know Your Target Group. Know and understand the characteristics, wants, and needs of the target client.
 - Position Your Product. Understand the factors that will influence a customer purchase and associate your product with these factors. Fuse the product and marketing strategy to customer needs.
 - Segment the Market. The market is usually diverse -- identify the target most likely to respond to your program's incentive.
 - Use Test Marketing. Before launching the project, use a small test group to determine the reaction of the intended target. This procedure will allow you to restructure the program if problems are found.
- Know How Decisions Are Made. Know which person at what level makes the investment decision for energy investments. Marketing should be targeted specifically to the right levels.
 - Focus on Your Strengths and Your Competitor's Weaknesses. Although energy managers don't normally think of energy conservation as having "competitors," energy investments compete with every other purchase a consumer will make. A basic marketing principle encourages the consumer to see the weaknesses of the competing purchase, and this strategy applies to energy also.

The following sections present several of these principles, including "Positioning," "Segmenting the Market," and "Test Marketing," as they apply both to the commercial and the residential sectors. The energy investment decision-making process for both sectors will be outlined, as well as strategies for influencing the process in both sectors.

Positioning and Knowine How Decisions Are Made in the Commercial Sector

In positioning, understanding the factors influencing the energy purchasing decision is crucial. This knowledge requires an analysis of the consumer investment decision-making process for energy purchases. It is incorrect to assume that the consumer -- the small business owner or the residential homeowner -- will make purchasing decisions based on the rational economic model of future savings based on an energy purchase today. Life-cycle costs of an energy-efficient investment are often difficult to understand, and purchasing decisions are rarely based on this model alone. Programs designed on the rational economic model, without examining other business goals and human motivations for purchasing items, will have difficulty in achieving success.

How are decisions made in the commercial sector for energy investments? What are the factors that influence that process? In other words, what are the elements in the consumer investment decision-making process for the commercial sector, and what are the techniques that influence those elements? The following is a list of those elements that must be considered in the commercial investment decision-making process.

Strategies To Address The Decision-Making Process

Local government energy planners must develop appropriate strategies to address these elements of the decision-making process when designing an energy program for the commercial sector. An energy service or conservation program will need to match an organization's goals, financial requirements, and technical considerations before being used by a commercial sector customer. Energy program designers need to think carefully when designing an energy program to consider a business's energy investment decision-making process. A description of potential strategies that energy managers may use follows.

Corporate Goals. Marketing techniques should demonstrate the corporate advantages of energy efficiency measures. When designing strategies, it is important to recognize that energy investments must support corporate goals of increasing market share and sales revenue. One strategy is to focus on how energy retrofits can lower per unit costs of production in particular industries. Companies should strive to use the least amount of energy in producing a product or service. Energy retrofits can also increase the profitability of firms by lowering a "variable" operating cost: the utility bill or the energy used in the manufacturing processes. Funds not used to pay energy bills may be used for expansion and for getting an edge on the competition. A two-year payback period based on energy savings is very attractive and is strongly recommended for small

businesses. However, for a small business person who owns the building his or her business is located in (and who pays all utility bills), a five- to seven-year payback may also be realistic. Also, an organization may gain a favorable public image as a company that uses the world's resources wisely and conserves locally. This factor can be another marketing technique to use in promoting energy retrofits with companies.

Organizational Structure. Obtaining knowledge about the hierarchy in an organization will help an energy manager direct marketing to the correct people. The financial and maintenance managers are key personal contacts. Energy managers should address the "splintering" of responsibility for energy use by creating a team approach to energy -- a finance/maintenance team -- within the organization. Managers should be sure that the finance/maintenance team sees the results of their efforts -- the energy savings that accrue to the company. Two other strategies include encouraging a "product champion" within the corporation and emphasizing peer endorsement of the energy efficiency measures.

Financial Considerations. Financial packages and incentives must be carefully designed to meet the needs of various segments of the commercial market. Differentiation to meet the thresholds of various companies will be needed. As mentioned previously, the two-year payback is a rule of thumb for most small companies -- paybacks taking longer will seem to create a negative cash-flow problem. A key technique to meeting the financial concerns of different sized companies is to offer many options of financial incentives to pay for the energy measures. The purchaser should have a wide range of financing plans to choose from. Financial assistance (loans) at below-market rates or rebates could be offered. Including a "free" service, such as offering the initial survey at no cost or at a low cost, is another incentive for those concerned about upfront costs.

Elements in the Energy Investment Decision-Making Process: The Commercial Sector

Corporate Goals

- increase profits
- maintain and expand market share
- increase sales/revenue
- reduce cost of manufacturing goods sold (Per-unit costs)
- increase productivity
- maintain positive cash flow
- create a positive, community-minded social image

Organizational Structure

- the structure of the decision-making process, including responsibility for purchasing
- responsibility for energy use and accountability for energy costs (usually fragmented)
- identification of key decision-makers
- group dynamics of, organization

Financial Considerations

- upfront capital costs
- return on investment
- operating and maintenance costs
- immediate, positive cash flow (for small business owner)

Technological Considerations

- product reliability
- ease of understanding and use of energy management technology
- certainty of payback -- and assurance that device will actually save energy
- adaptability to buildings and climate

Operational Considerations

- disruption of normal business operations
- employee/client discomfort
- aesthetics of energy technologies (particularly lighting)

Key questions that should be asked by an energy program designer include these:

- What does the buyer (of the energy service) value?
- How does the energy service or conservation measure influence those values?
- What are the buyer's purchase criteria?
- What options will provide the most value for the least cost?

Technological Considerations. A critical concern of decision-makers on energy measures is "Do they work?" Do the measures really achieve the savings that are proposed by the energy vendor/manager? Two means of proving reliability and effectiveness include (1) evaluation studies that have proven that previous similar energy retrofits have achieved their goals; and (2) for paybacks and other analyses, proof that the retrofits will be cost-effective. The key is to reduce uncertainty about the energy retrofits and the risks that the decision-maker is taking: stressing the high-quality past performance of the energy retrofit is essential.

Education, training, and information about the energy retrofits in the market place must be developed in clear, easy-to-understand manuals. Energy "contact" people must establish good working relations with the commercial customer and be able to help solve problems, offer advice and solutions, and recommend appropriate energy management solutions. Follow-up maintenance and availability of technical assistance are essential. One way of increasing the legitimacy of the energy retrofit is to have energy management solutions be included as part of routine service calls by other trusted heating and cooling businesses.

Operational Considerations. It is essential to assure the commercial client that energy retrofits will avoid disruption to normal business activity. Increased comfort for employees and clients must be stressed, as well as the increased aesthetics of new

technologies, particularly for the retail industry. Testimonials from peers can be very helpful in assuring the new commercial customer that the energy retrofit will be cost-effective and nondisruptive.

Segmenting the Commercial Market

The commercial market is diverse, including manufacturers, general merchandisers, food stores, auto dealers, apparel stores, restaurants, and hotels. To attract or retain the commercial market, different incentives and strategies must be applied to different market segments. Thus, in designing an energy program the commercial market must be segmented. Some of the ways to segment it include the following:

- type of business (wholesale, retail, food, etc.)
- major end uses of energy
- number of customers
- type of building
- type of ownership
- building size and design
- process of making energy and equipment decisions
- owner-occupied or tenant-occupied building

Local government energy planners need to identify which segment (or segments) of the commercial market they want their program to address. Selecting a particular type of business -- for example, manufacturers of electrical components for computers, which use energy for lighting, heating, ventilation and air conditioning (HVAC), and motors -- will allow specific incentives and marketing techniques to be developed based on the characteristics of that market. Tailoring a program to a particular segment will greatly increase the chances that the program will be implemented.

Once the commercial segment is chosen and the program designed, the appropriate marketing strategy needs to be developed. Generic marketing strategies include these:

- advertising and education (direct

- mail, brochures, radio, television, newspapers)
- o direct contact (workshops, energy audits, direct installations)
- o financial incentives (low-interest loans, grants, rebates, third-party or shared savings)

Each of the above must be appropriately designed for the chosen market segment. As an example, the marketing technique of choice for the owner-occupied retail building may be direct contact with a range of financial options, such as low-cost loans or third-party financing. For the tenant-occupied building, a direct contact to the owner with a strong package of financial incentives would be appropriate. The tenant will need to be reassured about client comfort and illumination of goods if energy measures are installed.

Test Marketing

A simple but rarely employed marketing technique in the energy management field is the use of test marketing or pilot programs to test the reaction of the target group before launching an energy program. Several utilities are beginning to explore this marketing technique. Two techniques to test market a conservation measure are phone or written surveys, and individual on-site discussions. A third technique is the use of the "focus" group which is usually composed of 8 to 12 individuals who have at least one but often several similar personal characteristics. In a small group setting, each individual is allowed the time and freedom to express opinions openly so that detailed consumer opinions can be received. Information from focus groups can help the energy program designer understand the needs of the target group in depth. Focus groups can help energy program designers to segment the market further, if need be.

Key Points in Working with the Business Sector

-When designing an energy audit program, remember that the "product" is the presentation of the results and actions from an audit, not the audit itself; the presentation should include an effective and memorable package that solves a specific, individual business problem.

-Cash flow is the most significant item for a small business. (For large businesses, emphasize total investment return.)

-Small businesses generally have a strong anti-utility bias and a similar but weaker bias against government.

Positioning in the Residential Sector

In the past, many residential conservation programs were designed and marketed based on the premise that the residential consumer was a rational economic decision-maker. These programs, which of ten recommended weather-stripping and caulking as a means of saving money, presented the benefits of purchasing an energy measure that, in the long run, would "pay back" the home owner with savings on the utility bill. Researchers and utilities are now delving more deeply into the motivations of the home owner and are finding (through market research) that these assumptions are not confirmed by reality. Programs based on these assumptions,

Elements in the Energy Investment Decision-Making Process: The Residential Sector

Residential Goals

- **home appearance and image in the neighborhood**
- **increased comfort**
- **convenience – no hassles**
- **ability to control lives versus control by utility company**
- **home security**

Technological Concerns

- **convenient, simple to understand and operate**
- **technically accurate, predicted savings**

Financial Concerns

increased value of home,, especially for resale reduced losses
immediate payback

therefore, have had difficulty in penetrating the residential sector. The concept of the "rational investor" is not a good basis for an energy program. The Electric Power Research Institute (EPRI) and other organizations, such as the Illinois Department of Natural Resources have been examining what actually does motivate a home owner. These researchers are now looking at homeowners in the residential sector as "customers" and are trying to determine what their needs and perceptions are, as well as what benefits they see from participating in various energy programs. With this information, programs can be designed to better meet the "customer's needs". A first step in determining what the needs of the customer are is to develop a framework of the decision-making process for the residential sector. (Above.)

Suggested marketing strategies and techniques to address the elements of the decision-making process in the residential sector follow.

Residential Goals. In designing an energy conservation program for the residential sector, there are several ways to address the goals of that sector. One is to stress the higher level of comfort that will result from the improvement; a second is to

market an improvement as a means of raising the quality of the home. The actual energy conservation measure, or "ECM," such as energy- efficient windows, should be marketed as of the "highest quality available." A recent Nebraska study found that the residential sector can be reached through a home improvement approach: marketing focused on home improvements saving money rather than conserving energy were more effective. The consumers in the study did not see a need for energy savings and instead saw the energy conservation measure as a home improvement that saved money.

Technological Concerns. In promoting and marketing ECM's, the simplicity of the ECM must be emphasized. It must be explained clearly in marketing materials -the technical staff developing the marketing materials must test market them on individuals who completely lack information about energy conservation measures. People are overwhelmed with material on an everyday basis and a decision to read material is made in the first 5 seconds after exposure. Large type, simple words, short phrases, pictures and white space will help get the attention of the home owner.

Financial Concerns. A driving force in home ownership is a focus on increasing the resale value of the home. The ECM must be marketed to demonstrate that it will in fact increase resale value. Marketing the ECM as a "home improvement," will help to achieve that financial goal. Other techniques include mixing options of services and financial arrangements. Researchers have found that having to obtain a loan for energy improvements is a barrier to conservation: the savings often cannot be guaranteed to "pay back" the loan. Offering several options, including rebates, shared savings, and low-cost loans with a mix of services, will provide the home owner with a greater selection.

Segmenting the Residential Market

Segmentation is essential to designing and targeting energy programs to those most likely to be responsive and to benefit from them. Segmentation may be based on demographics, such as age and income; life-style classifications; housing stock; attitudes; or past behavior. The program design and marketing may be tailored to fit each segment. Discussion of age and income demographics and life-style classifications follow.

Demographics. For the elderly, focusing on how the ECM provides security, (such as a steel storm door) is important. Savings to be derived over a long period of time are less important. Older people are reluctant to use their savings for measures that do not provide other benefits. Elements that will make a program successful include these:

- door-to-door canvassing with free installation
- elderly volunteers who visit elderly households and offer information and counseling
- Verification of eligibility through existing community/peer groups

- Rebate programs that offer highly visible, easily understood measures with short paybacks.

For low-income people, the measures should be simple, with little or no cost. If there is a cost, the energy payback should be immediate, as long-term energy savings are not key incentives. Anti-utility and anti-government biases are strong in this group, so appealing to the ability to take control of the utility bill away from the utility company is a good tactic. Working through neighborhood groups and peers is more effective than educational programs.

For the middle-income sector, an approach that stresses good results is effective. This group will take and revise actions based on initial results. For these individuals, the energy conservation measure is a commodity or product. Mixes and options work well and the program may be tailored to meet individual needs. A program must be offered to this group by a highly credible organization, and control over the utility bill is also important.


For the upper-income sector, energy program designers may use approaches that appeal to the conservation ethos or national security. Saving money is not a likely behavior incentive.

Life-Style Classifications. Professional marketing firms have divided the general population into many different subgroups, including categories such as belongers, achievers, hedonists, etc. Information is personalized to these groups. The National Analysts Division of Booz-Allen and Hamilton and the Electric Power Research Institute have developed classifications of the residential sector based on energy conservation behavior patterns of concern with particular needs and benefits. They have divided the population according to the following interests and needs:

- concern with appearance



Example of an Energy Program for the Residential Sector



The Austin, Texas 'Energy Star' program, designed by the City of Austin's Resource Management Department, is a program that rates the energy efficiency of new-homes for the Austin climate. Points are assigned according to the thermal envelope, mechanical systems, and water heating. One point is assigned for every 100 British Thermal Unit (BTU) saved per square foot per year. A builder must have 100 points to receive a star. More stars are given for a greater number of energy efficiency points. The program was started in 1985 and 32 builders are participating. The program had two requirements: simplicity and technical accuracy. The star system simplified the rating process for lenders and home buyers. The technical aspects of this program were given great thought and care. Builders had to be educated about energy efficiency measures appropriate to the climate. The marketing aspects were given just as much attention, and gaining the support of builders, realtors, and lenders was essential. Special information was developed for each target group: different approaches, such as brochures, handbooks, and audiovisual aids were developed for each group. Some brochures stressed comfort, some emphasized low-cost loans, others stressed energy efficiency. Each was targeted to a particular segment of the population.

A key marketing tactic was to gain quick acceptance with builders and to increase interest among lenders and realtors. The approach with builders was to assist them in selling homes rather than educating people about energy conservation. For the buyer, the program was tied into the excitement of buying a new house. The "star" gave legitimacy to the concept of energy efficiency for the buyer. Logos were placed on energy-efficient homes. Builders like this rating system and many have voluntarily joined the program. Approximately 1,500 homes have been rated since 1985.

The program seems to work best in a supply-short market because when the market is expanding it is more difficult to get the builders' attention. Other problems include getting information from the builders to the sales force, working with lending institutions, and evaluating savings,

Some future efforts include developing a rebate program, giving incentives to builders to install energy-efficient appliances, and requiring certain weatherization standards for new homes. The Resource Management Department is also beginning a large market research effort including telemarketing and focus groups.

- o avoidance of hassle
- o concern with safety
- o resistance to electric company controls
- o comfort, convenience, and control
- o high-tech orientation
- o cautious economizer

They believe that the design and promotion of conservation programs should be focused on the needs and benefits of the above classifications.

It may be difficult to conduct sophisticated segmentation of this type, but energy managers should try to be aware of "target" groups and develop programs specifically to match the attitudes and meet the needs of the particular groups they want to adopt conservation measures.

PUBLIC/PRIVATE SUPPORT AND FINANCING FOR COMMUNITY ENERGY MANAGEMENT

Cities and counties today are developing creative partnerships with developers, utilities, financiers, state governments, and foundations (among others) to support community energy management projects. These creative partnerships have included joint city/utility partnerships to offer energy conservation programs to businesses; partnerships with architects and engineers to incorporate energy-efficient features into new development; and partnerships with foundations to offer weatherization assistance to low-income people.

In Phase I of the Hidden Link: Energy and Economic Development, several of these innovative public/private financing measures were examined for their applicability to energy projects, including: venture capital, pension funds, bank-affiliated community development corporations, Community Development Block Grants (CDBG), Urban Development Action Grant (UDAG) paybacks, utility subsidies, and corporate social investment funds. A description of financing

measures, an examination of the potential

for energy projects, and information on accessing was included for each financial source. In Phase II of this project, PTI expanded the investigation of several of those sources to determine how they could meet the technical assistance needs of the four local governments participating in Phase II. The public/private measures examined for applicability to the energy projects in Phase II included the following:

- o CDBG and UDAG paybacks
- o Section 108 loan guarantees
- o utility measures
- o third-party financing
- o oil overcharge funds

Several financing experts from USHUD, and utilities such as Potomac Electric Power Company (PEPCO) in Washington, DC, and Pacific Gas and Electric (PG&E) in California, and independent financial consultants presented information on these topics to the participating local jurisdictions during several workshops. The information presented by each speaker is included in detail in Appendix B.

Summaries of information presented during the workshops and additional background information gathered during the project follow.

Community Development Block Grant (CDBG)

Potentially, great opportunity exists for the use of CDBG funds for community energy projects that address the goals of the CDBG program: primarily (1) creating viable living conditions for low-and-moderate income persons, and (2) promoting economic development in disadvantaged urban areas. Appropriate uses of the CDBG for energy include energy generation and distribution, building energy retrofit, and preparation of energy strategies. In addition, it is imperative that those involved with CDBG and UDAG funded activities consider energy implications of their projects to assure that energy costs will not jeopardize

material is made in the first 5 seconds after verification of eligibility through

the projects, and energy efficiency is maximized. For example, St. Louis requires that potential for energy retrofit be examined when CDBG or HUD Rental Rehab Program (CRRP) funds are being utilized. To access CDBG funds, energy managers should be involved early in the distribution process by which funds are distributed by the city or county and should interact with Community Development staff and others who originally proposed CDBG funding. Energy managers must demonstrate how energy projects support economic development goals, as for instance, how the district heating system in downtown Nashville, Tennessee, has provided a stabilizing force in the retention and attraction of downtown businesses.

UDAG Paybacks

There is a significant potential for UDAG paybacks to support energy projects. UDAG itself has been considerably curtailed, reducing potential for direct support of energy projects. UDAG paybacks (the money that accumulates as a result of paying back to the city the original UDAG loan) are however, a viable source of funding and may be used by the city for CDBG-eligible activities. UDAG paybacks are accessible to cities which can use the funds for any CDBG-eligible activity. This provides a wide latitude of activities. As with CDBG, using UDAG paybacks for energy projects will take initiative and creativity on the part of an energy manager since, traditionally, they are being used strictly for economic development purposes. They must demonstrate a strong, clear relationship between energy management and economic development to obtain the use of UDAG paybacks.

Section 108 Loan Guarantees

These guarantees provide front-end financing for large-scale physical development projects. They are loans with a 7.25 percent interest rate and six-year payback period, and their activities must mirror the use of CDBG funds. Funds are used to ac-

quire or rehabilitate real property or to acquire related relocation clearance or site improvements. These funds could be used for a energy retrofit and, as with CDBG potential for projects, energy improvements should be considered when using Section 108 loan guarantees.

Utility Measures

Utilities generally focus on rebate programs, particularly for items that have a quick payback, such as lighting programs for commercial buildings. Northeast Utilities, Boston Edison, Danvers Municipal Electric, and Seattle Light are some of the utilities offering lighting rebate programs for commercial customers. Both PEPCO and PG & E sponsor several conservation programs for small businesses. PEPCO's incentives for conservation programs include leveling demand and decreasing the long-term need for additional generating capacity. Another incentive for PEPCO to participate in conservation programs is being known as a good, community-minded corporate citizen. Utilities are interested in the economic health of the commercial and industrial sectors and will take action to foster a healthy economic climate. PG & E is also concerned about being a good citizen and serving the community. Local governments should try to tap these motivations when approaching a utility for financing assistance.

Third-Party Financing

Changes in tax laws, have greatly altered the ability to finance large energy projects. The changes eliminate fast depreciation, energy credits, tax shelters, and a quick return on investment. Additional costs need to be built in by the private third party to compensate for decreased returns caused by such changes. Private investors in large, third-party projects will look much more closely before investing in large projects. More emphasis should be placed on private contractor service arrangements, use of third-party credit enhancement, and direct linkage of public/private financing to economic development. In any case,

third-party financing, which is based on a secure payback, is not appropriate for non-collateralized projects such as insulation, lighting retrofits, and energy management. Also, it is difficult to get third-party financing for projects under \$500,000, which many energy projects are.

Oil Overcharge Funds

State governments currently have approximately \$2.1 billion to use for energy conservation in five specific areas, most focusing on low-income weatherization and energy assistance programs. Many states have completed the planning process for the use of these funds, and several have allocated large percentages of their Exxon funds to low-income weatherization and

home energy assistance programs. Kansas stripper well overcharge funds are also being allocated to state governments. Many states have not decided how to use these funds: some are reviving old energy committees or are soliciting proposals from the public. The key point to remember in the distribution of these funds is that it is a very political process at the state level, and cities and counties should learn how to lobby state legislatures for these funds. A state energy office can spend several months developing a plan for the rational distribution of these funds and have it dismissed in a state legislative committee when it comes time to vote on the use of energy funds. Cities should develop a plan that has the community leaders behind it to get their share of the oil overcharge and stripper well funds.

material is made in the first 5 seconds after verification of eligibility through

Example of an Energy Program for the Commercial Sector

The following is an example of a comprehensive energy program for the commercial sector.

Tennessee Valley Authority

The TVA emphasizes four commercial/industrial programs:

- **conservation and management**
- **new construction**
- **renewable and alternate sources**
- **financial assistance**

A free energy management survey is available to all commercial and industrial consumers whose facilities can be quickly evaluated. The energy management specialists concentrate on operation and maintenance procedures and quick opportunities for improving electrical energy efficiency. For larger facilities with more complex electrical energy-using systems, requiring additional time to survey, energy management audits are offered free of charge if the customer implements 70 percent of the recommendations, (Recommendations for energy management opportunities are then ranked in order by simple payback.) Some of the energy management opportunities may require capital investment. TVA has a financing plan designed to meet this need; qualifying commercial and industrial consumers may borrow from \$1,000 to \$100,000 to finance improvements that will save electrical energy. Financing is available at an interest rate reflecting TVA's cost of borrowing money, a rate regularly lower than other available funds, The TVA usually targets two individuals in the organization's hierarchy: the financial manager and the maintenance manager. TVA has found that 40 to 55 percent of measures recommended have been implemented. Follow-up audits are made to check on implementation. Measures with paybacks of two years or less are often promoted. The three marketing techniques that TVA uses are education and training, technical assistance and financial assistance.

TVA has found that surveys and audits alone do not work: companies must be supplied with vendor and suppliers. Word of mouth and brochures are the main avenue of getting the word out about their program.

CHAPTER 3 CASE STUDIES

INTRODUCTION

The four local governments participating in the USHUD Phase II project -- Hennepin County, Kansas City, New York City, and San Francisco -- were tackling community energy projects that required creative solutions to difficult challenges. All had received financial support from the Urban Consortium Energy Task Force to implement their projects. And, as part of the USHUD Phase II Marketing and Financing project, they had received technical assistance targeted to the challenges each faced. Chapter 2 described much of the technical assistance that was provided to them; the Appendices also contain descriptions of the technical assistance.

This chapter will present the challenges that each project faced, the development of strategies to address these challenges, and their recommendations to other local governments.

HENNEPIN COUNTY, MINNESOTA

"ENERGY ENHANCEMENTS IN NEW RESIDENTIAL CONSTRUCTION"

Protect Description

For two years, energy staff at Hennepin County worked with builders of new, single-family homes to incorporate energy-efficient construction practices into new residential construction. In 1986, they worked with local builders to develop a demonstration project of higher energy-efficient construction. They discovered that the State of Minnesota has stringent energy codes, but the spirit and intent of the code is not always carried out. Builder and subcontractor performance often dif-

fers from expectations. Although building codes specify energy-efficient materials for new construction, the codes do not cover occupant behavior and how it affects the achievement of energy efficiency goals. Hennepin County staff discovered that energy efficiency can only be accomplished through the integration of the building's envelope, its mechanical systems, and occupants' behavior: that is, using the house as a "system" concept. In 1987, as its goal in "Energy Enhancements in New Residential Construction," Hennepin County staff needed to determine how to increase the energy efficiency of new construction in affordable market-rate residential construction. This goal would increase the affordability of housing and enable more people to qualify for loans. Hennepin wanted to determine the best interdependent systems approach, including the envelope, mechanics, and occupants behavior to create the most energy-efficient new homes. Hennepin staff also wanted to determine the best means of influencing the behavior of builders, contractors, home owners, and lenders to incorporate energy efficiency into their programs. As an adjunct, Hennepin needed the best information possible from other cities and utilities around the country on how to market and support energy efficient homes effectively. Working with five builders, energy staff at Hennepin County developed a training program for construction firms on the concept of the house as a system. A workshop, as well as specific on-site technical assistance to builders, was conducted. The workshop focused on the house as a system composed of envelope, mechanical systems, and occupants; effects on that system of

energy-efficient design and construction; and marketing techniques and approaches for selling energy-efficient homes. As a follow-up to the workshop, on-site technical assistance on airtight construction was provided to builders. Plans for monitoring new homes built by those builders for airtightness in the upcoming year have been made.

Hennepin staff then focused on new home buyers and tried to determine the best means of educating them about energy efficiency. A brochure was developed for prospective home buyers to give them information about what really makes a home energy efficient. The brochure provides information to help prospective buyers get beyond initial questions about R-factors and stereotypical conclusions about what makes a home energy efficient. The idea behind the brochure is that better-informed consumers not only get a better product for themselves, they also provide an enforcement function for builders. (The brochure is enclosed as Appendix D.)



Lynnette F. Brouwer, Energy Planner in Hennepin County, in front of a house which is being constructed using energy efficient construction techniques.

Challenges

Hennepin County staff faced many challenges in trying to implement their project.

Several forces -- financial, climate, and energy prices -- combined to make the project difficult to conduct. A description of these forces follows.

- A drop in mortgage interest rates that led home buyers to swamp lenders with loan requests for new homes. It also made the use of "energy credits" to qualify more buyers undesirable to lenders.
- The lowered mortgage interest rate caused a boom in home-building activity. Builders could not build homes fast enough for new home buyers. This brisk market meant that builders did not need the added plus of energy efficiency to sell their homes. This fact resulted in a lack of interest by builders in participating in the Hennepin County project and, in fact, it was very difficult to recruit builders into the project.
- The cost of natural gas for home owners decreased. The 1985 average annual cost of residential natural gas was \$5.68 per 1,000 cubic feet (mcf). In 1987, it was \$5.06.
- In 1986-87, Hennepin County had a record-breaking short, warm winter. Builders were able to put in foundations all winter long.
- A final but important finding by Hennepin County was that because of the stringent Minnesota energy code, new home buyers assumed that new houses were naturally energy efficient. They assumed that a house built to code was going to be energy efficient, which was not necessarily the case.

All these factors resulted in apathy by lenders, builders, and home buyers toward increasing energy efficiency in new homes.

Strategies Hennepin County staff had to develop

strategies to overcome or circumvent these obstacles, including several marketing strategies that had been presented to them in the technical assistance workshops.

Strategy #1: *Focus on a small group of interested builders and provide them with specific technical assistance geared toward their needs.*

Hennepin County energy staff gathered a small, but select, group of interested builders to participate in the program. They overcame builders' reluctance to participate in the program by showing that the benefits would be long term. The builders would learn how to build better homes and how to better market their homes for energy efficiency. These benefits could help the builders strengthen their reputations and get a larger share of the home buying-market.

The focus was strictly on training the participating builders in the program. As mentioned previously, the staff held an excellent day-long workshop for builders on the "house as a system." Speakers representing the Dakota Electric Association, a construction firm, the Air Quality Division of the Minnesota Pollution Control Agency, and a marketing firm discussed the house as a system, moisture transfer, air infiltration, local demographics, and marketing angles. The workshop was well received by the builders. In addition, new needs of the builders came to light, particularly that of achieving airtightness through conscientious attention to detail throughout the construction process.

The participating builders were then provided with intensive on-site assistance in achieving airtightness. Homes were tested using the "blower-door" test. Homes were depressurized and then measured for rate of air flow out of the house with windows, doors, and fireplace dampers closed. Sources of leakage, discovered by using an infrared camera, were discussed with builders and general modifications to increase airtightness were identified. The builders were very pleased with the testing

and were willing to be tested by Hennepin County staff in the future.

Strategy #2: *Use market forces to encourage greater energy efficiency in new home construction by providing the customer with the tools to make informed choices among alternative builders and home construction techniques.*

Hennepin County staff discovered upon closer examination that many prospective buyers do ask about wall construction, R-factors, furnace efficiency, and windows. This realization led staff to conclude that some home buyers do care about energy efficiency but have blanket stereotypical conclusions about the relationship of building materials and energy efficiency. For example, people assume that using 2 x 6 boards for framing will result in an energy-efficient house. Yet R-factors influence energy efficiency more than the size of the boards. The brochure developed for new home buyers gives buyers information which can help them move beyond simplistic decision-making to questions which will help them determine the degree of energy efficiency of a house.

The brochure also helps home buyers to see that by simply meeting the state's energy codes the builder is not necessarily producing an energy-efficient house. Conscientious installation throughout construction is also critically important.

The brochure is intended to make consumers more knowledgeable about materials and methods. Once buyers have this information, they are more inclined to demand a high-quality product regardless of existing requirements.

Strategy #3: *Provide builders with marketing measures to better communicate energy enhancements to new home buyers and to target particular segments of home buyers with appropriate information.*

CHAPTER 3

Although builders were swamped with requests to build new homes, Hennepin County staff found that builders do very little to educate consumers about energy efficiency. To find out how builders could better communicate with new home buyers, Hennepin County staff visited sales offices all around the area. In addition, staff visited Austin, Texas, to review that city's Energy Star rating program and to explore additional methods of marketing new homes for energy efficiency. (This technical assistance trip was made possible by the USHUD Phase II project. For a full staff description of the trip, see Appendix C.) Hennepin County hired a consultant to help develop a list of recommendations for builders, including developing summary sheets of energy-saving features for the client and designing office displays that show roof sections and technical materials. The recommendations also included emphasizing local demographics in displays of construction materials.

Marketing Techniques Used

Hennepin County energy staff incorporated the following marketing techniques into their project:

- Developing a marketing brochure for home owners on new residential construction;
- Giving an educational workshop on energy enhancements in new residential construction for interested builders;
- Providing free technical assistance to builders on monitoring air-t
- Tightness as a means of showing them the benefit of a tightly constructed house; and
- Sharing techniques with interested builders on using energy efficiency in marketing their homes

Public/Private Support

Several private builders volunteered to participate in this program and contributed their time, labor and materials to this project. They agreed to explore new construction techniques, as well as to incorporate some of these features into their homes.

Examination of CDBG/UDAG Repayments

Opportunities for using CDBG funding in conjunction with the project to enhance energy efficiency in new housing were explored by Hennepin County staff with the Development Planning Division of the Office of Planning and Development, which is responsible for administering the Urban County entitlement grant. The HUD Regional Office was also contacted (Urban Hennepin County is not a recipient of UDAG funds.)

Forty-three communities in Hennepin County are Urban County subgrantees, and Minneapolis and Bloomington are "entitlement city" grantees. The sub-grantees generate their own projects consistent with county-wide objectives for spending CDBG funds. Hennepin County contributes to that decision-making process, but the communities are very effective in exploring and determining local priorities, and they begin the process well in advance of the budget year. By the time staff learned of the communities in which the homes of the participating builders would be located, municipal priorities for CDBG funds were already determined.

Further, the major intent of the CDBG program is to support projects that principally benefit low-and moderate income persons. Moderate income is defined as 80 percent of the area median income. This means that in 1987 a family of four, for instance, must have an income no greater than \$30,400. Although Hennepin's project included homes in the \$80,000 to \$120,000 price range – moderately priced new homes – they are generally not affordable for low-and-moderate income families. In fact, survey data of the project home owners supports this assumption. Only one household in 60 falls in the low-to moderate-income category. For this reason, Hennepin's project in its present form is not eligible for CDBG.

Modification of the project to “buy down” mortgage values with CDBG fund make these homes more affordable for low-and moderate-income families was also considered. However the cost per unit of this approach was determined to be excessive in relation to using the funds to improve energy efficiency in existing homes through rehabilitation.

Potential Uses for CDBG/UDAG Payback Funds to Support Energy Activities

Ideas discussed for future uses of CDBG funding included (1) supporting efforts to build a facility for use as a small business incubator; (2) adapting a City of Minneapolis program to improve energy efficiency of multifamily dwellings, including hot water boiler retrofit; (3) coordinating with the University of Minnesota’s Cold Climate building and Energy Resource Center to explore the relationship between internal and external environments in energy conservation and efficiency concepts into the design and construction of new commercial facilities. These ideas were developed in coordination with the Development Planning Division.

Recommendations

The following are the recommendations that Hennepin County had for other local governments undertaking similar projects.

- Before embarking on a project to enhance energy efficiency in new construction, determine the effectiveness of existing building codes in achieving energy efficiency.
- Developing an energy component for local or state building codes is a critical first step in creating energy-efficient new housing stock.
- Once an energy building code is in place, it is important to look at applying and monitoring the code to ensure its full implementation. Variations in used and application of required building materials can have a significant effect on the overall energy efficiency of new buildings.

KANSAS CITY, MISSOURI

“ASSESSMENT OF DOWNTOWN STEAM DISTRICT HEATING: RETENTION, RENOVATION, AND OWNERSHIP OPTIONS”

Project Description

Kansas City, like many other older, urban, Midwestern cities, has recently undertaken several redevelopment and revitalization strategies focused on the downtown area. A Burst of construction activity has occurred in the downtown area as well as a the River Market development near the Missouri River. Kansas City leaders are very interested in creating a viable downtown.

An 83-year-old district heating and cooling (DHC) system now serves about 130 customers in the downtown business loop, a critical downtown area. The cost-saving potential of central heating versus on-site heating (district heating versus individual boilers) is well-known. Additionally, if waste-to-energy plants supply the fuel source, the cost benefits increase and a steady source of fuel is assured. Problems arise when DHC systems are left to deteriorate, the customer base is allowed to shrink, and the system is poorly managed. This happened to the DHC system in Kansas City. The utility operated the system, Kansas City Power and Light (KCP&L), had planned to abandon the system and switch all of the 130 DHC customers to electric boilers. Recently however, the Missouri Public Utilities Commission (PUC) ruled that KCP&L must first try to sell the system before abandoning it in 1990.

Kansas city energy staff believe that the DHC system should be examined carefully in terms of its impact on economic

development in the downtown area and the feasibility of rehabilitating the steam system so that it can offer steam energy at a reasonable, stable price to downtown customers. Several cities with aging steam systems including Baltimore, Youngstown, Boston, Philadelphia, and Minneapolis, have been able to revive their networks and use them as an economic development tool to retain business and industry in the downtown area. In these cities, private companies took over the steam systems, renovated them, and expanded their customer base. Rates have either declined, remained stable, or slightly increased. Private companies are able to lower rates for steam customers because they are not subject to the/complex financial pressures that utilities experience in their efforts to satisfy shareholders. And, in fact, since the Missouri PUC announced that KCP & L must try to sell the system, several potential buyers have expressed an interest: Kinetic Energy Development Corp., St. Louis; Catalyst Thermal Energy Corp., Youngstown; and the Minneapolis Energy Center, Minneapolis. Kinetic Energy said it would probably build a trash-to-energy conversion plant to run the steam system. (The company is supervising a similar system in St. Louis.) Most recently, Kinetic Energy has put forth a desirable proposal for the system. Catalyst Thermal would also build a waste-to-energy plant to augment Kansas City's steam supply. These companies believe that they can rehabilitate the Kansas City system and make it profitable.

As part of this project, Kansas City energy staff undertook a feasibility study of DHC to see whether the system could be rejuvenated.

Steps in the feasibility study included the following:

- o Compilation of a representative database of information on the buildings in the steam loop;
- o Identification of new steam markets to enhance steam utilization in the future;

- o Exploration of ownership arrangements for a central plant of the existing distribution system based on legal and regulatory authority (ownership options could include private and/or public ownership);
- o Evaluation of the economic impact of district heating in Kansas City for a 20-year period.

In addition to undertaking the feasibility study, Kansas City energy staff decided that close contact with the current customer base of the existing DHC system was crucial. To improve relations with this group, energy staff held a workshop, with several prominent DHC experts from across the United States who presented information about district heating to the steam customers. (For more information on this workshop, see Appendix C.) After the workshop, Kansas City energy staff formed a working group of the steam customers, which continued to meet and discuss issues related to the DHC system. The result of the workshop and group meetings is that the steam customers now have the knowledge to make an informed decision about whether to stay in the system.

Challenges

Kansas City energy staff faced a number of challenges in their efforts to keep options open for maintaining the DHC system. Discussion of these challenges follows:

- o The customer base was diminishing, since several customers were making plans to leave the system and revert to natural gas or electric boilers. Additionally, the largest customer, National Starch, indicated a possible switch from steam to on-site cogeneration. This diminishing customer base created difficulty in presenting a strong demand for retention of the old system.
- o A lack of improvements to the sys-



*Joseph Gentile, Assistant Manager of Solid Waste,
in front of the district heating plant.*

tem, an offer of free electric boilers to those customers willing to switch, and increased user fees for steam through 1991 by KCP and L had created strong incentives to existing customers to abandon the old system.

- o Finding a qualified buyer for the steam system has been difficult. Since DHC is only slowly making a resurgence in the United States, there are only a few DHC companies who would be able to renovate the system. Additionally, the costs of rehabilitating the system and the feasibility of the system for providing low-cost heat are unknown.
- o Steam customers are unaware of the potential of DHC to provide a stable source of reasonably priced heating and cooling and the true future costs of electricity versus steam. An unbiased estimate of future costs

needed to be provided to them. In conjunction with a lack of information, steam customers also had a lack of organization or communication among themselves.

- o Finally, a quantifiable impact of DHC system on the downtown area in terms of economic growth and real investment has not been calculated.

It is assumed that a steady, reliable source of low-cost heating and cooling would be an attractive incentive for downtown growth and development. Further study needed to be made in this area to obtain actual investment dollar impact.

Strategies

The strategies that Kansas City energy staff undertook to address these challenges are as follows.

CHAPTER 3

Strategy #1: From a neutral standpoint, focus on educating customers about all available options.

Kansas City did not take a pro or con stance on DHC; instead, the position was that all available information on DHC should be presented to the steam customers, including information on rehabilitated older systems in other cities. It was important for DHC customers to know that more than one option existed -- that, in fact, private companies in other cities had been able to rehabilitate and operate DHC systems and offer energy at a reasonable price. Additionally, DHC customers were given realistic information of fuel costs for gas, electricity, and steam.

Strategy #2: Form a user group to
(1) create a sense of empowerment among steam customers and
(2) undertake the necessary investigative and advisory tasks involved in examining options.

The customers of the DHC system lacked organization and communication among themselves. They had no information source other than the utility, and therefore they could not share experiences or develop a common purpose beneficial to all involved. Kansas City, by holding a workshop and by forming a customer "user" group, was able to develop a sense of unity and a sense of empowerment among the users. The City has close ties with this group, as it believes their involvement is essential if the system is to be revitalized.

Strategy #3: Gather the facts about the financial feasibility of renovating the DHC system.

Kansas City has hired a consultant to conduct an in-depth evaluation of the current DHC system and the costs of rehabilitating it. In addition, this study will recommend ownership and financing options for the system. Kansas City energy staff will also

examine the possibility of utilizing municipal waste to fuel the steam furnaces.

Marketing Techniques Kansas City incorporated the following marketing techniques into the project:

- o Marketing efforts toward existing customers focused on an educational workshop and the development of a user group of steam customers. The results of the consultant's report on the financial feasibility of the system will be shared with customers.
- o-Marketing to decision-makers, with a focus on developing a strategy to compare building boiler systems to the steam system, was undertaken.
- o-Converting comparison data to an understandable level for individual building owners was done.

Public/Private Financing and Support

Future ownership options may include public/private funds, including third-party financing or federal grants.

Examination of CDBG/UDAG Pavbacks

Kansas City has a strong CDBG and UDAG program in progress. Each year the community development program addresses the entitlement process. To date, Kansas City has operated in the narrow band of CDBG/UDAG requirements and has not been a part of any special energy project that indirectly affects job creation. For two reasons, Kansas City energy staff did not pursue CDBG/UDAG funding:

o-The project was too new to begin identifying financing sources. In addition, project staff wanted to identify private funding before examining federal funding.

o To qualify for either grant process (CDBG or UDAG), Kansas City would have had to substantially restructure the proposal to study

the feasibility of DHC.

Finally, the emphasis of this study was to determine if DHC would remain a vital energy resource for Kansas City.

Recommendations

Recommendations made by Kansas City energy staff are as follows:

- The process of using CDBG/UDAG funds for DHC systems serving other downtowns should be clarified. There are obvious economic development benefits to such systems, but many cities do not know that CDBG/UDAG can be used for such projects, nor do they know how to implement such support.
- Communities should become proactive in getting the private sector involved in major investments in DHC. The private sector has a role to play, particularly in regard to the economic stability of downtown.
- Marketing DHC should focus on the energy dollar drainage issue -- dollars that pay for energy leave the city, whereas dollars spent on goods and services recycle and multiply creating more wealth in the community.
- There is a need for a local information network that keeps building owners informed about the benefits of district heating and cooling.

NEW YORK, NEW YORK

"JOINT CITY GOVERNMENT/UTILITY PARTNERSHIPS TO REDUCE BUSINESS ENERGY COSTS: ENERGY CONSERVATION IMPLEMENTATION"

Project Description

New York City has some of the highest energy costs in the nation for commercial

and industrial businesses, causing many businesses to seek to relocate to areas of lower energy costs in the region. One goal of Mayor Koch and his administration has been to reduce those energy costs through promoting energy efficiency and other measures for existing firms. To that end, the Mayor recently announced "The New York City Program for Competitive Business Energy Costs" that would help reduce energy costs for businesses by about 20 percent through a series of targeted programs for business and industry. It includes reductions in city and state energy taxes for businesses as well as energy conservation programs that will save energy costs by the fifth year of the program.

The City has, in the past several years, developed several joint City/utility partnerships to research, design, and conduct innovative conservation programs. In 1986, the New York City Energy and Telecommunications Office (ENERTEL), in conjunction with the Consolidated Edison Company (Con Edison), began to survey 300 previously audited industrial firms to determine the extent to which firms had implemented recommended measures. ENERTEL and Con Edison also worked together on a pilot project that included the design of a "state-of-the-art" lighting system in a commercial office building.

New York City's "Joint City Government/Utility Partnerships" project in 1987 completed the survey of previously audited firms and began implementing a pilot lighting demonstration project. New York City staff also began designing a technical and financial assistance program with Brooklyn Union Gas Company (BUG) to help audited firms implement gas and space heating conservation recommendations. The project was instrumental in identifying new conservation programs that will be implemented in the Mayor's five-year energy program.

To accomplish their objectives, staff for ENERTEL conducted the following

activities:

- reviewed national laboratory and other literature on energy-efficient lighting technologies to determine feasible approaches in New York City;
- evaluated previous energy audits to determine the needs of small to medium-sized firms;
- researched alternative means to deliver, market, and finance energy efficiency in the commercial and industrial sectors.

Results of this project have included the preliminary development of a joint New York City-New York State Energy Research and Development Authority (NYSERDA) rebate incentive pilot program for energy-efficient lighting; multi-year utility support from Brooklyn Union Gas for a technical assistance program for industrial firms implementing gas efficiency measures; recommendations to modify existing audit programs for small businesses; and design of an energy conservation loan program for small businesses.

The rebate program, to be supported in part by NYSERDA, will focus on marketing and delivery strategies to encourage companies to install high-efficiency lamps, electronic ballasts, and metal halide lamps. It will target selected industries and/or companies located in economic development areas. Approximately \$800,000 has been set aside for this program, including New York State and New York City matching funds.

The expanded technical assistance program for commercial and industrial firms requires a gas utility commitment of approximately \$300,000 to help firms implement the recommendations in the 300 audits previously done by New York City. Firms targeted include the food processing, apparel, and printing industries. A BUG utility engineer will return to the audited firm, sit down with the owner, and show him/her how to implement the recommendations. This new program will be closely

coordinated with existing city, state, and electric utility business energy programs.

The new revolving loan program for small businesses will be structured around achievable savings for the energy conservation measures that will be offered. The loan program will be designed so that it does not adversely affect the cash flow of businesses and so that businesses can reap the initial financial benefits of conservation. Loans will have flexible payments throughout their term. The companies to be targeted include those that are (1) involved in major manufacturing; (2) have significant energy costs; and (3) have demonstrated an ability to service debt. These may include printers, food processors, and metal working firms. The loan program will need \$3 million in capitalization, with funding coming from utilities, banks, foundations, and corporations. Each loan will be \$50,000 to \$100,000 and 36 to 45 companies are being targeted for the first year. The city is seeking capitalization from state oil overcharge funds, utilities, and other corporations to start the program.

Challenges

New York City faced several challenges in implementing these programs, including problems stemming from availability of financing, utility support, and interest by the small business sector. A discussion of these challenges follows.

- The small to medium-sized business sector has historically been a difficult market to penetrate with energy conservation measures.

New York City's economy is dominated by small to medium-sized businesses, many of which lease their space and lack the necessary knowledge and resources to implement energy-saving options. In addition, many of the businesses served by Con Edison are smaller firms. With about 350,000 commercial customers, only about 17 percent are above 10 kilowatt (KW) monthly demand. (Consolidated Edison's total electric

programs, however, are derived primarily from larger (over 100 KW) commercial customers.) A study recently completed as a follow-up of 300 previously completed audits found that 200 of them were conducted on businesses with under 10,000 square feet. The companies ranged from construction, food, textiles and apparel, to printing, chemicals, and metal working. They included a wide mix of small companies. The potential for energy savings and reduced operating costs in these small businesses remains high.

Energy conservation service companies have been unable to penetrate the small business market for a variety of reasons. Small businesses are usually cash poor and hesitant to invest scarce capital in a venture they may feel is somewhat risky. In addition, their energy costs may be a small part of their total budget and therefore do not warrant a great deal of attention by energy performance contracting companies because the potential for significant dollar savings is relatively small. Quick payback, as well as certain results, is a crucial element for small businesses in any program.

- o Utilities lack experience in commercial/industrial energy conservation programs.

The electric utility in New York City has only recently begun to explore seriously the potential for participation in city-wide commercial/industrial energy conservation programs. Its focus has historically been on supply-side resource planning rather than demand-side planning. Con Edison has developed a demand-side management plan (DSM), which includes several pilot conservation and load management measures that may be cost-effective for the company to implement. Additional research and evaluation is needed on these programs before they can be considered permanent elements of Con Edison's capacity plans.

- o Excess utility capacity is a problem.

The electric utility in New York City is in business to sell energy to customers. With excess generating capacity, historically it

has been difficult to get Con Edison involved in conservation programs that may raise average rates in the short term. This situation may be changing because of increased growth in demand in recent years.

- o There are insufficient City resources for full program actions.

New York City energy staff were proposing many programs: completion of audit reviews; surveys of commercial firms; development of a technical assistance program; and establishment of a revolving loan program. New York City had to identify new sources of funding to undertake these programs. In particular, the revolving loan program to implement energy conservation recommendations needed capitalization of \$3 million. The source of funds to capitalize the loan program was uncertain; oil overcharge funds were being pursued as one option. Other possibilities for funding included the state, utilities, foundations, and corporations.

Strategies

Many of the challenges faced by New York City in conducting this project were related to financing and marketing issues. One strength was the clear mandate from City Hall and top-level utility and state executives for action in developing energy efficiency programs for the commercial and industrial sectors. Some of the other strategies used in addressing their challenges are listed below.

Strategy #1: Determine the criteria necessary for a small business to move forward with implementing energy conservation measures, including payback requirements, technical considerations, and decision rationales.

New York City, before launching its technical and financial assistance program for small businesses, had to determine why firms choose to implement some energy conservation measures and not others

CHAPTER 3

recommended in the audits performed in earlier years by the City. By reviewing previously performed audits and surveying those firms that had been audited, they were seeking to determine:

- payback requirements for implementation of ECM's
- attitudes toward conservation
- decision rationales
- external factors influencing conservation investment
- required level of technical or financial assistance

The use of "focus groups" was another tactic New York City staff used to determine the needs of the small business sector in energy management. Working with Brooklyn Union Gas, New York State, Con Edison, and other city agencies, a group of executives of medium-sized industrial companies identified key market, technical, and financial barriers to implementing conservation measures and the types of assistance that could be most useful to them from local utilities, government, or other energy providers.

With this type of information, New York City will be able to design programs that have a good chance of penetrating the commercial sector. New York City is identifying different market segments and targeting efforts at developing programs for those sectors. Staff will know what the paybacks will have to be for participation in the program and what kinds of financial and technical assistance to provide in their energy management program for small to medium-sized business.

Strategy #2: Determine the utility incentives and interests for participating in a conservation program with the City.

A key part of New York City's energy project in 1986 and 1987 was joint local decision-making with the utilities, both Con Edison and Brooklyn Union Gas. This was particularly difficult because of lack of experience in joint project partnerships and potentially divergent goals. Yet New York City energy staff had been successful

in 1986 in working with Con Edison to identify and design joint city/utility research and demonstration projects to reduce business energy costs. (A large joint project in 1986 was the in-depth survey of previously audited firms.) In 1987, the New York City energy staff had the financial and technical support of Con Edison in completing data collection and the evaluation of previously audited firms. In addition, Con Edison also agreed to work with the City in a project to test the cost-effectiveness of "state-of-the-art" lighting systems in a commercial office building. Finally, New York City also worked with Brooklyn Union Gas in actually setting up an assistance program to ensure that the audit recommendations were implemented.

How did New York City energy staff successfully enlist the cooperation of the utilities in joint City/utility programs? Essentially, it did so by demonstrating to them how and why conservation programs would benefit them, even in times of excess utility capacity. Particularly, by pointing out the rate to which manufacturing firms were leaving the city (partially because of high energy costs), New York City was able to show utilities why business retention should be important to them. Development of the City's five-year energy programs, which included City and utility measures to reduce business energy costs, provided a mechanism for eliciting coordination from top utility management.

Strategy #3: Identify external sources of funding for conservation programs.

New York City energy staff were very successful in seeking and obtaining outside support for desired energy programs. They carefully researched many potential sources of funding, including private utilities, oil overcharge funds, and CDBG/UDAG repayment funds. The following is a list of organizations staff sought or obtained support from:

- Con Edison -- for completion of the audit reviews funded under its

end-user conservation program plan filed with the New York State Public Service Commission;

- Brooklyn Union Gas -- for the development of a new program to implement audit recommendations in firms;
- New York State Energy Research and Development Authority -- for a rebate pilot program for the installation of high-efficiency lighting measures in selected industries in economic development areas;
- foundations, utilities, corporations, banks -- for proposals submitted to capitalize a revolving loan program for a targeted group of commercial firms.

Marketine Techniques Used

Marketing techniques used by New York City energy staff included the following:

- Follow-up audit surveys and on-site visits by engineers.
- To better identify the needs of the target group -- the small business sector -- New York City staff and Con Edison hired a consultant to conduct a follow-up survey of previous audits. This action helped pinpoint the small business sector's motivations for taking energy actions.
- The use of focus groups with medium-sized manufacturers to identify energy conservation needs and motivating factors.
- the use of technical workshops to encourage another City agency to undertake a conservation financing fund.



Richard Kuo, Project Director of New York City's energy project, discusses energy assistance services for small businesses with Joseph Rend (center) of Brooklyn Union Gas, and Dick Koral of City University.

Public/Private Financing and Support

- Joint City/utility partnerships have been set up between New York City, Con Edison and Brooklyn Union Gas to design and implement energy programs.
- Both utilities contributed heavily to the energy projects they worked on with New York City -- Con Edison with the audit follow-ups, and Brooklyn Union with implementation.
- The revolving loan, which was designed by the City's Financial Services Corporation (with the assistance of ENERTEL), is providing capitalization by utilities, foundations, and private companies.

Examination of CDBG/UDAG Paybacks

Community Development Block Grant (CDBG) funds were committed to other New York City activities and were not available for capitalizing the City's proposed Energy Conservation Loan Fund. However, energy staff did establish a cooperative working relationship with the Financial Services Corporation (FSC), which is responsible for developing the Energy Conservation Loan Program. FSC uses CDBG money in its existing Revolving Loan Fund (RLF) to aid City businesses and UDAG paybacks for its other loan/grant programs.

UDAG funding was not sought because it requires firm financial commitments from the private sector as a prerequisite to an application. The FSC Energy Conservation Loan Fund is still in development and has not yet obtained such private commitments.

Potential Uses for CDBG/UDAG Payback Funds To Support Energy Activities

- Provide loan guarantees to marginally credit-worthy businesses (i.e., those unable to obtain conventional bank financing) located in or near CDBG-eligible areas for energy-efficient capital projects. Reduced business energy costs will help to retain or expand jobs in low-and moderate-income neighborhoods.
- Support planning and feasibility studies by local government energy agencies to assess local business energy needs and identify potential CDBG/UDAG energy projects.
- Provide low-cost funding for City-administered business energy loans to aid community/economic development strategies.

Recommendations

As part of the HUD/PTI technical assistance project, New York City had the following recommendations for other local

governments undertaking a similar project:

- First, be sure to obtain support from the top utility management in the area for the city's economic development and energy goals.
- Use focus groups and other market research techniques in program design to define and segment the market and determine the needs of program users.
- Allow for contingencies in developing energy financing projects because of potential delays, changes to baseline estimates, and changes in manufacturing processes.
- Utilize service contracts after project installation to ensure that energy savings materialize through operation and maintenance (O&M) procedures.
- Obtain the part-time services of technical or financial advisors to assist in the planning and design of new programs, provide specialized expertise to resolve outstanding issues, and help market the program to others.

SAN FRANCISCO, CALIFORNIA

"ENERGY PLAN FOR MISSION BAY"

Project Description

Mission Bay, a 300-acre site about a mile south of San Francisco's downtown, is an area that will be redeveloped into a mixed-use site in the next 15 years by the Santa Fe Pacific Realty Corporation. Approximately 7,500 residential units, 30% of them "affordable," will be integrated with research and development facilities (2.6 million square feet), commercial offices (4.1 million square feet), and retail shops (200,000 square feet). For its project, "Energy Plan for Mission Bay," the Bureau of Energy Conservation in San Francisco sought to incorporate energy conservation

The major tasks in achieving this goal were the following:

- o Compiling a comprehensive list of energy impacts for Mission Bay and then refining it to a manageable agenda of top-priority energy issues;
- o Researching and developing energy planning policy recommendations for the top-ranked energy issues;
- o Determining the most appropriate access points for energy planning inputs into the development process;
- o Reporting and advocating findings to institutionalize the recommendations as policies of the Mission Bay Master Plan; and
- o Determining whether a modern district heating and cooling system would be feasible for the project.

To select a comprehensive list of key energy issues for Mission Bay, San Francisco staff examined the impact of construction techniques, residential and non-residential building operating energy, on-site energy production potential, transportation energy, and energy used in public services. Results of the analysis showed that energy use at Mission Bay would be dominated by the building construction, building energy consumption, and transportation sectors. Additionally, district heating and cooling, solar technologies, and solid waste recycling showed significant potential for reducing nonrenewable energy consumption.

In studying the development process to determine the most appropriate access points for energy planning inputs, San Francisco energy staff came up with the following preliminary list: the proposed plan, the development agreement, and the environmental impact report. Energy staff also concluded that informal, direct contact with both the developer and the City Plan-

In developing policy recommendations for the top-ranked energy issues, San Francisco energy staff examined research they had done in the past two years on building energy design research, results of other community energy planning efforts, and several works on energy-efficient community design. Staff also had to take into account previously accepted policy objectives in the Mission Bay Project Plan, developer concerns, and City Planning objectives. Eighteen fully supported, locally applicable energy planning design recommendations were developed. Besides further study of district heating and cooling, these recommendations include measures such as reduced lighting power and daylighting in commercial buildings, load management strategies, and recycling and water conservation techniques.

San Francisco's energy staff is confident that many of these recommendations will be adopted during the current Development Agreement negotiations between the City and the developer.



John Deakin, Director of the Bureau of Energy Conservation, directed the effort to include energy concerns in Mission Bay, directly behind him.

The goal of reporting and advocating findings was to institutionalize energy conservation recommendations in the development process and advocate the recommen-

dations as Master Plan policies, design guidelines, and mitigation measures as appropriate. This advocacy took the form of technical support for recommendations, discussion of the marketing appeal of recommended measures, analysis of increased affordability in energy-efficient buildings, and provision of expert advice for district heating.

In determining whether district heating would be feasible for the Mission Bay Redevelopment area, San Francisco energy staff had to examine a number of technical, economic, marketing, environmental, institutional, and financial issues. The source of power for the system; costs involved; price of power; development of a customer base; and air quality, noise, and land-use impacts are just a few of the issues they examined. The source of financing for the initial feasibility study, planning/design phase, and construction needed to be identified. Marketing issues, including the identification of a customer base sufficient to generate revenues to cover the investment in a system, also had to be resolved. Preliminary results indicate that district heating and cooling are economically feasible for the Mission Bay development. Future attention will focus on advanced thermal production; storage and distribution techniques to optimize cost-effectiveness; and the institutional, legal, and regulatory feasibility of such a system.

Challenges San Francisco energy staff faced several challenges in their project, and a discussion of the challenges follows.

- o The time frame for the Mission Bay project was very short and decisions about the design of the redevelopment area were made quickly. To get energy conservation measures considered in the design process, staff needed to move rapidly to gain the attention of the developers and the other city agencies involved. The impact and importance of ECM's and district heating both by the developer and the city agencies involved.

In fact, the developer was resistant to further exploration of the feasibility of district heating. Also, City leaders lacked an understanding of the overall importance of energy efficiency to the economy of San Francisco.

- o The development impact of district heating on Mission Bay was uncertain. District heating had so many unknowns -- the source of power for the system, the cost of the system, the cost of power to the customers -- that it was difficult in the beginning to broach the idea with developers and city planners.

Strategies The following are strategies that the San Francisco energy staff used to address the challenges they faced.

Strategy #1: Start informal strategy sessions with developers and the Department of City Planning quickly to let them know the intent of the program.

Before the actual task of identifying access points into the development process started, San Francisco energy staff began meetings with the developers to inform them of their desire to incorporate energy efficiency into Mission Bay. Informal ties were developed between the Bureau of Energy Conservation and the Department of City Planning.

Strategy #2: Demonstrate the value of energy conservation to the Mission Bay developers, city planners, and city leaders.

San Francisco energy staff had to sell energy efficiency to the developers on the basis of its amenity, marketability, and affordability. They had to target what was most important and beneficial to developers in promoting energy conservation measures. Additionally, the workshop on district heating demonstrated that such systems in other cities had worked very well.

For city planners and leaders, energy staff had to demonstrate that ECM's can result in substantial savings. They used pre- and post-California building code data to show the effect of energy conservation measures. They also developed "baseline" scenarios of energy consumption in Mission Bay with and without ECM's. Additionally, energy staff demonstrated to city leaders that energy efficiency has a very positive effect, keeping dollars in the community rather than leaving to pay for energy.

Strategy#3: Hold a workshop for developers and city planners with national experts on district heating and cooling as speakers and resource persons.

National experts from the Washington State Energy Office; St. Paul, Minnesota; USHUD; and the California energy community presented information about district heating in general and how specific district heating systems have worked in other cities. Topics included the benefits of district heating, its use as a marketing tool, the relationship between district heating and economic development, and alternative ownership and financing solutions.

Marketing Techniques Used

- Holding a district heating and cooling workshop for developers and city agencies;
- Promoting the non-energy benefits of ECM's to developers, including benefits that would help them sell or market their real estate more easily; and
- Promoting the economic development benefits of energy efficiency to city leaders.

Private Support

- Pacific Gas and Electric had financed a study of district

heating and cooling at Mission Bay.

- The developer donated land and/or capital for a public purpose.
- Federal financial support is possible in the future as well as third-party financing.

Examination of CDBG/UDAG Paybacks

HUD funding at Mission Bay is most likely in two sectors -- affordable housing and community services. Energy conservation measures appropriate to these building types have been prepared and are presently the subject of negotiations between the City and the developer. However, the linkages between the energy measures and possible funding sources have not yet been made.

As the UDAG program is being discontinued, UDAG funding was not considered a viable option. San Francisco energy staff will be investigating UDAG paybacks as a possible funding option.

Recommendations

Recommendations made by San Francisco energy staff are as follows:

- It is a mistake to think of the energy conservation and efficiency effort as being solely, or even primarily, one of developing technical solutions. Many energy program problems are more frequently the result of institutional impediments. These may be solvable through marketing and educational means.
- Much of the marketing effort needs to be directed in-house to other City agencies, if they are to support energy efficiency programs in the outside world.
- Energy efficiency has to be marketed in association with other program characteristics. Linkage

must be made so that energy is not required to stand on its own merits. In what is perceived to be a time of plenty, most people, including professional planners and government officials, cannot get excited about energy efficiency for its own sake. It has to be "piggybacked" onto something else that people do see as being in their interest to support.

- o Non-energy benefits can be marketed effectively, and energy managers must learn how to do this if they are to have any impact outside strictly technical decision areas.
- o If energy programs are to succeed, planners must develop new

mixtures of program components to contain every combination of sticks and carrots, including legislation, guidelines, education, personal relationships, linkages with other interests and so on. Energy programs are more likely to be enthusiastically adopted by local governments when they can be seen to be reinforcing and supporting wider goals for which there is already a local mandate. For example, if "affordable housing" is a city goal, then city energy managers should work with the agencies responsible to add energy conservation programs into the Affordable Housing policy. This could include adding items such as energy-efficient appliance guidelines, solar access ordinances, and building code revisions for thermal insulation. In this way, energy conservation programs can more easily be perceived as furthering other popular goals..

PROGRAM ANALYSIS

INTRODUCTION

This chapter will present the challenges and successes of each project and will highlight creative solutions to problems that each project faced, particularly in creating the necessary support for implementation. Recommendations for means of furthering support for local government energy activities have also been included.

PROBLEMS AND SUCCESSES

Creating Support for Energy Management

A difficult challenge that all of the participants in the USHUD Phase II project faced was educating key actors in their projects about the importance of energy management. Project directors found that they needed to "market" energy management to the target groups in their projects, such as builders of *new* residential construction in Hennepin County, small business owners in New York City, steam heating customers in Kansas City, and developers in San Francisco. Project leaders also found that they needed to market their projects to political leaders, city staff, and other organizations whose support they needed to implement their projects. It became apparent early in each of the participating projects that a key to success was being able to impress upon others the need for action in energy management.

In Hennepin County, project leaders found that they needed to create and sustain interest among builders for participation in a project that would require a commitment of time, labor, and materials to achieve greater energy efficiency in new home construction. Project leaders were, in fact, successful in developing a core group of interested builders who agreed to attend a workshop, have their homes tested for air-

tightness, and incorporate energy efficiency practices into new construction. The workshop that Hennepin County staff held for builders on the "house as a system" was very successful, and the builders were pleased with the onsite technical assistance on airtightness. Many wanted to continue testing airtightness even after the project was completed.

Project leaders in Hennepin County also found a way to create interest in choosing an energy efficient home among new home buyers. After discovering that builders give *new* home buyers very little detailed information about energy efficiency, Hennepin energy staff decided to develop a brochure on energy efficiency for *new* home buyers. The staff then realized that they could use market forces to achieve energy conservation by giving the home buyer the data necessary to ask informed questions of builders about energy efficiency. Since its development, this brochure has been widely requested by builders and realtors in the Hennepin County area.

In Kansas City, energy project leaders needed to create interest among steam customers and city leaders in the potential of the existing district heating and cooling system to provide a stable future source of energy for downtown buildings. The technique energy staff used to create interest and excitement about the possibilities of the system was a luncheon/workshop for steam customers with several national experts making presentations on district heating. This workshop, and the ensuing publicity surrounding it, made a strong impression on the Missouri Public Utilities

Commission, to the extent that it requested Kansas City Power and Light to try to find an owner before abandoning the system.

In New York City, energy project leaders needed to create interest among local utilities for participation in energy management programs for the commercial sector. Both Consolidated Edison and Brooklyn Union Gas were approached and requested to assist in developing energy management programs for the small business sector. Energy project leaders were successful in obtaining assistance from these two utilities for an audit review program and a program to help small business owners to actually implement audit recommendations. An important catalyst for obtaining utility cooperation was the process for developing the Mayor's five-year Competitive Business Energy Cost Program, which linked energy concerns to the city's economic development goals and described potential public/private partnerships to achieve those goals.

In addition, to design an energy program for the small business owner, New York City had to determine what "carrots" to use to interest small business owners in participating in an energy management program. This meant careful review of a follow-up survey of previously audited firms; onsite follow-up visits to firms; and focus groups to determine the level of technical and financial assistance needed by small firms to implement audit recommendations. With this information, New York City energy leaders were able to develop a targeted financial and technical assistance program carefully crafted for the commercial and industrial sectors. Energy staff were also able to interest the Financial Services Corporation (a separate entity which handles several federal economic development grants), in developing a revolving loan program for energy efficiency measures.

San Francisco, on the other hand, needed to create interest in energy efficiency among the developers, city planning officials, and

city leaders involved with the Mission Bay Redevelopment project. To obtain the cooperation of the developers in incorporating energy-efficient measures into the development design, San Francisco energy staff stressed the aspects of these measures that would most benefit the developers, including the increased marketability of energy-efficient housing units, the increased cost-effectiveness of operating the units, and the increased comfort of occupants of the buildings in the development. San Francisco, like Kansas City, held a workshop on district heating for developers and city staff. San Francisco energy staff realized that they needed to educate and gain the support of the developers both in incorporating energy efficiency into Mission Bay and in examining the feasibility of district heating.

Identifying Public/Private Finance Support

A second difficult challenge for the energy program directors in this project was to identify financing sources for current and planned activities. It became apparent that only a few financing mechanisms were truly workable for the participating energy programs.

Although CDBG and UDAG paybacks may be used for energy activities, it was difficult for energy staff in the Phase II project to change the way CDBG is traditionally used in their communities. Housing projects, nonprofit organizations, and economic development projects are the traditional activities supported by CDBG funds. Although a few cities do allocate funds for weatherization improvements offered by nonprofit organizations, energy activities were not being funded by CDBG or UDAG paybacks in the communities in the Phase II project.

In Hennepin County, the municipalities in the county are each apportioned a share of the CDBG. It was difficult for Hennepin energy staff to modify the way the funds were currently being apportioned. Also, the priorities and uses of the CDBG were decided well in advance of the project year for Hennepin's "Energy Enhancements in

Residential Construction" project. In New York City, CDBG funds are committed to particular activities very early in the budgeting process. Through an extensive approval process, beginning at the local neighborhood level and ending with a citywide plan, priorities for the CDBG are established. Because of reduced federal funding for CDBG, it was not feasible to introduce new energy programs.

Both Kansas City and San Francisco project staff are still considering using both CDBG and UDAG paybacks for their district heating and cooling projects. It was too early in both projects to determine whether CDBG or UDAG paybacks would be appropriate, as the feasibility of the district heating systems in both cities was unclear.

Section 108 loan guarantees were not considered a feasible financing tool for any of the project participants.

Utility support is being used by New York City energy staff to develop energy management programs for small businesses. Both Consolidated Edison and Brooklyn Union Gas will be supporting audit review and financing programs for small businesses. Support from Pacific Gas and Electric may also be obtained by San Francisco energy staff in the Mission Bay project.

It became very clear during the examination of oil overcharge funds that the process for obtaining these funds is very political at the state level. Despite defined categories that these funds must be used for, a great deal of latitude in their implementation still exists. The oil overcharge funds may still be used for the New York City project or the San Francisco project however.

RECOMMENDATIONS

The participants involved in the USHUD Phase II project made the following recommendations. These are the observations of the practitioners who were im-

plementing innovative energy programs at the local government level. Some of the recommendations are collective; others are targeted to individual projects. They are organized according to the subject areas of marketing, financing, use of CDBG/UDAG paybacks, and technical recommendations.

Marketing

- o Energy and community development leaders in cities and counties should look beyond the technical advantages or merits of energy projects toward the behavioral factors that will make their programs successful. These include seeing the target recipient of energy programs as "consumers" of a service and then applying basic marketing principles to understand their motivations for undertaking energy actions. The consumer investment decision-making process and the impact of energy investment in that process must be identified.
- o An aggressive, pro-active approach in obtaining support from local government decision-makers for energy projects should be taken. The creation of support from political leaders should begin very early in a project. Institutional impediments will arise when the project is ready to be implemented if support has not been already established.
- o The non-energy benefits of energy projects should be emphasized both to consumers and to political leaders. For consumers, non-energy benefits, such as increased comfort, added value, and increased marketability should be emphasized. For political leaders, the economic development benefits of reduced energy costs should be stressed. The "dollar drainage" of energy dollars from a community should be noted.

- Professional marketing techniques should be used to design and market energy programs. Focus groups are just one of the many techniques that can be used to identify the motivating factors behind energy investment decisions.
- Obtaining the professional support of outside marketing firms in developing energy programs should be considered.
- A combination of sticks and carrots, such as legislation, guidelines, education, personal relationships, and linkages, must be employed to make energy programs successful at the local level.

Financing

- There is a need to be pro-active in getting the the local private sector, such as utilities, banks, and developers, to invest in energy projects that will benefit the commercial and industrial sector. All parties benefit from a successful venture that will enhance the economic condition of the local community.
- For projects that will need third-party financing, energy project managers need to bear in mind that additional costs must be built in by financiers to compensate for the decreased returns because of changes in the tax laws.
- In accessing oil or stripper well overcharge funds, local governments need to be aware that in many states the distribution of funds to various programs is a very political process. Energy managers should be prepared to use political means to obtain oilovercharge funds.

Use of CDBG/UDAG Paybacks

- More needs to be done to forge a connection between CDBG offices and energy offices at the local level. Local CDBG staff need to be more open to using CDBG dollars for energy activities, and energy staff need to be more aggressive in presenting the community development benefits of energy activities to CDBG staff. The process for using these funds needs to be identified earlier by the energy staff to incorporate their programs into the CDBG budget.
- Cities and counties should be better informed about the potential energy uses of the CDBG and UDAG payback funds.
- Potential new uses of CDBG funds that should be considered by local CDBG staff include these:
 - retrofitting multi-family buildings with hot-water boilers;
 - working with universities to better identify the relationship between internal and external environments in energy conservation;
 - working with suburbs to incorporate energy conservation and efficiency concepts into the design and construction of new commercial facilities;
 - providing loan guarantees to those businesses located in CDBG-eligible areas and unable to obtain conventional financing;
 - supporting planning and feasibility studies by local government energy agencies to assess the energy needs of local business and to identify potential

CDBG/UDAG repayment projects;

providing low-cost funding for city-administered business energy loans to aid community and economic development strategies.

Technical

- Energy programs should be designed so that investments by the commercial and residential sectors are low-risk and paybacks carefully calculated.
- Service contracts should be utilized after project installation to ensure that energy savings materialize through operations and maintenance procedures.
- The design of a residential conservation program for new construction should examine existing codes and laws regulating energy efficiency and determine how effective these have been in achieving energy savings.
- Monitoring after project completion is essential to ensure that implemented measures will achieve their project savings.
- More research needs to be done on the causal relationship between energy conservation measures and actual achieved savings both in the residential and commercial sectors.
- Contingencies must be built into energy programs for changes in paybacks caused by changing fuel prices and interest rates, and changes in the economy at large.

CONCLUSION

Energy management has a vital role to play in local economic and community develop-

ment strategies, including affordable housing, downtown rehabilitation, business retention, and commercial viability of redevelopment projects. In each of these strategies, increased energy efficiency will improve the success rate of achieving desired economic development goals. However, there are several difficulties involved in integrating energy management into vital economic programs. First, there is the difficulty in coordinating the goals and efforts of local economic development professionals and energy practitioners. Often these two different local functions operate completely independently of each other, with very little contact. Secondly, once joint economic/energy programs are scheduled to move forward, there is difficulty in designing programs that truly meet the financial and programmatic needs of the intended audience, whether that be the commercial, industrial, or residential sectors.

In this project, four local governments faced both of the above difficulties when they tried to implement projects that combined community development and energy goals. Their strategies included a great emphasis on understanding the behavioral as well as technical aspects of energy management. Technical assistance was provided to them in professional marketing techniques that are used to persuade "consumers" to take a particular action. In addition, successful energy/economic development programs offered by utilities and cities were presented and analyzed. Through this information, the four localities developed their own, unique solutions to the challenge they faced in their projects. They found that, as can be seen in the recommendations, that much remains to be done in achieving true integration of energy into economic and community development goals at the local level, including a stronger commitment from top local government decision-makers, greater "teeth" or "muscle" behind energy management programs, greater participation from local utilities, banks and developers, and greater openness on the part of local community development offices to energy concerns.

-



• REFERENCES

BOOKS

Jeffrey P. Davidson, Marketing Your Community, Washington, DC: Public Technology, Inc., 1986.

Eric Hirst, Jeanne Clinton, Howard Geller, and Walter Kroner, Energy Efficiency in Buildings: Progress and Promise, Washington, D.C. American Council for an Energy-Efficient Economy, 1986.

Willett Kempton and Max Neiman, (Ed.) Energy Efficiency: Perspectives on Individual Behavior, Washington, D.C. American Council for an Energy-Efficient Economy, 1987.

Donna L. Sorkin, Nancy B. Ferris, and James Hudak, Strategies for Cities and Counties: A Strategic Planning Guide, Washington, D.C. Public Technology, Inc., 1983.

Mike Weedall, Robert Weisenmiller, and Michael Shepard, Financing Energy Conservation, Washington, D.C. American Council for an Energy-Efficient Economy, 1986.

REPORTS, JOURNAL ARTICLES AND OTHER REFERENCE MATERIALS

Marketing: Proceedings from the ACEEE 1986 Summer Study on Energy Efficiency in Buildings, August 1986.

Proceedings of the 1987 Conference: Energy Conservation Program Evaluation: Practical Methods, Useful Results. The Third International Conference held in Chicago sponsored by Argonne National Laboratory, Bonneville Power Administration, Illinois Department of Energy and Natural Resources and U.S. Department of Energy.

"This Star Leads the Way to New Energy-Saving Homes", "People are Starting to Ask Questions", and "Austin Energy Star", Promotional material describing the Austin Energy Star Program, the City of Austin Resource Management Department.

The 1987 CDBG Family Calendar, San Francisco Community Development Block Grant Program.

Energy Rebates: Selected Network Rebate Program. Consolidated-Edison - Apple Power Programs, New York City, New York.

National Consumer Law Center, Inc. "Summary of State Plans for Distributing Exxon Oil Overcharge Funds," November 20, 1986.

Helping Your Business is Our Business: A Guide to Reducing Financing, Relocation, and Energy Costs in New York City. Financial Services Corporation, New York City.

Robert Groberg, "Innovative Financing for Energy Retrofit of Multi-Family Buildings", United States Department of Housing and Urban Development, at Michigan Energy Conference, October 21-22, 1986.

"The New York City Program for Competitive Business Energy Costs," Edward I. Koch.

Theodore Levitt, "Marketing Intangible Products and Product Intangibles", Harvard Business Review, May - June 1981.

The Mission Bay Plan: Proposal for Citizen Review. San Francisco Planning Department.

Tennessee Valley Authority, "Energy Management Survey for Commercial and Industrial Facilities", Office of Power, Division of Energy Conservation and Rates.

United States Department of Housing and Urban Development. The 108 Report, 10/8/86.

"The Success of Privatization", Journal of Water Pollution Control Federation, Volume 57, Number 5.

United States Department of Energy, Energy Security: A Report to the President of the United States, March 1987.

RESOURCE EXPERTS

Third-Party Financing of Large-Scale Energy Projects

Roger D. Feldman
Nixon, Hargrave, Devans & Doyle
Suite 800 One Thomas Circle
Washington, D.C. 20005
(202) 223-7200

Wally McOuat
President
W.G. McOuat and Associated, Inc.
712 Sansome Street
San Francisco, CA 94111
(415) 397-2210

Utility Energy Conservation Programs

Duane Gautier
Manager
PEPCO
1900 Pennsylvania Ave., N.W.
Washington, D.C. 20068
(202) 872-3589

Robin C. Calhoun
Director of Energy Management Operations
and Program Development
PG&E
77 Beale Street, Room H - 2644
San Francisco, CA 94106
(415) 973-2071

Jewell Horner
Power Utilization Engineer
TVA
Box 999
Jackson, TN 38302-0999
(615) 751-7396

Alfred Oronstein
Consolidated Edison of New York, Inc.
4 Irving Place
New York, N.Y. 10003
(212) 460-6545

Marketing Energy Conservation

Tod Davis
Synergic Resources Corporation
111 Presidential Boulevard
Suite 127
Bala Cynwyd, PA 19004
(215) 667-2160

Nicholas Hall
Management Analyst
Illinois Department of Energy and Natural
Resources
325 West Adams, Room 300
Springfield, IL 62704
(217) 785-3445

District Heating and Cooling

David W. Gatton
Development Initiatives, Inc.
1010 Vermont Ave., N.W.
Suite 710
Washington, D.C. 20005
(202) 293-7330

Federal/Regional United States Department of Energy and United States Department of Housing and Urban Development

Joel Posner
Community Development Representative
Department of Housing and Urban
Development
HUD Region IX
450 Golden Gate Avenue 9Cmb
San Francisco, CA 94102-3448
(415) 556-3751

Mary Fowler
Director of Residential and
Commercial Conservation Programs
Department of Energy
1000 Independence Avenue, S.W.
Washington, D.C. 20585
(202) 586-9104

Roger Olson
Director
Community Planning and
Development Division
U.S. Department of Housing and Urban
Development Regional Office for
Minneapolis/St. Paul
220 Second Street, South
Minneapolis, MN 55401-2195
(612) 370-3002

Bernard Manheimer
Energy Management Specialist
Energy Division
Office of Environment and Energy
U.S. Department of Housing and Urban
Development
451 Seventh Street, S.W.
Room 7156
Washington, D.C. 20410
(202) 755-5505

Robert Groberg
Director, Energy Division
Office of Environment and Energy
U.S. Department of Housing and Urban
Development
451 Seventh Street, S.W.
Room 7156
Washington, D.C. 20410
(202) 755-5505

State Energy Programs

Carroylin Threlkel
Deputy Division Chief
Conservation Division
California Energy Commission
1516 9th Street, MS 28
Sacramento, CA 95814
(916) 324-3290

Local Government Energy Programs

June Appel
Director of Resource Management
Resource Management Department
City of Austin
3000 South I H 35
Austin, TX 78704
(512) 441-9240

Anna Lloyd
Director
New York City Energy Cost Savings
Program
17 John Street
Suite 1200
New York, NY 10038
(212) 341-6064

STAFF OF THE PARTICIPATING ENERGY PROJECTS

Hennepin County, Minnesota

Robert D. Miller
Supervising Planner
Office of Planning and Development
A-2308 Government Center
Minneapolis, MN 55487
(612) 348-2601

Michael K. Brandt
Program Development Manager
Department of Environment and Energy
Suite 300
822 South Third Street
Minneapolis, MN 55415
(612) 348-3836

Lynnette F. Brouwer
Planner
Department of Environment and Energy
822 South Third Street
Suite 300
Minneapolis, MN 55415
(612) 348-3875

Kansas City, Missouri

Joseph Gentile
Administrative Officer II
Solid Waste Division
Public Works Department
414 East 12th Street
20th Floor
Kansas City, MO 64106
(816) 274-1823

New York City, New York

Richard P. Kuo
Director of Policy Analysis
NYC Energy and Telecommunications
Office
49-51 Chambers Street
Room 720
New York, NY 10007
(212) 566-3880

Peter Fusaro
Project Manager
NYC Energy and Telecommunications
Office
49-51 Chambers Street
Room 720
New York, NY 10007
(212) 566-4858

San Francisco, California

John F. Deakin
Grant Program Manager
Public Bureau of Energy Conservation
110 McAllister Street -- Room 402
San Francisco, CA 94102
(415) 864-6915

Terrence O'Sullivan
Bureau of Energy Conservation
110 McAllister Street -- Room 402
San Francisco, CA 94102
(415) 864-6915

APPENDIX A

THE ENERGY TASK FORCE of the URBAN CONSORTIUM

Overview

The Energy Task Force of the Urban Consortium is a leading national organization established to identify energy problems confronting local governments and to support the development of in-house capabilities to address those problems. The Task Force is composed of representatives from 20 Urban Consortium jurisdictions, each of whom was carefully selected for membership on the Task Force. These members include top managers, decision-makers and technical professionals who bring a wealth of collective experience and diverse individual perspectives to each of the problem areas the Task Force addresses. In October, 1988, the Energy Task Force began its tenth consecutive year of applied research and transfer programs to improve urban energy management and technology.

How Does the Task Force Work?

Each year since 1978, the members of the Energy Task Force have defined energy-related problems and issues of greatest concern to major urban governments. This annual *Needs Assessment* is the basis for a formal Request for Proposals distributed to all city and county members of the Urban Consortium. From responses to this RFP, approximately 20 projects are selected for funding during each program year. Generally, the RFP is distributed in mid-May of each year for projects that will begin in November of each year.

Projects selected for each program year are organized into management *Units*, with each Unit consisting of four to five substantively related individual projects. Each

Unit is required to meet as a group twice during each program year. An experienced member of the Task Force is designated as the *Unit Manager* for each Unit. This unit management structure assures peer-to-peer review and dialogue, supports the effective provision of needed technical assistance, and allows realistic project quality control while minimizing the program's management and overhead costs.

Accomplishments

Since 1979, the Energy Task Force has sponsored over 180 city or county led projects in 35 Urban Consortium jurisdictions. For *Local Government Operations*, projects have addressed systems for overall energy use and cost management, for efficiencies in municipal buildings, for vehicle and fleet operations, and for improved waste management. For *Community Energy Management*, projects have addressed innovative means to link energy management with economic development, to improve transportation options, and to deal with residential energy costs. Results from each Energy Task Force project are documented in formal end-of-project reports and summarized in an annually updated *Program Overview*.

The Program Overviews summarize projects conducted during Years 1 through 10 (1979-88) of the Energy Task Force Program. The Program Overview for all work supported by the Energy Task Force, and individual project reports are available through Public Technology, Inc. in Washington, DC.

Members of the Energy Task Force

Dewayne Huckabay (Chair)
Assistant Director
General Services
Houston, TX

Dr. Anthony Laska
Energy Coordinator
Law Department
New Orleans, LA

John K. Burge (Vice-Chair)
Director of Special Facilities
Kansas City Convention Center
Kansas City, MO

Dr. I.M. Levitt
Executive Director
Science and Technology Council
Philadelphia, PA

Terry Agriss
Director
ENERTEL
New York, NY

Rita Norton
Director
Energy Management Programs
San Jose, CA

Dr. E.K. Demos
Director
Environmental Services
Denver, CO

Robert Siller
Director
Public Utilities
San Antonio, TX

Thomas Hanley
Special Assistant
Office of the Mayor
Boston, MA

Raymond Sullivan
Director
Social Services Department
San Francisco, CA

Creighton Lederer
Director
Buildings and Engineering
Detroit, MI

Phillip Whittenberg
Chief Administrative Officer
Planning & Development
Shelby County, TN

Robert D. Miller
Supervising Planner
Planning and Development
Hennepin County, MN

Darshan S. Teji
Energy Conservation Manager
Department of Public Works
Phoenix, AZ

Robert Garrett
Director of Administration
Department of Public Works
Broward County, FL

Dr. Charles Williams
Director
Energy Management
Chicago, IL

Maureen Sullivan
Staff Assistant
Office of the Mayor
Seattle, WA

Dennis Whitney
Chief Engineer
Department of Water & Power
Los Angeles, CA

Terry Flynn
Director
General Services
San Diego, CA

Charles Clinton
Director
Energy Office
Washington, DC

APPENDIX B

PUBLIC/PRIVATE FINANCING WORKSHOPS

Appendix B contains a summary of the proceedings from the public/private financing workshops held during 1987 as part of the USHUD Phase II project. The purpose of the workshops was to explore various public/private financing measures which could be used to support community energy management projects. These workshops were held for the energy staff of the four local governments participating in the USHUD Phase II project:

- Robert D. Miller, Supervising Planner
Michael K. Brandt, Program Development Manager
Lynnette F. Brouwer, Planner
Hennepin County, MN
- Joseph Gentile, Assistant Manager of Solid Waste
Kansas City, MO
- Richard P. Kuo, Director of Policy Analysis
Peter Fusaro, Project Manager
New York City, NY
- John F. Deakin, Director
San Francisco, CA

WORKSHOP I: "PUBLIC/PRIVATE ENTREPRENEURIAL FINANCING WORKSHOP"

**January 22-23, 1987
Washington, DC**

"Community Development Block Grant and Urban Development Action Grant Paybacks and Their Use For Energy Projects" -- Bernard Manheimer, Energy Management Specialist, Energy Division, USHUD

Community Development Block Grant (CDBG)

Mr. Manheimer began with a general discussion of the CDBG program: it was es-

tablished in 1974 by Congress to aid in the development of viable urban communities. He noted the differences between larger "entitlement" localities and smaller communities which compete for funds within their states. Eligible activities include disposal of property, street improvements, water and sewer facilities, and rehabilitation of private property. It is important to note that using CDBG funds for the construction of housing is not eligible; rehabilitation of existing housing is eligible, however.

In 1981, CDBG legislation was modified to specify how CDBG funds may be used for energy-related activities. The major energy activities which are eligible for CDBG funds include:

- Energy generation and distribution;
- Building energy retrofit; and
- Community energy strategies.

It is important to note in reference to the last eligible activity that the USHUD Energy Division is currently stressing project and/or area specific initiatives rather than "global, comprehensive" strategies.

All activities that use CDBG as financial support must be done primarily for the benefit of low and moderate income persons (generally interpreted as 51% of the benefit accruing to low and moderate income persons). Other criteria which apply to activities supported by CDBG include the following:

- The activities must be used to prevent or eliminate slums and blight. Although CDBG funds cannot be used directly for new housing construction, they can be used to support clearance or the development of infrastructure.

(Construction of housing of last resort is eligible).

- o Be used to meet an urgent need that poses a threat to the health or safety of a community where no other funds are available.

One last important note was made by Mr. Manheimer: CDBG is the only federal funding source that can be used to match other federal funds.

UDAG Paybacks have a growing potential for use as locally flexible funding sources. UDAG's are usually grants to a locality which then loans the money to project sponsors. The loan payback may be used by the locality in the same way it uses CDBG funds. With regard to the UDAG Program:

- o Seventy-five percent of all (past and current) UDAG projects require a payback in the form of loan repayments, lease payments or equity participation.
- o The percentage of projects requiring a repayment has increased from 37 percent of FY 1978 projects to 94 percent of FY 1984 projects.
- o Fifty-seven percent of total UDAG program dollars awarded through March, 1984 are to be repaid -- usually with interest.
- o Total repayments, including principal and interest, from currently obligated projects are estimated to be at least \$3.0 Billion.
- o Total repayment volume will accelerate in future years as more recent projects (which have higher percentages of paybacks and dollars to be repaid) reach the stage when repayments are to begin.
- o Of 330 projects surveyed by the U.S. Office of Management and Budget (OMB), 68 percent have earmarked actual or anticipated repayments for economic development purposes,

with the balance for other CDBG eligible activities.

- o Of 117 cities surveyed by OMB, 59 percent have or plan to establish revolving loan funds to recycle UDAG repayments for economic development.
- o Finally, it should be noted that in FY 1984 and all future years, the magnitude of contractual and actual repayments will increase significantly.

As final comments, Mr. Manheimer also stated that:

- o If you are a community with a high formula of "Need", you should continue to focus on UDAG programs; and
- o Try to focus heavily on "UDAG-type" strategies that LEVERAGE private investment -- the technique has demonstrated its value, and should work regardless of the eventual continuation, discontinuation, or modification of UDAG from its current form.

"Utility Conservation Programs" -- Duane Gautier, Manager, Conservation Programs, Potomac Electric Power Company

Mr. Gautier began with some general comments on the use of EXXON and Stripper Well funds, then discussed technical assistance services available from utilities.

A key comment which Mr. Gautier made on utility-provided assistance and audit services is that many utilities do the things that they feel are needed, not necessarily the things that are needed by the businesses or industries receiving the assistance or audit. PEPCO attempts to work closely with both the District of Columbia Energy Office and the business or industry client to meet his/her needs. Mr. Gautier also made comments on the financing of energy services, emphasizing three elements important in

loan or other capital formation for conservation activities:

- Energy program sponsors can reduce bank loan origination and carrying costs through discussions with banks, through buy-downs or support of origination costs from State Energy Conservation Programs funds.
- Utilities can aid in the collection and payback of monies to the bank from an energy loan. Utilities can emphasize arrangements where the business client pays the utility and utility pays the bank, which reduces carrying charges.
- For security for the loan, energy program sponsors can reduce risk for the bank by establishing back-up guarantees (possibly from CDBG) to strengthen security for the loan.

A key in establishing any energy conservation program is an effective technical assistance team that focuses not just on the audit, but also on audit implementation, financing, and repayment, in a manner that appeals to clients and lowers cost of financing. As example, PEPCO sponsors an arrangement in Washington, DC with several banks whereby PEPCO buys down the interest rate and has no origination fees to the client. The motivating factor for PEPCO in this program is the concept of "Conservation Power Plants," a concept that saves money for PEPCO over the long run. PEPCO also supports and pays for some technical services through community-based organizations, from the realization that smaller businesses and industries often have no access to such services at reasonable costs.

PEPCO's incentive to spend money and time on these programs is the obvious one of leveling demand and decreasing the long term need for additional generating capacity. The second is the less quantifiable incentive to be a "good corporate citizen". Mr. Gautier also mentioned a list of other demand management programs

that PEPCO sponsors for its customers. All emphasize end-use management.

PEPCO has recently completed a survey for future actions with business and industry (smaller sizes). Survey consisted of:

- What technologies exist and are appropriate;
- What are attitudes of clients -- conservation or load management?;
- What is the decision process; i.e. who makes the decisions regarding energy projects, and how do they view energy projects?; how important is an investment in energy conservation versus other investments for the client? What factors and costs affect the "Buy Decision" within this market? This last point is the key -- helps define client needs and why some have not participated.

Results from survey will aid definition of the technology, the incentive for investment by the client, and who in the business should be approached to market conservation effectively.

Mr. Gautier then addressed the three ways that upper management can become interested in conservation:

- The commercial and industrial sector's health is vital to the utility;
- If the concerns and needs of the customer are known and responded to, PEPCO can reduce costs over the long term -- this is most important;
- Services can be provided by professional firms that are not a part of PEPCO.

PEPCO has supported several energy programs that reach low-income populations in conjunction with the D.C. government:

- o To increase effectiveness of community-based organizations, PEPCO paid the percentage of their administrative costs that could not be funded from Federal funds. PEPCO put in about \$1.2 million that leveraged and supported about \$5 million in conservation, and this was a key selling point for PEPCO management.

Founded the Community Weatherization Fund in partnership with the D.C. Community Trust to do rehabilitation, conservation and training as a business incubator for community-based organizations. They are leveraging EXXON funds, and other Federal and foundation funds to support this project. Types of projects include weatherization of single family and group homes, homeless shelters, etc.

- o In the above, the key is having the expertise to put a financial package together and to have access from the utility to some seed funds for leveraging other contributions. As a general example, PEPCO may place \$3,000 into a project that gets an additional \$15,000 from five other contributors to implement the project.

Mr. Gautier then discussed the business incentive for PEPCO to invest money in conservation. He reminded the audience that most utilities are "community-minded"; the point is to find a project for management that "hits" this interest and emphasizes the potential for economic development. Also, utilities are currently involved with many community affairs/public relations projects, and it is important to re-focus the utilities' efforts from things such as arts councils to energy conservation.

Mr. Gautier discussed PEPCO's attitude toward district heating and cogeneration, especially for smaller, individual building cogeneration systems. PEPCO feels that cogeneration is not really technically/economically viable now in

D.C.; it is oversold now for its benefits and PEPCO does not fund them. PEPCO's position is that it will support interconnections if they happen, but does not foster such systems now.

"Financing For Large Energy Projects" -- Roger Feldman, Partner, Nixon, Hargrave, Devans & Doyle

Mr. Feldman focused his comments on changes in project financing for large, public energy projects, such as district heating, cogeneration, and waste-to-energy plants.

He stated that a major objective in any large public financing is to bundle a series of funds together in such a manner as to assure repayment of all costs from operations with a positive cash flow. In such financing, the buyer's credit and security is a key since project financing is commonly highly leveraged. The "buyer" in this case is the buyer of the energy produced (as Con Edison would buy energy on a guaranteed contract from a cogeneration project). The project leverages a small amount of equity with a large amount of debt.

In the past there was a perception that support of cogeneration was essentially a support of conservation, especially for industrial uses, that would aid utilities in meeting demands for electrical capacity (it was the basis for original PURPA legislation). Cogeneration was also supported by earlier tax laws that gave advantages through accelerated depreciation on investment, and contracts for purchase by utilities: both highly tax-leveraged means. Cogeneration was also supported by industrial development bonds and other financing tools. The combined effect of public equity support, rapid write-offs and the like, gave much support to projects.

Now, Mr. Feldman stated that the situation is different:

- o The utility market has changed, with State PSC's altering formulas for purchase of energy, current implementation regulations for

PURPA, etc. These changes promise to be much less supportive of project financing; and

- o Most utilities have set up "PURPA-Subsidiaries" that are essentially unregulated sellers of power -- defacto deregulation of utilities.

Mr. Feldman felt that beneficiaries of the changes should be DHC systems and waste-to-energy projects, with emphasis by utilities on the public interest aspects of the project. The specific impact is that some utilities are now actually bidding on such projects, and expect to gain substantial revenues from the non-energy components of the project: i.e., from service fees for the disposal of waste and the like.

The current Tax Reform Act's impact on privatization include:

On the equity side:

- o Act eliminates (1) fast depreciation (except for waste-to-energy), (2) energy credits, and (3) the benefits of tax shelter and fast return on investment;
- o Act requires that any gains from passive investment can only be offset by passive losses from another investment. That will change the structure of financing and investment and return on investment needs; it will have especially negative impacts for the future of DHC.

On the debt side:

- o Act and other current Federal legislation places caps on total amount of industrial development bonds and other private use activity bond amounts;
- o Act limits the tax benefits earlier associated with interest and financing costs;
- o Act changes the treatment of lease and lease/purchase arrangements with private vendors and service

contracts that have "government purpose" elements.

Mr. Feldman then described what these changes would mean for financing energy projects:

- o First, the traditional structure for public/private financing must be looked at strongly, since additional costs must be built in by the private third party to compensate for decreased returns caused by changes in the act.
- o Lease and lease purchase elements will be more highly emphasized and with stronger contracts; but will change in terms of duration, and service elements.

Additional Impacts on Privatization:

- o Economics of many previous privatization approaches will not be as positive for both public and private parties as they have been. This will cause a much closer examination of the benefits of private participation.
- o With the example given from the current "Clean Water Act", Federal support for public/private projects may be in the form of seed money, such as a revolving fund establishment, with the states acting as bankers, creating "Infrastructure Banks". From this it may be possible to further leverage these public funds with additional private investment.
- o We should also see more interest in service arrangements where the private contractor can do the service less expensively than the public sector. In some cases, government will require this analysis prior to providing the service. This will also apply to "shared savings" and energy performance contracting. The "trick" is to have a procure-

ment requirement that requires the private sector to invest, to guarantee performance, and to subsidize the public risk in a project. Also, should look at the ability of the private party to guarantee security if project does not work. Private companies can be induced to take these risks.

- o Use of third party "credit enhancement" is especially evident now for Waste-to-Energy projects and will probably spread to other projects. This occurs where third party lends its security to a project that otherwise may be too financially risky for conventional financing.
- o Coming trend is the direct linkage of public/private financing to economic development. Currently, there is a beginning "wave" that represents an opportunity with few guidelines. An example of this would be credit companies beginning to say that "public-purpose" contracting-out projects are of high interest as a profit-making endeavor. Note: relate this to the earlier PEPCO point about the deregulation of PURPA subsidiaries: and the beginning of utilities to bid on Waste-to-Energy and other projects.

WORKSHOP II: "UTILITY AND FINANCIAL EXPERTS"

**March 12-14, 1987
San Francisco, California**

"PVEA And Stripper Well Funds" -- Carroylin Threlkel, California Energy Division

Petroleum Violation Escrow Account (PVEA) or Exxon oil overcharge funds will be used for the following activities in California:

- o Support to local governments for staff training and support services

in the fields of planning, design, permitting, conservation, comprehensive energy management, and the development of energy and energy resources -- \$10 million

- o Loans to local jurisdictions to purchase, maintain, and evaluate energy efficient equipment and small power production systems -- \$4 million
- o Energy staff training, operations, and maintenance for several California universities -- \$4 million
- o Loans to school districts to purchase, maintain, and evaluate energy efficient equipment and small power production -- \$3 million
- o Support to the Department of Transportation to continue the Traffic Signal Timing program -- \$7.5 million
- o Support to the University of California to provide technical assistance for agricultural energy extension services
- o A revolving loan fund for energy conservation and alternative energy projects -- \$3 million
- o Demonstrations of existing and new tillage and harvesting techniques -- \$ 1 million
- o Provide a small business energy assistance low interest revolving loan program to fund the purchase of equipment for alternative energy technology projects -- \$4 million
- o Support the purchase of flexible fuel vehicles for fleet operation and provide financial assistance to public and private transit operators for acquisition and operation of methanol-powered transit buses -- \$5 million. Many

of the above programs are grant programs for which applicants must submit applications.

Stripper Well funds will be used to:

- o Provide for the purchase and installation of air conditioning equipment for schools which are being converted to year-round operation -- \$30 million
- o Provides for Controller's Office to allocate funds directly to the Department of Transportation. DOT submits program plans, progress reports and expenditures to the California Energy Commission -- \$35 million

"Working With Utilities" -- Robin Calhoun, Pacific Gas And Electric

Robin Calhoun discussed the best "tactics" to use in approaching one's utility. She suggested examining the utility's motivations: many are investor-owned and want to be good citizens and serve the community. PG&E has had several loan programs for retrofit and energy efficient appliances. Other programs for the non-residential sector include joint ventures, loaned executive programs, direct financing, and pilot programs.

Ms. Calhoun discussed PG&E's small business loan program. PG&E provides direct rebates to small businesses because the loan program was not popular with small businesses. Rebates work better than loans for small businesses, according to Ms. Calhoun. New York City and Con Edison also have excellent energy/economic development programs, including business retention and attraction elements.

"Using CDBG And UDAG Funds For Energy Programs" -- Joel Posner, USHUD Regional Office

Mr. Posner discussed eligible activities for CDBG, which included projects that serve low and moderate income persons, blight, or an urgent need. CDBG funds do not finance new construction. Decisions on

CDBG funds are made by the cities themselves - for example in San Francisco, there is a strong citizens' process which is used to make decisions about how CDBG funds are to be used. The regional office reviews a city's decisions on funds and monitors their use.

"Third Party Financing Of Energy Projects" -- Wally McOuat, McOuat And Associates

Mr. McOuat's area of expertise is public/private financing of energy projects. Joint ventures are common. He does some feasibility studies and strategic planning, but mostly focuses on getting projects built. Most projects are energy generation, district heating and cooling biomass, and all are over \$1 million. Most have a good security value where one can measure costs and benefits, and where project financing and cash flow analysis are very well defined.

In energy conservation projects, where a city is planning to take a risk, such as in insulation, lighting retrofit and energy management, it can be difficult to predict savings. It would be difficult to get third-party financing for this type of project.

Some examples of third-party financing of DHC include the DHC system for the University of San Diego (UCSD). In that project there was no capital budget, and the developer obtained the financing. The lender provided 70% of the financing, the owner 30%. The owner then sells energy to UCSD at \$2.50 per KW. The back-up power is provided by San Diego Gas and Electric even if it is not used.

Mr. McOuat also described a lease/purchase arrangement for a DHC system. He concluded by stating that it is crucial to get the right financiers. For an energy project under 1/2 million dollars, it is almost impossible use with a third-party financing arrangement.

A traditional lease/purchase arrangement can work for a project under \$100,000. A

lighting retrofit project might be financed with a lease/purchase arrangement, or a straight municipal lease.

The toughest money to come by is the initial cost of the study, planning, and RFP. However, the utility (PG&E) and the California Energy Commission have given money for feasibility studies.

The cities might explore using CDBG as the security for the rent or lease payments, or using CDBG to secure a share savings deal.

WORKSHOP III: "UTILITY AND CITY SPONSORED ENERGY/ECONOMIC DEVELOPMENT PROGRAMS OF NEW YORK CITY"

**September 17-19, 1987
New York City, New York**

"Utility-Sponsored Energy Programs" -- Fred Oronstein, Consolidated Edison

Con Edison has been involved in energy conservation for many years. The Save-A-Watt Program, initiated in 1975, was one of the first utility-sponsored conservation programs in the nation. Some of their current programs include the Commercial and Industrial Energy Audit program and the Selected Network Rebate program.

The Commercial and Industrial Energy Audit program is providing energy audits to 400 customers with billing demands between 150 to 500 KW. The customers are located in Brooklyn and Queens as well as Westchester County. The audits deal with all energy consumption within the customers facilities with the exception of process loads. The objective of this program is to determine the customer response to free energy audits in terms of the installation of recommended conservation options.

Con Edison is also working with The City of New York on an analysis of a city sponsored audit Program that began in 1982. Under the auspices of the New York City program approximately 300 facilities

received energy audits. In this program, the objective is to determine how effective the audits were in encouraging companies to adopt energy savings measures as well as identify barriers and determine what services might be necessary to maximize conservation investments by business owners.

Currently Con Edison has a program of discounted utility rates for certain areas, such as the South Bronx and Brooklyn, called the Area Development Rate Program.

"Audit Follow-up" -- Jim Hudson, Consultant, Con Edison

Mr. Hudson is doing a follow-up study on 300 audits which were conducted by the City. Two hundred of the buildings are under 10,000 square feet and many are four story buildings. A very small percentage, one percent, are included in the SIC codes for construction, food, textiles or apparel, pulp and paper. The rest fall into the following categories: four percent are in the printing industries; eight percent in the chemical industries; 17 percent are in fabricated metals and platers; three and a half percent are non-electric machinery. There is a wide mix of small companies. Most of the measures recommended by the audit are fairly simple: such as lighting and space conditioning.

The State of New York co-funding another 3,000 Technical Assistance Energy audits on buildings to be paid for out of the oil overcharge fund. At least 50 percent of the cost of the audit must be paid by the company.

"Financial Services Corporation, NYC" -- Anna Lloyd, Financial Services Corporation, New York City

The Financial Services Corporation (FSC) is a non-profit corporation that administers economic development financing programs such as CDBG, UDAG and EDA for the City of New York. It also runs the IDA and IRB programs, as well as the state UDAG/EDA programs (the FSC sends applications to state for funds from those programs.)

An application can include improvements to infrastructure, real estate, or working capital. Other eligible activities for the state programs include:

- program development start-up costs
- enterprise zones
- three percent reduction in utility bills for firms tied into eligibility.

Ms. Lloyd then described the loan program to achieve energy savings. The staff of FSC is currently negotiating for seed capital for the energy conservation loan program. The FSC will focus on dollar savings and structure the loan around energy savings. They will look at financial strength of businesses, but also energy savings the business could achieve. The loan program should not adversely affect cash flow of businesses. The loan program will be structured so that businesses can reap initial benefits of conservation. Even payments must be made throughout the year by the business: it cannot be a seasonal business. There will be many benefits to the City: for every job, the City collects \$2,000 in tax benefits (includes sales and property taxes).

The FSC is looking for capitalization from utilities, state government, banks, foundations, corporations, or oil overcharge funds. The loan program will target apparel, printing industry, food processing, and metal working industries. It will also target the following kinds of industries:

- major manufacturers
- those that have significant energy costs
- those that are most often being squeezed out of Manhattan
- those that are most likely to replace old equipment

FSC is trying to get \$3 million in capitalization for the loan program. They will be targeting 36-45 businesses the first year, and each loan will be six months to a year or longer. The loan amount for each loan will vary from \$50,000 - \$100,000. The loan amount will be tied into energy savings, borrower credit worthiness, need for public support and other factors. This will be a pilot program for the first 18 months and, if successful, expanded to an ongoing program.



APPENDIX C

TECHNICAL ASSISTANCE

Each project in the USHUD-supported Phase II Marketing and Financing Project was provided with the technical assistance of their choice as a result of participation in this project. Types of technical assistance chosen by the participating jurisdictions included:

- site visits
- professional design assistance by firms skilled in developing marketing materials
- experts on various energy technologies to make presentations at workshops
- assistance by energy firms in reviewing program design

The following are detailed descriptions of the technical assistance used by each local government in the Phase II project.

HENNEPIN COUNTY, MINNESOTA

Technical assistance employed by Hennepin energy staff:

- Site visit to Austin, Texas to examine the Austin Energy Star program
- Development of marketing brochure on energy efficient construction for new homebuyers.

The following descriptions were written by Lynnette F. Brouwer, former Planner, Department of Environment and Energy, Hennepin County, Minnesota.

I Site Visit to Austin, Texas, August 6-7, 1987

The purpose of the site visit was to explore methods of marketing new homes for their energy efficiency, and generally increase our familiarity with the Austin rating program to enhance our project.

Energy Star

Austin's Energy Star program rates new homes on their energy performance based on envelope characteristics, equipment efficiency and solar orientation. The computer program BETA was designed specifically for the Austin program, and balances information about each of these home components to arrive at an overall rating. A home receives points, which then translate into a one, two or three star rating, and into a dollar savings estimate compared to a similar home built to the city code.

Energy Star is a voluntary program funded entirely by utility monies. It's intent is to save energy, provide better quality housing stock, and give the consumer a standard against which to judge available housing.

Rating System

Energy Star assigns points based on a composite of envelope characteristics, equipment efficiency and solar orientation. A home built just to code gets zero points on the scale, with 100-249 points being a one star home, 250-399 a two star, and 400 or more a three star home. The software also translates points into an actual gas and electric dollar-savings estimate over the base case, or code house. A recent comparison of predicted versus actual electricity use averaged only 2% variance overall, although individual variance was sometimes much greater or less, indicating effects of life style. The estimating process has since been revised, further increasing accuracy.

The BETA program does not analyze cost-effectiveness or perform cost-benefit cal-

culations. Both labor and material costs can vary enough between suppliers and subcontractors that to make such an analysis accurate and therefore useful, would be very complicated with data updated frequently. So the rating is based entirely on energy-efficiency, giving builders and buyers a standard against which to judge whether cost/price is consistent with value.

Typically a one star home would include R-30 insulation in the ceiling, R-13 in the walls, a moderate amount of glass, single or double pane windows, no sky lights or black shingles, low-flow shower and faucet heads, and medium-efficiency heating (75% AFUE) and cooling units (9.5 EER). Ways to increase a home's rating including minimizing or eliminating windows to the east and west, using light colored roofs and exterior walls, installing double-pane windows throughout, increasing wall and ceiling insulation, and upgrading heating and cooling equipment. Builders may also conduct blower door tests at their own expense. If the home is demonstrated by the test to be tighter than the standard entered in the BETA program, it will score additional points in the rating system.

Information to determine the rating is generally taken from drawings. Appliance and mechanical system specifications are verified on-site as are exterior colors and solar orientation. In addition to insulation values, mechanical systems and solar orientation information, the BETA program will also accept and compute data on lighting, temperature setpoints, windows and skylights, and estimated use of gas and electric appliances. Default numbers are entered for such items as lighting and indoor temperature, unless the builder supplies specific information that may increase the rating of the home. The software program balances all elements against each other, giving some elements greater and others lesser value in the overall energy rating of the home.

Context As Texas has no state-wide energy code for new construction, implementing a city code in Austin has been essential to upgrading and establishing a standard in

local new housing. Austin's energy code has an overall U-value requirement, so a variety of different designs and component combinations could all meet the code. The city code became effective only two years ago and Energy Star was implemented shortly after. As these changes are so recent, and means of meeting the code are flexible, builders are still experimenting with ways to meet the code and achieve one, two or three star ratings.

Energy Star staff seem to have an excellent relationship with city building inspection personnel. This is essential, as Energy Star inspectors often make site visits to determine and verify construction details necessary to rate the home, and building inspection personnel could conclude that Energy Star staff are overstepping their bounds. Both Energy Star and building inspection are in the same jurisdiction, i.e. city government, thereby enhancing communication. Also, Energy Star inspector Royal Johnson is a former city Building inspector, and before that worked construction for a local building firm. His experience in both inspection and construction, and rapport with individuals, departments and firms involved, greatly enhances the workability of the program.

Builder Participation

Builders are generally receptive to Energy Star, due in part to the poor housing market. On a downswing for several years now, local experts still aren't sure it's hit bottom. Existing homes, lost in foreclosure and resold below market value, have greatly affected the new housing market. But existing homes do not need to comply with the energy code, so meeting or exceeding the code can be an excellent marketing tool for builders.

Builder Participation Energy Star program

Program reaches builders one-on-one through telephone contacts and construction site visits. Doug Seiter stresses the program needs to be convenient for builders, and inspector Royal Johnson brings the program out to the field, setting appointments or dropping in on builders at the site unannounced.

Field-going personnel briefly introduce Energy Star and then follow up with details once the builder has had a chance to look over program brochures. Word of mouth between builders, local advertising, and display of the energy star logo on specific homes and in development areas also helps to pique builders' interest so when they are introduced to the program by a city official, the concept is not entirely new to them.

Marketing

The Resource Management Department markets Energy Star and participating builders through paid advertising in local publications, and phone calls and informal meetings with builders. Full color brochures designed for builders and buyers are available for distribution and upon request.

Staff are also beginning to work with consumers to encourage them to demand energy standards in the housing they buy. This is as a result of observations that present buyers, unlike those a decade ago, have come to expect and therefore assume that new homes are energy efficient. So encouraging buyers to continue to ask energy-related questions is an important part of increasing energy efficiency in new homes, and spreading the word about Energy Star.

Another new emphasis is the "Home of the Week." Energy Star managers select at random any house that has rated at least one star, as the Energy Star "Home of the Week." The builder can then use this designation to advertise and emphasize energy-saving features of that particular house, and generally draw attention to the firm and the development where the house

is located. This is a recent addition to the Energy Star program and is well-received by participating builders. It's also viewed and used by program officials as an additional incentive for builders to participate in Energy Star.

Energy Star staff are presently working with the Department program evaluation staff to develop a method and guidelines to gather specific market-related information. With a body of solid data regarding potential new-home buyers in Austin, staff will be able to plan and implement additional marketing programs and techniques.

Effects

Energy Star is affecting local construction in at least two ways. The most obvious effect is on builders who are participating in the program, and are modifying their homes to make sure they rate at least one star, or to improve their initial ratings. These builders are learning new, and sometimes easy, ways to improve the energy efficiency of their homes.

This program also seems to be affecting builders who are not presently having their homes Energy Star rated. Royal and I stopped at a home being built by a firm whose homes did not even rate at one star a year ago. At that time the builder decided not to pursue the program further. The home we visited had good site orientation, light colored exterior siding and shingles, double pane windows, and caulking around exterior wall and ceiling penetrations. Royal suspected this home may receive two stars if rated and planned to contact the builder, encouraging him to have one of his new homes rated for information purposes. One builder who came in contact with the program, opted out of participation, but still improved construction methods and materials; there may be others.

In Summary

Generally the Energy Star program helps cast a pleasant light on complying with the city building code -- the city code is mandatory, Energy Star is voluntary. Energy

Star staff work with the builders to help them achieve greater energy efficiency in their new homes through overall design, and in selection of construction methods and materials.

Builder participation is already high and continues to increase. The rating system gives builders a marketing tool which can help them get an edge in a down market. The program seems to have a positive image internally, in the building community, and among consumers. And it's having a significant effect on the quality and energy efficiency of local residential construction.

Application to Hennepin County Project

A major difference between Energy Star and the Energy Enhancements project is the question of cost-effectiveness. The focus of Hennepin County's project is to improve energy-efficiency of low to moderately priced new housing, while keeping costs in that lower range. To do that, recommendations had to take cost-effectiveness into account.

And that does make things fuzzy, as Energy Star staff concluded when they decided to establish a rating system speaking strictly to materials and methods, and let the builder and buyer deal with cost issues in their own ways. Energy Star is a much cleaner system in this regard, but does not speak directly to the matter of achieving good quality energy efficient housing in the lower price ranges. It does seem, however, to be having an indirect effect in this regard in the Austin area, in that while some large scale builders of lower cost housing continue to squeak by, barely meeting code requirements, others are gradually incorporating energy enhancing features identified in the Energy Star rating system. There are certain local conditions though, which contribute to this effect.

Those conditions in Texas and Austin include lack of a statewide energy code and a very poor housing market. These are both opposite of our situation *here* in Minnesota and Hennepin County. The poor housing

market is a strong incentive to builders to use the rating system to get an edge on their competition. If they adopt just enough of the lower cost measures to rate even one star, they have an added marketing tool. Right now in the Twin Cities metropolitan area, the new housing industry is booming. This spring a realtor observed, "The largest problem we foresee this year is not enough homes to sell." The shortage in previously owned homes, coupled with good interest rates and a pent-up demand from buyers, means an excellent market for new homes. "Everyone with a hammer is calling themselves a builder these days," said a new home sales person last week. And with that kind of market, builders generally want to put up homes and sell them, not deal with trying out new ways to improve their product.

While Energy Star gives points for envelope characteristics -- materials used in construction and their R-value -- there is some doubt as to whether the best way to achieve energy efficiency past a certain point, is through upgrading materials. Builder guidelines resulting from the "Energy Efficient House Research Project" conducted by Minnesota's Department of Energy and Economic Development in 1985-86, addressed heat distribution systems, air leakage through exterior envelopes, and application and use of insulation. Both the air leakage and insulation guidelines speak to quality of material used and installation. We are finding the same thing to be true in our Energy Enhancements project, that is, that once reasonable base standards are achieved for energy efficiency in construction, the next most important thing to do is to make sure required materials are installed properly.

Among other things, Minnesota's energy code calls for a continuous vapor barrier and insulation equaling R-38 in the ceiling, R-20 in exterior walls, and R-5 over the entire foundation wall or R-10 above grade to the frostline. In fact, technical specifications of builders involved in the *Hennepin* County project, indicate up to R-50 ceiling insulation, R-23 wall insulation, and R-14

foundation insulation. The question, however, is not one of technical specifications; rather it is one of quality installation. Simply increasing R-value of insulation does not guarantee that it won't be compressed around wires, pipes and other intrusions to the wall cavity, or that gaps won't be left when a batt doesn't fit just right. And requiring a "continuous vapor barrier" but not inspecting the home just prior to sheetrocking and specifically for the condition of that vapor barrier, does not guarantee tears and seams will be sealed. This is where attention needs to be placed now -- on careful and proper installation and use of required energy enhancing materials.

Royal Johnson, Energy Star inspector, indicated they are approaching this point with their program as well, but noted quality is much harder to monitor for technical specs. And at that point, the nebulous but agreed-upon boundaries between building inspector and energy program inspector get even hazier. Training and monitoring for quality are an important, perhaps essential, next step, but internal government politics, builder reputations, and the mindset that technology rather than technique offers the quickest and best solution, must all be dealt with. It's a complicated shift of direction, but one which needs to be looked at in areas where technical requirements are adequate.

The purpose of the brochure (see Appendix D) is to identify key elements enhancing, or detracting from, energy efficiency in new homes. The brochure focuses on construction practices buyers can, and probably should, personally monitor during the building process. At the very least, the brochure will introduce buyers to new questions they can ask to determine the actual energy efficiency of their new home. It will also augment the existing building energy code, by providing consumers with useful information on how energy efficiency can be enhanced in new homes.

This approach to marketing for energy efficiency is being taken for several reasons. First, while our initial assumption was that

buyers today don't really care about energy efficiency like they did in the 70's, our more informed conclusion now is that they do care, but don't talk about it much because they assume energy efficiency is built into the new Minnesota home. To an extent, they are correct. The state has a solid energy component to its building standpoint. But as we looked at enhancing energy efficiency beyond the building code, we learned that installation and application of required materials is a frequently overlooked, but key element in achieving cost-effective energy efficiency. This brochure will help the buyer who assumes energy efficiency is built in, understand that simply meeting materials specifications doesn't necessarily mean energy efficiency.

Then there are the people who do ask questions about energy efficiency, and who frequently visit the site while their home is under construction. They generally ask about R-factors, and less often, about furnace efficiency and windows. They watch their home being built, but usually don't know what they're seeing and how it translates into energy efficiency. This brochure will help those people identify additional questions to ask to garner the information they need, and monitor their home's construction with an informed eye.

Still other buyers gather pieces of information and use them to draw blanket stereotypic conclusions about whether a builder's homes are energy-efficient. An excellent example is the 2 x 6/2 x 4 piece of information. "They know we build 2 x 6," said a salesperson, "and they equate that with energy efficiency." On the other hand, a builder who frames with 2 x 4's continually fights the assumption that his homes are less energy efficient, although the technical R-factor in walls and ceiling is as great as, or greater than, that in the 2 x 6 framed home. This brochure will give those buyers information which can help them move beyond this simplistic decision-making process to one which will really help them determine degree of energy-efficiency in new homes.

Then there is the builder. Minnesota has a mandatory building energy code, but how are such codes really enforced? While inspectors attempt to enforce every aspect of the building code, the integrity of a continuous vapor barrier and careful installation of fiberglass batts to prevent air bypasses, may take lower priority than structural considerations. But as consumers become more knowledgeable about materials and methods requirements and practices, they also begin to perform an enforcement function. If the buyer demands a quality product, and knows what a quality product is, then the builder is more inclined to provide it, regardless of requirements. This brochure will augment consumer information to achieve greater builder compliance with existing requirements and generally enhance quality of new home construction.

KANSAS CITY, MISSOURI

Technical assistance employed by Kansas City staff:

- o Workshop on district heating and cooling in general; and the options available to Kansas City's steam customers, in specific.

Audience: steam customers of current Kansas City Power and Light owned DHC system.

The following description was written by Joseph Gentile, Administrative Officer, Solid Waste Division, Kansas City, Missouri.

District Heating and Cooling Workshop for Steam Customers, July 29, 1987, Kansas City, Missouri.

Background

A widely publicized fact about district heating systems is that it can provide high density occupancy with inexpensive heat, while conserving energy and improving air quality. Yet, the current national trend of local-investor owned utilities has been to

methodically "phase out" existing district heating energy systems due to a lack of commitment to maintain the systems. This planned phase out is giving owners a license to pull out of the steam supply business through very careful legal and operational maneuvers.

The Kansas City system (over 80 years old) is plagued with financial problems, specifically being unable to turn a profit. It has genuine line loss problems, operational efficiency problems, and maintenance problems stemming from a non-committed attitude toward steam production. Excessive capacity is directly related to rising per unit costs and Kansas City Power and Light's (KCPL) desire to phase out the steam system. KCPL has petitioned to the Missouri Public Service Commission (MPSC) for a phase out of the existing District Heating System as it exists today.

The current business plan of KCPL has been somewhat of a relief to many steam customers. Their generous offer to install free electric boilers in steam customer locations has attracted them as well as their competitor, Kansas Power & Light Gas Service Company. Both are looking to attract new heat customers from the demise of the district steam system.

The individual customers have been reluctant to invest capital in an on-site generation system. Most steam customers are nearing the critical decision to convert to an alternative heating system. The key factors in choosing a new system is investment return and first cost. All these factors have brought the focus of this project to the point of action on the part of City Hall.

Kansas City, Missouri is currently conducting a feasibility study to determine the present condition and demand of the downtown district heating systems and customers. From this study we plan to develop a project to continue the present system or develop a replacement system. In addition to this study, we decided to have a workshop to educate the steam customers to their options in this dying system.

We wanted to educate the district steam customers to the economic benefits of remaining on the system. This is in lieu of replacing their existing steam system with newer more expensive stand alone boilers or HVAC systems.

WORKSHOP

1. Technical Assistance Providers

Bernie Manheimer, HUD
William Hanselman, Resource
Development Association
Ron Sundberg, Springsted
Incorporated
Paul Mydler, Bi-States Development
Michael Howard, Attorney
Jack Kattner, Minneapolis Energy
Center
Jerry Finnegan, Attorney
Ken Clark, Burns & McDonnell
Doug Criner, Burns & McDonnell
Floyd Collins, Department of
Energy
Bob Brickner, GBB
Tom Brown, Burns & McDonnell
James Hall, Burns & McDonnell

2. Problem Addressed

Conduct an educational process to address the issues surrounding the recent request by Kansas City Power & Light Co. to the Missouri Public Service Commission to phase out over the next four years service to steam customers remaining on the system.

The workshop provided unique learning process that created stimulus for the steam customers. It provided a means for them to view first-hand alternatives that have been reached by other cities with similar problems.

Technical assistance providers presented views on marketing steam, comparisons between steam and gas and electric for purposes of fuel costs. They also gave a view of the events leading up to the public hear-

ing which was requested by KCPL. The workshop provided a balance of information for those who seemed severely restricted in their decision process. Most importantly, the workshop was intended to truly educate the steam customer about alternatives regarding choices for heating and cooling.

The information gathered during the workshop preparation and the actual result of the event will be utilized by the consultants doing the feasibility study for the City of Kansas. They will refocus their proposal to reflect the workshop findings.

Support from DOE and HUD was plentiful. The efforts of Floyd Collins and Bernie Manheimer to bridge resources for this project was a key factor. We relied on their judgment to bring together the right mix of experience that they could present to the subject in a way that would convince the customer base of the alternatives remaining open to them.

The type of information that was necessary to provide stimulus to the customer centered around heating costs. But some very important associated information was also necessary for a better understanding of the project. Having all these facts presented to the downtown steam customers gave them the opportunity to avoid being acted upon by the power company. They have a chance to take an initiative and keep something very few other cities have, a fairly good operating district steam heating system. It is and will be one of the cheapest fuels for heat. This is a chance to remain competitive in the future. Kansas City needs to act now to be sure our energy future remains affordable.

NEW YORK, NEW YORK Technical assistance employed by New York City energy staff:

- o Review of proposed energy conservation loan program by an energy financial consultant

[Written by Peter Fusaro]

**Review of Financial Services Corporation
Loan Program, September 14 and 16, 1987.**

New York City's HUD/PTI technical assistance involved hiring an energy financial consultant to assist city officials in the development of our proposed energy conservation loan program. The form of this technical assistance consisted of two full-day seminars at the NYC Financial Services Corporation (FSC), the City's not-for-profit economic development financing agency. The technical assistance was held on September 14 and 16, 1987 at FSC. The seminar was given by John Hyfantis, a noted energy consultant in the New York-New Jersey area, and president of Energistics, Inc. a consulting firm specializing in promoting energy savings. Over twenty professionals from FSC and the NYC Energy Telecommunications Office (ENERTEL) participated in the presentations made by Mr. Hyfantis.

ENERTEL provided a statement of work to the consultant that identified specific tasks that were to be performed in preparation for the seminars and the topic areas for discussion with the City. These tasks included: (1) reviewing the draft of the loan program proposal focusing specifically on company eligibility criteria and technical data requirements necessary to evaluate projects for financing; (2) assessing the extent to which energy efficient process technologies can yield dollar savings that can be relied on for monthly loan payments; (3) review of loan programs in other states; (4) identifying problems in establishing a loan program; and (5) providing audit samples of printing, apparel, or food processing industries.

The first day's presentation consisted of an overview of energy systems. These included lighting, energy management systems, heat recovery, cogeneration, motor replacement and thermal storage. Par-

ticular detail was given to cogeneration

The second day's presentation concerned an in-depth evaluation of the City's proposed energy conservation loan program. Areas covered included: how to enhance technical data for reasonableness, accuracy, and verification; how to monitor savings for payback criteria; and most importantly, how to establish baseline energy cost savings as a yardstick to structure the first two to three years of the loan program. Moreover, Mr. Hyfantis recommended using simple projects with proven technologies to initially show off the benefits of the program and minimize risk. Specifically, he mentioned boilers and lighting retrofit projects. He also highlighted some of the pitfalls of energy conservation financing projects. These included little control over the quality of the energy audit, little collateral available from equipment once its installed, the need for a service contract to maintain equipment, and the failure to cover project contingencies from delays, process changes and changes to energy and cost baseline estimates.

The information obtained by the technical assistance will be very useful in the Year 8 project because it will aid City financial/economic development measures in the structuring of an energy conservation loan program by identifying specific energy technologies, issues and problem solving approaches.

SAN FRANCISCO, CALIFORNIA

Technical assistance employed by San Francisco energy staff:

- o District heating and cooling workshop for the developers of the Mission Bay Redevelopment area, City planning department, and other city officials.

[Written by John Deakin, Director, Energy Conservation Bureau, PUC]

Mission Bay District Heating and Cooling Workshop, October 19, 1987

Background

As part of the design of an energy plan for the Mission Bay redevelopment area, San Francisco is studying the feasibility of developing a modern district heating and cooling system. Mission Bay is an area of approximately 300 acres south of the traditional downtown financial district which the Santa Fe Pacific Realty Corporation plans to redevelop. A significant amount of new commercial and residential growth is proposed over the next few years (including affordable housing). This land is presently under utilized as railroad yards and associated businesses which will be replaced by housing and mixed commercial uses.

District Heating and Cooling (DHC) is the centralized generation of thermal energy for distribution and use in individual buildings. It can provide an economical and efficient supply of energy to most of the new commercial and residential construction that will take place over the next few years in Mission Bay. DHC can provide thermal energy at lower prices and can greatly reduce initial capital investment costs to building developers. Additionally, DHC could lower annual energy expenditures and operation and maintenance costs to building owners.

Type of Assistance Provided

The Technical Assistance provided by USHUD consisted of financial support to bring a number of nationally recognized authorities on District Heating and Cooling (DHC) to San Francisco. They participated in a workshop on DHC designed to persuade the developers of the Mission Bay redevelopment area and City government decision makers that DHC at Mission Bay is technically practical and financially viable way of heating and cooling buildings, with many other benefits as well. In addition, San Francisco energy staff planned to iden-

tify and discuss some of the important issues affecting the implementation of DHC at Mission Bay with people who could answer many of the questions. A final goal was to stimulate enough interest in DHC so we could then go to the important players to ask for help in funding an initial feasibility study for the project.

The speakers included Gordon Bloomquist, Monica Westerlund, John Nimmons and Wallace McOuat. Their presentation topics are given in the attached agenda. One key speaker was unable to attend the workshop at the last moment, but Andrew Euston spoke on his subject of economic development. Other workshop participants included representatives of the local utility, Pacific Gas and Electric; representatives of Santa Fe Pacific Realty Corp., the primary developer of Mission Bay; and representatives from City government agencies such as City Planning and Public Utilities Commission.

Content of the Workshop

The topics covered in the workshop are shown in the agenda following this narrative. Pertinent points made are summarized below. District heating and cooling is a proven, reliable method of heating and cooling buildings. The benefits of DHC include:

- o-lower energy, operating, and maintenance costs,
- o lower building construction costs,
- o increased usable space in buildings,
- o freer, more attractive design alternatives for architects,
- o reduced insurance costs,
- o flexibility in fuel choice,
- o improved air quality,
- o community self-sufficiency, and economic development benefits. Mission Bay shows promise for DHC because:
 - o Buildings could be designed from the outset to use DHC.
 - o Reduced distribution net costs from combined trenching.

- Phasing of system can match phasing of development, and
- Favorable heat density and mixed building uses.

For the Mission Bay project developer, district heating and cooling can be packaged with the overall plan to enhance project marketability. DHC will become even more attractive during the 20 year construction period at Mission Bay.

All the benefits mentioned previously will directly or indirectly benefit the City. While the economic development spin-off of DHC projects is hard to predict, many cities are using DHC to promote and direct redevelopment.

The local utility, Pacific Gas and Electric, expressed a strong desire to serve Mission Bay with [DHC](#). PG&E is currently doing an initial DHC assessment. They also expressed interest in coordinating the analysis with the other interested participants. HEATPLAN, a computer model available from the Washington State Energy Office, would be a useful tool for this initial feasibility analysis.

It is important to structure the system so that some entity has the incentive to see it through to completion. Ownership of the system is the key issue; it could be owned by a public entity (municipality or special use district), a private entity (utility or DHC developer), or a combination of the two. Different institutional, legal, and regulatory issues apply to each type of ownership. These issues should be investigated in any feasibility study.

At this time, it appears the City lacks the political will and skill to be the primary owner of DHC system. The two most attractive options are:

- PG&E wholly or in conjunction with someone else.
- a city-encouraged public or private non-profit developer.

If analysis show that there are economic benefits in DHC at Mission Bay, it can

probably be financed. The financing alternatives are tied to the type of ownership chosen. However, timing is crucial. The study needs to be done now, and the actors in the project will have to start making commitments.

Reactions of various players

During the workshop, time was set aside for discussion. The most interesting reaction came from a representative of the project developer and major landowner, Santa Fe Pacific Realty Corporation. His concerns are as follows:

- how DHC would affect phasing of development;
- no interest on their part in entering into the energy business;
- does not want to make commitments to using a DHC system;
- marketing of buildings or of parcels to be developed with constraint of using DHC, since individual developers will have different attitudes towards DHC;
- future technologies may provide more attractive heating and cooling options; and
- up front costs to the developer are a key issue.

All of these concerns were addressed by other workshop participants. Perhaps the most contested issue remaining was the need for commitment, since a DHC developer will need to have some commitments before initiating the construction of a DHC system. All of these concerns give direction to further work on the part of the Bureau of Energy Conservation.

Its Value to the Project

The goals of the workshop were to 1) generate interest in DHC among city decision-makers, the project developer, and other players; 2) discuss some of the issues involved in its implementation; and 3) generate enough enthusiasm among the participants in order to make it easier to approach them about funding a feasibility study.

Actual results were as follows:

- The program generated substantial interest with the Department of City Planning. However, the one other city decision maker present was a substitute, and he was unable to attend the entire workshop.
- There was substantial resistance to DHC from the project developer. While all of his concerns were more than satisfactorily addressed, he maintained an unwillingness to pledge cooperation at this time.
- The presentations and discussions were extremely successful in identifying the options available and the issues that need to be considered in future work.
- The workshop was a useful forum for PG&E to present their interest and ideas to the developer, the city, and the experts who were able to support that interest.
- Whether there was enough interest generated in order to fund a feasibility study will become apparent in the coming weeks. Depending on PG&E's initial findings, the company appears to be at least one source.
- While not a stated goal, the workshop provided the Bureau of Energy Conservation with some real direction for the future. Tasks identified include 1) obtaining HEATPLAN tool to analyze feasibility as a supplement to PG&E's work, 2) coordinating with PG&E to clarify our role in their work, 3) developing the necessary support of major city government officials, and 4) addressing the concerns of the project developer.

Overall, the workshop was a success, primarily because of the assistance provided by the invited speakers. The quality of their presentations and their

The symposium is organized by the City

abilities in responding to questions and providing guidance were the strongest part of the workshop.

WORKSHOP AGENDA

Mission Bay District Heating and Cooling Workshop

October 19, 1987

11:00 AM to 3:00 PM

Kensington Park Hotel

450 Post Street

San Francisco, California

Purpose

The purpose of this workshop is to demonstrate to the developers of Mission Bay and City government decision makers that District Heating and Cooling (DHC) is, at a minimum, a technically practical and financially viable way of heating and cooling buildings. Furthermore, that when well managed, DHC can contribute to the effective marketing of the Mission Bay project area as a whole. Persons involved in the planning, development, and operation of some of the most modern and successful DHC systems in the United States will be coming to San Francisco to share their experience and knowledge with the Mission Bay planning team.

Sponsors

and County of San Francisco Public Utilities Commission, Bureau of Energy Conservation. Financial assistance is being provided by US Department of Housing and Urban Development.

Overview

As part of the design of an energy plan for the Mission Bay redevelopment area, San Francisco is studying the feasibility of developing a modern district heating and cooling system. Mission Bay is an area of almost 300 acres south of the traditional downtown financial district which the Santa Fe Pacific Realty Corporation plans to redevelop. A significant amount of new

commercial and residential growth is proposed over the next 15 to 20 years (including affordable housing). At project completion, the plan envisions almost seven million square feet of office and light industrial uses, almost one million square feet of other non-residential uses, and 7,000 to 8,000 housing units. This land is presently under-utilized as railroad yards and associated businesses which will be replaced by the housing and mixed commercial uses.

The Mission Bay development has a number of characteristics ideal for DHC system development:

- Favorable building and heat load density,
- Diverse building uses,
- Reductions in distribution system costs as piping can be installed prior to street surfaces and sidewalks,
- The *new* buildings can be designed from the start to utilize district energy,
- A single developer owns most of the site and will be developing a substantial number of the buildings.

Participants

Speakers

R. Gordon Bloomquist, Washington State Energy Office, Olympia, Washington.
John Nimmons, John Nimmons and Associates, Sausalito, California
Wallace McOuat, Hansen, McOuat and Associates, San Francisco, California

Monica Westerlund, Strategic Communications, St. Paul, Minnesota
Andrew Euston, Office of Environment and Energy, US Department of Housing and Urban Development, Washington, DC

Santa Fe Pacific Realty Corporation

Don Marini, Project Manager
Kerstin Magary, Project Manager

City and County of San Francisco

Public Utilities Commission

Lee Knight, representing Douglas Wright, Director of Planning and Development

PUC/Bureau of Energy Conservation

John F. Deakin, Director
Jim Hanford, Project Manager

Department of City Planning

Lilia I. Medina, Associate Planner
Lois Scott

Bernie Choden, representing San Francisco Tomorrow

Pacific Gas and Electric Company

Lance Elberling, Director, Marketing and Customer Relations, Steam Heating System
Dirk van Ulden, Manager, San Francisco Division Marketing
Gwenn Hardin, Account Executive, San Francisco Division Marketing

APPENDIX D HENNEPIN COUNTY BROCHURE

Ventilation hat to look for:

Should I be concerned?

If your search for a new home results in the purchase of a well-built, energy-efficient one, it's important to think about ventilation. Some people advocate whole-house ventilation while others maintain bath and kitchen exhaust fans are sufficient; few disagree that bathroom and kitchen ventilation is essential in new, tight homes. Select quiet fans—you'll use them more often because they won't be annoying while running.

Exhausting cooking odors and excess humidity will help keep your home's air healthy. Sealed combustion or induced draft water heaters and furnaces will do the same because they use air directly from outside without separately installed combustion air intakes.

It's possible to have an airtightness test performed on your home to determine overall air leakage, which is directly related to energy efficiency. A variety of local professionals can perform this test for a fee.

This brochure prepared by:
Hennepin County
Dept. of Environment & Energy
822 South 3rd Street—Suite 300
Minneapolis, MN 55415



This brochure distributed by:

Hennepin County does not discriminate on the basis of race, color, creed, religion, age, sex, handicap, marital status, affections, preference, public assistance status, criminal record, or national origin. If you believe you have been discriminated against by Hennepin County, contact the Affirmative Action Programs Department, 4403 Government Center, Minneapolis, MN 55487, 161211484096 or TDD 1612, 348-5467.

Printed on recycled and recyclable paper.

ENERGY EFFICIENCY IN NEW HOMES

Thinking of buying a new home? Not sure what to look for?

It is hard to know where to start. That's where this brochure can help. It won't tell you everything about new homes, but it will help you get started looking at specific energy-conserving features and thinking of questions to ask. Then as you learn more about how new homes are put together, there will be other things you'll want to know.

The information in this brochure, is targeted to help you find an energy efficient new home. It's a common assumption that all new homes are energy efficient—that's not necessarily the case. But the more you know about what it takes to make a house energy efficient, the better chance you have of making sure your new home is energy-wise.

Have fun, and good luck looking for that new home.

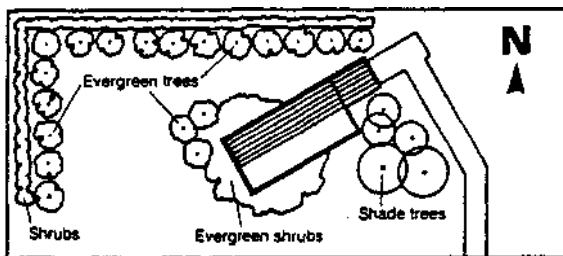
Orientation and landscaping

all construction

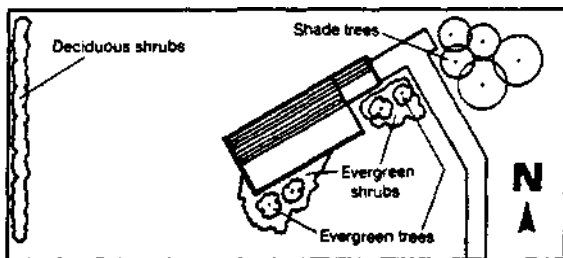
What do I look for?

Shade trees, windbreaks and the orientation of your house to sunlight and prevailing winds can make a big difference in its energy use.

Effective Landscaping



Ineffective Landscaping



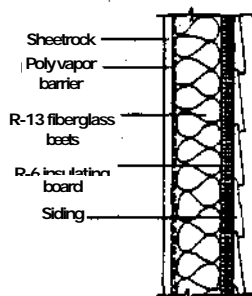
While you can plant evergreen shrubs along the north and west sides of the foundation after you buy a home, big shade trees and wind breaks take a long time to grow. Sometimes trees and other vegetation can be saved during excavation, which will moderate the effects of extreme seasonal weather.

Overall placement of your home in relation to northwest winter winds and the sun's rays is determined very early in the planning process. And once your house is built, that orientation will never change. If you have a part in deciding the orientation of your house, considering its general placement and angle can make a big difference in energy use and conservation for years ahead.

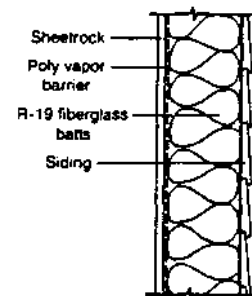
2"x4" or 2"x6" framing?

Both 2"x4" and 2"x6" construction can have the same insulating quality, or R-value.

2"x4" Wall=R-21



2"x6" Wall=R-21



The simple fact that a house is built with 2"x4" or 2"x6" stud walls says very little about its overall energy efficiency. It's important to know what else has gone into those walls, and what their overall R-value is. Both types can meet or exceed the Minnesota code requirement of R-20 in exterior walls.

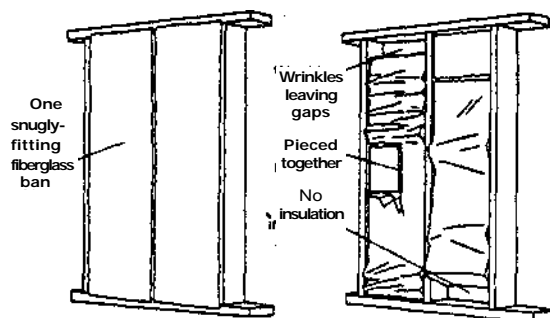
With 2"x4" frame walls, a foam board is added on either the inside or outside of the studs. Sometimes this insulating board is added to 2"x6" frame walls, bringing the overall thermal quality to about R-24, depending on the insulating quality of the board.

Insulating board comes in a variety of forms which vary in thickness and R-value, including expanded polystyrene (beadboard), extruded polystyrene (blueboard, greenboard, yellowboard, etc.), polyisocyanurate, urethane and phenolic. The important thing to know is the R-value of the board used.

Batt insulation

Does it matter how it's put in?

Yes, it does matter how it's put in. More doesn't necessarily mean better, but it must completely fill the wall cavities. If the batt insulation looks neat, it's probably going to do a better job than if it doesn't.



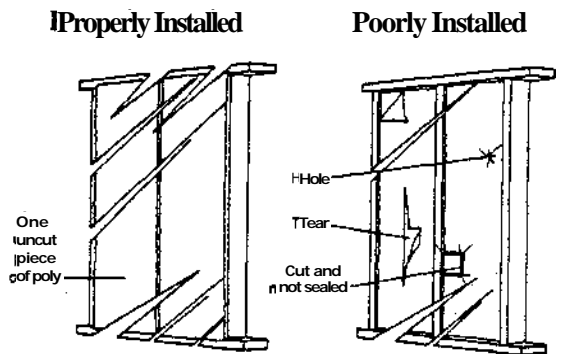
Gaps and holes between pieces of fiberglass batting, or between the insulation and studs, leave what are called "bypasses" that let cold in and heat out. Fiberglass batts and pieces should fit snugly, filling these bypasses, but not be excessively compressed.

Wherever possible, a continuous piece of batting should be installed in the wall cavity. An alternative is to use blown-in insulation, which completely fills the cavity; ceiling insulation is commonly blown-in rather than batts. Where plumbing and other wall components prevent the use of a continuous batt, pieces cut to fit together should be tucked in around the piping and other fixtures.

Vapor Barrier

Properly Installed Poorly Installed What is it and what's it for?

A vapor barrier is required by the Minnesota building code, and may be foil-faced sheetrock, or poly installed between insulation and sheetrock. It keeps interior water vapor from condensing in the insulation, and can reduce flow of warm and cold air through walls and ceiling if seams and penetrations are sealed.



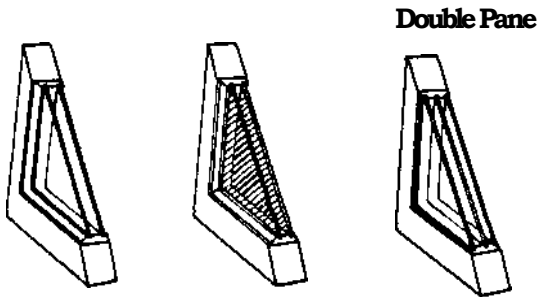
If well-installed, a vapor barrier can tighten your house, reducing drafts and air infiltration. A good vapor barrier is continuous over the entire inside wall and ceiling, with few breaks for light fixtures, switches or electrical outlets. Sealing poly at unavoidable breaks increases airtightness. A vapor barrier is not required at the rim joist, so penetrations and gaps here, and those leading to the attic, should be sealed with caulk or gaskets.

An excellent time to look at your house is after the insulation, vapor barrier, and caulk or gaskets *have* been installed, but before sheetrock is applied. This lets you see the quality of the insulation job, and look for holes in the vapor barrier while errors can still be corrected.

Windows

Double or triple pane, or low-E?

While insulating value of windows can vary depending on distance between panes, quality of seal, frame material and window style, generally each pane of glass adds R-1 to its thermal value.



The most important thermal characteristic of windows is R-value. Low-E or "low-emittance" coating reflects radiant heat, thereby increasing the insulating value of a window by about R-1. But low-E glass does not reduce solar gain in winter like an additional pane of glass does.

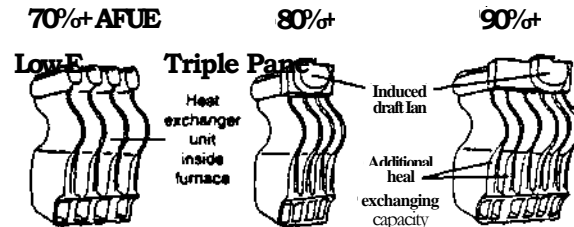
The price difference between traditional double pane windows and double pane low-E has decreased since low-E glass was first introduced. So while the cost of low-E windows is generally little more than double-pane without emittance coating, thermal value approximates that of triple-pane glass.

All-aluminum frames generally have poorer insulating qualities than wood or vinyl frames. Many frames which appear to be vinyl or aluminum, are actually wood with exterior cladding. Vinyl-cladding tends to transmit less heat and cold than aluminum-cladding.

Furnace

Do I have a choice?

Yes you do have a choice. Builders generally provide a 70%⁺ or 80%⁺ efficiency furnace, and offer an upgrade option for a flat fee.



AFUE (annual fuel utilization efficiency) best measures efficiency because it includes all energy used by the furnace, including that used to start it, and energy lost between cycles. But it is rarely stated on the furnace, so you may have to ask.

It's hard to predict payback on higher efficiency models because of variables like size of house, cost of fuel, and lifestyle. But it's generally a good idea to upgrade at least to the 80% range. These furnaces have a constricted heat exchanger to keep more furnace heat in the house, and an "induced draft" fan to push air with combustion gases out of the furnace and into the chimney.

In high efficiency furnaces (90%⁺), more heat exchanging capacity is added to retain additional heat. Air leaves the furnace at about 100°F, so a PVC pipe, instead of a chimney, is sufficient to vent exhaust gases. These furnaces generally have "sealed combustion", taking in fresh air directly from outside to feed the furnace fire. Both induced draft and sealed combustion units reduce the possibility of furnace gases mixing with air in the house.

APPENDIX E

NEW YORK CITY FINANCIAL SERVICES CORPORATION ENERGY CONSERVATION LOAN PROGRAM

PROPOSAL

Summary

The Energy Conservation Loan Program (ECLP) will provide financial assistance, enabling firms in New York City to undertake energy conservation measures. The program will offer flexible financing for the acquisition of energy efficient machinery and equipment, the retrofit of existing equipment to save on consumption, the upgrading of manufacturers' processing methods to derive higher productivity, or the conversion of high cost oil powered machinery to high efficiency low cost gas equipment.

The purpose of the program is to encourage conservation and to reduce businesses' operating costs, thereby making New York City based manufacturers more competitive. Through achieved energy efficiencies the viability for manufacturers to remain in New York City will increase dramatically and will ultimately assist in the retention and creation of jobs. The Financial Services Corporation (FSC) proposes this innovative financing program as a partnership between the City, the State, and the Brooklyn Union Gas Company. The program will require a \$2.5 - \$3.0 million capitalization for the first 18 months of operation. We propose that BUG make a \$1.0 million direct contribution for the first phase of activity. The inception period will focus on the high efficiencies derived from natural gas fueled equipment used in manufacturing and heating for a selected audience.

Background

Firms frequently cite high energy cost as a major factor in their decision to relocate elsewhere. The exodus of businesses, especially industrial firms, has had a substantial impact on the local economy. The City of New York, recognizing this issue, created the Financial Services Corporation of New York City (FSC) to provide financial assistance to small and medium sized firms.

On a daily basis acting as the "banker" for the city, FSC assists businesses in the purchase of machinery and equipment and the renovation or construction of new facilities. However, most firms lack the technological information, the expertise, and the access to capital which would permit them to evaluate and implement a wide range of energy efficiency measures. The exigency remains for companies to be educated, motivated, and encouraged to make investments which would help them save money in the long term, and strengthen their domestic operations. This is an opportune moment for industrial concerns to utilize FSC's resources and expertise in the administration of this highly innovative loan program.

Historically, most small and medium-sized businesses have great difficulty gaining access to capital. The cost to process a small loan is generally the same as a larger loan (in terms of staff time, overhead, etc.), and therefore the profit to a lending institution is proportionately less. Commercial banks often have difficulty accepting equipment as collateral because its resale value is difficult to assess. Assigning a value to state of the art equipment is par-

ticularly problematic because its rate of obsolescence is highly uncertain. These equipment financing problems can be intensified for manufacturers renting space on short or medium term leases, a common situation in New York City.

To investigate this problem further, FSC surveyed 47 manufacturers in the Energy Cost Savings Program pipeline. The survey examined their expansion or improvement schemes, energy conservation measures, and factors inhibiting the implementation of these plans. The survey included such firms as food processors, bakeries, electroplaters, and glass and plastics manufacturers. Of these all considered energy costs to be a substantial part of their operating overhead. Forty-four percent (44%) revealed the lack of access to capital as a factor inhibiting expansion or conservation improvements. Seventy-four percent (74%) of the companies owned machinery over 5 years old and were aware of energy efficient equipment, but had neither the capital to purchase state of the art technology, nor the technical ability to adequately review alternatives.

The ECLP will assist in overcoming these problems by linking technical assistance with direct financing. FSC will provide the critical interface between technical information and recommendations received in audits, and the financial analysis needed to evaluate, encourage, and institute energy efficiency measures. From our experience with the target audience this practical assistance will be crucial to the successful implementation of energy improvement plans. As a further measure in evaluating a project, the potential applicant would seek assistance from Brooklyn Union Gas, in areas of equipment options, retrofitting, cogeneration, and conversion from oil to gas. This would be an effective means of direct BUG involvement which may substantially broaden the utility's client base. The loan rates and terms will be structured to recognize the payback period of the investment and cash flow constraints of the client. FSC will look solely to the energy savings for the repayment of the loan in the first two to three years of the project.

Program Implementation

I. Marketing

FSC staff, in conjunction with Brooklyn Union Gas, will develop a list of energy intensive industries and highlight firms that have exhibited an interest in, and can benefit from, state of the art energy technologies. The list will include size, type, energy consumption characteristics, and geographic location of the firms. During the demonstration phase of the loan program, the list will draw from recipients of the Energy Cost Savings Program in BUG's territory, as well as businesses recommended by other sources including banks and local development corporations. It is estimated that potentially 4000 firms could be prime candidates for assistance under the ECLP.

New gas technology, energy efficiency applications, and various financing options will be marketed to the targeted population. Innovative applications may include the following: 1) heat recovery on continuously operating process equipment; 2) *new* furnaces; 3) *new* hydronic boilers; 4) high efficiency water heaters; 5) new refrigeration compressor systems for commercial cooling; 6) co-generation; 7) boilers to generate steam; 8) ovens used in manufacturing processes; and 9) electric load management.

II. Technical Information

In order for FSC to evaluate a project, detailed technical information on the cost and benefits of each proposed energy conservation measure will be required from Brooklyn Union Gas technical staff or other sources. This information will include: (a) a monthly analysis of current energy use including demand and consumption characteristics, and cost, in all impacted areas of a firm's operation; (b) monthly projected energy use broken down by demand and consumption and cost of energy after implementation of the project for each area affected; (c) specific cost breakdown of the project, including installation and required maintenance; (d)

detailed characteristic of specific measures, including impact on the firm's daily operations, and analysis of the technology to highlight how the savings are achieved; and (e) information on the uses of this technology in other similar business operations. The study will identify the appropriate technologies and the financing available to implement recommendations for the selected facility. In general, study recommendations will provide: an analysis of building and equipment characteristics requiring capital investment; a technical and economic analysis of the specific systems or equipment most appropriate to accomplish energy savings; and an implementation plan. If the firm cannot access this technical information from existing resources, then FSC may provide assistance for the firm to undertake a feasibility study, financed by ECLP.

III. Financing

FSC will establish an Energy Conservation Loan Program (ECLP) to be accessible to eligible businesses to implement energy efficiency measures in Brooklyn Union Gas territory in Brooklyn, Queens, and Staten Island. FSC, having the resources and operations infrastructure to administer the financing package, would make available loans, from the ECLP, for the acquisition, conversion, and/or retrofit of energy efficient equipment, upgrading processing methods and renewable energy measures. The ECLP will have the flexibility to finance up to 90% of total project costs, but wherever possible, firms will be assisted in seeking private financing for a portion of the project.

Rates and terms for the loans will be flexible and based on the payback of the investment; FSC, as a participating lender in the State's Energy Investment Loan Program (EILP), will provide interest rates no higher than 5%, regardless of the loan amount. During the first critical phases (two to three years) of the project, repayment will not be greater than the savings derived as a result of the investment. This will ensure that the cash flow of the business is not strained.

FSC, in conjunction with B.U.G. marketing and technical staff, will issue applications to firms which meet the eligibility criteria summarized in the guidelines. FSC staff will present each loan to a subcommittee of FSC's Board of Directors which will include representatives from Brooklyn Union Gas Company for approval.

Program Guidelines

Loan Program

I.

A. Eligibility Criteria

1. Applicant must have sufficient technical information from a qualified and approved source, including: (a) a monthly analysis of current energy use, including demand and consumption characteristics, and cost, by an area of a firm's operation that will be affected by the proposed project; (b) monthly projected energy use broken down by demand and consumption and cost of energy after implementation of the project for each area affected; (c) specific cost breakdown of project, including installation and required maintenance; (d) detailed characteristics of specific measures, including impact on the firm's daily operations, analysis of the technology to highlight how savings are achieved; and (e) information on the uses of this technology in other similar business operations.
2. Demonstrate ability to service debt as evidenced by the financial condition of the applicant and an analysis of the proposed project.
3. Demonstrate need for public assistance in order to proceed with the project as structured.
4. Eligibility will also be subject to all applicable Federal, state and local laws, rules and regulations governing the use of the funds.

B. Approval Process

Eligible firms will be selected on the basis of several factors, including (1) ability to service debt, (2) estimated energy savings per dollar of loan requested, (3) energy costs in relation to total operating costs, (4) impact of energy savings on company's costs of goods sold, and (5) need for public assistance. All loans will be approved by a subcommittee of FSC's Board of Directors which may include selected representatives from various funding sources.

C. Loan Amount

1. Energy loan participation of up to 90% of total project costs, with a minimum 10% equity requirement by the company or principals.
2. Average Energy Conservation Loan amounts are anticipated at \$50,000 to \$100,000 per firm.

D. Use of Proceeds

Energy Conservation Loans can only be used to implement energy efficiency or conservation measures that have been approved by FSC. This will include but not be limited to:

1. acquisition of machinery and equipment which assists in achieving energy savings for business operations, i.e., industry state-of-the-art;
2. premise improvements, renovations and rehabilitation of existing structures to conserve energy and promote efficient operations.
3. retrofit of existing machinery and equipment to save on energy demand and consumption; and
4. upgrading industrial process procedures.

E. Shared Savings/Performance Contracting

We will also consider providing financing to shared savings or performance contracting firms in order to induce their participation in a project.

F. Rate of Interest

1. Flexible, prime or less, and determined by an analysis of the payback of the investment.
2. Principal And in some cases interest may be deferred during the payback period to induce the investment.

G. Term of Loan

Flexible and based on the payback period of the project and the term of the lease, useful life of the asset, etc. (whichever is appropriate).

H. Collateral

1. Minimum of 100% coverage on fixed assets acquired, existing fixed assets of the firm or suitable substitute collateral. At the Board's discretion, this requirement may be waived if sufficient collateral is unobtainable.
2. Personal guarantees of all principals with over 20 percent ownership of the firm may be required. If not available, additional collateral will be required.

I. Appraisal

1. If real property is being provided as collateral for the loan, a current Narrative Appraisal Report performed by a certified appraiser, acceptable to FSC; and/or

2. If machinery and/or equipment is being provided as collateral for the loan, a current appraisal performed by a certified appraiser(acceptable

to FSC) indicating (i) current fair market value, (ii) useful life, (iii) depreciation patterns, and (iv) knock down "liquidation" value.

J. Fees

Loan Application Fee: \$500.00

Commitment Fee: 1% for loans over \$100,000 (less application fee)

<u>Type of Transaction</u>	<u>Application Fee</u>	<u>Commitment Fee</u>	<u>(1)</u>	<u>Closing Fee</u>
Standard RLF Loan (2)	\$500 Deposit	1% Less Deposit		\$500
In House Closings:				
>\$100,000	\$500 Deposit	1% Less Deposit		0-100,000 1,000
				\$100,001-200,000 1,500
				\$200,001-300,000 = 2,000
				\$300,001-400,000 3,000
				\$400,001-500,000 4,000
				\$500,001-600,000 = 5,000
				\$600,001-greater 5,000
>\$100,000	\$250	N/A		\$1,000
Long Term Commitment(3)	N/A	1/2% for every six months		N/A
Interest Subsidies	\$250	N/A		N/A

Non Refundable Commitment Fee Deposit, payable at application.
 Loans closed by outside counsel.
 Commitments which are extended for a period of six months or longer. This fee will be in addition to other Fees charged for application, commitment and closing.

- H. Technical Feasibility Study** (1) manufacturing concern in the City; or
- A. Applicant Eligibility Criteria** (2) those portions of commercial business in the City that are back-office operations or other intensive energy use operations.
- 1 Applicant must demonstrate ability to service debt of an energy conservation loan, as evidenced by the financial condition of the applicant. 3 Applicant must demonstrate a substantial need for energy savings based on the age and condition of equipment and building, an analysis of the manufacturing or
2. Applicant must be a:

operations processes and the energy intensity of the applicant's operations.

4. Demonstrate that required funding for technical feasibility study is not available from other sources in the time frame needed to enable the project to proceed.
5. Eligibility will also be subject to all applicable Federal, state and local laws, rules and regulations governing the use of the funds.

B. Approval Process

A subcommittee of FSC's Board of Directors (which may include other non-Board members) will award grants to eligible firms based upon staff recommendations. Eligible firms will be selected on the basis of several factors, including:

1. firms that are eligible for benefits under the Energy Cost Savings Program;
2. firms that demonstrate a specific area of their operations that can achieve substantial energy savings;
3. firms whose annual total energy bills are over \$50,000 and where energy costs are a significant portion of total operating costs;
4. firms that are prepared to implement energy efficiency measures as demonstrated by their financial condition;
5. firms that have received an energy audit and require a technical feasibility study in order to imple-

ment energy conservation measures.

C. Grant Amount

Grants will be provided for 50% of the cost of an approved Technical Feasibility Study up to a maximum grant of \$5,000 per firm.

D. Use of Grants

Grants may only be used for a Technical Feasibility Study by an approved and licensed engineer. The Study will be defined in the Request for Proposal requirements that will be issued to determine approved engineers. A Technical Feasibility Study will include:

1. physical description of the facility; and
2. listing of recommended measures in order of priority based on projected return on investment including, but not limited to the following: industrial process procedures; electrical demand improvements; systems tuning; load factor improvement; heating and ventilation; air conditioning; lighting; building envelope; equipment modifications; retrofit and replacement; heat recovery; process efficiency improvements; boilers and distribution systems; and fuel switching; and
3. profile of historical energy cost and consumption.

E. Fees

There will be a \$250 application fee.

Report and Information Sources

Additional copies of this report, *The Hidden Link: Energy and Economic Development -- Phase II: Marketing and Financing Strategies for Community Energy Projects*, and *Phase I: Strategic Planning*, as well as more detailed individual project reports from each of the participating local governments on the project team are available from:

Publications and Distribution
Public Technology, Inc.
1301 Pennsylvania Avenue, N.W.
Washington, DC 20004
(202) 626-2400

Please contact PTI's Research Center staff in Washington, DC, for more information on this or other activities of PTI. (www.pti.org)

Publication No.
DG/87-310
01/89-310





