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A Primary Urban Energy-Management-Planning Methodology

A Management Report

ENERGY TASK FORCE
of the
URBAN CONSORTIUM FOR
TECHNOLOGY INITIATIVES

Conducted by

Office of Energy Management
Dade County, Florida

Joint Center for Environmental
And Urban Problems
Miami, Florida

New York City Energy Office
New York, New York

Cooper Union Research Foundation
New York, New York

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The Urban Consortium for Technology Initiatives was formed to pursue technological solutions to pressing urban problems. The Urban Consortium is a coalition of 37 major urban governments, 28 cities and 9 counties, with populations over 500,000. These 37 governments represent over 20% of the nation's population and have a combined purchasing power of over $25 billion.

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Public Technology, Inc. is the applied science and technology organization of the National League of Cities and the International City Management Association. It is a nonprofit, tax-exempt, public interest organization established in December 1971 by local governments and their public interest groups. Its purpose is to help local governments improve services and cut costs through practical use of applied science and technology. PTI sponsors the nation's largest local government cooperative research, development, and technology transfer program.

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November 1980

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The research and studies forming the basis of this report were made possible by a grant from the Office of Intergovernmental Affairs of the U.S. Department of Energy (DOE) in cooperation with the Community Energy Program of the Office of Buildings and Community Systems (DOE) through the Energy Task Force of the Urban Consortium for Technology Initiatives.

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Preface

The Urban Consortium conducts its work program under the guidance of Task Forces which are analagous to the functions of local government. The Energy Task Force is composed of senior level local government energy management practitioners from seventeen of the nation's largest jurisdictions. Beginning in October, 1978, the Energy Task Force initiated a program for practical urban energy management research and development through a series of lead jurisdiction projects funded by a grant from the U.S. Department of Energy. The nature of these projects was determined by the Task Force during its priority setting process.

A description of each of the lead jurisdiction projects conducted under this grant follows:

- Baltimore - Evaluation of Landfill Gas as an Energy Source. This project was designed to develop a process for evaluating the feasibility of methane recovery from sanitary landfills. The evaluation process includes procedures to estimate the methane production life expectancy, the potential quality and quantity of gas produced, types of treatment required and potential methane uses.

- Chicago - A Methodology for Energy Impact Analysis of Community Development Projects. The objective of this project was to develop a method to evaluate the impact large urban development projects can have on an urban jurisdiction's energy supplies and consumption by source. The model developed can analyze options to minimize the energy impact of any new major development.

- Dade County - Primary Urban Energy Planning Methodology Handbook. This project developed an energy planning method that can be implemented incrementally with in-house staff and limited data. The methodology provides guidance for initial organization, data development, formulation of goals, objectives and actions, implementation and monitoring.

- Los Angeles - A Decision Process for the Retrofit of Municipal Buildings with Solar Energy Systems. This project developed a method to aid in identifying, analyzing and selecting solar energy retrofit alternatives for public buildings. The method is designed to assist local government managers in evaluating solar retrofit technologies and their cost effectiveness.

- Seattle - A Course on the Administration of Public Energy Programs. This project developed, evaluated and tested a graduate level curriculum for instruction of local government officials in the management of public energy programs. The course covers national energy issues and policies, government mechanisms for achieving energy conservation, methods for facilitating community involvement and the structure and function of energy utilities.

Public Technology, Inc. serves as the secretariat to the Energy Task Force and provided technical and editorial assistance for the conduct and documentation of these projects.

Management Reports or Technical Guides summarize results of each of the five projects to share experiences with other urban jurisdictions. The Chicago, Dade County and Baltimore methodologies will be applied and expanded by other Urban Consortium jurisdictions in the 1980-81 Energy Task Force work program.

Acknowledgement

The Primary Urban Energy Management Planning Methodology Handbook from which the Management Report was drawn was prepared by the Joint Center for Environmental and Urban Problems of Florida Atlantic University and Florida International University. Mr. Joseph Revis and Ms. Toni Meador of the Joint Center were principal authors of the Handbook. Mr. Danny Alvarez, Energy Coordinator for the Office of Energy Management for Metropolitan Dade County, Florida, was responsible for the overall coordination and direction of the project. The application of the methodology in New York City was performed through the New York City Energy Office under the direction and supervision of Mr. Richard M. Kuo, Project Director. Mr. Lewis M. Kwit of the Cooper Union Research Foundation and Vidya Patil of the New York City Energy Office authored the report of the New York City application. Special thanks are given to Dr. Chor Tan, Vice President of the Cooper Union Research Foundation for his guidance and advice during the New York Project. Mr. Richard Zelinski, Energy Program Manager for Public Technology, Inc. wrote this Management Report.

To assure that the Handbook would meet with the needs and expectations of local government practitioners, a User Requirements Committee was assembled to review the Handbook contents at critical periods during its preparation. We thank the following persons for their thoughtful participation throughout the course of the project:

Albert H. Baugher - Assistant Commissioner, Department of Planning, City and Community Development, Chicago, Illinois

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Herbert Fivehouse - Energy Coordinator, Baltimore, Maryland

Dewayne Huckabay - Urban Policy Planner/Legislative Analyst, Houston, Texas

Angie Jones - Energy Coordinator, Atlanta, Georgia

Anthony Laska - Chairman, Mayor's Energy Management Task Force, New Orleans, Louisiana

Richard Layton - Director of Budget and Planning, Atlanta, Georgia

Ann Meier - Director, Office of Energy and Telecommunications, Columbus, Ohio

Jeremy O'Brien - Project Engineer, Public Technology, Inc.

Michael Semmler - Energy Policy Analyst, San Francisco, California

Ron Wewerka - Energy Division, Prince George's County, Maryland

We would also like to thank the many other people who contributed to the preparation of this report. These people include numerous employees of the City of New York, State and Federal agencies and the utility companies servicing the New York City area.

Special thanks go to the representatives of the U.S. Department of Energy which sponsored the project, especially Mr. Gerald Leighton, Division of Buildings and Community Systems and Mr. David Rivers and Mr. Marrel Foushee of the Office of Intergovernmental Affairs.

Richard W. Zelinski
Public Technology, Inc.
October, 1980

Contents

A PRIMARY URBAN ENERGY MANAGEMENT PLANNING METHODOLOGY (PEP)

Overview

INTRODUCTION

This Management Report is written for city and county administrators and their deputies concerned with the development and implementation of community-wide Energy Management Plans. The importance of local government leadership in improving community-wide energy use efficiency increases with each rise in energy prices and each threat of interruption in imported oil supplies. Energy management has not, however, been a traditional local government function. As a result, those local governments which have begun the process of dealing with their own energy problems have generally broken new ground--collectively establishing a new field of public administration.

Recognizing the need to learn from these experiences, the Energy Task Force of the Urban Consortium for Technology Initiatives assigned Metropolitan Dade County, Florida, the task of developing a pragmatic, transferable methodology to assist local governments in their attempts to develop and implement energy management plans. This Management Report summarizes the Dade County work and provides suggestions to guide the application and refinement of a Primary Urban Energy Management Planning Methodology (PEP).

PURPOSE OF THE PEP METHODOLOGY

The major purpose of the Primary Urban Energy Management Planning Methodology (PEP) is to provide local governments with a system-

atic approach for dealing with short and intermediate-term urban energy management problems while at the same time laying the groundwork for the formulation of long-term energy management activities. The PEP methodology was designed to meet the following criteria:

- Implementable within a one year time frame using resources currently available to local government
- Emphasis placed on public sector action and leadership
- Adaptable by any local government
- Emphasis on flexibility and quick response capability
- Simple, pragmatic language and tasks
- Linkages with long term energy management strategies

The PEP methodology is intended for use primarily by those local governments still in the early or formative stages of developing Energy Management Plans. Portions of the methodology may, additionally, be of assistance to more experienced local governments as a basis for review and modification of their currently developed energy planning and management procedures.

COMPONENTS OF THE PEP METHODOLOGY

The PEP methodology includes five major tasks as summarized below:

- Organizing for the PEP Process. Implementation of the PEP process will require a commitment of local government staff and financial resources. To make the best use of these resources, it is essential to identify a core internal staff, to locate additional resources for special assistance and expertise, to develop an organizational structure for PEP conduct and to formulate a detailed work program including a budget, staff assignments, and task schedules.

- Performing an Energy Use and Supply Inventory. A primary factor in determining the emphasis for initial energy management activities is the community "Energy Profile"--the data defining the relationship between energy supply and demand by energy sources and by energy consuming end uses. Complete data acquisition can, however, be complex and time consuming. The PEP methodology emphasizes a focused data collection effort to provide a basis for problem definition and a background for decision making.

- Formulating Energy Management Goals and Objectives.

  Based on the results of the energy use and supply inventory, community energy goals and objectives can be structured. The PEP methodology outlines goal development processes and provides examples of effective means for community participation.

- Developing Strategies to Achieve the Energy Management Objectives. Achievement of energy management goals and objectives requires the definition of specific strategies and actions and the development of an administrative structure for their implementation. The PEP methodology provides a process for identification, evaluation and selection of energy management strategies and administrative structures.

- Monitoring and Evaluation. A monitoring process is essential to evaluate how well the implemented plan is performing in meeting its stated energy use objectives and to provide feedback to improve this performance. The PEP methodology discusses considerations necessary in the design of an effective monitoring system.

TAKING THE NEXT STEP

If your initial reading of this Management Report generates positive interest in applying the PEP methodology in your community (or if you need more detail before making a decision) you may wish to read the full PEP Methodology Handbook from which this Management Report was written. Reprints of the complete Primary Urban Energy Management Planning Methodology

Handbook are available as noted on the final page of this Management Report.

USE AND REFINEMENT OF THE PEP METHODOLOGY

The PEP Methodology is designed to provide a framework for local government entry into the field of energy management. It contains sound guidance, synthesized from a broad spectrum of local government experience, to aid the development of energy use and supply data, the formulation of alternative energy management strategies and the implementation of an administrative structure necessary as bases for an effective Community Energy Management Plan. While it will not provide detailed answers to every specific energy management problem you may encounter, it does present a realistic process to guide your choice of planning and management options to those best suited for your community.

With the recognition that energy management is a new, but increasingly important area for local government concern, the PEP Methodology is also intended as a dynamic planning guide, providing good advice now, but capable of refinement and improvement as it is used within local governments. Metropolitan Dade County, Florida, is applying the PEP Methodology with the expectation that their experiences will be evaluated to make appropriate improvements to the Methodology. New York City has already used the PEP Metholodogy as a guide to assist data development and their formulation of energy management goals and policies.

Still further refinement of the PEP process will occur in 1981 as the city of Columbus, Ohio, and Prince George's County, Maryland, apply and evaluate the methodology as part of the continuing Urban Consortium Energy Task Force Program.

Summary of the PEP Components

ORGANIZING FOR THE PEP PROCESS

Although the PEP process is intended to be substantially less complex than a long-term comprehensive planning strategy, it still represents a major effort. If the intent of your effort is to address energy management throughout the community, you will require support from a wide range of community resources, and direct involvement of the community is essential if work is to be successfully and expeditiously completed. Furthermore, such support and involvement must start at the very beginning of the process -- including the phase of "getting organized." This early participation will assist in developing a strong community commitment to plan recommendations; accurate identification of the scope of technical assistance and support available (funding and staffing); improved political support; and early identification of potential areas of conflict (e.g., environmental, economic, and social issues). In developing an organizational framework, you should treat, at minimum, the following three components:

- Inventory of Organizational Activities and Resources. One of the most important outputs of the PEP process will be a comprehensive analysis of the types and scope of agencies and community organizations presently concerned with energy problems. In most communities there are a wide range of on-going activities related to energy use and supply. An early inventory of these activities will help identify the core group of people, other staff and financial resources which may be utilized for the project through all its phases.

- Development of an Organizational Structure. The organizational structure to implement the PEP process must be designed to cope with a wide range of coordinative, technical and administrative demands. If you start with an informal cooperative structure, recognize that you may need to define its authority, responsibility and composition more formally as work proceeds. You may wish, additionally, to consider structuring temporary working groups to perform limited tasks such as your initial data inventories.

- Development of Assignments and Work Programs. Many actors will be involved in the PEP process. The time to begin developing good working relationships is during your initial organizational efforts. Many planning programs have floundered at the start because of misunderstandings over who was responsible for what tasks. Developing a detailed work program that spells out tasks, specifies the role and time required of each participant in completing each task, and defines the way in which work will be coordinated, contributes greatly toward preventing such misunderstandings.

PERFORMING AN ENERGY USE AND SUPPLY INVENTORY

Local government energy management planning cannot be undertaken without basic information describing how and where the community's energy is being used and supplied. An analysis of this data enables local government officials to identify the areas of greatest potential for local action in reducing energy problems. Obtaining this information and, most importantly, determining the scope and content of useful information may often prove the most difficult problem to overcome in implementing the PEP methodology. If the energy use and supply inventory is not carefully designed with limited, well defined objectives, it can easily become an end in itself, confusing rather than assisting the planning process.

Unfortunately, the local government energy management field is of such recent origin that few "hard-and-fast" rules exist to guide the development of useful, as opposed to unnecessarily detailed and comprehensive, community energy data bases. A review of the design of data inventories for implemented local management plans such as those for Portland, Oregon, and Davis, California, can provide some experiential guidance. Additionally, the evaluation of the first stage of the DOE sponsored Comprehensive Community Energy Management Program (with sixteen participating jurisdictions) will provide further definition of data sources and usable levels of data detail.

Even with these experiences, however, a universally applicable definition of data adequacy is unlikely in the near future. In implementing the PEP methodology, it will be your responsibility to carefully design your data inventory tasks to provide a sufficient basis for early decision making with the realization that extremely detailed data should be captured only if a specific, well justified need exists.

To assist this design, the PEP Handbook provides procedures and suggested sources for energy data development. Data can be found in two basic forms:

- Secondary Data is existing information which has already been researched, collected and documented, usually for purposes other than the PEP process. Good sources of such information include federal agencies, state energy offices, local universities and your own municipal departments.

° Primary Data is new, detailed information developed specifically for the PEP process. An energy audit of a building might be a good example of primary data.

In developing the PEP energy data inventory, you will probably make use of both data forms. Secondary data should be emphasized in developing a general background description of the national energy picture, your state or regional position in this picture and (if available from your state energy office, local utility or university) to provide an overview of your general community energy use and supply situation.

More detailed local data needs can also be satisfied by secondary data sources, expanded with primary data when more accurate, "hard" numbers are needed to support a decision or to provide specific definition of a potential energy problem.

The PEP handbook lists general sources for secondary data and includes detailed instructions and procedures for the development of primary data for buildings, fleets and other operations within the governmental sector.

FORMULATING ENERGY MANAGEMENT GOALS AND OBJECTIVES

When you have become familiar with your community's basic energy profile, existing community organizations and federal and state energy legislation, you should be ready to begin development of community energy goals and objectives. While you or your staff can provide general direction for the goal formulation process, you must assure that the goals are built with the participation of those individuals and groups who will be affected by and responsible for the implementation

of energy management programs to achieve the goals.

Such involvement and participation can take many forms, including the establishment of Task Forces or Advisory Boards, the structuring of town or district meetings and the holding of special referenda. Several local governments, including Seattle, Philadelphia and Portland, (Oregon) have had successful experiences with Advisory Boards and Task Forces. Lessons learned from these experiences indicate that you should consider, at minimum, the following factors in structuring a Board or Task Force:

- Membership. Define who you wish to involve by considering talents and skills needed, reputation within the community, representation from potentially affected governmental and non-governmental community sectors, and sufficient individual ability and interest to allow thoughtful consideration of energy related topics.

- Role and Responsibilities. Decide early whether the Board should have advisory, monitoring or decision making roles in the PEP process. Develop specific tasks you wish the Board to accomplish and define any special study areas which may require a subcommittee organization. Develop a task schedule and a general process for internal decision-making or voting.

- Length of Involvement. The Board or Task Force may be assembled to respond to only a single issue and then disband or it may become a permanent group to advise your ongoing energy program. Define the period of Board activity and assure that each member knows the amount of time he or she will be requested to give.

To illustrate, Appendix A of this Management Report presents a summary of the energy goals and policies developed by New York City in its application of the PEP process. Construction of an issue paper similar to the first four pages

of the Appendix is one means to start the goal formulation process with your Advisory Board or Task Force.

DEVELOPING STRATEGIES TO ACHIEVE THE ENERGY MANAGEMENT OBJECTIVES

Selection of Strategies and Actions

With the formulation of energy management goals and objectives, the local government will have established a basic policy guide within which more specific strategies and actions can be structured. The PEP Handbook identifies and groups potential strategies according to the five general categories of governance powers available to local government. Within each category, examples of possible actions are defined. Strategy categories and sample actions are shown on Table 1. Many of these strategies and actions are simple, low cost efforts which can be accomplished within municipal departments by executive order. Other strategies, especially those affecting the general community, will be much more complex to implement and may require substantial community support before they can be developed into effective programs.

Your choice of actions will depend on your critical energy management needs (as defined from your energy profile), the commitment and support shown through your Advisory Board or Task Force, and the particular nature of your community's administrative, political and financial structure. In your choice of actions, remember that Federal and State energy programs can provide substantial technical and financial support.

TABLE 1

Selected Energy Efficiency Strategies and Actions

Local Government Leadership

- Sponsor employee award programs to encourage energy conservation efforts
- Promote energy education in schools
- Work with utilities and oil distributors to establish communication links and bases for cooperative conservation efforts
- Use federal, state and local funds and incentive programs for weatherization of buildings in non-governmental sectors of the community
- Publicize your energy conservation actions through the various news media networks to increase public awareness.

Local Government Operations

- Initiate recycling programs
- Consider flexible employee work schedules
- Establish employee car pool/van pool programs
- Adopt life cycle purchasing techniques
- Improve building management by:
  - Calibrating building thermostats
  - Adjusting and locking thermostats
  - Installing time clocks to control thermostat settings
  - Using drapes and blinds to let in or keep out solar heat
  - Minimizing use of window air conditioners
  - Regular maintenance and inspection of heating and cooling systems to assure maximum efficiency
- Decrease energy use in lighting by:
  - Eliminating unnecessary or decorative outdoor lights
  - Using high pressure sodium vapor street lights instead of filament or mercury vapor lights
  - Using interior fluorescent lighting where possible
  - Keeping light fixtures and bulbs clean
  - Reducing the number of interior fixtures and bulbs where possible
- Minimize energy use for water heating by:
  - Disconnecting hot water spigots where unnecessary
  - Adjusting hot water thermostats to 105°F
  - Insulating water heaters and pipes
- Minimize fleet energy use by:
  - Gradually changing where possible, to smaller more efficient vehicles
  - Planning more efficient routes for trash collection, school buses and other service vehicles
  - Implementing centralized fuel dispensing management systems

Capital Improvements

- Consider systems for energy recovery from wastewater and solid waste operations
- Build pedestrian and bicycle paths in selected residential/commercial areas
- Apply energy efficiency standards in equipment purchase and building design

Land Use Planning and Zoning

- Include energy efficiency criteria in comprehensive plans; i.e. cluster development, infilling and multiple use areas
- Encourage rehabilitation of older structures
- Structure zoning incentives as tradeoffs for energy efficient development
- Review New York City's Policy Statements (Appendix A) for additional strategies.

Municipal Codes and Ordinances

- Include energy efficiency standards in building codes
- Repeal "nuisance" codes prohibiting outdoor clothes lines, compost heaps, etc.
- Establish solar access ordinances for new development
- Establish "no car" zones in selected areas to encourage use of mass transit
- Review New York City's Policy Statements (Appendix A) for additional strategies.

Often, a formal strategy evaluation and ranking process can assist in determining which actions are best suited for initial emphasis and which should be acted upon at a later date. Performance of these previous tasks will show that a number of particular actions have strong potentials to save energy and to address your stated energy management objectives. The PEP evaluation process will then help identify which of these follow-on actions can be implemented quickly and with the least amount of effort so as to maximize their energy saving potential. The PEP Handbook sample evaluation process is based on ten reasonable criteria designed to assess the ease of implementation for each strategy:

- Legal Capacity - Local statutory power to implement the action should exist.
- Fiscal Resources - Capital outlay should be minimal or promise a payback period of from 1 - 5 years.
- Procedural Delay - The administrative process for implementation should be an established process and involve a minimum of red tape.
- Monitoring - Evaluation of the energy saving effectiveness of the action should be possible as a regular administrative procedure.
- Staffing - Few additional staff resources should be required.
- Organizational Expertise - Additional technical expertise and equipment requirements should not greatly exceed those required in normal, day-to-day operations.
- Environmental Impact - Negative environmental impacts should be minimal.
- Social Impact - Negative social welfare impacts should be minimal.

- Intergovernmental Coordination - Complicated governmental coordination efforts should not be necessary.
- Political Resistance - The action should be supported by local executive and legislative bodies.

Rarely will any action meet all of these criteria, nor is the list intended to be exhaustive. The criteria should, however, assist in choosing your first actions and should help in the identification of work necessary to implement other actions as your energy management program proceeds.

Development of an Administrative Structure

The simple establishment of energy goals and objectives and the choice of potential actions will be ineffective without a sound administrative structure for implementation and monitoring.

When considering an administrative system the local government should consider potential responsibilities which may be assigned. These duties will be a function of the strategies and actions selected and may include (but are not limited to):

- Data collection
- Citizen education and public outreach
- Policy and program development
- Monitoring and evaluation
- Compilation of government energy use inventory data
- Contingency planning
- Intergovernmental coordination
- Grant generation

° Liaison work with private and public institutions

° Budgeting local government energy use.

Additional duties may include overseeing or directing those programs controlled by other government departments, such as: transportation; planning, building and zoning codes; retrofitting and weatherization; energy impact assessment; waste and resource recycling; land use planning; and other technical programs.

During development of the PEP methodology, administrative strategies which had been utilized to implement energy management plans in several local governments were inventoried. These structures were placed in four general categories each having specific advantages and disadvantages. The structural categories are listed below in order of decreasing comprehensiveness and capacity with their advantages and disadvantages shown on Table 2.

° Energy Executive and Staff. Organize an Energy Unit for the city whose responsibilities include a wide range of energy management responsibilities. Such a unit would be headed by an Executive under the Mayor or chief administrator and staffed by personnel with backgrounds in management and public administration, economics, engineering, and architecture with experience relating to energy problems in their fields. This structure creates a new department or section within the local government which can have direct operational control over energy management activities.

° Energy Coordinator. Hire or appoint an Energy Coordinator whose responsibilities include implementation of energy management for the local government. A background in engineering or architecture or a related field would be a definite advantage, although an employee in this position will need to know a little about many subjects. The Energy Coordinator will obviously not have the same resources available

TABLE 2

The Primary Energy Management Process
Advantages and Disadvantages of Alternative Administrative Structures

STRUCTURE	ADVANTAGES	DISADVANTAGES
Energy Unit and Staff	Comprehensive, centralized management and responsibility Central coordination, facilitates departmental and community access Development of substantial centralized data bank resources Lessens confusion as to who has program responsibility after assignment Development of expertise and professional staff Centralized policy and program development Easier monitoring and evaluation	Personnel expense Addition of another layer to government Possible duplication of services Potential rivalry and resentment of other departments who lose programs Difficulty of determining a new assignment of responsibilities
Full-time Energy Coordinator	Professional expertise at minimal cost Spreading responsibility increases city employee involvement and awareness Little disruption of existing city administrative structure	Less comprehensive approach Less depth of response, possible neglect of citizen outreach Difficulties of coordination Less authority may hamper a concerted direct attack on problems
Part-time Energy Coordinator	Increased responsibility for city departments expands number of actors and expertise of city employees Increased responsibilities of technical and citizen advisory committees expands community involvement No disruption of existing city administrative structure	Less devotion of resources to problems may inhibit effective responses Overwhelming amount of work in addition to current responsibilities if city is serious about energy management Difficulties in establishing a central community policy and unified responses with many actors Absence of central data collection activity and responsibility may mean duplication and wasted effort
Task Force	Pool of expert knowledge available to local government Minimum disruption of established administrative structure	Less devotion of time and resources to problem No single responsibility for energy management activities

to him as would a full energy unit. His or her responsibilities may tend to be more oversight and coordination of the local government's energy management programs. Program implementation responsibilities under this structure are usually allocated to individual departments.

- Employee Assignment. Assign a current employee to undertake energy management as one of his or her responsibilities. In this approach, reliance on other local government departments will obviously be great. The employee may be drawn from any number of existing departments -- budget, building and zoning, administration, or others. His or her major responsibilities would necessarily be limited because of time constraints, and might consist of coordinating local government energy management activities and serving as liaison for other public and private groups.

- Task Force. Organize a Task Force to study and recommend energy management activities for the local government. The local government choosing this strategy has many options in formulating the membership and number of task forces it wishes to use. For example, a single task force could be composed of representatives from each government department. Such a group might meet regularly to exchange information and propose new programs. Close liason with the local executive body or officer should be maintained.

Although each of these strategies may be implemented separately, there is no reason why the local government may not combine elements of each to best suit its particular circumstances. Each of the first three strategies, for example, could be complemented by the addition of an interdepartmental task force. In addition, each department may wish to add the responsibility for keeping track of energy-related developments in its field to one of its current employees.

Many communities have established their initial administrative structures by starting with a task force or part-time employee structure which has gradually evolved to a more

formal full time unit as increased responsibilities and financial resources allowed.

MONITORING AND EVALUATION

In order to determine the effectiveness of your initial energy management strategies and actions, you must be able to measure their individual effects on energy consumption. Monitoring differences in energy consumption after implementation of a selected action will allow you to gradually improve your ongoing energy program by defining incremental adjustments to improve performance of the action.

Additionally, demonstrated success in reducing energy use will build confidence within the administration and the community for attempts at more ambitious and long range strategies.

The PEP Handbook outlines information needs, data collection methods and analysis procedures of concern in the design of a monitoring and evaluation process.

SUGGESTIONS FOR USING THE PEP METHODOLOGY

The five tasks composing the PEP methodology are based on a traditional planning process of data collection, data analysis, problem definition, formulation of goals and objectives, strategy development, strategy implementation, and monitoring and evaluation. This sequential ordering of tasks has been proven in many applications as a sound means

for addressing a complex planning problem, especially in the community context where consensus building is essential.

The soundness of this sequential approach does not, however, imply that the PEP process will be effective only if performed in this precise order. Rather, the PEP methodology should be seen as a presentation of flexible planning steps which may be ineffective unless adapted and ordered to fit the specific needs and resources of your community.

For example, you may find the PEP process more effective if you structure a multi-step data inventory task in close coordination with the goals, objectives and strategy development tasks. In this slightly modified approach, your initial energy supply and demand inventory could be very "quick and dirty," establishing only approximate boundaries for the Community Energy Profile. With this very general information in hand you could then focus on the formulation of preliminary goals and objectives or conservation strategies. More detailed energy supply and demand information would be collected only as related to a perceived problem area or a consensually defined objective.

This latter approach may violate a strict "systems" analysis of total energy flow into and out of the community. It admits to the possibility of missing some potentially significant energy management needs, and it is far from comprehensive. It may, however, foster the incremental implementation of energy management actions -- building community consensus and confidence as it proceeds.

Other modifications of the PEP methodology can be made to fit your needs, staff resources and available expertise. The important consideration is that the PEP methodology does present realistic options for getting started and obtaining quick results. Local governments do have many options available to them in the area of energy management. Many of these are simple to identify, to implement and usually pay for themselves in terms of energy cost savings over a relatively short period.

APPENDIX A

Extracts from

PLANNING NEW YORK CITY'S ENERGY FUTURE

A Study of Policies, Procedures and Programmatic Guidelines To Develop an Energy-Efficient New York City

Prepared Under the Direction and Supervision of

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With the assistance of Vidya Patil

May 1980

PROJECT DESCRIPTION AND METHODOLOGY

The objective of the Primary Energy Management Planning Process (PEP) is to develop a series of targeted analyses as a framework for specific programs and projects to lessen New York City's dependency upon fossil fuels, particularly oil, and to minimize the impact of rising energy costs. Such action-oriented programs should be consistent with longer-range goals within the context of local energy policies. To accomplish this, a strategic planning process to indicate priority areas for energy programming has been developed and initiated. The process began by articulating the following general areas of concern:

1. The ability to curtail the City's dependency upon fossil fuels, particularly oil and natural gas;
2. The ability to assure adequate supplies of fuel and ameliorate the effects of shortages and supply interruptions;
3. To develop methods which are capable of reducing or stabilizing energy costs and, where this becomes impractical, mitigating the economic impacts associated with increasing energy costs.

Three basic goals were set to provide the initial framework for the study data collection and analysis efforts:

1. Promote cost-effective energy conservation measures in end-use consuming sectors;
2. Promote efficiency in the supply and distribution of primary fuels, electricity, and steam where applicable (cogeneration, district steam stytems, integrated utility complexes);
3. Promote the maximum feasible uses of alternative energy resources within consuming and supply sectors (solar, wind, solid waste, waste-methane).

Throughout this project, a series of meetings and communications were undertaken with members of the City Energy Office, to review findings and concerns as they evolved. Information was solicited from the City's utility companies, public agencies at all levels, energy officials in other cities, as well as public and private research organizations. It became apparent that specific and defined priority concerns would be needed. As a result, the following policy recommendations were suggested and accepted as those requiring more specific analysis and concentration.

1. The City should develop procedures which encourage, and if necessary mandate, energy conservation in renter-

occupied, multi-dwelling buildings.

2. The City should develop immediately an energy conservation information dissemination service for small commercial and retail uses. Work should also begin to aid such shop owners in financing conservation systems. This could take the form of tax credits, low-interest loans or loan guarantees.

3. The City should articulate that it finds the Power Pool and State Energy projections regarding increased electric capacity totally unacceptable unless the plans needed to realize them reflect commensurate reductions of oil usage. This can be accomplished through numerous ways (using coal and waste fuels, shaving summer peaks, increasing operating efficiencies). It should be noted that recent data indicate that increased economic activity has occurred without any commensurate increase in electric peak demand (1979 consumption figures are not available yet, but it is anticipated that they will not be appreciably higher than the 1978 figures).

With acceptance of these policy recommendations, the project began to focus its data collection and analyses efforts upon these areas. These evolved into the three problem definition guidelines and respective alternative policy recommendations.

The strategic energy planning process which evolved sought to collect aggregate energy information and analyze its consumption within various end-use sectors. Information regarding prices over time, as well as trends in consumption and demand, were reviewed. Once the priority problem areas were identified, the information collection efforts shifted to the specific substantive area to determine the impact of energy upon multi-family housing, and small business more specifically.

Such analyses are imprecise however, since energy is difficult to isolate in terms of its quantitative impact upon other trends, particularly when numerous other socioeconomic factors also contribute to on-going events. This is an area in which much work needs to be done.

Several comparative analyses were also undertaken which, while not statistically conclusive, indicate that energy problems, particularly escalating prices, have had a significant and deleterious impact upon the City's socioeconomic fabric and growth potential. The City, therefore, should further define these relationships and develop the programs and projects needed to mitigate the most serious negative impacts.

The problem analyses have served as a basis for the preparation of respective City policies, which can, in turn, provide a focus for reviewing and subsequently articulating City energy programs. This process can now be expanded to include other City agencies responsible for particular substantive areas, as well as the utility companies and private concerns, on an as-needed basis.

As a result of the work undertaken, a series of ten energy goals has been prepared to help chart a course towards the realization of a less wasteful and more energy-efficient New York City. These are described in the next section.

GOALS AND OBJECTIVES

The articulation of broad goals and objectives for the City's energy activities provides an important foundation for the development of policies, programs and projects. As programs are developed, the goals and objectives serve as a continuing yardstick to measure the program's ability to realize City visions. Such goals can also be matched against goals, policies and programs developed by the State and Federal Governments to determine their ability to satisfy City needs.

The following goals and objectives are designed to reflect general concerns which specific efforts can satisfy.

Goal #1 - To reduce the City's dependency on imported oils specifically, and all depletable fossil fuels in general.

Goal #2 - To promote the use of energy conservation measures, the use of renewable energy sources within both the built environment and in the energy supply and distribution infrastructure servicing City consumers.

Goal #3 - To seek to change existing City government regulations, procedures and policies which encourage or mandate wasteful energy practices and jeopardize conservation-oriented activities.

Goal #4 - To stabilize and/or reduce peak electric demand and thermal energy needs.

Goal #5 - To work with other governmental and private concerns (including utility companies) to eliminate the impact of rising energy costs.

Goal #6 - To restructure utility rates and service classifications so they are fair to all consumers and encourage conservation.

Goal #7 - To promote the implementation of feasible, appropriate and new technologies which reduce energy consumption and costs.

Goal #8 - To work with other government agencies and private lending institutions to improve the cost-effectiveness of conservation measures and renewable resource applications to City consumers.

Goal #9 - To develop energy projects and programs which benefit the City's business climate and economic viability.

Goal #10- To secure the needed financial resources to realize the above goals.

Problems caused by rising energy costs and supply shortages affect all City consumers and jeopardize the City's ability to compete for new business and residents. Publication of the above goals as stated City priorities will serve as a commitment by the City to address seriously the major issues which comprise the local energy situation.

The following section presents alternative policies to address the three major energy problem areas which emerged as a result of the data and information collection efforts.

ALTERNATIVE POLICIES RELATIVE TO OVERALL DECREASE OF ENERGY DEMAND AND CONSUMPTION IN NEW YORK CITY - PROBLEM DEFINITION 1

Policy #1 - The City of New York should consider efficiency in the use of energy (by all sectors) of critical importance to achieve an overall decrease in energy demand and consumption in the City.

Policy #2 - The City should aggressively promote, solicit support and seek the active involvement of the Federal and State governments, all City agencies, private industries and businesses, small and minority business, non-profit organizations, social and cultural institutions, the news and TV media, and all other consumers, to achieve reduced energy consumption in the City.

Policy #3 - The City should develop an energy demand and consumption data base for end-use sectors, by requiring that all the utility companies (Con Edison, Brooklyn Union Gas, PASNY, LILCO), all petroleum vendors, heating oil vendors and other petroleum products suppliers report all their energy sales data on a regular basis to the City of New York.

Policy #4 - The City should review the energy costs to the utilities, the rate structures and schedules established by the utilities, work with the Public Service Commission and recommend necessary changes in the rate schedules for consuming sectors in order to encourage energy conservation in the city.

Policy #5 - The City should actively investigate, explore and support efforts for alternative energy sources in the City (for example: resource recovery, solar, cogeneration) while working with the State government to get cheaper energy supply (for example: hydroelectricity, Quebec power) for New York City.

Policy #6 - The City should thoroughly review all Federal and State energy programs; study their applicability and impact upon New York City and recommend suitable modifications when necessary in order to produce optimum benefits for the City.

Policy #7 - The City should critically review the State Energy Master Plan, study its applicability and impact upon New York City and recommend modifications that are necessary to protect the best interests of the City with the overall objectives of promoting energy conservation.

ALTERNATIVE POLICIES RELATIVE TO ENERGY CONSERVATION IN MULTIPLE DWELLING BUILDINGS

Policy #1 - The City of New York should consider the conservation of energy in multiple dwelling residential buildings of critical importance.

Policy #2 - Energy conservation measures should be incorporated within residential buildings as integral components of rehabilitation and renovation efforts.

Policy #3 - Private lending institutions should be encouraged to lend money, at reduced interest rates, to owners of multi-unit residential buildings for implementation of conservation measures.

Policy #4 - The City should review existing tax abatement and other incentive programs designed to promote housing rehabilitation and renovation so that energy conservation measures are encouraged and implemented.

Policy #5 - The City's building code should be amended to reflect energy-efficient building construction for

new buildings and energy conservation measures in rehabilitation projects.

ALTERNATIVE POLICIES RELATIVE TO PROVIDING ENERGY CONSERVATION ASSISTANCE TO SMALL BUSINESSES IN THE CITY OF NEW YORK

Policy #1 - The City of New York should consider energy conservation in the small business sector of critical importance to increase overall business activity and contribute to the economic growth of the City.

Policy #2 - The City should encourage cost-effective energy conservation in all small business in the City by developing specific programs and incentives for this sector.

Policy #3 - The City Energy Office should work with the Office of Economic Development, small business groups, minority business groups, the Chamber of Commerce and Industry, in developing a program of conservation plans, energy audits, retrofit measures, weatherization, business process modifications, equipment efficiencies, mechanical system efficiencies to assist this sector in energy conservation.

Policy #4 - The City should obtain and provide tax incentives, reduced utility rates for small business, low-interest loans and financing for energy conservation measures and encourage the adoption of Federal, State, and City legislation to offset the costs of energy conservation in the small business sector.

Policy #5 - The City should develop energy efficiency standards, procedures and methodologies for assisting, performing, certifying, and evaluating conservation plans, energy audits, etc., for cost-effective energy conservation measures in the small business sector.

Policy #6 - The City should work with the Public Service Commission and the utility companies to eliminate the cost-differences between small and large businesses.

APPENDIX B

FULL REPORT SOURCES

This Management Report was drawn from documents produced by Metropolitan-Dade County, Florida and New York City. These documents are:

- The Primary Urban Energy Management Planning Methodology Handbook, written for local government managers and administrators. It provides a detailed methodology for planning and implementing an initial local government energy management program within one year. In addition, the Handbook contains extensive bibliographic references and abstracts of existing local government energy management plans. Available from:

  - Office of Energy Management
    Metropolitan Dade County Government
    Suite 2302
    44 West Flagler Street
    Miami, Florida 33130

- Planning New York City's Energy Future, written as an application of the PEP Handbook in data, goal and policy development. It describes New York City's current and historical energy profile and lists alternative energy management goals and policies. Available from:

  - New York City Energy Office
    225 Broadway, 22nd Floor
    New York, NY 10007

PTI also has available a series of Energy Dispatches, Information Bulletins, Management Reports and Technical Guides relating to many aspects of Local Government Energy Management. A listing of available publications can be requested from:

- Publications and Distribution
  Public Technology, Inc.
  1301 Pennsylvania Avenue N.W.
  Washington, D.C. 20004

For further information, contact the Energy Program, PTI, at (202)626-2400.

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PTI also participates in the International Urban Technology Exchange Program, Ltd., (IUTEP) and has developed working relationships with a number of major international organizations.

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