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A MODEL FOR THE ADMINISTRATION AND IMPLEMENTATION
OF A COMMUNITY ENERGY MANAGEMENT PROGRAM

by

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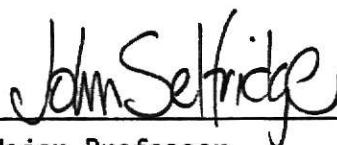
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FOREWORD

From the fall of 1981 through the fall of 1982, I was Project Director of the Riley County Energy Project. This local energy project was a complete assessment and analysis of energy demand by land use sector in Riley County. The experience I gained from this project, along with my exposure to various energy projects in Kansas and across the country, has served as the foundation for this paper.

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ACKNOWLEDGEMENTS

I would like to express my gratitude to the following people. Each of them has played a vital role in the formation of my ideas and ideals as they relate to community energy planning--Gary Coates, Amory Lovins, Davis Morris and Jim Benson.

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INTRODUCTION

This paper is about how American communities can respond to changing conditions in energy supply and demand. The underlying premise of the paper is that the United States has entered a major period of energy transition. The energy transition period is a process in which the present fossil fuel dependent energy base is transformed to one composed of diverse renewable energy sources and improved end-use efficiency that is cognizant of how the laws of thermodynamics affects the conversion and transmission of energy. This paper, therefore, seeks to offer a strategy for communities to address the long-term challenges brought about by the energy transition process.

The purpose of this paper is to develop an administrative model for the implementation of a citizen-based energy management program within the framework of local government. There are numerous models capable of encouraging energy conservation and local energy production (See Chapter Two). As perceived by the author, however, community energy management is a mechanism that would allow the socio-political system to determine the future energy resource base of the United States. The administrative model presented in this paper is designed to address the social and political issues of energy development. It is also devoted to both a serious conservation effort, which "produces" energy by encouraging more efficient use of current supplies, and to producing energy from local energy resources.

The development of the paper takes the following form. Chapter One examines the events leading up to the emergence of community energy management. The chapter begins with a discussion of the energy crisis facing the United States and the possible "paths" the nation might follow in addressing the nation's energy future. The chapter then presents the

various reasons why local government should engage in a community energy management program.

Chapter Two begins with an overview of federal involvement in community energy management. The chapter then focuses on the approaches used to implement a community-wide energy management strategy. By examining the traditional and participatory approaches to implementation, the paper seeks to offer a new model for implementing community energy management. This new approach, which is titled the innovative approach, is based on integrating participatory, citizen-based energy planning with traditional, local government energy management.

Chapter Three presents the organizational structure of the innovative approach to community energy management. The goal of the organizational structure is to allow for maximum citizen involvement throughout all activities of the energy program, while at the same time, allowing for effective implementation and decision-making within the framework of local government.

Chapter Four provides an identification and explanation of the components of the model. The four components are 1) Data Gathering and Research, 2) Local Government Assistance, 3) Policy and Plan Development, and 4) Public Outreach. Each of these components is discussed to illustrate the activities that are needed in a community energy management program.

Chapter Five provides a synthesis of the paper and concludes that innovative community energy management is intended primarily to facilitate citizen involvement in the activities of local government energy planning in order to insure public participation in conservation and renewable energy development. The success of the innovative approach is dependent upon

three factors. The first factor is how the elected officials and community perceive the conditions of energy supply. Secondly, the innovative approach is dependent upon effective leadership and communication among community leaders, the CEMP Coordinator and the citizens involved with the planning process. Finally, the innovative approach must be capable of adapting to changing conditions of energy supply and demand as well as to increased reliance on innovative marketplace arrangements.

CHAPTER ONE

The Context for a Community Energy Management Program

"The oil embargo of 1973-74 gave way to the natural gas crisis of 1976-77, the coal strike of 1977-78, and the Iranian turmoil in 1978-79, bringing the public to the realization, not only of the scarcity of the resources, but its vulnerable and tenuous distribution systems."¹ This came as a shock to many, because energy had been viewed as a readily available and easily purchased commodity. When natural gas and petroleum were viewed as scarce resources, the "energy crisis" became a reality throughout America. However, the energy crisis mentally signaled to the public there was a beginning and end to the energy problem. This created for many a public perception that alleviation of the energy problem would be achieved by cooperation between energy producing industries and the federal government.

The energy crisis, however, moves beyond a supply problem because the root of the problem lies in the fact that non-renewable energy resources compose the energy base of the United States. Not only did non-renewable energy become the base, but public and private policies resulted in under-pricing and overproduction. In addition, the limits of finite resources and exponential consumption as projected by M. K. Hubbard appear to be correct.² In short, the era of cheap and abundant fossil fuel energy is now drawing to a close.

The uncertainty about the energy future suggests that the United States has entered into an energy transition period. This transition period will be marked with the task of finding new energy sources to replace the dwindling supplies of fossil fuels and the job of redesigning America to operate with the non-fossil fuel sources and more efficiently with the remaining fossil fuels. This transition period places America in a time when energy

policy decisions of enduring significance must be reached.

The Energy Debate

In his landmark book, Soft Energy Paths: Toward A Durable Peace, Amory Lovins addresses not only the technical issues of the energy problem, but also the economic, social and ethical questions associated with production methods for meeting the future energy needs of the United States. He frames the issue of future energy production as a choice between two paths, soft versus hard.

The soft path is characterized by decentralized energy technologies that are fueled by renewable energy sources, such as solar energy, wind and water power. These diversified energy technologies would be environmentally benign and operated at the community or end-use level. The second path is the hard-technology strategy, which is characterized by large-scaled central authority such as large-centralized power plants that among other things require an elite cadre of technical experts. The hard path exemplifies a perceived rigid belief about the linkage between energy consumption and Gross National Product (GNP): Higher energy consumption is required to increase the GNP. Table 1 compares the impact of hard path versus soft path technologies in each of six areas, with a general definition of the differences states in the focus of each technology type.

Central to the Lovins thesis is the concept that technology has profound impacts on human freedoms. An emerging argument offered by Gary Coates suggests technology also affects human settlement patterns.³ Therefore, another element of the soft path is a deconcentration pattern of human settlement, whereas the hard path is reflective of concentration. A choice also exists between decentralized policy-making and centralized policy-making. The former is indicative of the soft path where the individual can participate in the decision-making process that affects his or her lifestyle. On the other hand,

Table 1

Comparison of the Soft Path versus Hard Path

Focus:	To expand energy supplies to meet the extrapolated needs of a dynamic economy.	To meet energy needs of the economy but emphasizing the technical and political structures involved.
Economic:	Capital intense; inflationary; less jobs; false pricing due to subsidies; capital tied up in production, thus no money available to make products to use all the energy created; expensive distribution (2/3 of every \$1.00); escalation due to lag time.	Labor intense; creates and maintains jobs; inexpensive, due to shorter lag time, inexpensive distribution; capital remains fluid, which allows for reinvestments.
Structural:	Technical; centralized; vulnerable; difficult to replace; lag time; ecologically malignant; high failure risk; expensive distribution system.	Simple (understandable); no change in lifestyle; rapid deployment; renewable; mass produced; diverse (site specific); benign; resilient; low failure risk (reliable).
End-Use Efficiency:	1/2 total amount of energy generated lost in conversions and distributions; projected quads generated: 225.	About 5% of energy generated lost in conversion and distribution; projected quads generated: 75.
Political	Technocracy; centralized; bureaucratic; "We the Experts" replaces "We the People"; regulatory commissions.	Locally controlled; pluralistic; participatory local government; no need for regulation.
International:	Increases imports of oil, thus creating dependency; exports agriculture; exports technocrats.	Lessens oil imports, thus lessening dependency; promotes world equality; U.S. militarily more secure.

Source: Ertl, Christine, "Hard-Soft", Handout at Multi-State Community Education Workshop, Kansas City, Missouri, 2-4 November 1981.

centralized policymaking is characteristic of the hard path where technocratic experts make decisions affecting individual freedoms.

Until the soft versus hard path controversy, the energy problem had been viewed by the public as a technical problem to be solved by the experts. Yet, as Lovins points out, "the most important, difficult, and neglected questions of energy strategy are not mainly technical or economic but rather social and ethical. They pose a supreme challenge to the adaptability of democratic institutions and the vitality of our spiritual life."⁴

The exclusive development of the hard path could have irreversible implications for our energy future, and how that future relates to our economy, our livelihood, and our sense of democracy. It is the intent of the community energy management model developed in this paper that all the issues of the energy debate (i.e., social, political, ethical, economic, and technical) are brought to the public attention. Major energy policy decisions deserve the most thorough consideration and the widest possible participation by the members of society.⁵ Since the energy decisions facing our society transcend economic and technical considerations, "it is critically important, therefore, that major energy policy decisions are not made solely on the basis of political expediency, bureaucratic self-interest, narrow and specialized perspective, or short-term profit considerations at the expense of future generations."⁶

The debate between advocates of hard and soft path technologies has precipitated an emerging awareness in the United States that new energy sources and technologies are needed. More importantly, the debate has expanded the energy problem to include an evaluation of the social, political and ethical implications of energy technology.

Resolving the Energy Debate

After seven years, the debate between the advocates of the hard path and

the soft path continues. The competing camps are now possessed by a zero sum game mentality, where a gain by one is viewed as a loss by the other. "In other words, the soft and hard path are viewed as mutually exclusive and incompatible."⁷ Since examples of both technologies are already in place, it would appear that discovering the appropriate mix of energy technology is the actual task which lies ahead.

One solution to the hard versus soft path dichotomy is the development of energy systems at the community level. Community energy systems would emphasize efficiency and integration, where the waste of one process would become the raw materials of another. David Morris, author of Self-Reliant Cities, has entitled this strategy "human-scaled energy production systems." This new concept of community energy production involves new roles for utilities and local government; it also involves a new self-image for a city's residents. Rather than residents viewing themselves as consumers, they would see themselves as producers and investors.⁸

Statement of the Problem

Since the United States has entered into an energy transition period, the economic, social, and political ramifications of the transition will depend on the impact and rate of change from fossil fuels to renewable energy sources. If the United States waits and reacts to changes in energy supply, impossible demands could be made on the economy, the political system, and our entire social fabric.⁹ In light of this, community energy management can play an important role in determining whether a smooth or chaotic transition to a new energy base occurs.

Since the length of the transition period is unknown, emphasis should be given to providing enough time for the United States to adapt to a new energy base. A more orderly pace of change will permit America to investigate alternative energy sources.¹⁰ Federal, state and local government must begin

to encourage and foster policies and plans that allow individuals, institutions and communities to adapt within the energy transition process.

Local government, in the context of the need to facilitate the development of new decentralized energy technologies and energy conservation, should attempt to implement a Community Energy Management Program (CEMP).

There are several reasons for local government involvement in a Community Energy Management Program. The rising cost of energy is a most obvious reason. Between 1976 and 1981, the city government of Manhattan, Kansas had about a six percent reduction in total energy use. Annual energy costs nearly doubled from \$266,000 in 1976 to \$520,000 in 1981.¹¹ According to an International City Management Association study, energy expenditures were the second highest item in local government budgets for more than 50 percent of those budgets.¹² If energy costs continue to rise so dramatically, less money will be left for other local government services without equally dramatic tax increases. Hence, local government officials are learning that involvement in energy management means better use of tax money.

Likewise, high energy costs affect the economic health of a community. As more business or industrial income is spent on energy, less is available for business investment, plant modification and industrial expansion except in those industries that benefit from rising energy prices. The local economy is further eroded by the tremendous outflow of energy dollars from the community. Across the country, energy studies are revealing that approximately 85 percent of each energy dollar leaves the local economy. When this money leaves the local economy, it is transferred to a variety of energy producing companies located in energy-rich states and countries. Subsequently, the ability of energy dollars to generate additional income within the local economy is diminished, because the money cannot circulate locally. On the other hand, if that 85 percent were allowed to circulate locally, additional

revenue and jobs could be created.¹³ This happens because the flow of energy dollars out of the economy is slowed down, leaving more disposable income to recycle internally and to be invested in the local economy.

Local energy production, through conservation and the development of renewable resources, can help stabilize an area's economic base.¹⁴ Stable energy supplies and prices from local resources are an incentive for industries and businesses to remain in or move to a community. Local government must view community energy management as a means for economic stabilization and as a means for future economic development.

Local government is the logical vehicle to demonstrate alternative approaches to energy supply. "An innovative, conservation-minded municipality can, by example, substantially affect public perception of the energy problem."¹⁵ Davis, California is an excellent example of such a community. Local government has the authority and means to adopt and enforce policies that are aimed at promoting conservation and new energy sources through public regulation. Without local government involvement and regulation, decentralization and deconcentration of energy sources is not likely to succeed. The reason for this is that the following areas of concern need local government attention: solar access, energy efficient land-use development, building codes designed to promote conservation, and tax incentives to encourage conservation and renewable energy.

A community energy management program can function as an effective mechanism to inform the public on energy policy. As structured here, it is also an opportunity for the public to inform elected officials in local, state and federal government about how they feel about energy policy. The local community should not expect the federal government to dictate specific policies or programs to be implemented in a community. It is the role of local government to assess local energy needs and to develop specific programs to meet

the needs of those living within the community. Finally, each community, because of variations in topography and climate, will need to develop community-specific policies and plans to manage energy-related problems.

The reasons that have just been presented for a CEMP have dealt with factors that can be affected and in some cases controlled by the local government. However, it is not in the local government's power to affect supplies from national or international energy sources. Nonetheless, the consequences of energy related problems, such as an oil cutoff, will have their most dramatic and long-term impact in the local community. By encouraging community energy management, local government can reduce the impact of uncontrollable external fluctuations in energy cost and availability. For instance, a CEMP can help mitigate energy curtailment problems, such as job layoffs, heating fuel shortages and inadequate police and fire protection.

CHAPTER TWO

Implementation Strategies for a Community Energy Management Program

Even in the present context, community energy management is not a new technique. In fact, Davis, California and Seattle, Washington have been engaging explicitly in energy management since 1975 and 1976 respectively. The city council of Davis, California adopted an energy conservation ordinance that encourages the use of passive solar heating and cooling processes in new residential buildings. "Davis claims an 18 percent reduction in electricity and natural gas consumption in the residential sector since the building ordinance was proposed in 1973."¹⁶ After much debate, the city council of Seattle turned down an option to invest in two nuclear power plants and adopted instead a conservation policy. "Seattle realized a 7.7 percent reduction in electricity consumption in 1977, the first year of its conservation programs, although an undetermined part of this reduction was attributed to drought-induced conservation."¹⁷ Through their energy conservation plans, these communities gained national attention, and in so doing stimulated federal interest in community energy management.

In 1976, the Department of Housing and Urban Development (HUD) funded three projects to identify ways municipal energy conservation could be implemented. These energy management projects were located in Portland, Oregon, the Massachusetts Department of Community Affairs, and ten California communities with Anaheim as the lead city.¹⁸ The HUD projects focused primarily on promoting energy conservation in accordance with traditional responsibilities and resources of local government.

In 1978, the Department of Energy sponsored the Comprehensive Community Energy Management Program (CCEMP). The purpose of this program was to test

the ability of local communities to conduct energy management and to provide information useful to policy makers and other communities interested in energy management.¹⁹ The seventeen communities involved with CCEMP used the Hittman Associate, Inc. methodology and process of community energy planning.²⁰

To further illustrate the growing importance of community energy planning, an abbreviated listing of federal programs supporting local energy management is presented below:

Decentralized Solar Energy Technology Assessment Program:

A program designed to provide communities with documents for use in community energy technology assessment. The objectives of the program were 1) to assess the socioeconomic and institutional impacts of the widespread use of renewable energy technologies; 2) to involve communities in planning for their energy future; and 3) to plan for local energy development.²¹

Solar Cities Program:

This program was designed to assist cities and towns with the problems of energy supply, economic development and urban quality.²²

Technology Assessment of Solar Energy Systems:

The overall purpose of this program was to investigate the impacts of various solar-based energy systems on the community environment and its physical and social structure.²³

Site and Neighborhood Design Program:

This program focused on case studies of new-town design and development that used state-of-the-art techniques in energy conservation, community design and land use planning.²⁴

Integrated Community Energy System Program:

The concept for this program was based on a comprehensive approach to conserve energy based on decentralized energy technology and community design.²⁵

In terms of federal involvement, community energy management from 1976 through 1978 was in a research, development and demonstration period. Evidently this period was viewed as successful by some, because by 1979 the following

bills were introduced into Congress. These bills were designed primarily to clarify the role of state and local government in United States energy policy.

Local Energy Management Act of 1979:

This bill was intended to create a demonstration grants program to provide funding to selected localities for the development of energy plans. Also included was a Local Energy Reference Center, which was to distribute documents of local energy planning programs. ²⁶

Energy Management Partnership Act of 1979:

This bill would have authorized Department of Energy grants and technical assistance to state governments for energy emergency and conservation planning; it would consolidate three existing federal energy grant programs. ²⁷

Community Energy Efficiency Act of 1979:

The purpose of this bill was to establish a grant program designed to aid communities in developing conservation and renewable resource plans and programs. ²⁸

The Community Energy Efficiency Act was eventually incorporated into the Energy Management Partnership Act. However, by the time the Energy Management Partnership Act was out of committee review and placed on the Senate floor, the Reagan Administration had been elected. Consequently, federal priorities moved away from supporting energy conservation legislation; thus, federal involvement in local energy management diminished.

Throughout the brief history of community energy management, there have been two approaches to the implementation of a community-wide energy management strategy. On one hand, there has been the "traditional" approach where local government attempts to manage current energy usage. On the other hand, there has been the "participatory" approach in which citizen energy committees are formed to encourage a local self-help strategy to promote energy conservation and the development of local energy resources.

The typology used to classify the traditional approach and the participatory approach to energy management is based on the "roles or models" of

planning practice and theory (i.e., technocratic versus advocate). The traditional approach is based upon "traditional planning" as described by Susan and Norman Fainstein.²⁹ The participatory approach is based upon the work of Richard Applebaum,³⁰ John Friedmann,³¹ and Donald Mazziotti.³² This planning typology was applied to energy management in an effort to account for the insufficient documented evidence substantiating the effectiveness of different community energy management implementation techniques.

Traditional Community Energy Management

Traditional community energy management can be defined as integrating energy conservation concerns into the ongoing policy, planning and management processes of local government.³³ The traditional approach adheres to the "social planning" model of community organization practice as developed by Jack Rothman. The social planning model emphasizes a technical process of solving problems.

"Rational deliberation and controlled change have a central place in this model. Community participation may vary from much to little, depending on how problems present themselves and what organizational variables are present. This approach assumes that planned change in a complex industrial environment requires experts who guide change processes through the exercise of technical skills. Building community capacity or fostering radical or fundamental social change does not play a central part." ³⁴

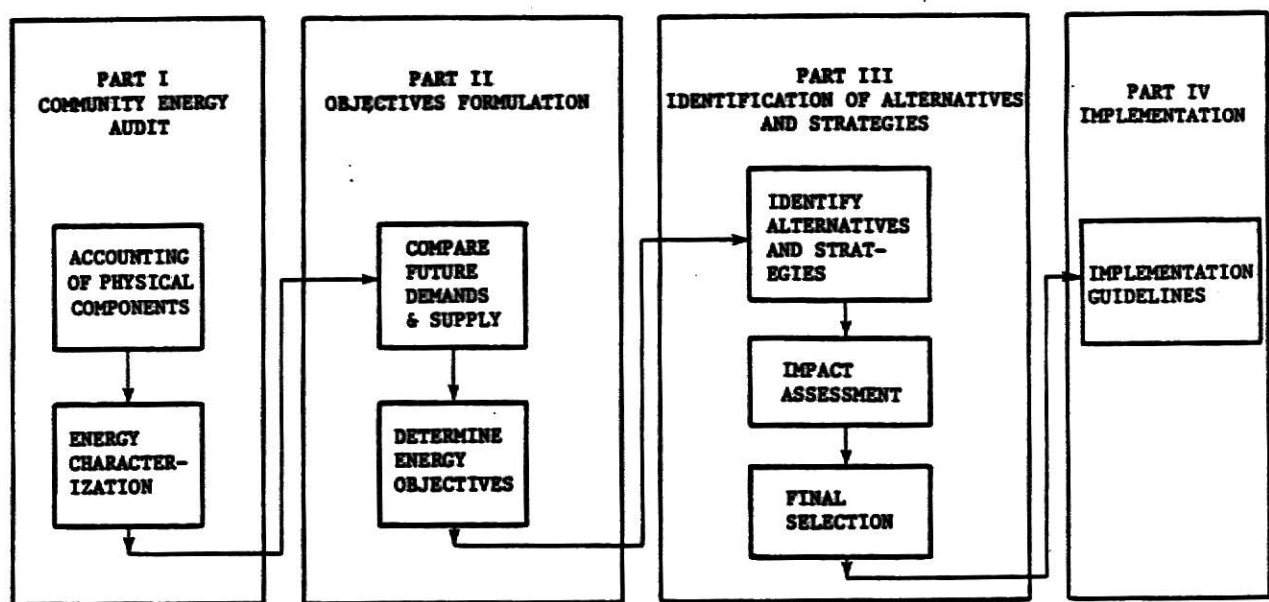
Typically, there have been two major areas of emphasis in the traditional approach. The first emphasis area, municipal operations and facilities, is concerned with improving the technical and management efficiency of government buildings, equipment and services, such as schools, water treatment plants and street lighting. The second area of emphasis is public policy and planning. The focus of these policies and plans is to: 1) promote energy efficiency and conservation on a community-wide basis, and 2) encourage and allow the development of renewable energy. In light of this concern, existing

ordinances and regulations have to be evaluated to facilitate the implementation of energy conscious design in the redevelopment of previously developed areas, and in the planned development of currently undeveloped areas.

The "Community Energy Plan" usually represents the focal point of the traditional approach. This plan is intended to provide decision makers with a rational basis to evaluate energy conservation proposals. The community energy plan also seeks to widen and to publicize the range of choices concerning future energy conditions. The process employed by the traditional approach to develop a community energy plan is illustrated in Figure 1.

Figure 1

Planning Process of the Traditional Approach



Source: Hittman Associate, Inc. Comprehensive Community Energy Planning.

The significant aspect about this process is that local government assumes the energy plan will be implemented. This is very critical, given the lack of citizen involvement in the process. Without initial citizen participation in the determination of objectives, alternatives and strategies, the implementation

of any nongovernmental elements of those strategies is not likely to come to fruition. This is especially true given the misconceptions surrounding conservation and renewable energy. Based on the preceding methodology (Figure 1), traditional community energy management is premised on the concept that the "planner," which in this case is local government staff, prescribes both the objectives and strategies necessary to attain community-wide conservation.

Traditional community energy management actions promulgated by local government relating to municipal operations and facilities are usually effective in reducing energy consumption. However, from a community-wide perspective, conservation strategies, policies, and plans, in most cases, lack public awareness and thus support. This prevents effective implementation outside of the local public sector.

Participatory Community Energy Management

Participatory or citizen-based energy management is characterized by attempts by citizen advocates to engage the community and/or local government in community energy management. It emerged in response to the lack of citizen participation and community control associated with federal or corporate energy planning. The dependence on imported petroleum and centralized energy technology heightened the awareness of local citizens that economic stability and social vitality was largely subject to federal or corporate mandate with little or no local input or accountability.

Participatory energy management is usually associated with strategies for energy conservation and alternative energy production which can be implemented at the local level. The primary thrust of the participatory approach is to increase the ability of local citizens to help shape their own energy future. A local "self-help" approach enables citizens to become more active participants in achieving their own energy security. The participatory

approach presupposes that community change may be pursued optimally through broad participation of a wide spectrum of people at the local community. Moreover, it seeks to alter human attitudes and behavior patterns about energy through education, exhortation and a number of other methods for stimulating energy self-reliance.

Generally, citizen-based energy management seeks to:

- 1) Promote local employment in conservation activities, such as weatherization, solar hot-water construction and installation, and passive solar retrofit.
- 2) Reduce the outflow of energy dollars from the local economy by encouraging local energy conservation and production.
- 3) Facilitate citizen involvement in energy policy making and energy management and implementation.
- 4) Encourage energy sources matched in scale and quality to end-use energy needs.

The participatory approach to community energy management presupposes that political rights in a democracy give the citizenry the power and responsibility to influence government and thereby lead to better public policy, which is more closely attuned to the needs and desires of the citizenry. An activist role is explicitly oriented to both the political and administrative structures and processes of local government. Thus, the participatory approach facilitates and demands an open and ongoing communication process between the public and its government.

The goals of citizen-based energy planning are local control of energy producing technologies, democratic participation in the determination of energy policy, and increased local energy self-reliance.

Innovative Community Energy Management

The administrative and implementation model developed in this paper is coined the "innovative approach." The innovative approach is based on the

integration of the traditional approach with the participatory approach.

Traditional energy management, because of local government support, has the authority and means to adopt and enforce policies that are aimed at promoting conservation and development of new energy sources. When the local government is leading a conservation effort, by example and policymaking, it indicates to the citizens and business community the commitment to conservation and renewable energy development. Without government involvement and regulation, community energy management strategies are unlikely to succeed. A primary drawback of the traditional approach can be the lack of citizen participation. This is due, in part, to the low priority placed on encouraging citizen participation, which in turn inhibits the implementation of certain elements of the energy management strategy.

As previously indicated, the participatory approach, on the other hand, is oriented to obtaining maximum citizen participation in energy planning. For this reason, the goal of the innovative approach is to integrate the citizen participation of the "participatory" approach with the involvement of local government associated with the "traditional" approach. Ideally, then, the innovative approach strives for the best of both traditional and citizen-based energy planning.

The first task innovative community energy management must undertake is problem identification: the community must recognize and define its local energy-related problems. This requires an "educational" process, because large segments of the population may fail to grasp a clear understanding of the energy problems facing the United States. After the recognition and definition of the energy situation, the CEMP proceeds with formulating policies and strategies of action to deal with the energy problems from a local perspective.

The innovative approach is based on several assumptions. One fundamental

assumption is that a community's capacity to engage in cooperative problem-solving on a self-help basis will induce social action to change the vulnerable and tenuous nature of energy production and distribution in the United States. The goal is to have the local community regain an element of energy self-reliance. Also assumed is the ability of the "free-market" to aid in effecting economic and social change in the direction of conservation and renewable energy. However, since the energy market is corporate controlled and/or publicly regulated, free-market forces are precluded from inducing major change. Consequently, innovative community energy management attempts to encourage new energy producing technologies, businesses and institutional arrangements.

To recapitulate, innovative community energy management is an approach designed to create awareness of the potential social, political, and economic implications created by absolute dependence on fossil fuel technologies and their present delivery systems. The innovative approach also seeks to develop planning strategies and policies to implement conservation and renewable energy by encouraging new business and institutional arrangements that allow for local energy production.

Naturally, there are numerous possible approaches to accomplish this goal. According to this author, however, when a Community Energy Management Program is established within the framework of local government, and is allowed to encourage a broad base of citizen involvement, the degree of community acceptance and support for energy conservation is enhanced.

The innovative approach should not be viewed as a permanent structure of local government. Instead, the CEMP is a tool to facilitate the educational process and initial planning stages to lay the groundwork for an efficient and renewable energy future.

The CEMP must also function as a management tool for local government to reduce consumption within its own operations.

CHAPTER THREE

Organization Structure for Implementation of a CEMP

Since the innovative approach to community energy management attempts to facilitate new political actions, the elected officials are placed in a precarious position. The local politicians must be convinced by staff, community members or other politicians that energy alternatives must become a reality. Thus, the first prerequisite for an innovative CEMP is an informed and concerned elected body, willing to provide financial support for a CEMP that seeks to change the public's perception of the energy future, and to encourage conservation and renewable energy. This will require that the elected officials are convinced that energy management is within the purview of government and that citizens will receive a benefit from the program.

The second prerequisite is that elected officials understand why a CEMP should be supported by local government, but at the same time be semi-autonomous of government staff. This will again place the elected officials in a difficult position, but they must be shown that community-wide conservation can best be achieved when there is a broad base of citizen involvement. Both of these topics, local government and citizen participation, will be addressed in further detail later in the chapter.

It is important to note that the innovative model is adaptive to various local government size and format. As illustrated in Figure 2, the CEMP can be linked with the planning department. However, many communities do not have a permanent planning staff. In communities where this is the case, the innovative model would instead be linked to the local government framework as deemed appropriate by the elected officials.

It is extremely important that community energy management be kept in tune with the overall framework of community planning programs. Many of the

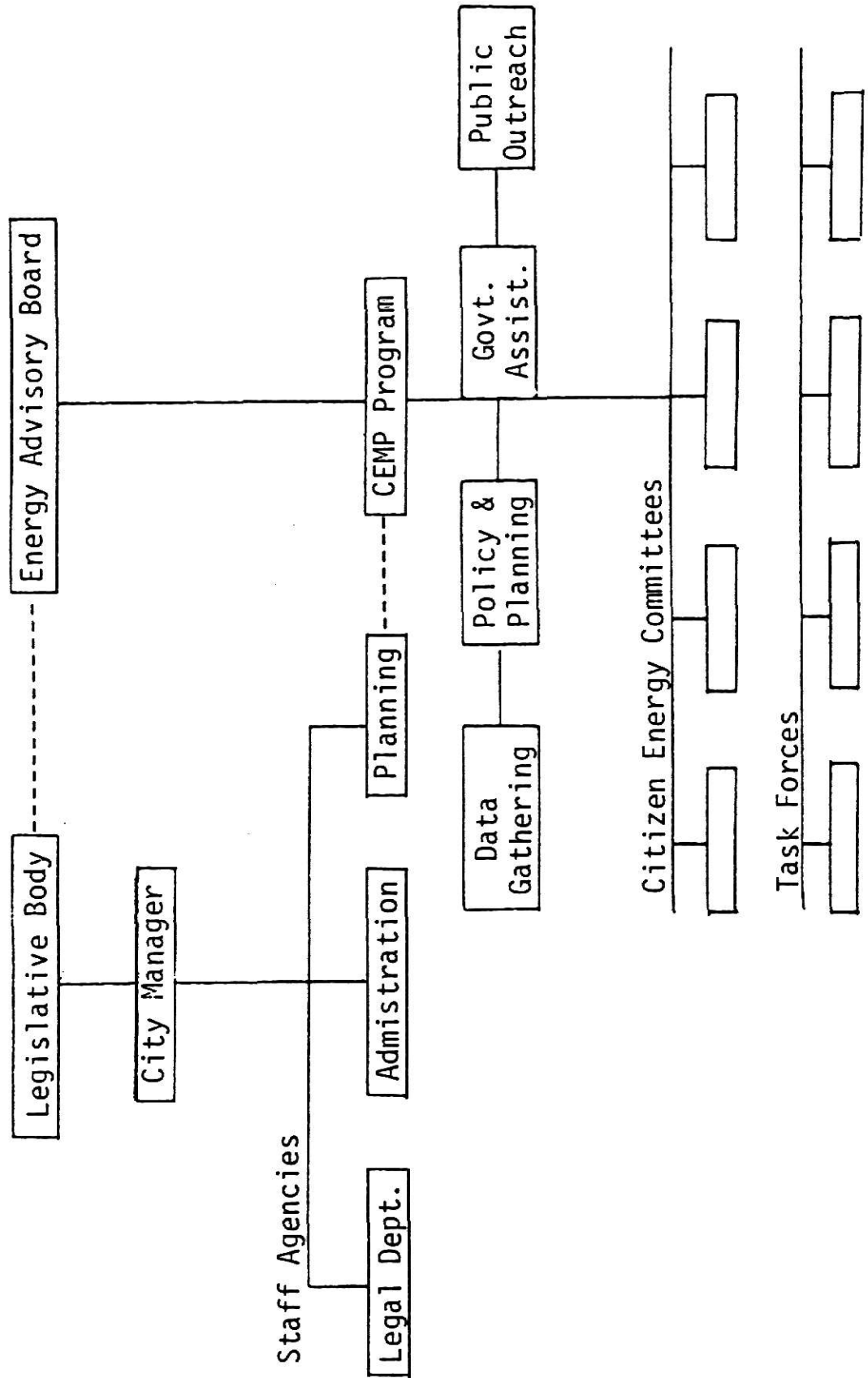


FIGURE 2

Organization Structure of the CEMP

land-use related programs will have to broaden their perspective to involve planning and design criteria to allow for conservation and emerging energy technologies. By having the CEMP linked with the planning department, coordination and communication is enhanced, which is essential if energy-efficiency and conservation are to become incorporated in internal government operations and service delivery.

The CEMP must be viewed by the planning department and other staff agencies as a semi-autonomous program. By semi-autonomous it is meant that the program be allowed enough freedom to create an image of a cooperative public/private organization. It must be remembered the success of the program, at least from a community-wide implementation perspective, is dependent on citizen participation.

The Role of Local Government

There are two prerequisites for local government involvement in an innovative approach to energy management: 1) a willingness to facilitate an educational process to change the public's perception of our present and future energy situation, and 2) a willingness to participate and provide financial support for a semi-autonomous program based on a cooperative public/private arrangement. Granted this is no small order for politicians to support, but a selling point for the CEMP is that the program is not intended to become a permanent fixture of government bureaucracy. Instead, each year the CEMP Coordinator must show to the elected officials that either the government or community at large has reduced energy consumption, and thus saved tax dollars, or has provided a direct energy or money savings for taxpayers. It is anticipated that in the first several years, the CEMP is capable of 1) improving energy efficiency in government operations and facilities, 2) setting forth policy and plans to allow for the conservation and renewable energy,

and 3) cultivating citizen awareness to such a degree that the citizenry will support and participate in the various energy management programs. In effect, then, the CEMP is a program where, after several years, the community has either lost interest in energy management, because of conflict, ineffectiveness, or lack of need; or the community has laid the initial groundwork for increasing energy self-reliance and the CEMP has evolved or simply dissipated. Regardless, the role of local government is to provide leadership to gain acceptance of the CEMP and to facilitate its implementation.

With the CEMP located in a semi-autonomous position to local government, the program has positional legitimacy in order to influence the outcome of decisions. Since almost all energy management programs, policies or plans are dependent on governmental approval, it is crucial to have a channel of communication to the elected officials. This positional legitimacy also shows to business leaders, civic groups and others the relationship of the CEMP to the public decision-making center. In other words, the CEMP is viewed by the community as a legitimate organization for the effective implementation of community energy management.

The Role of Citizen Participation

An integral component of the innovative approach to community energy management is citizen participation. In community energy management, citizen participation serves several functions: 1) to influence individual behavior through group behavior, 2) to provide a strategy for the acceptance and implementation of energy management plans, and 3) to create a sense of community. When citizens have been engaged in the process of goal and strategy identification, a commitment to those objectives can be achieved. In addition, when citizens have been involved in the development of plans and policies, they are more likely to become advocates for the approval and acceptance of the energy plan.

Citizen Energy Committees, such as those developed in the Harvey County Citizens Energy Project, represent one vehicle to increase citizen involvement.³⁵ These committees are dependent upon voluntary members who possess an interest, knowledge or skill in relationship to a particular energy interest. The formation of the committees are intended to pertain to areas of local energy needs and opportunities. The CEMP Coordinator will be responsible for identifying areas of concern on which committees will be developed, and for insuring the broadest possible spectrum of individual interest and expertise. Presented in Table 2 are possible areas of concern for committees.

TABLE 2
Citizen Energy Committee Concern Areas

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- Emergency Energy Preparedness
 - Building Conservation and Retrofit
 - Financial Incentives for Local Energy Measures
 - Industrial Energy Management and Development
 - Municipal Government Energy Management
 - Public Outreach
 - Transportation and Conservation Techniques
 - Agriculture: Energy and Alternatives

Collectively, these committees constitute the major guiding force behind the development of goals, objectives and strategies for community-wide energy management. Essentially, the duties of the committees are as follows:

- 1) Obtain as much information as possible concerning energy conservation and alternative energy resources for their respective areas of concern.
- 2) Analyze the community energy data base and projections to determine future community-wide energy problems and needs to suggest possible strategies to help solve the identified problems.

- 3) Define goals and objectives that relate to the overall energy picture and their particular areas of concern.
- 4) Facilitate or provide a citizen mechanism to implement community energy management policies and programs.

The Citizen Energy Committees assist in the identification and interpretation of energy problems, objectives and goals. In effect, then, they operate as the primary mechanism to include a broad base of citizen input in policy and plan development. The plans, policies, and recommendations developed by the Citizen Energy Committees are submitted to the Energy Advisory Board.

The Energy Advisory Board evaluates and recommends to the legislative body any energy policy action taken by the city. This board has the responsibility for supervising the work of the CEMP Coordinator and staff, and their budget. In addition, the board makes recommendations to the legislative body for actions the city should undertake in energy management. There are five members on the board, all of whom are appointed by the legislative body. On the ideal board, one member of the board should have knowledge of energy supply and conversion systems; one member should have knowledge of environmental issues; one should be an attorney; one member should be a banker or have knowledge of finance; and one member should be from the public at large.

This openness in development and circulation of community energy management proposals reduces the chance that one interest will dominate the outcome to the exclusion of others.⁴⁰ This open and informed policy process is required in order to develop effective policies adopted to local circumstances.⁴¹ Moreover, when the energy management proposals are adopted by the Energy Advisory Board and the legislative body, the motivation for responsible and effective implementation is strengthened. This is due to the fact that citizens have been making policies for themselves, and therefore assumed the risks and costs as well as the projected payoffs. "Similarly, opponents of the policy adopted tend

to develop an interest in effective oversight. In Davis, a builder compared room temperatures between old units and units built under the new code, in an effort to prove the building code ineffective (having seen the results, he now endorses the building code and implements its principle)."⁴²

Unfortunately for the Citizen Energy Committees, the distinction between advising and deciding are not always clear. For this reason, the expectations and responsibilities of the Citizen Energy Committee members must be clearly delineated. There also needs to be an element of motivation for the committees. It is suggested that CEMP staff attend each meeting or work sessions to record the minutes and serve as staff to each committee. Since the CEMP Coordinator must also attend these meetings, he or she is responsible for limiting the duties that the staff can perform for each of the committees. The coordinator at the meetings also functions as meeting facilitator and to insure the committee accomplishes its goals.

Another vehicle to encourage citizen participation is the use of task forces to assist in specific duties of the CEMP. For instance, a task force could be organized to assist in data gathering for the end-use energy assessment of the community. Here again, the task forces are composed of voluntary members, and therefore, require a clear explanation of duties, responsibilities and schedules. The benefit of task forces is two-fold. First, they provide a pool of no-cost labor. Secondly, those involved in the process gain an appreciation of energy management and could become stalwart supporters for program approval and implementation. The CEMP Coordinator must be willing to utilize voluntary help or at least be capable of organizing a work schedule around help that may be overly enthusiastic, or undependable, or both.

Personnel Needs and Duties

The CEMP Coordinator is hired by the planning department head, and is

responsible to that individual. The role of the CEMP Coordinator is supervisory in nature. The task is to develop and coordinate citizen committees to provide maximum participation in the CEMP. This person is also responsible for administrative work involved in the more difficult areas and phases of community energy management policy and plan development. The individual must also be capable of developing and coordinating a public information system describing to community residents the activities of the CEMP. This position requires skills in research methods; knowledge of municipal organization functions and services; effective writing and editing techniques; considerable knowledge of the principles and practices of community organization; and an ability to compile and analyze data and develop detailed reports.

Since the CEMP is located within the planning department, the department head must understand what is expected of his or her staff. Because they are familiar with zoning regulations, building codes, growth management policies, etc., the regular staff of the planning department play an integral role in the CEMP. They will be in charge of rewriting and initiating ordinance change procedures of existing ordinances, regulations and policies to allow for conservation and renewable energy. This will allow a larger percentage of the Coordinator's time to be devoted to other phases of the project. In essence, the existing staff of the planning department and other staff or line agencies operate as technical support staff to the CEMP. By having government staff working on projects related to the CEMP, cooperation will be enhanced in terms of developing, administering and evaluating proposals to conserve energy in municipal facilities and operations.

Since local governments are faced with dwindling funding sources and increased competition among funding needs, it is imperative that the CEMP not create an undue financial burden. For this reason, it should be requested that

only one full-time and one part-time paid staff member be hired. The duties of paid staff members include activities in data gathering, report writing, newsletter and other communications layout, writing minutes and reports of the Citizen Energy Committees, and facilitating the organization and preparation of workshops and public meetings. Depending on the existing work load of the planning department secretaries, they could perform daily office operations and, therefore, eliminate the half-time position.

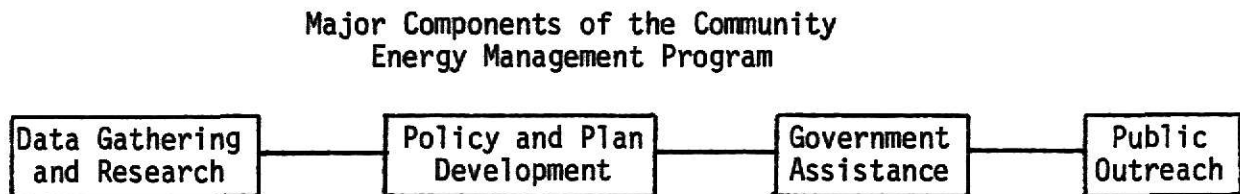
The CEMP should not limit funding from only the local government. The CEMP Coordinator should actively pursue federal, state and private grant sources. Also, the local utility should be approached and asked to provide funding for the various projects of the CEMP.

CHAPTER FOUR

Components of a Community Energy Management Program

Four primary operations have been defined as major components in the innovative model for a Community Energy Management Program. Each component has an integral function in the development, implementation and operation of a CEMP. The purpose of this chapter is to identify and explain the composition of each component. Furthermore, the chapter seeks to inform the reader of the actions associated with the components. Figure 3 illustrates the four major components.

FIGURE 3



Data Gathering and Research

Inherently, the basis for any planning or policymaking is in the quality of the data. Thus, the first step in establishing a sound CEMP, is the creation of an energy data base. The energy data base is designed to provide both private and public decision-makers with the following information:

- Present and future energy demand and cost
- Factors affecting energy supply in the present and future
- The basis for assessing the performance and impact of the CEMP
- The basis for assessing the energy impacts of private sector development proposals.

The energy data base is prepared by performing a community energy audit,

which is a study of end-use energy within the residential, commercial, industrial, institutional, transportation, and agriculture sectors of the community. In each sector, various types of energy are traced to end-use demand requirements. For example, in the industrial sector the end-use tasks are space heating and cooling, space lighting, industrial process heat, and office equipment. The study of end-use energy is important because of the emerging need to match the scale of sources and quality of energy to end-use requirements. Since new technology allows for decentralized energy production, it is essential that energy data concentrate on end-use requirements. The community energy audit documents the type, cost, and amount of energy currently used for all sectors and, as well as, the energy required to perform end-use tasks. This creates a composite picture of energy consumption for the entire community.

The data generated in the community energy audit enables energy demand to be projected into the future. Energy projections can be performed by individual sector or for the community as a whole. Simple energy projections study past trends in population growth and energy demand to extrapolate these trends into the future. Future energy costs can also be projected to comprehend the possible price of energy in the year 2000. Since the price of energy and the level of demand fluctuates, many energy projections incorporate a high, normal, and low level of energy demand. This approach, in many instances, clarifies that changes in demand and growth are inevitable. Thus, energy projections provide quantitative data necessary to identify energy goals and objectives.

After completion of the community energy audit, a preliminary report documenting the energy data base should be prepared. The report should include a statement of the energy problem, information on how the community

receives its energy (i.e., distribution facilities), energy conversion loss information, energy profiles of each sector, and future energy projections of cost and amount. In most cases, this report will represent the first time a complete community energy profile has been developed.

The second major element or activity of the data gathering and research component is an energy management information system. An energy management information system is a management tool to assist in the gathering and recording of information pertinent to a CEMP. Since energy is a pervasive and necessary commodity throughout the community, the scope of an information system can be overwhelming. It is necessary, therefore, that cooperation with government agencies, the utilities, and the business community be established. Information systems can become very complex and may require the use of computers. However, for this CEMP model the information system is a traditional filing system. The energy management information system is designed to compile factors influencing local energy consumption and to maintain an ongoing record-keeping system of energy consumption in the community. The information system assists in the identification of existing constraints and opportunities for energy management. In addition, it records energy consumption in the community, especially the energy consumption of government operations and facilities.

There are nine key categories represented in the information system. These include data files on the local economy, the area's population, land use systems, environmental systems, transportation systems, utility system, local government, energy conservation, and renewable energy. The following summary presents the general scope on the energy management information system.

1. Economic Files:

Past, current, and projected employment and sales for the industrial, commercial, and agriculture sectors. Also document innovative energy conservation measures and building techniques in these sectors.

2. Population Files:

Past, current, and projected population. Also document past and current population and housing characteristics published by the Census Bureau.

3. Land Use Files:

Obtain the following: Comprehensive plan, land use plan, capital improvement program. The local building codes, zoning ordinances, subdivision regulations, and growth management policies are also needed.

4. Environmental Files:

Obtain information on environmental factors that influence energy consumption, such as topological and weather data, heating and cooling degree days, wind speed, and solar insolation.

5. Transportation Files:

Search for information such as vehicle miles traveled, number of registered autos and the average number of miles driven. Identify the distributors of gasoline and propane. In addition, look for feasibility studies on public transit, bikeways, and various transportation engineering reports.

6. Utility Files:

Mapped location of gas mains and power lines, along with pumping stations and service boundary areas. The location, type, quality, use, and capacity of power plants serving the community. In addition, include information on past, present, and projected rate structures. An updated listing of consumer services offered by the utility should be maintained.

7. Local Government Files:

Obtain any energy audits performed for the government. Past and current energy consumption data for municipal buildings and facilities. Develop and maintain an accurate record keeping system for government operations and facilities. The type, amount, and cost of energy is recorded monthly for all energy consuming devices, buildings and equipment.

8. Energy Conservation Files:

This file consists of six sub-categories. In each sub-category, information is filed on actions, policy measures, and techniques to conserve and improve the efficiency of energy use.

- 1) residential
- 2) commercial

- 3) industrial
- 4) agriculture
- 5) transportation
- 6) local governments, including schools

9. Renewable Energy Files:

Information is recorded on the following forms of energy:

- 1) solar
- 2) wind
- 3) biomass
- 4) hydro-lectric
- 5) photovoltaics
- 6) co-generation and district heating
- 7) state and federal regulations on renewable energy

The energy management information system (EMIS) allows CEMP staff an extensive resource base from which to understand, identify, and evaluate the range of factors influencing energy consumption, conservation, and local energy resource development. In addition, the EMIS operates as a record-keeping system for local government energy consumption and the community as a whole. Of equal importance is the integral part the EMIS plays in public education and citizen participation, because the EMIS can provide business owners, private developers and the general public with the knowledge to monitor and manage energy consumption.

Once the energy management information system has been initiated, the next priority is a preliminary report on community-wide opportunities and potential for energy conservation. This report will review each sector and outline various strategies for energy conservation. Since this is a preliminary report, all possible opportunities, regardless of political or institutional barriers, should be listed. When specific proposals for conservation have been identified, the next step is to research the economic feasibility, life-cycle costs, pay-back period, finance mechanisms, and anticipated energy savings.

Table 3 provides examples of specific energy conservation proposals:

TABLE 3

Community-Wide Energy Conservation Proposals

<u>Residential:</u>	- Revise building codes to reflect conservation standards - Home energy audit service - Property tax abatement for conservation solar improvements
<u>Commercial:</u>	- Energy conservation management training - Reduce lighting used for advertisement - Discourage retail strip development
<u>Industrial:</u>	- Reuse industrial waste heat - Energy conservation management training - Discourage energy in efficient industries
<u>Government:</u>	- Generate energy by burning solid waste - Improve efficiency of city vehicle fleet - Weatherize existing buildings
<u>Agriculture:</u>	- Reduce the use of petro-chemicals - Encourage the use of solar and wind - Establish direct marketing arrangements
<u>Transportation:</u>	- Parking management policy - Develop a bicycle system - Encourage car-pooling

Another undertaking requiring research is a preliminary report on the application and potential of renewable energy. Various alternative energy sources need local exploration, such as solar, wind, and biomass. Usually, the technology exists to develop these sources, but government and public support is required. This report can provide valuable information necessary to encourage renewable energy. The report should reveal legal and regulatory barriers, the required technology, case studies, and, if applicable, cost-benefit or other appropriate analysis. This report should be general, yet comprehensive, in scope. Its primary purpose is educational: it is not an engineering report.

The activities described above, energy data base, energy management information system, conservation opportunities, and renewable energy potential, represent immediate undertakings in data gathering and research. Naturally, data gathering and research continue after these projects have been completed or initiated. The level of research activity will eventually depend on requests from elected officials and the activity of the Citizen Energy Committees. In this CEMP model, the primary function of the data gathering and research component is the initial compilation of data used in policy and plan development and public outreach. This does not mean, however, that data gathering is abandoned, because a continuous process of data gathering and seeking new information is essential for evaluation and continuation of the CEMP.

Local Government Assistance

Once the energy data base, EMIS, and preliminary reports on conservation and renewable energy have been completed, the CEMP staff concentrates on local government assistance. Depending on community priorities, a logical place to begin energy management is within the local government. By focusing on government, the concept is to show elected officials the value of the CEMP.

This is accomplished by reducing energy consumption and saving taxpayers money.

In local government energy management, one major area of emphasis is operations and facilities. The goal is to improve energy efficiency and reduce energy consumption. The place to begin is in reducing the energy requirements for municipal buildings. Many municipal buildings were built prior to 1973. Therefore, the buildings are likely to have a high heat-loss factor and inefficient heating, ventilating, and air conditioning (HVAC) systems. A comprehensive inventory and analysis of municipal space needs may indicate opportunities for the consolidation of activities and personnel into less building area or fewer buildings, hence retiring underutilized structures.

After a building inventory, the next step is an energy audit of the buildings. The purpose of the audit is to indicate conservation opportunities and the potential for retrofit incorporating the use of renewable energy. Consideration of the type and use of a building and its anticipated life must be part of the decision-making process when energy conservation and retrofit improvements are planned. To assist in monitoring and administering a conservation program, a complete and accurate record keeping system must be established. This should, however, already be established within the EMIS file on local government.

Often, street lighting is a major energy consumer and a major energy cost for communities. Selecting the most energy-efficient light fixtures in the correct locations can produce a substantial savings both in money and energy. A community light management survey will provide an inventory of present streetlights, the type of lighting used, the type of traffic signals used, the type and amount of lighting used for public recreation and an economic breakdown of present and future costs.

The study can also indicate which street lighting is essential and which is not. However, community safety and security must have top priority.

One other substantial consumer of energy in local government is the municipal vehicle fleet. Vehicle type and specification must be inventoried in all government operations including police, fire, public works, parks and recreation and city administration. There are several options that vehicle conservation should focus on: Vehicle size, maintenance, operational procedures, and the purchasing of fuel in bulk. Here again, energy consumption and mileage must be recorded in the EMIS.

Not to be overlooked are the services that a local government provides, such as water and sewage treatment, solid waste management, and road maintenance. The local citizenry, in many instances, fails to realize how these services place a tremendous fiscal strain on a local government budget. Since large amounts of energy are required to pump water throughout the community, an energy audit of the system may produce a savings.

In recent years, new technology is allowing local government a choice of alternative waste water and solid waste facilities. For example, the use of municipal solid waste as an energy source and as a means of waste disposal has considerable attraction for local governments. The technology exists today for this to occur.⁴³ Due to the development of new technology, rising energy costs, and the budget constraints placed on local governments, elected officials owe it to themselves to explore the options of innovative technology to save money and energy in the long run. Presented in Table 4 is a summary of strategies to conserve energy in government operations and facilities.

TABLE 4

Conservation Strategy Areas in Local Government

<u>Government Operations:</u>	- Solid waste management - Water and sewage treatment - Police and fire protection
<u>Government Facilities:</u>	- Municipal buildings and vehicle fleet - Street lighting and traffic flow - Parks and recreation
<u>Ancillary Services:</u>	- Public schools and hospitals - Ambulance service - Municipal airport

For the continued operation of CEMP, it is essential that elected officials receive direct benefit for their conservation actions. Furthermore, a good working relationship and professional credibility will enhance the success of future energy management initiations. In short, if in one year the CEMP cannot reduce government expenditures for energy, the CEMP may not operate the following year.

Policy and Plan Development

To provide guidance to elected officials and those involved with community energy management, a Community Energy Management Plan must be developed. The plan is a document intended to broaden the perceived range of possible energy futures, establish criteria for decision-making, assist in the determination of priorities, and help coordinate CEMP policies.

The table of contents of the Community Energy Management Plan is illustrated in Table 5.

TABLE 5
Contents for the Community Energy
Management Plan

-
-
- Statement of the problem
 - Present energy situation
 - Future energy situation
 - Community conservation potential
 - Renewable energy potential
 - Goals and objectives
 - Immediate, short and long-range actions

A sizeable portion of the plan is developed from the preliminary reports prepared during data gathering and research. The information should be prepared in terms that are readily understandable to the person who has limited knowledge of energy technical jargon. Other issues related to policy and plan development are presented in Table 6.

TABLE 6
Policy and Plan Development Issue Areas

Solar Utility Ordinance: Implementation tool to finance energy conservation or the use of solar technologies. An example is the issue of city bonds to purchase solar hot water heaters which are then leased by homeowners from the city.

Property Tax Abatement: A financial incentive to encourage solar heated/cooled homes by reducing local property taxes.

Utility Franchise Tax: Evaluate the use of local utility taxes to support local conservation and renewable energy development.

Job Creation Through Conservation: Analysis of the potential to increase local employment by reducing the outflow of energy dollars.

Regional Energy Planning: Evaluate the regional aspect of energy conservation and renewable energy development.

As brought out in Chapter Three, the planning department staff will be updating existing zoning ordinances, subdivision regulations, and building codes. Furthermore, the city comprehension plan, land use plan, and any other development plans or policies should be evaluated in terms of promoting energy conservation and renewable energy development.

Public Outreach

This component of the CEMP, to some degree, has already been discussed in Chapter Three when the role of citizen participation was reviewed. The Citizen Energy Committees represent an important mechanism to reach the public about the CEMP. Other examples of public outreach include a newsletter which would describe the activities of the CEMP, and provide energy saving tips. A residential energy audit service, in cooperation with the local utility, is another way to reach the public. Community energy workshops, seminars, and public meetings are also key elements in reaching the public. Use of the local newspaper and radio are excellent avenues to inform the public on local energy issues.

If at all possible, the CEMP should be housed in a home that has been retrofitted to demonstrate energy conservation techniques and passive solar design. This house would function as office space for the CEMP, a demonstration center, and as an information center for people to drop-in and obtain data on conservation information.

CHAPTER FIVE

Conclusion

The occurrence of the 1973-74 oil embargo, which forced the United States to reassess its assumptions about energy policy, precipitated the realization that the nation does not have and will not have a free market in energy, and that fossil fuels are finite resources. Therefore, it has been the contention of this paper that the United States has entered into an "energy transition" period. Because of this transition period, America is at a critical watershed, a time when energy policies of enduring significance will be formulated.

In the years immediately following the 1973-74 oil embargo, the energy problem was viewed by the public as a technical problem to be solved by government and energy industry experts. However, with the publishing of Soft Energy Paths by Amory Lovins, this public perception eroded into a dichotomy pitting centralized energy production against decentralized energy production. The energy problem was no longer viewed as a technical or economic problem, but a problem that affects the adaptability of democratic institutions and the social and ethical vitality of our way of life.

Since there are currently examples of both soft and hard technologies in place, it would appear that discovering the appropriate mix of renewable and non-renewable energy technology is the task which lies immediately ahead. Moreover, the energy transition period will be focused on the improvement of the end-use efficiency of energy production and transmission. Because the length of the transition period is unknown, federal, state and local government must begin today to encourage and foster policies and plans that allow individuals, institutions, and communities to adapt to the energy transition

process. By providing enough time to investigate alternatives, a more orderly pace of change will occur, and impossible demands on the economy, the political system, or the entire social fabric will not be made. In light of this view, this paper has been concerned with how American communities can implement a Community Energy Management Program, and, therefore, respond to local challenges induced by changing patterns of energy supply. These challenges include various economic, technological, social, and political impacts facing communities.

Community energy management is built around a serious conservation effort, which "produces" energy by encouraging more efficient use of current supplies and is aimed at producing energy from local energy resources. The reasons why a local government and the citizenry should engage in a community energy program are linked to political, social and economic incentives. As a safeguard for democracy and to preserve self-government, a CEMP can counter-balance the institutional forces neglecting to adopt to the transition process. A less esoteric and more palatable rationale for local energy planning is the economics of conservation and local energy production. A program that can create jobs, reduce energy expenditures, attract industry, generate additional income for local business, reduce state and federal control, and strengthen national defense will surely appeal to elected officials, the business community, and the local citizenry.

In the brief history of community energy management, there have been two approaches to implementation: 1) the "traditional approach" where conservation concerns are integrated into local government policy, planning and management processes, and 2) a "participatory approach" which developed when citizen advocates promoted a local self-help strategy to encourage conservation and renewable energy use. The purpose of this paper has been to develop

an administrative model for the implementation of citizen-based energy planning within the framework of local government. This strategy has been coined the "innovative approach."

The innovative approach seeks to involve a wide spectrum of people in the policy and planning process while at the same time operating within local government. The first task in innovative community energy management is for the community to recognize and define its local energy-related problems. This requires an educational process involving elected officials, the business community, and the general public. After the recognition and definition of the energy situation, the CEMP proceeds with the formulation of policies and strategies of action to deal with energy problems from a local perspective.

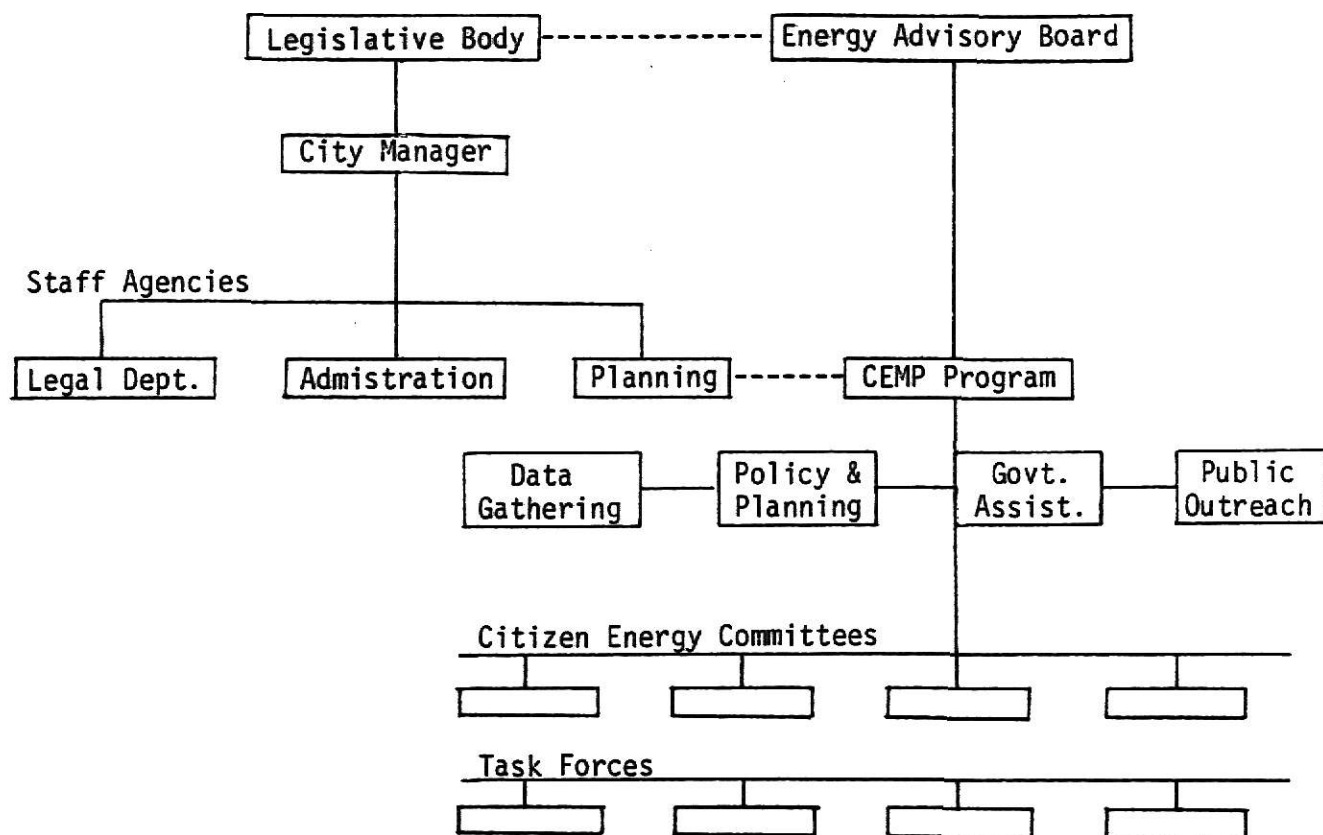
The first prerequisite for an innovative CEMP is an informed and concerned elected body willing to provide financial support for a program that seeks to change the public's perception about the present and future energy situation. This will require that elected officials are convinced that energy management is within the purview of government and that the citizens will receive a benefit from the program. The second prerequisite is that elected officials understand why a CEMP should be supported by local government, but at the same time be semi-autonomous of government staff. In other words, a cooperative public/private arrangement. Ideally, after the first several years, the CEMP should be capable of 1) improving energy efficiency in government operations and facilities, 2) setting forth policy and plans to allow for conservation and renewable energy, and 3) cultivating citizen awareness to such a degree that the public will support and participate in the energy management programs. In effect, then, the CEMP is a program where, after several years, the community has either lost interest in energy management, perhaps because of conflict, ineffectiveness, or lack of need, or the community has laid the initial

groundwork for increasing energy self-reliance and the CEMP has evolved or simply dissipated.

Citizen participation in the innovative approach serves several functions: 1) to influence individual behavior through group behavior, 2) to provide a strategy for the acceptance and implementation of the plans, and 3) to create a sense of community. When citizens have been engaged in the process of energy management strategy identification, a commitment to those plans is more likely to be achieved. While citizen involvement is a central part of the innovative approach, the ultimate decision-making authority rest with the elected officials. This is clearly illustrated in the following figure.

FIGURE 4

Organization Structure of the CEMP



The four primary components of an innovative CEMP are 1) data gathering and research, 2) policy and plan development, 3) government assistance, and 4) public outreach. The activities associated with data gathering and research include the preparation of an energy data base with projections of energy demand and supply, an energy management information system, and preliminary reports on conservation and renewable energy potential. The primary function of the aforementioned activities of the data gathering and research components are to compile information to assist in the development of energy policy and plans, and to educate the community about the local energy situation.

After completion of the energy data base and preliminary reports, the logical place to begin energy management is within local government operations and facilities. By focusing on local government, elected officials receive a direct benefit from the CEMP, i.e., reduced energy bills. Potential areas of conservation in local government include municipal buildings, vehicle fleets, street lighting, solid waste management, water and sewer treatment, police and fire protection and ancillary services such as public schools and hospitals.

The policy and plan development component is concerned with the Community Energy Management Plan, which establishes criteria for decision-making and helps coordinate and evaluate CEMP policies. In addition, this component evaluates the existing ordinances, regulations and policies to insure that they promote energy conservation and renewable energy. It is during this component that the Citizen Energy Committees are used to identify and develop the goals, objectives and strategies for community-wide conservation.

The last component of the CEMP is public outreach. This phase of the program is intended to inform the public on local energy issues and facilitate the involvement of citizens in all CEMP activities. For instance, an information center, a newsletter, radio shows, workshops, and residential energy

audit services are examples of means of reaching the public. Perhaps the most important mechanism to inform the public is with the Citizen Energy Committees. Collectively, these committees constitute the major guiding force behind the development of community energy goals, objectives, and strategies. The Energy Advisory Committee acts in an advisory capacity to the elected officials. This open and informed policymaking process is essential in order to develop effective policies adapted to local circumstances.

As with any innovative problem-solving process, there will be obstacles. Examples of obstacles facing an innovative CEMP include a legislative body not willing to support energy management, a poor level of citizen involvement, and a hostile attitude from the business community. These are just a few from a potentially long list. Because of these obstacles, it should be clear that not every community is suited to community energy management as presented in this paper. Furthermore, the key to a successful innovative CEMP is effective leadership from elected officials, and open communication throughout the entire CEMP process, as well as a CEMP Coordinator capable of generating citizen involvement and governmental support.

Notes

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A MODEL FOR THE ADMINISTRATION AND IMPLEMENTATION
OF A COMMUNITY ENERGY MANAGEMENT PROGRAM

by

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MASTER OF REGIONAL AND COMMUNITY PLANNING

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Because the era of cheap and abundant fossil fuel energy is now drawing to a close, the United States has entered an energy transition period. This period will be marked with efforts to find new energy sources to replace dwindling supplies of fossil fuels and with the job of redesigning America to operate more efficiently with remaining fossil fuels and new renewable energy sources. Since the length of the transition period is unknown, emphasis should be given to providing enough time for the United States to adapt to a diminishing fossil fuel energy base. Local governments, in the context of the need to facilitate the development of new decentralized energy technologies and energy conservation, should attempt to implement Community Energy Management Programs (CEMP).

Community energy management is devoted both to a serious conservation effort (which "produces" energy by encouraging more efficient use of current supplies) and to producing energy from local energy resources. This study presents an administrative model for the implementation of a citizen-based energy management program within the framework of local government. The model is coined the "innovative approach." The innovative approach is based on the assumption that a community's capacity to engage in cooperative problem-solving on a self-help basis will induce social action to change the vulnerable and tenuous nature of energy production and distribution.

In general, the innovative approach seeks to involve a wide spectrum of people in the policy and plan development process while at the same time working within regular operations of local government. The innovative CEMP model is viewed as a cooperative public/private program. There is an Energy Advisory Board appointed by the legislative body, which evaluates and recommends any energy policy action taken by the city. The CEMP Coordinator and staff work for this board, yet are also responsible to the city executive through the city

planning department head. Working in cooperation with the CEMP staff are Citizen Energy Committees, which assist in the identification and interpretation of energy problems, objectives and goals. This openness in development and circulation of CEMP proposals is essential to developing effective policies and to strengthen implementation.

The report concludes that the success of the innovative approach is dependent upon 1) how the elected officials and the community perceive the conditions of energy supply, 2) how effective is the leadership and communication among community leaders, the CEMP staff and the citizens involved with the planning process, and 3) how adaptive the community is to changing conditions of energy supply and demand, and of increased reliance on innovative marketplace arrangements.