THE ROLE OF LOCAL GOVERNMENT IN ENERGY PLANNING

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INTRODUCTION

Until the oil embargo of 1973-1974, American consumers in general gave little thought to using energy efficiently. The real price of energy actually fell by 28 per cent between 1950 and 1960[1] and consequently most of the existing capital stock was not designed to be energy efficient. U.S. consumption of energy increased at approximately 3.5 per cent annually, so that in 1976 Americans were using double the amount of fuel used in 1963.[2] In 1978 U.S. energy consumption totalled 77.7 quads, the equivalent of 36.7 million barrels of crude oil per day. Domestic energy production grew by 3 per cent annually between 1950-1970 but has been at a virtual standstill since 1970, so that by the time of the oil embargo, the domestic economy was easily disrupted by shortages of imported oil.

It was not until consumers were faced with a quadrupling of oil prices during the embargo and actual shortages of fuel supplies which led not only to waiting in long lines for gasoline, but even to short-term unemployment for many, that a call went out for Federal government intervention to relieve the crisis situation.

During the 93rd Congress the Energy Reorganization Act of 1974 was passed into law establishing the Energy Research and Development

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[1] Executive Office of the President, The National Energy Plan, Washington,D.C.:Government Printing Office, April 1977,p. vii.

[2] Lovins, Amory B. "Energy Strategy : The Road Not Taken", Not Man Apart, Friends of the Earth,6,20, November 1976, p.12.

Administration (E.R.D.A.), whose primary mission was to develop the necessary energy technologies to promote energy self sufficiency by 1984, and the Nuclear Safety and Licensing Commission (N.S.L.C.) to promote regulation of the growing nuclear power industry.[3]

The Congress found that:

> "there is no comprehensive national energy policy but instead Federal energy activities consist of a myriad of laws, regulations, actions and inactions resulting in narrow, short range, and often conflicting decision making by individual agencies without adequate consideration of the impact on the overall energy policy, not future energy needs; and as a consequence of not having a comprehensive national energy policy, the Nation faces mismanagement of energy resources, unacceptably high adverse environmental impacts, inadequate incentives for efficient utilization and conservation of energy resources, shortages of supply, and soaring energy prices."[4]

The energy crisis had clearly pointed out the need for a comprehensive national energy plan. Comprehensive energy planning is concerned with the collection and analysis of data on the production of energy by fuel type, its supply, availability, price, and consumption patterns. Energy planning must include the development of a legal framework for the implementation of distribution and conservation measures, both in times of emergency and during times of adequate supply. This would help to assure the continued provision of services deemed necessary for the maintenance of adequate health, safety and welfare standards, and to allow for greater stability in the economy. Energy planning must also be coordinated with and responsive to all levels of government so that energy policies will reinforce rather than negate each other. Finally, comprehensive energy planning must assess the environmental impact of

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[3]United States Congress, Energy Reorganization Act of 1974, Washington,D.C.:Government Printing Office, 1974,p.2.

[4]Ibid.,p.97.

energy production and conservation plans to assure that future generations might have similar aspirations to a high quality of life.

Proposed Solutions to the Energy Crisis

While the debate over policy and technology issues preoccupied the politicians, many of the moral implications of the energy crisis were debated at length among western intellectuals. After a flood of self recrimination about the exploitation of third world countries by energy gluttonous western society[5], global pollution, nuclear proliferation, and general disgust with the wasteful and decadent lifestyle of the West in general, the U.S. in particular[6], some solutions were proposed.

Noted environmental scientist Barry Commoner wrote that in order to solve energy problems policymakers should be guided by the second rather than the first Law of Thermodynamics[7], and that the American political system should be changed from a democracy to a socialist state.[8] British economist E.F. Schumacher wrote that victory over

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[5]The U.S. with only six per cent of the world's population consumes one-third of the energy used in the world. Further consumption data is available in Energy Alternatives: A Comparative Analysis, Science & Public Policy Program, The University of Oklahoma, Norman, Government Printing Office, 1975, Pp.1-32.

[6]For example, in Barry Commoner, Human Welfare : The End Use for Power,A.A.A.S.,1975,p.102, he asks : "Is it just that a wealthy household should contribute so much more heavily to power consumption - and therefore to the resultant pollution - than an impoverished one, when the environment is the common property of both?"

[7]The First Law of Thermodynamics states that energy in the universe is constant. The Second Law states that the entropy of the universe is constantly increasing.See Barry Commoner, Poverty of Power, New York: Alfred A. Knopf Inc., 1976, p.29.

[8]Ibid. p.258.

man's "greed and envy" would be a viable solution to the energy crisis. He wrote that we need new technology and equipment that is:

> "Cheap enough so that they are accessible to virtually everyone;
> -Suitable for small-scale application; and
> -Compatible with man's needs for creativity.
> Out of these three characteristics is born non-violence and a relationship of man to nature which guarantees permanence".9

Perhaps the most useful treatise written on U.S. energy policy was by Amory Lovins. He suggested that we must choose between two courses of action in meeting the energy challenge:

> "The first path resembles present federal policy and is essentially an extrapolation of the recent past. It relies on rapid expansion of centralized high technologies to increase supplies of energy, especially in the form of electricity. The second path combines a prompt and serious commitment to efficient use of energy, rapid development of renewable energy sources matched in scale and in energy quality to end-use needs[10], and special transitional fossil-fuel technologies. This path, a whole greater than the sum of its parts, diverges radically from incremental past practices to pursue long-term goals."[11]

Two key factors in Lovin's report are firstly, that the two paths outlined above are mutually exclusive because of the lead time required in setting up soft technologies[12] and limited capital resources. Secondly, he stresses that delay in energy conservation will only make

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[9]Schumacher, E.F., Small is Beautiful : Economics as if People Mattered, New York:Harper & Rowe Publishers Inc., 1973, p.32.

[10]For example, in using electricity to produce heat two-thirds of the original fuel energy has been wasted - Carnot's heat engine law.

[11]Lovins, op. cit.,p.4.

[12]Ibid. p.7. Lovins defines soft technologies by the following characteristics :
-they rely on renewable energy flows, such as sun and wind;
-they are diverse, so that energy supply is an aggregate of many individually modest contributions, each designed for maximum effectiveness in particular circumstances;
-they are flexible and relatively low-technology;
-they are matched in scale and in geographic distribution to end-use needs; and
-they are matched in energy quality to end-use needs.

the energy crisis a reality because a smooth transition from fossil fuels to either the nuclear solution or the renewable resource solution will require some new technologies ("bridges"), probably based on coal, which need to be developed now.

It is no small wonder that politicians charged with formulating national energy policy have been reluctant to propose quick solutions to the challenge of meeting future energy requirements. A Budget Issue Paper written for Congress in early 1977 listed another barrier to the formulation of a national energy policy. The problem is that many of the goals of energy conservation are in direct conflict with one another. For example,

> "providing low cost energy encourages energy use, which in turn generates pollution. Protecting the environment through strong regulations on air quality, strip mining, and nuclear waste disposal raises the cost of energy. Protecting the nation from supply interruptions means the creation of domestic reserves or alternative energy sources, which would raise energy costs. The efficient use of alternative energy sources, which would require modifying the regulations that currently hold down the price of natural gas and domestic oil, might adversely affect both the rate of inflation and unemployment."[13]

Policymakers must rank national priorities and there will ultimately be a tradeoff among the objectives.

The National Energy Plan

Comprehensive national energy planning became closer to a reality when the National Energy Plan of 1977 was presented to Congress and the American people by President Carter. The Plan stated that the U.S. has three overriding energy objectives :

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[13]United States Congress, Congressional Budget Office, Energy Policy Alternatives, Washington, D.C.: Government Printing Office, 1977, p.xiii.

"-in the short term to reduce dependence on foreign oil and vulnerability to supply interruptions;

-in the medium term to keep U.S. imports sufficiently low to weather the period when oil production approaches its capacity limitation; and

-in the long term to have renewable and essentially inexhaustible resources of energy for sustained economic growth".[14]

The national energy plan is based upon ten principles :

"1) The energy problem can be effectively addressed only by a government that accepts responsibility for dealing with it comprehensively, and by a public that understands its seriousness and is ready to make the necessary sacrifices.

2) Healthy economic growth must continue.

3) National policies for the protection of the environment must be maintained.

4) The United States must reduce its vulnerability to potentially devastating supply interruptions.

5) The United States must solve its energy problems in a manner that is equitable to all regions (to avoid "energy Balkanization"), sectors and income groups.

6) The growth of energy demand must be restrained through conservation and improved energy efficiency.[15]

7) Energy prices should generally reflect the true replacement cost of energy.

8) Both energy producers and consumers are entitled to reasonable certainty as to Government policy.

9) Energy resources in plentiful supply must be used more widely, and the nation must begin the process of moderating its use of those in short supply.

10) The use of nonconventional sources of energy must be vigorously expanded."[16]

In general, the President's plan was well received and marked the beginning of earnest comprehensive national energy policymaking. One study projected that implementation of the conservation element alone would save consumers $27 billion between 1978 and the year 2000.[17] This would be achieved by appliance efficiency targets which would save

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[14] The National Energy Plan, op. cit.,p.ix.

[15] This is often referred to as a "technical fix" where resources other than energy, such as design, capital, technology, etc., are substituted, so that you have the same output using less energy.

[16] The National Energy Plan, op. cit. Pp26-31.

[17] Hirst,Eric and Janet Carney,"Effects of Federal Residential Energy Conservation Programs", Science,199,4331, 28 February 1978,p.845.

20 per cent by 1980, thermal performance standards for new construction which would reduce energy used for space heating by 40 per cent and energy required for air conditioning by 30 per cent, and retrofitting (weatherization) of existing housing units which would typically save 35 per cent of energy use during the heating season.[18]

The Department of Energy

The National Energy Plan called for the consolidation of federal energy agencies into one single federal department. Creation of this 12th Cabinet department, the Department of Energy (D.O.E.) on October 1, 1977, marked the beginning of the likelihood of a comprehensive approach to national energy planning at the federal level.[19]

The new department assumed many of the functions and resources from other federal bodies in order to eliminate duplication and to centralize energy activities. It has taken over all functions from the Federal Energy Administration, the Federal Power Commission, and the Energy Research and Development Administration. Energy planning functions from the Department of Interior, the Defence Department, the Interstate Commerce Commission, and the Department of Commerce are now also incorporated in the D.O.E. in order to consolidate and coordinate energy planning.[20]

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[18]Hirst, Eric and Linda Pearlstein, "Residential Energy Use, How Much Can We Save?", Sierra, 63,2, March 1978, p.15.

[19]See Appendix 1 for the outline of purpose of the U.S. Department of Energy.

[20]United States Department of Energy, Organization and Functions Fact Book, Washington, D.C.: Government Printing Office, September, 1977, Pp. 3-4.

The National Energy Act

On October 15, 1978 passage of the National Energy Act (N.E.A.) further strengthened the new department's ability to implement a national energy policy. Energy Department Secretary James Schlesinger said that the N.E.A. would help to decrease oil imports by:

> "-replacing oil and gas with abundant domestic fuels in industry and electric utilities;
> -reducing energy demand through improved efficiency;
> -increasing production of conventional sources of domestic energy through more rational pricing policies; and
> -building a base for the development of solar and renewable energy sources."[21]

The N.E.A. is composed of five bills: The National Energy Conservation Policy Act of 1978, the Powerplant and Industrial Fuel Use Act of 1978, the Public Utilities Regulatory Policy Act, the Natural Gas Policy Act of 1978 and the Energy Tax Act of 1978.[22]

The Conservation Policy Act includes weatherization grants to low income families, energy conservation loan programs, energy audits for public buildings, appliance efficiency standards, automobile fuel efficiency standards and solar demonstration programs. The Industrial Fuel Use Act prohibits new oil and gas fired boilers and establishes an $8 million pollution control program to reduce the negative impacts of increased coal production. The Public Utilities Regulatory Policy Act sets standards on rate design, sets rules favoring industrial cogeneration establishes a loan program for small hydro projects, and funds additional university coal research laboratories. The Natural Gas Policy Act lifts price controls on new gas as of January 1, 1985 and gives the President

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[21] D.O.E., Energy Insider, 1, 28, October 1978, p.4.

[22] Ibid., p.1.

the authority to declare an emergency if a gas shortage is imminent. The Energy Tax Act provides for residential tax credits for insulation and conservation and solar applications, business energy tax credits, it sets a graduated excise tax on gas guzzling cars, and exempts gasahol from excise tax.

Although the N.E.A. is a weaker version of the proposals submitted by the President in his National Energy Plan of 1977, the D.O.E. still predicts a reduction of oil imports by 1985 and a savings of 2.5 to 3 million barrels of oil per day as a result of the new legislation.

Coordination of Federal Energy Policy with State and Local Government

In order to carry out federal energy planning policies, a framework for delegation of certain responsibilities to state and local governments has been established. Firstly, the D.O.E. Organization Act sets out the relationship with states in Section 103:

> "Whenever any proposed action by the Department conflicts with the energy plan of any State, the Department shall give due consideration to the needs of such State, and where practicable, shall attempt to resolve such conflict through consultations with appropriate State officials. Nothing in this Act shall affect the authority of any State over matters exclusively within its jurisdiction".

The Act also established an Office of Intergovernmental Affairs which is charged with:

> "assuring that national energy policies are reflective of and responsible to the needs of State and Local governments, and for assuring that other components of the Department coordinate their activities with State and Local governments, where apporpriate, and develop intergovernmental communications with State and Local governments". (Section 203 (a) (6)).

Two Divisions in the Office of Intergovernmental Affairs are charged with specific liason with State and Local governments. They are the Division of City and County Relations and the Division of State

Relations. The following objectives serve as a guide to their implementation of Section 203 (a) (6):

> 1. To develop a variety of mechanisms which provide a strong voice and a fully active role for States and Local governments in the development and implementation of national energy policies and programs.
> 2. To identify and remain fully cognizant of the energy needs and desires of State and Local governments and to insure that this information is always available to other components of the Department.
> 3. To serve as a linkage between our State and Local constituencies and the various programmatic areas of the agency to facilitate communication, arrange for assistance(financial, technical, or advisory) and to promote a better understanding of our interdependency.
> 4. To serve in liason capacity for State and Local governments so that such representatives always have a "window" into the agency and a readily identifiable entity who will serve (when it is consistent with national energy programs and priorities) in a position of advocacy.[23]

The Division of State Relations is responsible for State briefing packages and papers, Federal region liason, nuclear waste issues, the Energy Emergency Management Information System (E.E.M.I.S.), and day to day operations. The Division of City and County Relations is responsible for the Local Government Outreach Program, the Local Government Energy Advisory Committee, awarding urban consortium grants, community assistance programs, and day to day activities.

In addition to these formally delegated intergovernmental relationships, the Federal government has delegated many other energy planning functions to State and Local governments. For example, the Community Services Administration's Weatherization program which filters down money to State Economic Opportunity Offices and Community Develop-

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[23]Information received from correspondence with Mr. William Peacock, Director, Intergovernmental Affairs Office, U.S. Department of Energy, December 27,1977 and November 7, 1978.

ment Corporations is designed to:

> "enable low-income individuals and families, including the elderly and the near poor, to participate in energy conservation programs designed to lessen the impact of the high cost of energy on such individuals and families and to reduce individual and family energy consumption".[24]

Other examples of federally financed projects at local and state level are D.O.E. Solar Heating and Cooling Demonstration projects[25], D.O.E. grants to cities to help them develop methods for adapting energy technologies to urban needs[26], D.O.T. grants for bicycle lane networks, and H.U.D. grants for solar water heating systems for single family homes. By disseminating grants such as these the federal government enables communities to share the benefits of energy research and development.

Federal money is also being channelled into states for the purpose of developing statewide energy conservation programs. The Energy Policy and Conservation Act (E.P.C.A.) of 1975 authorized $50 million per annum for 1976-1978 to be used by the states to produce state energy conservation plans. Funding was contingent upon a projected energy use reduction of 5 per cent or more by 1980. State plans had to contain the five following elements: mandatory lighting efficiency standards for public buildings, programs promoting carpooling, mandatory

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[24]Community Services Administration, A Community Guide to Weatherization, Washington, D.C.: Government Printing Office, September, 1975, p. 30.

[25]U.S. Department of Energy, Solar Heating and Cooling Demonstration Project Summaries, Washington, D.C.: Government Printing Office, May 1978.

[26]In October 1978 the D.O.E. awarded $878,000 to Chicago, Baltimore, Seattle, Los Angeles County and Dade County for projects designed to be transferable to other cities and urban areas. D.O.E. press release, October 25, 1978.

energy efficiency standards for state procurement practices, mandatory thermal efficiency and insulation standards for new and renovated buildings, and provision for motorists to make a right turn on a red light.[27]

The Energy Conservation and Production Act (E.C.P.A.), August 14, 1976 authorized $25 million for fiscal year 1977 and $40 million for 1978 and 1979 for supplemental state energy conservation programs. These plans had to include provision for public education, coordination of state and federal programs, and procedures for conducting building audits.[28]

With federal funds available for state and local government energy planning, it would be wise for them to make use of these resources and "devise energy conservation programs that reflect their own preferences rather than invite future federal intervention and control of yet another matter with significant state and local impacts"[29] because of poor local and state response to planning opportunities.

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[27]Harrington, Winston, Energy Conservation: A New Function for Local Governments? Chapel Hill, N.C.: Center for Urban and Regional Studies, University of N. Carolina, 1976, p.49.

[28]"Energy audit" refers to the ways energy is lost in a system. It concentrates on the distribution system (pipes, ducts, etc.) and the applications (production processes, space conditioning, materials handling, etc.) to identify losses and possible reductions in needs. See Looney, Quentin, "Energy Audits and Information Systems", in Energy Management Seminar Proceedings, Institute of Electrical Engineers Inc., New York, 1977, Pp.35-41.

[29]Harwood, Corbin Crews, Using Land to Save Energy, Cambridge, Massachusetts : Ballinger, 1977, p.4.

State Energy Planning

State energy offices were established in response to a growing awareness of the need for energy planning. In many states fuel shortages were directly responsible for cutbacks in manufacturing and consequently higher short-term unemployment rates, closing of schools, and rapid increases in utility rates. The grave political consequences of inaction probably gave the state energy planning effort its greatest boost.

New Jersey was the first state to establish a State Department of Energy in April 1977, and by now most states have either created their separate D.O.E.'s or have an Energy Office within the Executive branch of government.

States are responsible for policy which can influence energy use in the following areas:

> "-Exercise of controls over land use, environmental effects, and facility siting;
> -Utility regulation;
> -Imposition of taxes and subsidies;
> -Energy conservation policy actions; and
> -Control of resources on state-owned land."[30]

Because of this wide regulatory authority it is apparent that the energy planning emphasis taken by a state will set the tone for any action or inaction by local governments.

The federal government has delegated energy planning to the states in three main areas. In the maintenance of the E.E.M.I.S. the states are fact gatherers of data for federal energy decision making. The states will also play a major role in utility reform programs guided by federal objectives. Finally, the states will serve as educators in the pilot

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[30]Ahearn, William, Ronald Doctor et.al, Energy Alternatives for California: Paths to the Future, California: The Rand Corporation, 1975 p.9.

Energy Extension program funded in ten states.[31]

Local Government Energy Planning

After the oil embargo some local governments acted immediately to incorporate energy planning into community development goals and to implement energy conservation programs. Davis, California and Portland, Oregon are among the best examples of this. However, the vast majority of local governments are still not actively engaged in comprehensive energy planning.

One example of state coordination with local government energy planning is in the state of Oregon. In 1973 Oregon Senate Bill 100 authorized the state land use agency, the Land Conservation and Development Commission (L.C.D.C.), to review all local plans to determine whether they conform to state goals. Energy conservation was included as one of the state goals with which major projects had to comply.

> "The Oregon L.C.D.C. review gives local governments a high degree of flexibility in determining the relative weight given to energy considerations by giving them the right to list reasons for non incorporation of a goal, including the goal of energy conservation, if it does not match overall community development goals. Choices range from a locality requiring maximum energy conservation at all times to a situation where energy conservation is only one of many considerations to be weighed in developing a comprehensive plan."[32]

Because of the extreme emergencies that could develop in the larger metropolitan areas in case of energy supply interruptions, most major cities have now developed their own contingency plans and many are making use of federal grants for demonstration programs. It is encouraging to note the high degree of success that some cities have had

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[31]U.S. D.O.E., Energy Reporter, November 1977, p.2. The States are: Alabama, Connecticut, Michigan, New Mexico, Pennsylvania, Tennessee, Texas, Washington, Wisconsin, and Wyoming.

[32]Harwood, op.cit., p.50.

when their emergency plans were put to the test even though stiff penalties of 50 per cent billing surcharges or even five-day power shut offs had to be drawn up to ensure adherence to conservation goals.[33]

Federal delegation to local government in the coordinated planning effort lie mainly in the area of conservation through such items as reviewing local building codes to improve the thermal efficiency of new buildings, retrofitting existing housing, regulating the traffic flow, demonstration projects of wide applicability, and so on.

Statement of the Problem

Because of the complexity of devising a comprehensive energy plan and the distinct characteristics of each community, it is essential that local government take the initiative for developing and implementing an energy plan of action. Each community should attempt appropriate energy resource management techniques that will work and are suitable for that community.

There are several reasons for local government involvement in energy planning:

> "First, a municipality has the capacity to influence how energy is used at the local level by virtue of its planning and other regulatory powers. Second, a municipality can save on energy costs, for itself or for the community it represents. Third, a municipality would be wise to develop some measure of loacl energy self-reliance if possible. Finally, energy considerations can reinforce other municipal objectives such as efficient land use and environmental protection."[34]

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[33]For example, the commercial sector in Los Angeles cut energy use by nearly 30 per cent and residential and industrial use dropped by 10 per cent during the winter of 1973-1974 by voluntary conservation coupled with stiff sanctions. See F.E.A. Office of Conservation and Environment, "How Business in Los Angeles Cut Energy Use by 20 per cent", *January, 1975*.

[34]Bryant, Pamela and Anne Golden, What Can Municipalities Do About Energy? , Canada: Bureau of Municipal Research, 1978, p.i.

Other considerations include the need for emergency allocation programs in the larger metropolitan areas where the health, safety and general welfare of the population would be in jeapordy if essential services were cut.[35] In smaller communities needed capital improvements may have to be delayed if scarce financial resources have to be diverted to meet increasing energy costs. For example, in a statewide survey of cities and counties in Texas it was found that capital improvement programs were adversely affected in 17 per cent of responding local governments during the energy crisis of 1973-1974.[36]

Because of the unique energy requirements of each community it is proposed that local governments incorporate energy planning and development policies in their general plan. One reason for this is that:

> "Although the Federal government can establish the broad contours of a national conservation program, the intelligent and efficient use of energy resources is, in the final analysis, dependent upon local consumption patterns."[37]

In the State of Kansas Planning Statutes 12-704,[38] which outlines the powers and duties of the planning commission with regard to the comprehensive plan and its review, provision is made for showing the general location, extent, and relationship of the use of land for major utility facilities. What this has usually meant is the inclusion of a

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[35]See Edward H. Allen, Handbook of Energy Policy for Local Governments, Massachusetts: Lexington Books, 1975, for model ordinances to deal with the setting up of emergency programs.

[36]Calderon, Cinda Martin and David W. MacKenna, Energy and Local Government: A Report to the Cities and Counties of Texas, Arlington: University of Texas, September 1974, p.74.

[37]Collins, Eugene N. "Conservation of Energy in Chattanooga", Municipal Attorney, January 1975, p.12.

[38]League of Kansas Municipalities, Kansas Planning Laws, May 1976, p.52.

map in the comprehensive plan showing the location of utility lines and probably listing the name of the energy suppliers somewhere in the text. The philosophy of comprehensive planning is that it is incremental, growing to meet the needs and complexity of the community. It is important therefore that the resource conservation element be reviewed to accomodate the changing conditions brought about by energy shortages.

Energy planning bears a direct relationship with a local government's ability to deal with development. For example, if a community is seeking stability via the "managed growth" concept, it must assess the level at which new housing starts can be accommodated by the utility company which is serving the community in order to maintain the quality of life for those already there while continuing to provide the same level of services to newcomers at a reasonable cost.

> "More and more local governments are engaging in planning to ensure that they do not find themselves overwhelmed by the burdens associated with growth while their neighbors attract only the benefits. The Ramapo (Golden v. Planning Board of the Town of Ramapo, 30 N.Y. 2d 359,285,N.E. 2d 291,334,N.Y.S. 2d 138, appeal dismissed, 409 U.S. 1003 (1972)) and Petaluma (Construction Industry Assoc. of Sonoma County v. City of Petaluma, 522 F 2d 897 (9th Cir. 1975) cert. denied, 424 U.S. 934 (1976)) cases, which tested the right of localities to control the timing and extent of their growth provide evidence that localities are beginning to use their land management tools with more sophistication, although perhaps to the detriment of surrounding areas."[39]

It must be remembered however, that the landmark Ramapo case might not have been upheld without the comprehensive plan which showed that the proposed growth management system was a rational response to the threat of overwhelming growth pressures.

In a community that is seeking growth, there must be data

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[39]Harwood, op. cit. p.48.

available to assure in-coming industries that energy needs can be met. This information should be readily available so that costly consultant fees can be minimized and so that no time is lost in gathering the information needed for decision making.

> "If the goals of growth and development are to similtaneously achieve community balance, enhance economic growth and increase productivity, maintain the environment, and enhance overall quality of life, then the weight of energy considerations is unclear. Energy conservation may, in fact, rate rather low among competing objectives, so that sub-optimal energy conservation becomes a more realistic possibility."[40]

Local government can be an effective unit for energy planning. The three primary tools of local government planning are zoning, subdivision regulations and other development codes, and capital improvement programming. Before these can be implemented the law states that a comprehensive plan must be adopted by the governing body. If provision is made within the comprehensive plan for energy planning, it could be implemented through the traditional local planning tools, education and demonstration programs, and quite possibly, new legislative and regulative procedures.

This report will examine the potential for local government involvement in energy planning. Energy planning policies and implementation guidelines will be suggested from which local governments may adopt selectively those policies which conform to individual community development goals. The community must obtain information needed to optimize energy use and to allow for stability and to promote a high degree of energy independence. The following chapter will examine how three communities have responded to this challenge.

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[40] Metropolitan Washington Council of Governments, Energy, Land Use and Growth Policy: Implications for Metropolitan Washington, Second edition, 1975, p.7-2.

Chapter 2

SELECTED EXAMPLES OF ENERGY PLANNING BY LOCAL GOVERNMENTS

This chapter will examine how three communities are working toward meeting the energy challenges that they each face. The communities chosen for this report are Garden City and Wichita, Kansas, and Davis, California. They were selected because data on their energy planning activities was available to the author through field study and library research. One common goal shared by these communities is their expressed commitment to the conservation of energy. This chapter will also briefly review the state legislation of both Kansas and California as it relates to the local government planning effort.

Energy Planning in the State of Kansas

Energy planning in the state of Kansas is focussed in the Kansas Energy Office (K.E.O.) established in 1975. The K.E.O. is attached directly to the Governor's Office and is charged with emergency fuel allocation, conservation, public education, liason with Federal and Local governments, collection and analysis of energy data, and on-going research. The K.E.O. has an operating budget of $614,000 for fiscal year 1979. The State of Kansas provided $89,000 of this and the balance is federally funded, mostly by the D.O.E. for energy conservation programs.[1] Planning activities are presently focussed on the development of a data bank, the Kansas Energy Information System, to enable supply and demand forecasting.

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[1]Information from correspondence with Jan Johnson, Assistant Director, Planning and Research, Kansas Energy Office, November 28,1978.

K.E.O. local government assistance to date has been mainly in offering grants totalling $40,000 in 1978 for the administration of Project Conserve, a residential energy use audit and evaluation of cost effective conservation alternatives for homeowners. Nine cities took part in the program.[2] A very similar project was undertaken in the state of Kentucky as a 4-H youth project.[3] Future K.E.O. local government assistance programs anticipated include a demonstration of computerized school bus routing, educational programs in local government procurement practices, maintenance and building engineers workshops, conservation in small businesses, vanshuttles, and municipal energy awareness.

The relevance of any of the above programs in effectively promoting significant energy conservation is questionable. For example, the computerized school bus routing would probably only have applicability in perhaps two of 105 counties. It is disconcerting that the state cannot put forward a more substantial commitment to the people of Kansas in promoting a degree of energy autonomy that will, in the final analysis, be a major factor in determining the rate of economic development in Kansas.

The Kansas State Economic Opportunity Office has also participated in the state energy conservation effort. The Crisis Intervention Program, which helped low-income families pay fuel bills during the heating season, assisted 400 families with an average annual grant of $55 each to pay towards their fuel bills. In its administration of the

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[2]The cities were Wichita, Great Bend, Dodge City, Agra, Chanute, McPherson, Neodesha, Downs, and Roseland.

[3]Fehr, Robert L. et.al. "Statewide Program Involving a Computerized Analysis of Home Energy Reduction", Paper presented at the winter meeting, American Society of Agricultural Engineers, Chicago, Dec.1977.

Community Services Administration's Weatherization Program, the S.E.O. granted $194,000 for the weatherization of 2,701 homes in Kansas as of May 1977.[4]

Energy has been relatively abundant in the state of Kansas. For example, the state generated 92 per cent of its own electricity in 1974. Kansas ranks as the nation's fifth largest producer of natural gas, but official predictions are that this resource will be depleted by the end of the next decade.[5] The state has a particularly high rate of natural gas usage in that natural gas is used to provide 76 per cent of total industrial needs, 70 per cent of residential needs, 59 per cent of commercial energy needs, and 57 per cent of the total energy generated.[6] Passage of the 1978 Powerplant and Industrial Fuel Use Act (in the National Energy Act of 1978) means that major changes in power generation procedures are ahead for Kansas because of restrictions on new gas fired boilers. Residential and commercial usage of natural gas will also be affected. Hookups for new construction have been denied in certain circumstances[7] and the State Corporation Commission has issued mandatory insulation and air conditioning efficiency requirements for all new construction.[8] Legislation aimed at strengthening the state's energy conservation potential is summarized in Table 1.

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[4]State Economic Opportunity Office, Kansas, State Energy Conservation Plan, May 1977, Appendix E.

[5]League of Women Voters of Kansas, Energy in Kansas, 1977,p.2.

[6]MathTech Inc.,The Ozarks Regional Commission, Regional Energy Alternatives Study: Kansas Summary, 1977,p.13.

[7]For example, the Gas Service Company has placed a moratorium on new gas hookups in Burns, Kansas since 1973 and local spokesmen feel that this has had a direct effect on preventing growth. See Wichita Eagle, May 31, 1977 p.1.

[8]Kansas Corporation Commission, Docket No. 110,766-U.

Table 1

State of Kansas
Energy Conservation Bills Passed 1975-1978*

1975	
SB 13	Created Kansas Energy Office.
HB 2969	Income tax credit and 60-month amortization for solar installations.
1977	
HB 2096	Creation of written solar easements.
SCR 1601	Directs Secretary of Administration to consider solar energy and energy conservation designs for all state construction.
SB 14	Income tax credits for solar installations.
HB 2618	Property tax rebate on residential solar installations and income tax deductions on home insulation.
SB 152	Allows two or more cities operating electric generating systems to create a municipal energy agency for the purpose of securing reliable energy supplies.
HCR 5031	Directs the Kansas Corporation Commission to study electrical rate structures and consumer conservation measures as means of extending the state's energy supply.
HB 2582	Clarifies the rulemaking authority of the Kansas Energy Office regarding the priority system of allocation of available energy supplies during an energy emergency.
1978	
SB 512	Prohibits the sale of thermal insulation unless it meets standards approved by the State Fire Marshall and the Kansas Consumer Protection Agency.
SB 546	Income tax deductions for insulation installation.
Sub HB 2698	Utility companies must file regulations restricting connections to residential, commercial or industrial structures which do not comply with heat loss standards and energy efficiency ratios for airconditioners and heatpumps adopted by the Kansas Corporation Commission.

*Source: 1975- Paine, Sally "Safe Energy Laws in the States", Critical Mass Journal,4,6, September 1977,p.8.
1977-Kansas Energy Office, Kansas Energy Newsletter, 12,May/June 1977.
1978-Legislative Research Department, Kansas Legislature Summary of Legislation, 1977,1978.

Some of the problems associated with energy legislation in Kansas stem from the fact that laws may give the appearance of being token legislation passed in order to meet the minimum requirements for gaining federal grants. For example, the C.S.A. Weatherization Program administered by the state stresses prevention of infiltration by a multifaceted approach, i.e. use of storm doors and windows, caulking, weatherstripping, and insulation, and the Federal government allows tax credits for all of these. Yet the state will only give credit for one weatherization item, i.e. insulation. It might be argued that the near poor do not commonly file an itemized tax return, but on the other hand perhaps weatherstripping is more affordable than insulation, or more effective in infiltration penetration, yet this would not qualify for a state tax credit. Although the state provides solar installation credits there are few solar houses in Kansas and the examples of solar technology applications in the state are predominantly federally rather than state subsidized.[9]

Probably the more serious complaints about Kansas state legislation lie in two areas of energy planning delegated to the State Corporation Commission. Firstly, the 1978 regulations setting minimum standards for heat loss and energy efficiency ratios for air conditioners and heat pumps for new construction before connection to utilities are not standards for maximum energy conservation.[10]

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[9] D.O.E., Solar Heating and Cooling Demonstration Project Summaries, op.cit.

[10] By setting "minimum" standards this may be interpretted as maximums by builders and homeowners. While they may increase energy conservation levels over past efforts, they should in no way be considered optimal. If treated as such they may be responsible for inefficient energy use and eventually lead to considerable cost burdens on homeowners. See U.S. Department of Commerce, National Bureau of Standards, Retrofitting Existing Housing for Energy Conservation, Washington,D.C.:Government Printing Office, December, 1974.

The 1977 directive to the K.C.C. to study rate structures in order to extend the state's energy supply has not been fruitful. A study by the Electric Power Research Institute[11] has suggested such ratemaking principles as: basing rates closer to marginal costs, using time-differentiated pricing, and offering interruptible service.[12] These principles might facilitate load management to such a degree that peak demand could be reduced and consequently the need for costly additional generating capacity would also be reduced. At present, in the state of Kansas, the price of electricity declines proportionately with additional use (this is known as declining block rate).

In spite of the lack of a strong state level energy conservation program, due in part to a "growth-at-any-cost" position taken by the state[13], a recent history of relatively plentiful fuel resources, and a population characteristically slow to adapt to change, some local governments have begun to plan for greater self reliance in meeting their future energy needs.

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[11]Electric Power Research Institute, Rate Design and Load Control, Electric Utility Rate Design Study, Palo Alto, 1977.

[12]Marginal cost pricing refers to the consumer paying the true marginal(incremental) cost of adding one more kilowatt of electricity to the generating plant.
Time differentiated pricing gives consumers a reduced rate for using power in the off-peak periods, such as very early in the morning, and charging more for electricity in peak usage periods, such as late afternoon.
Another alternative rate is the lifeline rate which has a low cost initial block which then increases in price proportionately to increased usage. This rate was originally intended as a social welfare measure but it was found that not all small users of electricity were poor and not all poor people are small users of electricity.

[13]A survey of local governments in Kansas by the State Department of Economic Development found that in spite of energy shortages, population growth, industrial development and annexation of adjacent areas still appear to be goals that are actively pursued. Planning Division,K.D.E.D., Kansas Energy Policy Study, July, 1974, p.95.

Energy Planning in Garden City, Kansas

Garden City is one example of a community which is struggling with the many questions posed by an uncertain energy future. It lies in the southwestern corner of Kansas and is a prosperous and growing service center of 20,000 people. The economy is based on an extremely productive agricultural sector and manufacturing. Average daily temperatures range from 21.1°F. in January to 78.5°F. in July, with the average annual temperature being 54.5°F. Although the area receives 18.93 inches of rain as an annual average, this has not been enough for the demands of current land use and so groundwater irrigation is used as a supplement. Because of declining water table levels, the conservation of water is another issue of local importance with, in turn, its own energy component and similar resource issues.

When one reads about the geology of the area around Garden City it is remarkable that energy conservation has received so much attention. Garden City lies on the edge of the Hugoton-Panhandle gas field, which is 160 miles long and 50 miles wide. This gas producing area accounted for approximately 18 per cent of the 1962 nationwide sales by producers to natural gas pipeline companies.[14] Although production has peaked, it is estimated that remaining reserves in the field are 39,000 billion cubic feet.[15] Production in the Kansas section of the field was 515,516,082 m.c.f. in 1977.[16]

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[14]Federal Power Commission, Docket AR64-1, p.6.

[15]International Petroleum Encyclopaedia, p.240.

[16]Information from the Kansas Geological Survey.

A public opinion survey taken by People's Natural Gas in Garden City during 1977 posed many questions about future perception of the length of availability of natural gas for the home.[17] Whereas 72.9 per cent of those responding to the survey were confident that supplies would be available in the next five years, only 32.9 per cent felt that it would be available in twenty years from now. The survey also found that the majority of homeowners had added insulation, installed storm doors and windows, and had lowered thermostats to conserve energy.

In order to address the many issues related to future energy resources, the Garden City Energy Conservation Advisory Board was established by Governing Body Resolution in March 1978. It is composed of seven members who are appointed by the mayor with Governing Body concurrence. The Board is made up of a diverse group of people with a common commitment to the study of energy and its local application.

The main role taken by the Energy Board to date has been in publicizing the benefits of energy conservation in the local media, through special projects and energy workshops. The Energy Board, in a joint effort with the City of Garden City and the local utilities, sponsored energy contests where citizens competed against themselves in reducing water, electric, and gas consumption rates between 1977 and 1978. Results of the competition showed just how effective conservation measures can be as the winner of the electricity unit lowered home consumption by 67.64 per cent between 1977-1978, and the water conservation winner reduced usage by 61.8 per cent during the same period.

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[17] People's Natural Gas Survey taken by P.N.G., 2223 Dodge St., Omaha, Nebraska,68102 during 1977.

The Energy Conservation Advisory Board meets monthly and is constantly studying energy issues and their local application. Recent items on the agenda have included the review and investigation of alternative fuel supplies and a feasibility study for paper recycling. It is important to note that the Garden City energy planning effort has been funded entirely from municipal utility funds, without federal or state support.

Energy Planning in Wichita, Kansas

With a population of 260,000 Wichita is Kansas' largest city and in many ways serves as a model city for the rest of the state. The economy is based on the aircraft industry, manufacturing, retail trade, and agriculture. Wichita State University and a private 4-year college are located in Wichita. The city is also the home of McConnell Air Force Base.

Average daily temperatures in Wichita range from 31.3°F. in January (4700 heating degree days) to 80.7°F. in July (1500 cooling degree days).[18] Annual average precipitation is 30.58 inches, falling mostly during the warm season. Winds are predominantly from the south and average 12.7 miles per hour.

Energy planning in Wichita city government is performed by the Energy Office in the Department of Housing and Economic Development.

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[18]The daily degree statistic is calculated by subtracting the mean temperature for the day from a base temperature of 65°F. For example, if the mean temperature was 45°F. then 20 heating degree days would be accumulated, and if the mean temperature was 78°F. then 13 cooling degree days would be accumulated. The winter degree days is an effective measure of season heating needs. Summer cooling is compounded by other factors, especially humidity, that makes cooling degree days an ineffective measure of cooling needs.

Energy activities are divided into three broad areas: administration, the home insulation program, and the energy test facility. The city hall staff of three deals with administration, research, and public relations. One of the major projects undertaken by Energy Coordinator, Dr. James Myers, has been the establishment of the Wichita Energy Commission in September 1978. The Commission includes elected city, county, state and federal representatives and a liason staffer from the Kansas Energy Office, thereby enabling the city government to present its concerns directly to the lawmakers.

The broad program areas of the Energy Commission are: to develop a contingency energy emergency management plan, to formulate a city-wide comprehensive energy policy, and to serve in an advisory capacity in the study of long-range energy policy for the City of Wichita and its environs.[19] The Office of the Energy Coordinator is also working with Wichita State University's Engineering Department on a Continuing Education Grant from the Department of Health, Education and Welfare to coordinate exchanges on energy planning experiences with ten other cities and universities.

The second branch of Wichita's energy planning activities is the home insulation program. A staff of five, including clerical personnel, administer this program. Zero interest loans are distributed to eligible homeowners[20] for the purpose of increasing the home's attic

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[19] City of Wichita, Ordinance No. 35-615.

[20] Eligibility is determined by family income. For example, a family of 4 earning less than $7,520 per annum have up to five years to repay the zero interest loan. See Christopher Perleberg, The City of Wichita's Home Insulation Loan Program, Wichita State University, Department of Mechanical Engineering, September 1978, p.9.

insulation. The city building code sets an R-19 minimum standard for attic insulation. Funds for the program come from a Community Development Block Grant. Over 3,500 city residents have utilized these loans between 1976 and 1978.

The third area of city energy activities is the city energy test facility. The city acquired a 1,200 square foot single storey frame house in a deteriorating neighborhood that has been extravagently retrofitted with miscellaneous energy saving devices donated by local inventors and energy companies. The test house staff of five serve in various public relations capacities, giving tours of the house, distributing pamphlets on energy conservation, and compiling statistics on equipment in the house. Once a year the test facility hosts an energy fair so that the public can view energy exhibits by local companies. The City of Wichita was aerially photographed in March 1978 at night with thermal sensing techniques to show heat loss through building roof tops. Energy test facility staff help citizens interpret these thermograms to determine if additional attic insulation is needed in individual homes and businesses.

Wichita's future energy planning activities face major challenges. Funding for most programs has been met by Community Development Block Grants, so new sources must be found before they are phased out in just two year's time. The only funding available to the city from the state this year is a Stage II grant for Project Conserve. The U.S. Department of Energy has subsidized solar installations in two private commercial buildings, the La Quinta Motor Inn and the medical offices of Charles Henning,M.D., as part of the federal solar heating and cooling demonstration program.

The biggest energy issue facing the city is its heavy reliance on natural gas. All major industries use natural gas, nearly all homes are heated by natural gas, and nearly all the city's electricity is generated by burning natural gas.[21] While some major gas users joined together in 1975 to obtain long-term gas supplies[22] the majority of energy consumers are faced with rising gas prices and the very real prospect of shortages. Wichita is already losing potential in-coming industry. For example, a General Motors truck plant decided not to locate in Wichita in 1978 because the city could not assure the company that future energy needs could be met.

In 1978 Wichita posed a referendum on whether the city should issue industrial revenue bonds for construction of a $1.25 billion coal gasification plant. The proposal was rejected and no alternative solution to meeting future energy needs has been put forward since then even though optimistic energy demand forecasts predict an annual energy growth rate of 1.5 to 2.5 per cent.[23] It seems that the major thrust of the Energy Office activities, that of energy emergency management, might currently be the most realistic investment of time and money for the City of Wichita.

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[21] The Wichita Eagle, "Our Energy Search", November 1977, p.6.

[22] Wichita's Industrial Energy Corporation is composed of Boeing, Coleman, M.B.P.X.L., Cessna, Beech, Gates Learjet, Dubuque Packing, and the City of Wichita.

[23] Wichita City Ordinance 35-615, p.3.

Energy Planning in the State of California

California state policy illustrates an innovative and decisive approach to meeting the challenges of an uncertain energy future. State energy legislation passed in California since 1975 is summarized in Table 2. The most significant advances in California have been in the area of solar energy. Homeowners are eligible for a 55 per cent tax credit for solar installations and this, coupled with flexible long-term financing available from many Californian finanical institutions, has enabled 50,000 Californians to live in solar equipped homes.[24] Other state legislation contributing to the growth in solar industry are further tax incentives, research grants, and a requirement that state buildings use solar water heating systems.[25]

The California Public Utilities Commission has predicted that natural gas prices will increase 90 per cent by 1984 as a result of federal deregulation of natural gas prices[26] and so installation of solar equipment is a rational economic response for many Californians.

State energy legislation gave private industry a boost that has since gained momentum. Some beneficial spinoffs from the popularity of solar energy in California are that the state predicts the solar industry will provide 50,000 new jobs in the 1980's and will generate $5 billion worth of business during the decade.

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[24]The cost of an average solar water heating unit installed is between $2500 and $4000.

[25]Over 50 state buildings are already equipped with solar water heaters.

[26]The Denver Post, "Solar Energy Thrives in California's Political, Social Climate", January 28, 1979, p.36.

Table 2

State of California
Energy Conservation Bills Passed 1975-1978*

1975	
AB 1265	Allows gas and electric corporations to institute home insulation assistance programs.
AB 1575	Amends Public Resources Code promoting conservation, alternative energy.
1976	
AB 2740	Provides for local option to orient buildings for solar installations.
AB 2820-2822	Prohibits siting of nuclear fission thermal power plants pending development of nuclear reprocessing technology, nuclear waste disposal technology, and studies of berm containment.
AB 3590	Provides for a geothermal task force.
AB 3658	Regulates utility oil sales revenues and rates.
AB 3833	Provides for Energy Commission research and development of alternative energy demonstrations.
AB 4032	Ties utility rate increases to alternative energy investments.
AB 4195	Provides for experimental utility rates to encourage energy conservation.
SB 218	Solar tax deductions.
SB 1524	State funded insulation and solar energy loan program.
1977-1978	
AB 2225	Authorizes Savings and Loan Associations to make loans to promote the efficient use of energy.
AB 2321	Makes it a misdemeanor to allow vegetation to shade more than ten per cent of a solar collector surface between 10 a.m. and 2 p.m.
AB 2636	Encourages all Californian schools to purchase recycled paper.
AB 2976	Requires the Energy Commission to fund a state wind program.
AB 3012	Requires the State Solid Waste Management Board to study the feasibility of recovering methane gas.
AB 3046	Requires the Energy Commission to conduct a statewide competition to select outstanding passive solar residences.
AB 3247	Requires the Public Utilities Commission to investigate financing solar energy systems for utility customers.
AB 3250	Establishes a solar rights bill to: void restrictions that prohibit solar energy systems; require subdivision maps to provide for future use of passive solar; and to allow the cost of obtaining a solar easement to be a tax credit.

*Source: Paine, Sally, "Safe Energy Laws in the States", Critical Mass Journal, 4,6, September 1977, p.7.
Energy Resources Conservation and Development Commission, State of California, Legislative Summary,1977-1978.

Table 2 (continued)

AB	3324	Requires the Energy Commission to develop a plan for maximum solar implementation in California by 1990.
AB	3539	Requires the Energy Commission to develop a program to increase the use, quality, and cost effectiveness of energy surveys to the public.
SB	1633	Sets insulation materials standards.
SB	1767	Gives the Energy Commission authority over the use of generating facilities upon declaration of an energy emergency.
SB	1834	Requires the Department of Water Resources to study the feasibility of equipping existing dams with electrical power generating facilities.
SB	1855	Amends laws pertaining to the State Litter Control, Recycling and Resource Recovery Fund and the Revenue Bond Law of 1941 to assist financing of solid waste projects.
SB	2066	Appropriates $15 million for use in a coal gasification demonstration program.

Complete solar subdivisions are now becoming feasible because of state solar policy and rising fuel prices.[27] Village Homes Development in Davis, California is among the best examples of this because of its design features. While supportive state policy alone cannot guarantee success in energy planning, it certainly seems to have given impetus to local government energy planning activities in California.

Energy Planning in Davis, California

Perhaps the most widely publicized energy planning effort by a unit of local government has been that of Davis, California. Davis is a town of 36,000 just twelve miles east of Sacramento. The economy is supported for the most part by a branch of the University of California, a major Land Grant Institution, and a productive agricultural hinterland. The climate is mild, average daily temperatures range from 45°F. in winter (2819 heating degree days) to 95°F. in summer (1063 cooling degree days). Cool evening breezes from the south through the Carquinez Straits help to moderate summer temperatures. Annual average rainfall is 18 inches and falls mainly in the winter months.

It was not until the 1972 update of the General Plan that development goals were brought into focus. After extensive citizen review it became clear that a growth management program was favored to protect prime agricultural land.[28] Davis began to study energy

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[27] Homebuyers are becoming aware of the need: to buy on the basis of first cost plus operating cost; to be aware of the short amortization period of the additional first cost; and to realize the value of an energy efficient structure in terms of resale potential at some future time when energy prices are even higher than they are today. Hittman Associates, Technology Assessment of Residential Energy Conservation Innovations, Columbia, Md., 1975, p. vi-2.

[28] City of Davis, General Plan, adopted 1973, revised 1974-1978, proposed a population ceiling of 50,000 by 1990.

conservation in earnest after a 1972 report on energy consumption by a citizen's advisory group found that Davis residents used a third more electricity per capita than the U.S. average.[29] The city hired Living Systems, a solar design, research and consulting firm to design a local building code to reduce energy use. Financial assistance for the project was obtained from the University of California and a H.U.D. Innovative Project Grant. Two major products of the H.U.D. grant were the Davis Energy Conservation Report and the Energy Conservation Building Code Workbook which clearly outline the means to achieve a reduction in the use of energy.[30]

A twelve point conservation program forms the basis of the Davis energy planning project.

1) Building Code - the aim of the Davis Energy Conservation Code is that new construction should meet specified thermal efficiency standards.[31] The regulations offer two alternative means for compliance. Path I is a set of prescriptive standards and Path II is a set of performance standards.[32] The Path I prescriptive standards has been

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[29]Hunt, Marshall and David Bainbridge, "The Davis Experience", Solar Age, May 1978, p.20.

[30]Living Systems, Davis Energy Conservation Report - Practical Use of the Sun, H.U.D. Innovative Project, April 1977.

[31]For example, a 1500 square foot detached single family dwelling can lose no more than 208 B.T.U.'s/sq.ft/day in winter and gain no more than 98 B.T.U.'s/sq.ft/day in summer.

[32]Performance standards will allow any plausible solution to be used as long as it satisfies the desirable set of standards outlined within the text of the code. Prescriptive standards set forth minimum requirements in terms of particular materials, systems, designs and construction methods. See Lee, Dr. Kaiman and Stuart L. Rehr, Energy Conservation and Building Codes, Boston, Mass.: Environmental Design and Research Center, 1977, p.4.

most widely used by builders. Some specification for Path I include: a light colored roof with a Munsel rating of 6-10, six inch insulation (R-19) as a minimum in the roof, three and a half inch insulation (R-11) in the walls between the studs, light colored or shaded exterior walls with a limit of 15 per cent dark allowed for trim, glazing limited to 12.5 per cent of the floor area for apartments with an additional 20 square feet of window allowed for single family residences, and unshaded glazing limited to 1.5 per cent of the floor area.[33]

Path II describes a calculation technique to achieve minimum performance standards. It generally provides for greater design flexibility. For example, if the design calls for more window area, then the builder can substitute additional insulation in the ceilings and walls or devise an interior shutter system to compensate.

2) Lot orientation - over 80 per cent of the lots approved since 1976 are north-south oriented.[34] This allows for greater effectiveness of solar heating during the winter months.

3) Fence and Hedge Regulations - these have been modified to allow placement closer to the street when the house faces the south to enable low-angled winter sun to enter the window and heat the residence.

4) Solar driers - clotheslines which were banned in the past because they were considered to be unaesthetic are no longer prohibited and new multi-family dwellings are required to provide clotheslines for the occupants.

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[33]The Elements, The Davis Experiment, Public Resource Center, 1977, p.10.

[34]McGregor, Gloria S., "The Davis Program", Practicing Planner, December, 1978, p.33.

5) Swimming pools - the city has restricted pool heating systems to solar systems, and pool owners with gas systems will be required to convert to solar within ten years.

6) Home occupation ordinance - the city encourages cottage industries such as photography, crafts, etc. that do not involve the sale of merchandise from the house or generate above normal traffic. Employment is restricted to the family with one additional non-family employee. The ordinance aims to cut down on the energy spent in commuting and to reduce new building construction in Davis.

7) Street widths - local streets are recommended to be reduced from 34 to 28 feet wide in order to reduce asphalt usage and to slow down traffic. Collector streets are recommended to be 38 feet wide, and cul-de-sacs 25 feet wide.[35]

8) Recycling - Davis Waste Removal collects newspapers, glass and cans at curbside and breaks even by selling $3,000 worth of recyclables every month.

9) Bicycles - over 19,000 bicycles were registered with the city in 1977. The city encourages bicycle use by providing bikeways and encouraging shade tree planting along the sides of the roads to moderate the microclimate.

10) Buses - Davis uses second hand double decker diesel buses to provide public transportation at minimum cost and energy usage.

11) Trees - the city is planting deciduous trees to allow for summer shade and sun in winter. Parking lots are required to have 50 per cent

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[35]Hammond, Johnathon et.al., A Strategy for Energy Conservation, City of Davis, 1974, p.36.

of the lot shaded. Drought tolerant species are used wherever possible. 12) All new construction is to be in energy conserving planned developments. Developer Mike Corbett's Village Homes are a good example of what he calls the "new kind of lifestyle" based on resource conservation and a shared sense of community.[36] Grants from H.U.D. in 1976-1977 for solar heating and cooling systems and solar water heating systems, and D.O.E. demonstration grants in 1978 for solar water heating systems show that the development has gained in federal government favor since the early '70's when the F.H.A. disallowed low interest housing loans in the development because of objections to design features.

Conservation operations within day-to-day city activities are steadily improving. City vehicles are chosen according to energy use and cost with less concern given to comfort or convenience. For example, larger Plymouth Furys were replaced with Chevrolet Novas and Honda CVCCS. Street lighting is being spaced further apart and high pressure sodium vapor lights are replacing incandescent and mercury vapor street lights. Energy used for lighting in city buildings is being reduced by the use of fluorescent rather than incandescent lights, and by using lighter wall and ceiling colors.

Success of the Davis program can be measured in at least two areas. Firstly, acceptance of the building code requirements by local developers and secondly in the actual energy use reductions achieved. Builders were skeptical about being able to pass on the added costs of

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[36] For details of the Village Homes Development see Robert DePrato, "The Village", Solar Age, May 1978, pp.24-26 and Richard Nilsen, "The Transformation of the Tract Home", The CoEvolution Quarterly, Summer, 1977, pp. 62-65.

energy conservation measures, averaging $254 per house,[37] and about the building inspector's ability to work with the new building code. While booming sales have been the response to the first question, time and experience have solved the second. In terms of actual energy saved, between 1973 and 1978 per household energy consumption dropped by 18 per cent.[38]

Summary

In each of the three communities observed there was an expressed commitment to the conservation of energy. While there were differences in size, population, climate, economic base, energy requirements, and so on, it is clear that in the case of another oil embargo or in a situation where natural gas prices were to double, that the Davis community would probably be less disrupted than either Garden City or Wichita. If this were so, then perhaps we should be looking at the transferability of the energy planning program used in Davis, or perhaps it would be beneficial to propose other suitable policies available for a local government to pursue in order to attain some degree of energy autonomy. In either case, it appears that public commitment to energy conservation coupled with innovative state policy are factors contributing substantially to the probability of success for local government energy planning.

The case studies point out that an energy conservation program appears to be most successful when it is a part of an overall resources

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[37] Living Systems, Davis Energy Conservation Report, op.cit., p.116.

[38] McGregor, op.cit., p.34.

management program. Both in Garden City, where a declining water table has become an issue of major concern, and in Davis, where preservation of prime agricultural land from urban development is a major conservation challenge, the general public has become increasingly responsive to a wide range of environmental issues, which include the conservation of energy. Both Garden City and Davis have placed a high degree of emphasis on the importance of public participation in the formulation of energy policy, and in on-going educational and demonstration projects. In contrast, the City of Wichita shows a poor energy track record despite substantial financial backing from both the state and federal government, largely because of the city's political visibility. The Energy Office itself faces problems such as having its offices and staff physically dispersed and poorly accommodated, its future sources of funding in question, and resultant low staff morale. Future energy supplies for the city are in question, and in general energy conservation seems to be a low priority for the people of Wichita.

The following chapter will examine various energy conservation policies for local government to pursue where they may be appropriate in the city's overall development objectives.

Chapter 3

ENERGY PLANNING OPTIONS FOR LOCAL GOVERNMENTS

When a community has made the commitment to optimize energy use within various energy systems which may change over time, there are several options available to implement this goal.[1] The first step might be to formally incorporate energy goals into the general plan. Citizen participation in plan formulation might possibly be responsible for more meaningful support of the goal of energy conservation. An example of a goal statement might be simply that "the City and County shall pursue land use planning that will maximize potential for energy conservation".[2] Another example of a stated energy goal would be "to implement the concept of stewardship and conservation regarding the utilization of exhaustible energy resources, including the improved efficiency of the development of land and supporting systems, and prepare for the conversion to new energy sources as technology and financial feasibility permit".[3]

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[1] Branch, Melville C.,"Goals and Objectives in Civil Comprehensive Planning", Urban Planning Theory, Dowden,Hutchinson & Ross,Inc., Pennsylvania, 1975, p.274. "Goals are desires or intentions, whose nature is so general and hopeful, and whose attainment is so indefinite and distant that they cannot be expressed as part of the comprehensive plan. They set the direction toward which planning objectives are oriented. Planning objectives are those intentions which have been identified, examined, and adopted by such an analytical process."

[2] Albuquerque-Bernalillo County, New Mexico Comprehensive Policies Plan, 1975.

[3] Energy goals adopted by the Lincoln, Nebraska City Council and Lancaster County Board of Commissioners after a Joint Public Hearing. Quoted in Harwood, Corbin Crews, Using Land to Save Energy, Massachusetts Ballinger Press, 1977, p. 239.

Once a general statement of purpose has been incorporated into the city's general plan, specific policies and objectives which are appropriate to the individual needs of the community may be proposed for implementation. This report does not give an exhaustive listing of the policies which may prove to be beneficial to every community because of the distinctive characteristics each possess, however, it will list activities currently undertaken throughout many local governments which may be selectively adopted to meet the needs of individual communities.

The five main policy areas suggested are: municipal energy use, land use, transportation, housing and building codes, and renewable resources. These policy areas were selected because local government can influence energy end use in these areas most significantly. Energy end use in the United States is summarized in Table 3.

Municipal Energy Use Policies[4]

- establish an energy emergency program in case of supply interruptions;
- investigate the availability of long term fuel supplies;
- establish a liason with state and federal agencies for both technical and financial assistance, and to coordinate programs;
- compile and maintain a data bank on consumption of energy by economic sector;
- establish a citizen's advisory energy council to investigate possibilities for energy conservation;[5]

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[4]A H.U.D. study found that a city government's share of community energy consumption is about 10 per cent. A survey of six mid-sized Massachusetts towns divided energy use into: municipal buildings (70-80 per cent), vehicles(10-15 per cent), and street lighting (10-15 per cent) Mounts, Richard, "What Cities are Doing about the Energy Crunch and what Remains for Them to do", Nation's Cities, March 1978, p.4.

[5]Cassidy, Robert, "A Few Cities aren'a Waiting for the Next Energy Crisis", Planning, February 1977, p.25.

Table 3

Energy End Uses, United States, 1968

Industrial Sector		41.2%
Primary metals	9.0%	
Chemicals	8.0%	
Petroleum refining	5.0%	
Food	2.0%	
Paper	2.0%	
Other	15.2%	
Transportation Sector		25.2%
Automobiles	13.0%	
Trucks	5.0%	
Airplanes	2.0%	
Railroads	1.0%	
Other	4.2%	
Residential Sector		19.2%
Space heating	11.0%	
Water heating	3.0%	
Cooking	1.0%	
Refrigeration	1.0%	
Air conditioning	1.0%	
Other	2.2%	
Commercial Sector		14.4%
Space heating	7.0%	
Air conditioning	2.0%	
Feed stocks	1.6%	
Water heating	1.0%	
Refrigeration	1.0%	
Other	1.8%	

*Source: Socolow, Robert H., "Energy Conservation in Housing: Concepts and Options", in Robert W. Burchell and David Listokin, Future Land Use, New Jersey: Rutgers, Center for Urban Policy and Research, 1975, p.315.

- issue in house memoranda urging staff to maximize energy efficiency by taking such measures as setting thermostats to 65°F. in winter and 80°F. in summer, turning off lights when not in use, encouraging carpooling to and from work, and set targets within each department for energy use reduction;

- conduct an energy audit of all municipal buildings, including schools, hospitals, libraries, etc. which are supported by local taxes and make the necessary adjustments to achieve energy efficiency.[6] The movement begun in California to limit property taxes (Proposition 13) makes this action particularly appropriate;

- all new municipal construction should at least meet the energy standards recommended by the American Society of Heating, Refrigeration and Airconditioning Engineers (ASHRAE 90-75);

- reduce water consumption where possible to save on energy used in pumping for distribution;

- when purchasing new vehicles for the city or county fleet consider "life-cycle cost", i.e. the lowest cost over the operating life of the vehicle, rather than the lowest initial cost;

- restrict the use of city vehicles where possible by using the telephone instead, or by combining trips;

- improve vehicle maintenance to achieve optimum energy efficiency;

- establish a "bike pool" for employees to use on short trips around town;

- optimize street lighting by spacing lights further apart where this does not jeapordize safety, and by using sodium vapor lights or other energy efficient lighting rather than incandescent fixtures;

- restrict commercial and ornamental lighting;

- consider the feasibility of collecting trash once weekly and help lower the amount of trash generated by adopting local returnable bottle laws, etc.;

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[6] The U.S. Department of Energy, Office of State and Local Programs, has published a series of Energy Audit Workbooks, Washington, D.C. Government Printing Office, 1978, written for schools, hospitals, etc. that is a useful guide to indentify energy conservation opportunities.

- promote trash separation at the point of origin to facilitate recycling;

- consider laying narrower streets in new residential areas in order to conserve asphalt, reduce speeds, and increase the potential shaded area;

- maintain sidewalks in good repair to encourage pedestrian traffic, and provide curb cuts so as not to impede the movement of wheelchairs and baby carriages;

- work with local utilities to provide consumer information on energy saving;[7]

- establish an on-going public education program;[8]

- implement demonstration programs for energy efficient development such as solar greenhouses, urban agriculture, etc.

Land Use Policies

- permit planned unit developments which provide for clustering of buildings, variable density, and mixed land use thereby reducing the need for travel by private automobile;[9]

- allow for greater density in housing to cut down on both individual residential energy consumption and on the cost of extending municipal services;[10]

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[7]The San Diego Gas and Electric Company Marketing Division, for example, has prepared several publications on energy conservation that are applicable to residential, commercial, industrial, and agricultural sectors of the economy. San Diego Gas and Electric Conservation Programs, 1976-1977.

[8]For example, encourage awareness of energy consumption in the selection of household appliances. Seidel, M., Energy Conservation Strategies, U.S. Environmental Protection Agency, 1973, p.v. Comer Taylor,"Planning and Energy Conservation", Practicing Planner, June 1978, suggests a travelling energy show to visit schools and civic organizations, and the use of the local media to pass along the message of energy conservation.

[9]Harwood, op.cit. p. 107, "As P.U.D.'s are subject to site plan review, opportunities are provided for analyzing the energy efficiency of the road network, landscaping, and other individual features as well as the overall project."

[10]A study by the Real Estate Corporation, The Costs of Sprawl, prepared for the U.S. Council on Environmental Quality, Washington, D.C., 1974, found that high density planned communities use 44 per cent less energy than unplanned, sprawling communities. See David Mosena, "Site Design: Can it Really Save Energy?, Planning, December 1977, p.23.

- transfer development rights, where the density of development has a degree of flexibility as the right to develop land can be bought and sold, may be appropriate;

- consider delaying annexation of adjoining land until vacant land within the city limits has been fully utilized;

- consider "land banking" where the city may acquire open land on the fringe of the city and restrict its use until the pressure of growth necessitates its development;

- encourage the clustering of retail, professional and industrial services along major thoroughfares to facilitate the use of mass transit;[11]

- require large developments to state how they will deal with the energy impact of their proposals;[12]

- revise subdivision regulations to facilitate optimum solar orientation, setbacks, etc.;

- permit small offices or home industries to be established in single family homes provided that they do not generate excessive traffic or unduly alter the character of the neighborhood by the use of large signs, etc.;

- promote activities that reduce energy use such as community gardens.

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[11]The City of Portland has mapped five "energy zones" based on the relative efficiency of energy use to prioritize capital improvements expenditure. The most highly efficient energy zone is: served by transit, sewered, within one mile of the central business district, within 1/8 mile of 1995 transit routes, 1/3 mile of major shopping centers, and 1/2 mile of industrial or commercially zoned land. The least efficient energy zone is the unsewered and all areas outside the present city boundaries. U.S. Department of Housing and Urban Development, Energy Conservation Choices for the City of Portland, Oregon, Washington, D.C.: Government Printing Office, 1977, p.12.

[12]Items such as availability of housing that is reasonably accessible to the place of employment, accessibility to community facilities and public transportation, anticipated trip generation rates both within and beyond the development, and transportation energy demands created and so on, must all be considered in the energy impact statements required by the South Florida Regional Planning Council.

Transportation Policies

- encourage the use of mass transit by providing economic, reliable, regular and safe service to the public;
- provide "park and ride" areas on the fringes of the city to cut down on inner city traffic congestion;
- deter the use of private vehicles downtown by imposing high parking fees, restricting the creation of new parking lots, and by putting a time limit upon on-street parking;
- reserve traffic lanes for carpool users and buses;
- establish reversible lanes for peak hour flow;
- encourage the use of bicycles or light motorcycles by providing lanes separate from vehicular traffic;
- synchronize traffic lights;
- restrict the development of "drive-in" facilities;
- encourage delivery service by local businesses.

Housing and Building Code Policies

- update zoning regulations and building codes to encourage the construction of energy efficient structures;[13]
- require certification as to energy efficiency in all new construction;
- do not discourage retrofitting of existing homes by reappraising energy conservation expenditures to increase property and other taxes;
- protect homeowner's investments in solar equipment by adopting and enforcing solar rights ordinances;
- encourage the use of solar water and space heating;
- encourage the planting of shade trees and windbreaks around buildings to modify the effects of the climate;

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[13]Examples of standards can be found in U.S. Department of Commerce, National Bureau of Standards, Design and Evaluation Criteria for Energy Conservation in New Buildings, Washington, D.C.: Government Printing Office, 1976, or in the revision of this, ASHRAE 90-75, Energy Conservation in New Building Design.

- encourage multi-family housing which uses less energy than detached, single-family dwellings;

- consider setting energy efficiency standards in existing buildings that must be met before allowing the transfer of title in a sale;

- develop programs which reward energy efficiency.

Renewable Resources Policies

- encourage recycling of solid waste material;[14]

- investigate the feasibility of biomass conversion whereby organic wastes, such as municipal sewage, can be converted to a fuel substitute;

- use the "waste heat" that is a by-product of the electrical generation and transmission process (referred to as co-generation);[15]

- encourage the use of renewable resources such as direct sun, wind, hydro (especially low head hydro), geothermal heat, etc.

Implementation

Implementation of energy conservation techniques is made possible by using the two main areas of a city's powers, the police power and the taxing power. The police power governs all matters affecting the health, safety, morals and general welfare of the citizens within the government's jurisdiction. Enforcement of zoning ordinances, land use laws,

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[14]The City of Milwaukee (population 700,000) converts 90 per cent of its annual 250,000 tons of solid waste to recoverable resources such as metals, glass and paper. The refuse-derived fuel produced in this process is used by the Wisconsin Electric Power Company in supplementary coal fired burners to generate electricity. Bryant, op.cit., p. 27.

[15]To achieve energy savings with cogeneration it requires that the powerplant be in close proximity to energy consumers and that the community be densely populated. Scandinavian experience suggests that hot water for space heating and for heating domestic hot water can be economically supplied to densities as low as four dwelling units per acre. The technology which captures the waste heat is referred to as a modular integrated utility system. H.U.D. has set up such a demonstration project in Jersey City, N.J. See Harwood, op.cit., p.23.

building codes, etc. are within the authority of the police power. In order to be upheld in court, the police power must have a legitimate objective, i.e. the promotion of the health, safety, morals and general welfare, and the means used to regulate must be reasonable and not unduly harsh or oppressive to any segment of the community. The economic importance of energy conservation and the potential threat to society caused during supply shortages make energy regulation a valid application of the police power.

The taxing power may be used to discourage waste of energy by imposing taxes on products or activities which contribute to excessive energy use. Surcharges on parking fees and gasoline purchases are examples of this. Municipal taxing power may also be used as an incentive to energy conservation by allowing tax credits or exemptions on weatherization of residences or installation of solar devices.

The implementation of energy conservation measures by local government is facilitated by the use of a plan to guide progress. A plan should set realistic, attainable goals and contain the following elements:

> "How energy is used today, a sector-by-sector analysis of energy end use to compare against standards;
> Ways to save - list and evaluate specific conserving actions;
> Ways to implement - examine educational, incentive and mandatory implementation techniques;
> Conservation choices - potential programs are created by combining "ways to save" with "ways to implement". The costs and the savings resulting from each conservation choice can be calculated;
> Impacts - describes the consequences of price increases and supply cutbacks on the city if it fails to establish an energy conservation program".[16]

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[16]U.S. Department of Housing and Urabn Development, Energy Conservation Choices for the City of Portland, Oregon, op.cit.,p.39.

The success of the energy conservation program will depend upon the commitment and the cooperation of many individuals. Adherence to conservation policies by municipal employees sets a good example for the rest of the community to follow. Because of higher fuel prices and the movement around the nation to cut local taxes, it is becoming increasingly important that cities show responsibility in the use of the resources charged to them.

It is also important that local governments work closely with community leaders to ensure that energy policy complements other community objectives. The local utility company may be among the most knowledgeable sources to rely upon for assistance in devising a public education program. It would also be advisable for the municipality to be in close and constant contact with state and federal energy officials for both financial and technical assistance, demonstration programs, planning and allocation programs, coordination, etc.

Federal Support for Innovative Local Government Policies

Several communities have developed programs to save energy at the local government level. Success is a positive feedback because innovative communities have established an energy track record that enables them to gain federal grants for continued energy planning and research. For example, the D.O.E.'s State and Local Policy Division studied eight of the more innovative communities [17] to find out what local government was doing in the context of energy emergency

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[17] D.O.E. Local Role Study, September 1978, selected the following communities for further study because of their innovative approach to energy planning: Suffolk County(Boston) Mass., Allegheny County (Pittsburgh) Pa., Dade County(Miami) Fla., Dallas County (Dallas) Tx., Los Angeles County (Los Angeles) Ca., Alameda County (Oakland) Ca., King County (Seattle) Wa., and Hennepin County (Minneapolis), Mn.

preparedness, energy planning and analysis, energy conservation and management, coordination of energy-related government activities, and coordination of local government with the community. In turn, this study not only designated standards, but has generated additional funding for these communities.

Another example of federal support for local government energy planning is H.U.D.'s Office of Policy Development and Research's funding of three demonstration programs developed to show how communities can integrate energy conservation concerns into ongoing policy, planning and management processes of local government.[18] It must be realized that no matter how strong and well planned that the national energy policy may be, its ultimate success will be greatly influenced by cumulative individual energy use that is reinforced to a large degree by local government policy.

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[18]U.S. Department of Housing and Urban Development, op.cit., preface. The Massachusetts Department of Community Affairs assisted small cities through a program of training, technical assistance and information dissemination involving the testing and implementation of conservation measures in municipal buildings operation, street lighting and fleet management. Anaheim, California, in conjunction with nine other California Innovative Group Cities surveyed existing energy conservation practices and developed a model energy conservation plan and energy audit procedure. Portland, Oregon, developed a comprehensive energy conservation plan assessing potential energy savings of alternative conservation programs and recommending changes in municipal codes and ordinances and capital budgeting procedures.

Chapter 4

CONCLUSION

During the first quarter of 1979 national attention was again focussed on America's energy problems because of a nine per cent price increase in imported O.P.E.C. oil[1] and the threat of a melt-down at the Three Mile Island nuclear powerplant in central Pennsylvania. However, government statistics continue to show that each year Americans are using more and more energy in spite of higher prices[2] and Presidential requests that energy use be cut back.

In Europe the cost of energy is considerably higher than in the U.S.A. and governments have been quick to act to discourage higher energy consumption rates. In Denmark, for example, the government has taken measures to require mandatory building and appliance performance standards, set quotas on energy consumption, increase energy prices, and conduct public education programs to achieve the goal of a low energy society. Energy policy analysts in Europe recommend no growth in energy consumption for the dual purpose of achieving economic and environmental integrity.[3]

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[1]The price of Mideastern crude oil was $2.80 per barrel in October 1973, $10.84 in January 1974, $12.70 in July 1977 and $14.54 in April 1979. U.S. News & World Report, April 9, 1979, p.20.

[2]For example, despite a 17 per cent increase in gas prices in Los Angeles there was no difference in consumption, i.e. gas prices are elastic to demand. This trend holds for other sources of energy as well. See Schneider, Alan M.,"Elasticity of Demand for Gasoline", Energy Systems and Policy,1,3, 1975,pp.277-286.

[3]Norgard, Jorgen Stig, "Towards a Low Energy Society", Paper presented at the Second Open Discussion on Nuclear Energy, organized by the European Communities in Brussels, 24-26 January, 1978.

Planning for energy conservation is an appropriate and valid expenditure of time and resources of local governments.[4] The authority of local governments to implement energy planning recommendations comes from the police power and the municipal taxing power. The police power governs all matters affecting the health, safety, morals and general welfare of the citizens within that government's jurisdiction. Enactment of zoning and land use laws, housing and building code requirements are examples of energy responsive development codes that would come under the police power. Municipal taxing might be used to encourage energy conservation by adding surtaxes to gasoline and parking fees or by granting exemptions or credits for home weatherization and other energy efficient property improvements.[5]

Appropriate areas for local government action in energy planning lie in traditional tools of zoning, subdivision, and capital improvement programming. Additional emphasis might be given to educational and demonstration programs and new procedures designed to meet changing needs.

Some barriers to the implementation of local government energy planning cited are lack of money and technology, political obstacles

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[4]"It is the responsibility of governments to participate in meeting energy needs without neglecting other needs and considerations relating to the quality of life of the individual and of society and the respect for the environment. Local authorities must play an essential part by means of territorial planning in support of national planning to lessen energy requirements".
Economic Commission for Europe, "The Impact of Energy Considerations on the Planning and Development of Human Settlements", Ekistics, 269, May 1978, p.196.

[5]For a detailed discussion on municipal authority in energy planning see H.U.D. , Energy Conservation Choices for the City of Portland, Oregon, op.cit., Volume 4, "Model Local Code Revisions for Energy Conservation",pp. 8-39.

such as lack of leadership and knowledgeable people and low energy costs and lack of interest by the public.[6] Perhaps the most serious obstacle of all the above is the public lack of interest in energy conservation. For example, while the majority of new housing construction meets minimum standards for thermal efficiency, the majority of new houses sell "whether or not they are well-designed or well-sited or well-built".[7] Even in energy saving developments such as the new towns of Reston, Va. and Columbia, Md. where schools, shopping and recreation are in easy walking distance, apparently most residents still prefer to drive.[8] However, in the case of another "energy crunch" these people do have the option of walking. Places without this option are out of luck.

In spite of the apparent obstacles and the relatively long-term required before the benefits associated with land use planning for energy efficiency are realized in many communities, it would be advisable for local governments to investigate fully the opportunities for energy planning. Their very future may depend upon it.

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[6]The true cost of imported oil is potentially three times its current price in U.S. markets. Stobaugh, Robert and Daniel Yergin, "After the Second Shock: Pragmatic Energy Strategies", Foreign Affairs, April 1979, p.867.

[7]U.S. Department of Energy, Energy Insider, March 19, 1979, "Energy Efficient Builder Saving 80 per cent in Home Heating Costs", p.C4.

[8]Silverman, Jane,"Energy Conservation Through Community Planning and Design", A.I.A. Journal,66, October 1977, p.48.

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APPENDIX

The Department of Energy Organization Act (Public Law 95-91, Section 102, 95th Congress) outlines the purpose of the department:

"- to achieve effective management of energy functions of the Federal Government, including consultation with the heads of other Federal departments and agencies in order to encourage them to establish and observe policies consistent with a coordinated energy policy, and to promote maximum possible energy conservation measures in connection with the activities within their respective jurisdictions;

- to provide for a mechanism through which a coordinated national energy policy can be formulated and implemented to deal with the short-, mid-, and long-term energy problems of the Nation; and to develop plans and programs for dealing with domestic energy production and import shortages;

- to create and implement a comprehensive energy conservation strategy that will receive the highest priority in the national energy program;

- to carry out the planning, coordination, support and management of a balanced and comprehensive energy research and development program;

- to place major emphasis on the development and commercial use of solar, geothermal, recycling and other technologies utilizing renewable energy resources;

- to continue and improve the effectiveness and objectivity of a central energy data collection and analysis program within the Department;

- to facilitate establishment of an effective strategy for distributing and allocating fuels in periods of short supply and to provide for the administration of a national energy supply reserve;

- to promote the interests of consumers through the provision of an adequate and reliable supply of energy at the lowest reasonable cost;

- to establish and implement through the Department, in coordination with the Secretaries of State, Treasury, and Defense, policies regarding international energy issues;

- to provide for the cooperation of Federal, State, and Local governments in the development and implementation of national energy policies and programs;

- to foster and assure competition among parties engaged in the supply of energy and fuels;

- to assure incorporation of national environmental protection goals in the formulation and implementation of energy programs, and to advance the goals of restoring, protecting, and enhancing environmental quality, and assuring public health and safety;

- to assure that the productive capacity of private enterprise shall be utilized in the development and achievement of the policies and purposes of this Act;

- to provide for, encourage, and assist public participation in the development and enforcement of national energy programs;

- to create an awareness of, and responsibility for, the fuel and energy needs of rural and urban residents as such needs pertain to home heating and cooling, transportation, agricultural production, electrical generation, conservation, and research and development;

- to foster insofar as possible the continued good health of the Nation's small business firms, public utility districts, municipal utilities, and private cooperatives involved in energy production, transportation, research, development, demonstration, marketing, and merchandising; and

- to provide for the administration of the functions of the Energy Research and Development Administration related to nuclear weapons and national security which are transferred to the Department by this Act."

THE ROLE OF LOCAL GOVERNMENT IN ENERGY PLANNING

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AN ABSTRACT OF A MASTER'S REPORT

submitted in partial fulfillment of the

requirements for the degree

MASTER OF REGIONAL AND COMMUNITY PLANNING

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KANSAS STATE UNIVERSITY

Manhattan, Kansas

1979

Until the Arab oil embargo of 1973-1974 and the resultant quadrupling of crude oil prices and widespread fuel shortages, energy planning was low on the list of priorities for government in the United States at all levels. National energy functions were dispersed among at least seven government agencies before the creation of the U.S. Department of Energy in October 1977. Since the new department was created and in spite of additional energy-related funding both energy costs and energy consumption have continued to rise.

Some local governments have taken steps to incorporate energy planning in their communities. By implementing a twelve-point conservation program, the City of Davis, California, for example, managed to reduce city-wide energy consumption by more than eighteen percent since 1973. Several other communities have also developed innovative methods of using traditional land-use and capital improvements tools, along with educational and demonstration programs to implement the goal of energy conservation in harmony with other community development goals.

This study investigated the progress of energy planning in Davis, California and in Wichita and Garden City, Kansas to determine if the adoption of energy conservation policies could make a difference in meeting the problems of higher energy prices and the possibility of fuel supply interruptions. A list of energy planning policy options was proposed from which local governments could select those which would be appropriate to their needs in reducing energy consumption.

The report concluded that local government can be an effective agent in helping to optimize community energy use. While federal and state financial and technical resources can supplement the local

planning effort, its ultimate success will depend upon the commitment of community leaders to pursue the goal of energy efficiency and the willingness of the general public to reorient their lifestyles to the changing demands of a low energy society.