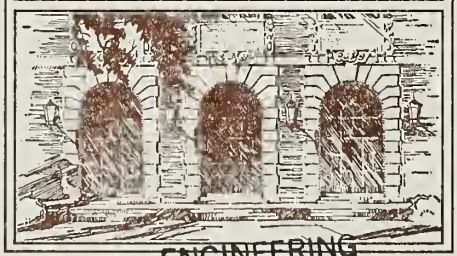

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ENERGY AND THE REGIONAL PLANNER

by

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ABSTRACT

A land use planner can substantially affect energy demand in many ways. The planner designs the constraints within which the residents of an area choose to adopt energy conserving or energy wasteful lifestyles.

This paper defines the energy impact of planners' decisions, and develops a way of thinking about energy so it can be considered at every stage of the comprehensive planning process. Suggestions are offered for designing features into a community to insulate it from the instabilities of energy shortages and expected price increases.

TABLE OF CONTENTS

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INTRODUCTION

Events during the recent energy crisis emphasized the extent of our dependence on energy. It has taught us that our economic system is like the ecosystem: everything is connected to everything else, and energy is what does the connecting.

It is important for planners to expand their way of thinking about energy, to be able to identify its potential impacts on every element of a comprehensive plan. It is not sufficient to consider only direct requirements for energy, that consumed in the form of gas, oil, or electricity. For a region or community, we must consider the energy indirectly needed to supply the inhabitants with all the goods and services they demand. Everything has an energy cost, for energy is a necessary input to virtually every phase of the production processes for all goods and services.[1] If we consider this energy as "embodied" in the goods and services, we enlarge our view of energy flow through a region. Besides the direct energy flows, we must consider the indirect energy embodied in the goods and services entering and leaving a region.

With such a picture of energy flow, the planner can consider more options for energy conservation, and anticipate potential impacts of energy shortages on his region or community.

In the next section, the energy dependence of a community is described in more detail. Second, the outlook for energy supplies and prices are discussed from the point of view of the planner who must consider real contingencies. Finally, specific examples are given to demonstrate how regional planners can incorporate energy into various phases of the planning process.

THE ENERGY DEPENDENCE OF A COMMUNITY

Of our nation's total energy demand, only about one-third is consumed directly by individuals in the form of electricity, gas and oil.[2] That means about two-thirds of every individual's energy demand is consumed by commerce and industry in response to his demands for goods and services such as food, clothing, cars, education, etc. The same thing holds for a community; less than half of the energy is consumed directly by individuals, more than half goes to supply the other goods and services purchased by the inhabitants. The energy requirements of a community then depend upon its lifestyle. To describe the lifestyle of a community, we must consider the totality of all consumer decisions made by the residents.

This brings us to the planner's role. The resident of a sprawling suburb makes an independent consumer decision to purchase a second car and gasoline rather than bus tickets. The decision was not totally the individual's; the planner had a hand in it, because he designed the ground rules within which individuals make their decisions. By carefully designing other constraints such as subdivision regulations, PUD provisions and transportation system plans, planners can have a substantial impact on individual citizens' decisions to adopt energy intensive or energy conserving lifestyles.

To the extent planners can influence government spending, they can affect the community's energy dependence in a second way. Just like individuals, governments are consumers when they purchase construction and paving materials, electricity, office supplies, etc. Studies have shown, for example, that spending $5 billion on highway construction requires nearly three times as much energy and creates fewer jobs than spending an equal

amount on mass transit, and that spending a given amount of money on national health insurance creates more jobs and consumes less energy than building dams and channelizing rivers.[3, 4]

ENERGY IN THE COMMUNITY

Too often, our vision of the ideal future community contains only the benefits of energy consumption. The social and environmental costs of energy are often far removed from its benefits; sometimes naturally, sometimes by plan.

We must expand our vision of the ideal community to include all the strip mines that it needs; the nuclear power plants; all the off-shore drilling platforms; and all the filthy smoke produced by burning energy. In the past it has often been quite easy for planners to leave these things out of the picture, to assume that they will be someplace else.

But in the future the picture will be different, for a new kind of shortage looms on the horizon. The United States may run short of people too poor or ignorant to fight a strip mine, a radioactive waste disposal site, or freeway exhaust fumes. The day has passed when the wealthy citizens of Santa Barbara could stop oil drilling off their shores, transferring it to the shores of less wealthy areas like Mississippi and Louisiana.

Obviously due to physical and economic factors each community cannot be self-sufficient in energy. There will always be certain regions that produce most of the energy and other than consume it. But what will change is the price of energy; it is sure to increase steadily as more and more costly environmental measures must be taken. After these costs are finally internalized, it will no longer be possible for a planner to separate the benefits from the costs of energy consumption. Admittedly it will take years, perhaps decades, before an oil spill enrages the citizens of Mississippi and they are powerful enough to do something about it; before some terrorist hijacks an airliner and crashes it into a nuclear power plant, demolishing

the idea of "clean" nuclear energy. Substantial social, political, and economic changes will occur, after which planners will be left with the reality of high-priced energy.

What every planner must decide today is whether he will also be left with a city that can survive in an era of high energy prices. Think for a moment what $2.00 gasoline would do to your town. Under such conditions Los Angeles might not survive; whether your town would survive depends largely on what changes planners advocate and effect during the 1970's.

I use $2.00 gasoline as an extreme example; the probability of that happening depends strongly on the number of Alaskan earthquakes, the number of nuclear disasters, and environmental awareness in the state of Mississippi. Planners have virtually no control over these factors, but have a responsibility to plan for real contingencies. The possibilities for such unforeseen events are very real, and the situation will persist at least until energy growth rates begin to level off. A serious debate now underway in scientific circles could conceivably result in scrapping the entire nuclear fission program, because of unacceptable security risks and problems of monitoring lethal radioactive wastes for hundreds of thousands of years. Other potential disruptions are perhaps smaller, but by no means negligible. For example, an earthquake along the route of the Trans-Alaska Pipeline could cut off more oil than the recent Arab embargo.

The planner must consider several factors in the energy problem including resource scarcity, the depletion of easy-to-get-at resources, environmental safeguards, and national security risks. His task is simplified because all these factors point the same direction: toward higher energy prices. The only uncertainty is over the <u>rate</u> of increase, and the <u>frequency</u> of supply interruptions.

WHAT THE PLANNER CAN DO

The most important thing the planner can do is to advocate changes that will protect his community from the uncertainty of energy shortages, and the certainty of energy price increases. To do this, he must have a clear understanding of exactly how energy fits into the construction and operation of his community. He must think not only in terms of the direct energy use, but also be able to see the energy embodied in the flow of all goods and services in and out of his region. Most important, he must exercise his responsibility as a public official to examine impacts of policy alternatives over planning horizons much longer than the 10 to 15 years characteristic of the private sector. He cannot afford to be myopic; he must realize that today's subdivision ordinance represents a commitment to consume gasoline which may very well be unavailable 50 years from now when the streets and houses are still standing.

He must design a certain amount of stability into his community, anticipating the impacts of probable trends in energy prices, and even assessing the risks of future energy shortages. He must plan for the very real possibility that high energy prices may do to suburbs what abundant cheap energy did to inner cities. Above all, he must act immediately to begin reshaping his community and planning future cities that can survive in an era of high energy prices and resource uncertainties.

To help assure stability in case of energy shortages, one should exercise some discretion in attracting new industry. For example, industries which consume large amounts of energy (e.g., concrete, aluminum) and industries producing energy intensive products (metal cans, fertilizers) may induce more instability than, say, less energy intensive service industries.

In the immediate future, while energy prices remain low, economic forces will favor energy wasteful actions over energy conserving ones. They will also encourage long term commitments to energy intensive activities, such as automobile travel on over-illuminated streets. To combat these forces, large-scale interventions such as substantial energy taxation could be a viable federal policy[5], but could spell economic suicide at the local level. Nevertheless, planners have many opportunities to take precautions against today's low energy prices luring them out on a limb that could get sawed off by a terrorist or a sheik. Most of these options involve careful design of the constraints within which individual consumers will choose between energy intensive and energy conserving lifestyles.

Let us first consider changes in the ground rules within which transportation decisions are made. To encourage shifts to energy conserving transport modes, local governments can overtly subsidize and encourage mass transit while overtly discouraging auto travel. An example would be banning on-street parking and creating bus-only lanes. Buses cannot compete when they get bogged down in traffic jams created by autos. Other measures might include wheel taxes, parking taxes, or limits on the number of parking spaces. Potentially regressive aspects of such actions might be mitigated by giving priority to mass transit service in low income areas. Subdivisions could be designed with few through streets for cars, but direct access to shopping areas via sidewalks and bikeways. Existing city streets can be converted to bikeways by simply installing bumps to discourage car travel, and leaving gaps for bicycles. To reduce transportation energy use, planners can reduce the demand for passenger-miles, and shift the burden to more energy-efficient modes.

There are also ways in which planners can persuade governments to take actions to conserve space heating and air-conditioning energy. Updating building codes and changing assessment practices are obvious possibilities. If newly constructed buildings were required to meet rigid insulation standards, perhaps arrangements could be made with local gas utilities and the State Commerce Commission to assure adequate supplies for new natural gas hookups. If homeowners were exempted from real estate reassessments for insulating existing structures, they may have more incentive to save space heating energy in that way.

Transportation and space heating are obvious areas for energy conservation, but there are many others. Planners can support the development of recreation areas in and near population centers, in concert with the National Park Service's program of bringing the parks to the people. Emphasizing areas for non-motorized recreation would also have secondary energy conservation benefits. In planned unit developments, planners could arrange to give apartment dwellers an opportunity to have a garden, thus presenting an alternative to the highly processed energy intensive food from supermarkets. Developers could be encouraged to come in with proposals oriented toward energy conservation.

From these examples, the main point should be clear. Planners can, directly and indirectly, influence literally thousands of energy consumption decisions made daily by individuals and by governments. By being perceptive, innovative, and aggressive a planner can keep his community from getting irreversibly hooked on cheap abundant energy. As a responsible public official the planner must evaluate the energy impact of his actions over a long planning horizon--the lifetime of a railway, highway, or city street

layout. He must view almost every decision as a commitment of potentially scarce or unavailable energy resources.

I hope this paper has helped to expand the planner's way of thinking about energy. I hope you can now see the energy in your vision of the community of the future, and that you have decided where the smoke, the stripmine, the radioactive waste, and the oily beach fit into the picture.

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