Industry and Local Government Cooperation on Energy Strategies

Richard Hood

I appreciate this invitation to discuss our experience at General Motors (GM) in developing a joint program with industry and local government to assess energy problems, including alternative strategies for responding to a new energy supply interruption. Our experience and findings should be of value to local governments looking for ways to moderate the impact of energy supply disturbances on their citizens, and to federal and state authorities concerned about the local impacts of specific strategies.

The purpose of the GM Urban Energy Assessment (UEA) program, supported by this study, was to understand the energy future in total context--economics as well as technology. Our working conclusions so far are that the GM product slate can be structured to accommodate all rational economic scenarios.

Begun in 1978, the program involved 3 years of cooperation with 26 local jurisdictions in 5 regions of the United States. I will discuss the four phases of the program: (a) program planning and goals, (b) data gathering, (c) plans for subsequent phases, and (d) conclusions.

General Motors' interest in sponsoring this program grew out of our concern that changes in oil prices would induce changes in the nation's cities. We were also concerned about how GM's traditional products--standby power as well as automobiles and trucks--would be used and the impact on GM of interruption of petroleum from the Organization of Petroleum Exporting Countries (OPEC), particularly the Persian Gulf.

The experience in conducting the UEA program has improved our understanding of the relative benefits of various contingency response strategies. Although many of the major policies, such as the Strategic Petroleum Reserve (SPR) drawdown philosophy, were beyond the scope of the program, these policies contributed greatly to the understanding of state and regional needs, the needs of energy users, and to the identification of strategies that could alleviate some of the concerns of groups affected by an interruption in the supply of petroluem (i.e., those on fixed incomes, businesses, local governments, and utilities).

Most national energy studies that were available in 1978 lacked much of the essential data needed to develop useful energy strategies. What was required was a basic approach, starting from the bottom. Local governments were the logical units for study because they represent all the elements of society and all types of energy users.

The initial impetus for the UEA program came from representatives of local governments. The GM Transportation Systems Division (TSD) had been working with cities to assess new ideas in public transit based on the assumption that the energy-created changes would increase the need for transit. Many cities recognized that petroleum supply disruptions could create social and economic problems. They anticipated that there would be a public outcry to do something in an energy emergency to avoid unemployment and welfare costs as well as lines at gasoline stations and cold houses. The mayors and city councils who prepared in advance for an energy emergency should not only reduce the cost to the cities but should create a better image for their citizens.

The program was developed in three-phases:

Phase 1: Survey the energy situation, determine what data exists, and identify potential responses.

Phase 2: Collect new data, develop analysis techniques, and conduct tests to determine if response strategies were technically or economically feasible.

Phase 3: The local governments were to implement the responses that suit their particular needs.

Formal participation in the program by GM ended with completion of phase 1. However, some guidance was provided to the local governments who wanted to continue.

Initially we planned to select a representative sample of five local governments of different sizes with different industries and growth histories. We quickly learned that one city's energy problems could not be addressed in isolation; as a result up to seven adjacent local governments, in most cases the counties, were included in the sample. All the cities expressed an interest in the program but there were clearly different levels of interest, and we experienced different levels of success.

The five regions selected for the study were:

1. Orange County (California) with Anaheim as the lead city;
2. Broward County (Florida) with Ft. Lauderdale as the lead city;
3. Northern Illinois with Evanston as the lead city;
4. Dallas/Arlington/Ft. Worth, Texas; and
5. Rochester and Monroe Counties in New York State.

In most cases, the cities selected had a manager form of government. The managers of the lead cities were active in their national organizations and were recognized for their willingness to try new approaches. Still it required nearly one year of working together to understand the different languages, approaches, and problems. Any similar program involving local government and industry, or significantly different units of government, will require an equivalent learning period.

Although GM was willing to subsidize phase 1, it had to be primarily the local governments' program. GM could provide staff support and technical assistance, but the success of the program depended on local initiative and support. Therefore, each of the five regions were required to pay a small fee. This fee amounted to less than 20 percent of GM's cost, but it made it necessary for each of the 26 jurisdictions in the five regions to go to their local councils to obtain approval for the program and to make a public commitment to its support. This step uncovered some interesting reactions, primarily surprise that GM would be involved in such an effort.

We believed that it was important to be candid about GM's reasons for sponsoring this program; for example, our concern that energy-induced changes could have an impact on our products in ways not anticipated, and because GM does sell standby generators and similar equipment. When we found sales opportunities we notified the appropriate divisions.

The cities were asked to designate a local coordinator to obtain data if necessary and to provide the nucleus of an ongoing local ability to make use of the study results. The degree of success of the program in each jurisdiction can be related to the interest, continuity, and supervision of the local coordinator, as well as the ability of GM to provide rapid responses to inquiries from the local governments.

The GM team consisted of eight people working on the program: one person was assigned as liaison to each region. The team included specialists in fuel costs, energy technology, economic modeling, and so forth. The teams spent several concentrated periods in each region obtaining data, talking with utility companies, local energy suppliers, and city and regional planners. Data were collected on all forms of local energy consumption in each jurisdiction during a 10-year period--from 1970 to 1980, in most cases. The objective of the study was to obtain sufficient information to make three future projections for a low rate of petroleum price increase with a strong economy, a high rate of petroleum price increase with a weak economy, and a major supply interruption.

During phase 1 only existing data were used. If additional data were to be required to assess the impact of local policies on urban growth or to assess response to an energy emergency, these data were to be provided during phase 2. The quality of the data varied.

In several cases the cities' energy consumption was found to be increasing more rapidly than that of the private sector. In many instances, the local governments did not have a full accounting of their energy costs. In some cases, the cities' contracts with the utilities could be interpreted as encouraging the use of energy or at least not encouraging conservation. Tax revenues increased with energy use and in at least one case the city was given essentially free electric power.

In general utility data appeared adequate for our purposes but such data were difficult to relate to local jurisdictions. Several of the utilities devised special programs to isolate the data. Several weeks were spent isolating the data by hand. The accuracy of the utility forecasting was not evaluated in phase 1, but useful projections were obtained in all but one instance. This project has stimulated interaction between the cities and the utilities servicing their jurisdictions. There have been joint discussions on the future growth of the cities, the demands for electricity and natural gas, and how such demands may be affected by energy supply and by regulations.

The data on car and truck fuel consumption were, of course, interesting and difficult to obtain; distributors and car owners do not respect local jurisdictional boundaries when they sell or buy fuel. We developed programs to estimate consumption based on local car ownership, pumping by service stations, and disaggregated regional data. We believe our projections of local energy consumption by cars, trucks, and buses are accurate. We would like to update the projections to see how the regions have adapted to the petroleum price cycles of 1980 and 1982.

We are comfortable with the estimates of residential and commercial energy consumption and the trends in use. Because data on energy switching potential--from oil to gas or from coal or heat pumps as well as penetration of solar energy were incomplete or nonexistent--surveys and questionnaires to obtain these data were planned for phase 2.

We did not understand energy trends in industry as well as we would have liked, therefore, the scope will be expanded in phase 2 to include cities with high-energy consumption industries. Follow-up plans included additional contacts with local industrial energy groups, chambers of commerce, and so forth, to determine how decisions are made on energy conservation and substitution of coal or electricity for petroleum products.

After collecting the energy data, we identified the potential impact of high and low energy prices and supply interruptions on the cities. The availability of adequate utility power and natural gas was a major concern in all regions, and in most cases the utilities cooperated by describing how potential shortfalls could be avoided.

A major portion of the effort was directed to identifying the impacts of an energy supply interruption on the community and preparing preliminary assessments of the tools that the community could use to minimize the economic and social problems.

There was general agreement on the importance of continuing the cities' economic activities, that is the jobs that maintain income and tax revenues. This required assessing existing or proposed strategies to ensure that adequate energy would be available to operate businesses and provide transportation for employees and customers.

Preliminary assessments were prepared of more than 150 conservation and emergency response alternatives that had been proposed; some were specific to the city but most were generally applicable. The alternatives were divided into three parts: those that might be implemented soon because of their economic benefits, those that could be inititated at the beginning of an emergency to alleviate its impact, and those that could be implemented at a later date if or when they became technically and economically feasible. We worked with the cities to identify the local governments' role--reduction of its own consumption or initiating changes in ordinances, codes, or zoning. The conservation and emergency response alternatives fall into three categories:

1. Steps to reduce energy consumption (or cost) by the local government.
2. Steps required to improve the response of the public and local businesses to the emergency.
3. Information that would encourage city residents to anticipate the problems and plan ahead.

The cities realized that they could reduce consumption of electricity by taking steps such as scheduling lights and recreation areas, by reducing the use of air conditioning, and, perhaps by using solar power for heating water.

The local governments could temporarily reduce their use of gasoline and diesel fuel by changing the way in which some of their service vehicles are used and, in some cases, switching to alternative energy supplies. However, many public services, such as police, ambulance, and fire, for example, cannot be significantly reduced. The primary need will be for additional funds to purchase needed fuels.

The local governments assessed their use of oil and natural gas for heating during an emergency. Some cities are seriously considering using methane from wastes to heat buildings and are joining together to produce methanol for their service vehicles. Although we expect methanol to play a major role in U.S. ground transportation in the future, we have some significant concerns about its premature use because the cars we are manufacturing are not intended to operate on methanol, which attacks terneplate and other materials. These developments

are long-term solutions and would be ineffective in an energy supply interruption.

Although it has been estimated in some studies that are national in scope that energy conservation mandates, such as no-driving days, temperature turndowns, and restricted work hours could save about 7 percent of U.S. oil, the results of our study imply that the benefits would be less significant and that many of the mandates could increase the economic problems. On the other hand, price increases would quickly lead to reductions in discretionary energy uses and to the voluntary formation of carpools, and so forth.

Rising energy costs will have a different impact on each community. People on fixed incomes may need special assistance to offset the increased cost of heating their homes. Some industries, such as automobile manufacturing and tourism, will be affected more seriously; local governments should anticipate unemployment costs. Appropriate national responses, such as the Strategic Petroleum Reserve (SPR) drawdown, will moderate the impacts and should be understood by the cities.

There are several steps that cities can take to make it easier for the general public to accommodate an interruption in energy supply. We expect an increase in the use of public transit by workers and shoppers at least during a short and deep energy shortfall. The existing transit system probably will not have sufficient equipment and school buses or private vehicles may be used to augment its services. This raises serious problems with franchises, insurance, and labor contracts that must be addressed in advance.

Ordinances and laws regulating the sale of fuel should be reassessed to identify barriers to the emergency use of safe alternatives. Compressed natural gas, which is relatively embargo-proof, could be useful for vehicles with daily driving cycles of less than 100 miles. Local governments could identify the shops and mechanics that can make these conversions in case of a petroleum supply interruption and provide them with advanced information on what would be needed.

Local businesses should be encouraged to review their use of trucks. In many cities a high proportion of the peak-hour traffic congestion and fuel waste could be avoided by limiting the hours of truck operations during the emergency. Some merchants might find it energy efficient and cost beneficial to cooperate in local deliveries and avoid using separate, lightly loaded trucks.

In a few areas the shortage of oil could lead to a major reduction in the electrical power supply. We believe that rotating black-outs and brown-outs are unacceptable methods of reducing energy consumption.

A market-like approach is needed that will create price incentives to reduce discretionary and low-priority uses of electrical power in an emergency. A part of this approach was used by the Los Angeles Water District in 1973 and 1979. An emergency charge was added to the bills of all users who did not decrease consumption to a targeted level. The response exceeded the Water District's expectations and the emergency charge was not collected. Although we have reservations about this specific approach, it does have market-like characteristics.

We believe that workable approaches can be developed through the cooperative efforts of state and local governments, utilities, industry, and other interested groups. Discussions among cities as well as between industry and local governments were valuable. Two workshops were held during phase 1: one in the fall of 1979 and one in the spring of 1981. The second workshop was originally planned for the fall of 1980 but the planning process took longer than expected. Several of the cities indicated that the workshops were the most useful part of phase 1.

The results of phase 1 of the urban energy assessment studies were published in a series of reports. In most regions a separate report was prepared for each jurisdiction and can be obtained from that jurisdication. These reports include a profile of the energy demand data, a supply profile, preliminary evaluations of the energy price scenarios, and suggestions about what should be included in phase 2.

There is a need for information on energy prospects for local governments and the general public. Specialized reports are required for top officials; summaries of specific problems and strategies tailored to the needs of mayors, governors, elected officials, local businesses, environmentalists, consultants, and so forth, will help keep people informed of the options. Public understanding should provide new sources of ideas and at the same time should help reduce the panic and economic disruptions that result from a lack of understanding. The role of local commerce and industry was viewed as particularly important by many of the participating government units.

Planning for phase 2 was well under way when the decision was made that GM would not participate directly in subsequent activities. Phase 1 findings were being used to determine what short- and long-term energy-related information was important to the local governments. We planned to evaluate the impact of rising prices on employment, tax revenues, welfare, and related social cost in an energy emergency. In any case, we believed that it was important to understand how energy cost increases would affect the cities' operating budgets. Over the longer period we were addressing issues such as the impact of energy costs on urban development and industrial growth. Would average residential densities continue to decrease? Or would there be redensification as a result of the increasing costs of transportation and housing?

It was important to develop practical methods of analysis that the cities and counties could use to evaluate their own situations and select strategies to accommodate the expected changes. This would require that the cities designate one or more persons from each region to develop and test the methodology. Although preliminary discussions have been held with the U.S. Department of Energy (DOE) and the National Science Foundation, there has been little progress in the development of methodology or in obtaining additional data.

Several of the local governments are continuing to address energy problems; they are working together to identify the benefits of using alternatives and are becoming increasingly active in developing approaches for reducing the impact of petroleum supply disruptions in their communities. We have provided information on alternative energy systems and in particular on potential response strategies for energy supply interruptions.

CONCLUSION

The mutual education process can be slow and painful. Local governments and industry have common goals and can work together by defining their problems, evaluating the response strategy, and cooperating in demonstrations.

The major impacts of an energy supply interruption on local governments will be social and economic. The cities will experience the direct impact of lines at gasoline stations, unemployment, and reduced revenues coupled with increased costs for operation and public assistance.

The major response strategies require federal and state actions. However, cities should be able to estimate their increased operating costs (for fuel) and public assistance costs (welfare) and work with federal and state authorities to identify sources of funds and develop strategies to minimize the economic problems.

Local city data, when aggregated, can be used to assess the national benefits of various energy response strategies. Most of the cities that participated in the GM UEA study have expressed an interest in continuing to improve their ability to adapt to supply problems and a willingness to participate in specific studies or demonstrations.

From GM's viewpoint, the UEA study was of major value because it provided a better understanding of the needs of local governments and it provided data to assess alternative energy strategies and identify petroleum product needs.

The insights developed have been particularly valuable in our efforts to identify the steps that can be taken to moderate the impact of an energy shortfall and enable the economy to recover rapidly when the shortfall is over.

We hope that this program can serve as an example to encourage other industries to work with local governments in developing energy contingency response. The findings of this study have been used to develop response strategies that should minimize the economic impacts and avoid the problems created in 1973 and 1979 by allocations and other energy mandates.

Although these strategies have received positive response from representative elements of industry, we are continuing to seek ways of reaching other groups that would be affected by an energy shortfall.

Planning Ahead for Energy Emergencies: Whose Job is it Anyway?

Ronald L. Winkler

It is a pleasure to be here today to discuss the federal viewpoint on energy contingency planning for transportation in urban areas. My discussion reflects a number of the themes that I would like to stress today. These include issues such as responsibility, cooperation, innovation, and looking ahead not backward, to find solutions for today's problems.

My job at the U.S. Department of Energy (DOE) is Deputy Assistant Secretary for Energy Emergencies. As I have frequently pointed out over the last year and a half, this is a good time to be in charge of energy emergency planning--when we have a surplus of natural gas, a glut of oil, and hundreds of years of coal.

Joining the DOE in September 1981, I was the beneficiary of a number of energy policy initiatives that greatly improved our nation's energy emergency preparedness. Perhaps the most important of these initiatives was the removal in January 1981 of the remaining domestic price and allocation controls on petroleum. Some analysts now consider this action the single most important element in the chain of events that has led to a dramatic decline in world oil prices and a decline in the power of the Organization of Petroleum Exporting Countries' (OPEC) cartel.

In addition, storage of oil in the Strategic Petroleum Reserve (SPR) was increased, and a number of other general energy and economic measures were instituted which provided incentives for sound development and conservation of energy.

The overriding goals of our energy emergency preparedness program are to reduce the nation's vulnerability to energy supply disruptions and to alleviate their impacts on the nation. Previous policies of oil allocation, price controls, and mandatory demand-restraint measures have been abandoned because in some instances they were found to create adverse economic and social impacts and were, therefore, counterproductive. In the past the government attempted to allocate petroleum rather than rely on market forces during supply disruptions. Some of the consequences were energy shortages and lines for gasoline at service stations. We believe that the best way to ensure that petroleum is allocated where it is needed is to rely on the marketplace.

I would be less than candid if I did not admit that there are some who have doubts about the workability of this policy. It is a rare week that an article does not appear in some publication where an energy expert expresses concern about the Administration's energy program. As Secretary of Energy Donald Paul Hodel testified before the Senate Committee on Energy and Natural Resources:

> I can assure you that the United States is fully prepared to respond to any energy emergency situation, and our level of preparedness today is better than at any time in the past decade.

Secretary Hodel went on to state:

> In making this statement I do not mean to imply that our emergency preparedness program is perfect, nor am I suggesting that we are standing still on continuing improvements to the program. Nevertheless, I believe it is important to look toward ways