Session 2 Energy Contingency Plan Implementation Experiences

An International Review of Approaches to Demand Restraint in Transport Energy Contingencies

Martin E. H. Lee

The terms of reference for this presentation were to discuss the European experience of transport fuel shortages in 1979. Apart from some regional shortages in countries where price controls encouraged oil companies to export to more favorable markets, there are few situations from which we can draw conclusions for contingency planning. The United Kingdom experienced some localized shortages while adjusting to the abolition of price controls during the international crisis period of 1979, but these shortages were resolved by the retail petroleum industry. Turkey suffered a moderate shortage in this period, but it was attributed mainly to a lack of foreign currency.

Having relatively little to say about European shortages in 1979, I will take instead a more global perspective and offer some generalizations about the status of transport energy contingency planning since 1979 in the International Energy Agency (IEA) countries and comment on the experience of several countries that have endured fuel shortages. I want to point out that much of this information on both subjects is not available from published sources; the views expressed here are my personal interpretations of discussions by IEA participants, as well as of some strictly anecdotal sources, such as impressions of recent developments offered by overseas associates and consular officials.

GENERAL OBSERVATIONS ON THE PLANNING ISSUES

The IEA members comprise most of the noncommunist, industralized nations. All but two (Norway and the United Kingdom) are net importers of oil; however, a third, Canada has recently approached self-sufficiency in transport fuel. All face potential problems in a world oil supply shortfall, and even net exporters need contingency plans to deal with regional imbalances and the consequences of oil-sharing agreements.

It would be ideal to have information on the expected effectiveness of contingency measures. In order to know the effectiveness of contingency measures three levels of information are needed. Only the first level, the laws and regulations enacted by governments or placed on standby status, tends to be readily available. It is difficult to go beyond the level of rules and find out what governments really intend, and even harder to assess how the general public is likely to respond. For most IEA countries, there is no widespread experience in handling peacetime fuel shortages, and so a great deal of the discussion is of hypothetical policy, but some trends are apparent.

For most IEA countries other than the United States, the laws and regulations that do exist tend to resemble war-power acts. They address the type of situation in which normal patterns of government are suspended in favor of broad executive control. The rules are thus poorly geared by definition to the subcrisis situation in which demand-restraint measures, if such are favored by the country, may play an important part.

At the second level of information needed, what governments really intend, I infer from IEA discussions that the biggest issue is who bears responsibility in a crisis. This is, of course, a familiar issue, but note that it is discussed not only in terms of national versus subnational administrations, but also in terms of what role the oil industry is to play. One general observation can be made about government intent in other than crisis conditions: there is vigorous encouragement for the automobile industry in the major European countries and elsewhere to conform to voluntary fleet fuel efficiency goals, typically representing 10 to 15 percent improvement between the 1970s and the mid-1980s.

At the third level of information needed, how the public is responding, there seems to be a widespread sense of urgency outside North America for governments to maintain a high level of publicity about energy conservation in general. Currently this is perhaps focused more on the residential sector than on the transport sector, but it is fair to say that major government involvement in disseminating information also reflects concern for the continuing credibility of the need to conserve transport fuel. By contrast, discussions of contingency planning in the IEA countries rarely focus on providing accurate public information on product supply. I must add, however, that this observation may reflect the limitations of my sources rather than the state of planning in the IEA countries.

CONTINGENCY PLANNING IN THE IEA COUNTRIES

In Table 1 the 21 IEA countries are divided into

Table 1. Distribution of IEA fuel use by country group.

Category (Type of Fuel Consumed)	Percentage Fuel Consumption	Interventionist Countries	Percentage Fuel Consumption	Market-Oriented Countries	Total Consumption
Large users		Australia		West Germany	
Motor gasoline fuel	17.8	Canada	75.1	United Kingdom	92.9
Diesel and home heating oil	24.9	Italy	57.6	United States	82.5
		Japan			
Small users		Austria		Netherlands	
Motor gasoline fuel	4.6	Belgium	2.6	Norway	7.2
Diesel and home heating oil	10.9	Denmark	6.6	Sweden	17.5
		Greece		Switzerland	
		Ireland			
		Luxembourg			
		New Zealand			
		Portugal			
		Spain			
		Turkey			
Total motor gasoline fuel	22.4		77.6		
Total diesel and home heating oil	36.8		64.2		

Note: Percentages shown are of total IEA consumption for fuel type.

four categories according to their size and their general approach to managing petroleum demand. Each of the 14 small users consumes less than 1 percent of the total gasoline used by the IEA countries, except for Spain (1.3 percent). The seven largest countries--West Germany, the United Kingdom, United States, Australia, Canada, Italy, and Japan--consume 93 percent of the motor gasoline and 83 percent of the diesel and home heating oil (DHHO); the United States alone consumes two-thirds of the gasoline. Three of the large users and 4 of the 14 small users are currently committed to a general philosophy of allowing the market to handle fluctuations in supply, while all of the remaining countries continue to intervene with retail price controls. However, note that because it includes the United States, the smaller market-oriented group accounts for nearly 80 percent of IEA gasoline consumption.

This classification is somewhat subjective, and there are some ambiguities; for example, the Netherlands is included in the market-oriented group because it suspended retail price controls in August 1982, for a trial period; and Japan is classified interventionist because it monitors price closely with a view to intervening, even though retail controls are not currently in effect. It is also important to point out that each country is classified according to its current, noncrisis approach to the sale of petroleum, whether or not each would behave differntly during a fuel shortage. My purpose is to compare how interventionist and market-oriented countries approach the possibility of demand-restraint in emergency circumstances. Let us take a look at the current contingency planning trends in each of the four groups of IEA countries.

Large User, Interventionist Countries

The first two countries in this group, Australia and Canada, are examples of large users with variable subnational powers to manage a shortage, and both must contend with major regional differences in dependency on imports. Canada, for example, imports in the east and exports in the west. Some parts of Australia have recently experienced severe regional shortfalls owing to industrial action, which is discussed later in this paper. Both countries are substantial producers of oil, and in both there are federal regulations controlling the price of crude and forms of state or provincial intervention in retail prices. It is at the state and provincial levels that demand-restraint is primarily envisioned.

In Canada there is an ongoing effort by an interprovincial advisory group, with federal support, to research and coordinate the planning of demand-restraint measures to be used starting in the early stages of a fuel shortfall before it reaches the level of severity that would trigger a federally declared energy emergency (in which case there would be national allocation of crude and petroleum product, and ultimately coupon rationing for the motorist).

Australia also has federal standby plans for coupon rationing to be implemented after efforts to resolve shortages by bulk allocation have been tried. In its federal propaganda efforts, Australia has recently directed the message of its National Energy Conservation Programme to "counter the effect of the apparent glut" on the public's sense of priority.

Exhorting the public to conserve is a matter of nationalist appeal in Japan, one of the two other countries in the large user, interventionist group. Japan is exceptionally dependent on oil in the industrial sector, and transport fuel is less a concern than in many oil-importing countries; for example, whereas Japan uses 15 percent of all IEA oil, it uses only 5.8 percent of the gasoline. Transport fuel conservation is very much a part of ongoing campaigns to reduce oil use in general. Although Japan ended retail price controls in April 1982, the market is closely monitored (leading recently to public hearings on rapid price increases), and the national government clearly intends to intervene in a crisis. Standby demand-restraint measures are said to be strict, including possible curtailment of entertainment facility hours. Meanwhile, the publicity efforts are such that one day a month is designated Energy Conservation Day, and February is designated Energy Conservation Month.

The remaining interventionist large user is Italy, which suffered localized shortages in 1979, largely because oil companies diverted some petroleum for export to the spot market during a political dispute over the operation of price ceilings. The matter was resolved using ceilings indexed to a composite of European Economic Community (EEC) levels, which since December 1979 have been applied to gasoline and kerosene. A new national authority was created to administer demand-restraint measures in future shortages.

Large User, Market-Oriented Countries

It must again be emphasized that the consumption of gasoline in the United States is an order of magnitude larger than that in either of the other two countries in this group. Illustrated another way, 10 percent of the 1980 gasoline use in the United States is close to the total combined gasoline consumption of all 14 IEA countries classified as small users in Table 1.

The change in national approach to the oil market in the United States since 1980 and the debate on the causes of local shortages in 1979 are well known, so I shall do no more than recall that: only gasoline prices were controlled after November 1980; these controls were abolished in February 1981; the U.S. government intends to intervene in shortage markets to the extent that selling strategic reserve stocks may limit price increases; and most federal financial support for demand-restraint and state level contingency planning has been withdrawn.

In West Germany and the United Kingdom, the other two market-oriented countries, retail price controls are not in effect but could be introduced in an emergency. The West German government has broad flexibility for action with respect to motor fuel (gasoline and diesel) in an emergency, but it has experienced public resistance to the use of perhaps the most common restraint measure in IEA countries--global speed limits. By contrast, speed limits introduced in the United Kingdom during the 1973-1974 shortages have been continued, although some groups are now pressing the government to raise the 70 mph limit on motorways to 80 or 85 mph. Rationing powers are still on the statute books, but the intent of the government is to allow the retail oil industry to handle fuel shortages without intervention, if possible. Indeed now that the United Kingdom is a net exporter of oil, the nature of the policy debate has shifted toward maximizing the benefits of the resource.

Small User, Interventionist Countries

In this group of 10 countries are 5 countries (Belgium, Greece, Ireland, Luxembourg, and Portugal), which among them use only 1 percent of IEA gasoline and 5 countries that individually use from 0.4 percent to 1.3 percent. All 10 countries have retail price controls, most of which are intended to smooth rather than prevent price increases. In two countries (Denmark and Turkey), the controls are in some way indexed to world crude prices. Because of price controls independent fuel suppliers in Belgium were placed in a precarious situation during the 1979 increases in world fuel prices; they were given government assistance to stay within retail ceilings. In several countries the national governments own refining operations, a recent development in Ireland (attributed to the 1979 experience). Government ownership of refining operations amounts to a virtual refining monopoly in Portugal and Greece.

There are various levels of intent with respect to the use of demand-restraint in a fuel shortage, and although there is little specification beyond the often-mentioned speed limits, there is some experience. One type of experience arises from urban environmental problems that have led to traffic restraint; an extreme example of this is in Athens, Greece, where cars are restricted in some periods to driving on alternate days based on an odd-even license number scheme. In addition the New Zealand government implemented measures in anticipation of a greater shortage in 1979 than eventually materialized; these measures are examined later.

Before closing my discussion on the interventionist countries, I want to observe that the control of transport fuel prices is frequently part of broader price control policies and social contracts. Despite or because of this in some cases, notably Ireland and Spain, prices have increased rather sharply, although according to some of my European colleagues, the effect on demand is less than expected.

Small User, Market-Oriented Countries

One of the four countries in the small user, market-oriented group, Norway is a net exporter of oil. Nevertheless Norway has maintained detailed contingency plans, including rationing authority. Historically Norway has relied heavily on voluntary measures, especially the curtailment of recreational travel; these measures would be followed in a worsening crisis by some of the strongest restraint measures that have been discussed, including a ban on driving on weekends and during certain hours of the day. The rationing plan would be implemented after 3 months of increasing shortage if a reduction of 20 percent of baseline use were expected to be continued for 6 months or longer. Allocations would be made based on historical use (except for recreational craft) within four transport energy-use sectors as part of a plan covering all energy-use sectors. It is interesting to note that hearings on these contingency plans took place in November 1982--10 months after Norway decontrolled retail fuel prices.

Retail price controls in Sweden were lifted in September 1980, having been in effect since February 1979; and there is a similar history of temporary controls during the 1973-1974 shortage. Like Norway, Sweden experienced no significant fuel shortages in 1979, but there are standby rationing and allocation plans. In addition Sweden has conducted extensive personnel training for the implementation of emergency measures, which may be introduced rapidly but may not be continued for more than one month without parliamentary approval.

In the Netherlands there appears to be more equivocation over demand restraint than in Norway and Sweden. Recently the government has emphasized increased public information, especially on the results of government tests of the fuel efficiency of different automobiles on the market. The Netherlands experienced some local shortages because of exports to the spot market, and I shall have more to say later about public reaction. As in Belgium, some independent suppliers in the Netherlands experienced difficulties in 1979 under the now suspended price controls.

The last country in this group, Switzerland, has not attempted to control retail markets and has experienced significant instability in prices at the gasoline pump. Although the federal government has not announced demand-restraint proposals (except in the case of the army), the cantons have been creating regional energy boards to review public needs.

RECENT FUEL SHORTAGE SITUATIONS

In an effort to learn as much as possible from available information on recent fuel shortages, I have selected one example from each of the four groups of countries, large or small user--interventionist or market-oriented. I will now comment in more detail on what I have been able to learn about the state of contingency planning in European countries since the fuel shortages occurred. Following the previous order, the most severe example--the shortage resulting from industrial action in South Australia--is discussed first.

South Australia, September 1981

An industrial dispute, which prevented the shipping of crude oil and petroleum products and caused the closure of South Australia's only refinery, lasted from September 3-24, 1981. It was the state's third and most serious strike affecting petroleum supplies in recent years. The response by the government to restrict sales was thus based on some previous shortage experience, but it was unprecedented in its extent. Restrictions were imposed 13 days after the start of the dispute and 4 days after the refinery was closed.

There were four stages in the management of the crisis. The first stage, which lasted from a Wednesday through the following Thursday morning, was primarily to prevent stockpiling by the public in the urbanized part of the state (greater Adelaide); the restrictions included a maximum purchase of $7.00, price ceilings, odd-even sales, ban on shortage containers, and exemptions for two-wheelers, buses, and taxis (and also stranded vehicles, which were allowed 5 liters of gas). Sales were estimated at 2 percent above normal during this period. The second stage was a total ban on sales (except for negligible exceptions) for the remainder of the weekend. The third stage--coupon rationing--began Monday morning in Greater Adelaide and lasted until the dispute was settled 4 days later. A $7.00 maximum purchase was imposed in rural areas. For the first 2 days, ration allocations were available only to specified essential and high-priority users, including community services, transport and communication operators, essential goods and food-stuffs, and other priority economic activities; private motorists were included only under demonstrated circumstances of exceptional economic or compassionate need.

On the third and fourth days of rationing, only essential users were allowed fuel. Sales during rationing were 64 percent below normal. The final stage, lasting one week until the supply situation recovered, was the reintroduction of urban area restrictions similar to the first stage, and imposition of a continuation of the maximum purchase of $7.00 in rural areas; during this period sales were 20 percent below normal. The shortage caused significant problems, including long queues for fuel in some areas and some serious communications problems.

As a result of the experience gained with such a rapid crisis response, South Australia has been working on further refinements of its energy contingency plan. It might be said that if this approach were implemented for an extended period, the private motorist would represent a major problem, but recall that there is a federal rationing plan based on registered vehicles for use in a national emergency.

New Zealand, Mid-1979

New Zealand, which imports approximately 100 percent of its oil, was in a vulnerable position in 1979 because of the degree of its former dependence on Iran as a supplier. In anticipation of shortages in mid-1979, the New Zealand government implemented a series of demand-restraint measures, including closing service stations from 8 pm Friday to 8 am Monday, and a carless day system in which the vehicle owner was assigned a color-coded sticker to indicate his or her chosen day of the week on which the car could not be used. Retail prices continued to be subject to maximum and minimum controls; the price was high in comparison to, for example, Australia. To the extent that the measures did not sufficiently reduce demand, additional limitations on the hours for sale of gasoline were imposed. The public met these restrictions with a sense that there was no realistic alternative and it is interesting that the government chose to keep the carless day system in effect for one year. These measures proved to be adequate, as the ultimate shortage was only of the order of 2 percent, but the experience led to new developments. The feeling has been expressed that New Zealand was "almost caught with its pants down" and that improved contingency planning was inevitable.

In 1981 the New Zealand parliament passed the Petroleum Demand-Restraint Act, giving the government administrative discretion to implement any or all of the following measures: weekend service station closings, ban of container sales, odd-even sales, and maximum and minimum purchase limits. In addition, the carless day system could be introduced on 1 month notice. Work was in progress at the end of 1982 to clarify regulations for the demand-restraint measures. The act also authorized coupon rationing to deal with a 15 percent or greater shortage, although details of local administration and of a potential white market were subjected to further development; nevertheless, a 6-month supply of coupons were printed and are on hand.

United Kingdom, June 1979

The shortages that occurred in the United Kingdom in the first half of the summer of 1979 resulted primarily from a brief period of disorientation in the retail market following the abolition of price controls in May. Given events in the Middle East, public sensitivity was high, but by historical standards, the shortages did not appear to be serious. Britain had experienced severe restraints on energy use in recent years, not only because of the 1973-1974 shortages, but also because of a protracted coal miners' strike during the same period. Recall that the restrictions at one point extended to a national 3-day workweek. The government did not intervene in 1979, but the oil retailers took their own action, restricting service station opening hours, especially on Sundays, and in some cases imposing minimum purchase requirements. Prices rose, but not spectacularly; fuel taxation policy was a prominent issue for a period, but again approaching national self-sufficiency in oil came to overshadow the brief experience of local shortages.

Since 1979 taxes on both gasoline and diesel fuel have been raised, including an extra tax on fuel for private use of company-owned vehicles. The latter is an unpopular issue in a country where allegedly 70 percent of new car sales are made to corporations, many of which provide cars as an employee benefit. British government policy is now generally directed toward the supply side, with demand being influenced primarily by "improving the flow of information on energy efficient measures through advisory services and demonstration projects." It is claimed that 40 percent of the fuel currently used could be saved through conservation, and that a 20 to 27 percent savings could be achieved by the year 2000.

Despite the deemphasis of demand-restraint, I should point out that contingency plans still exist for three stages of shortages. In a shortage of less than 5 percent, the oil industry would be encouraged to respond as it did in 1979, and speed limits would be enforced. In a more severe shortage the government could regulate service station hours, reserve the last 15 percent of a retail outlet's supply for nominated priority users, intervene in the allocation of petroleum products, and impose coupon rationing if a 20-percent shortfall lasting 6

months or more was anticipated. Interestingly, the United Kingdom plan is the only plan of which I am aware that discusses a 50-percent shortfall, in which event fuel would be entirely allocated to designated uses.

The Netherlands, Mid-1979

The Netherlands is one of the European countries that suffered local shortages because of export to the spot market. Until August 1982 the Netherlands relied on a shock absorber system of price controls. Under this system, prices were allowed to fluctuate within a confidence interval around a designed mean, but this was apparently updated too slowly for events in mid-1979 and some suppliers moved petroleum out of the country. Now that the Netherlands has experimentally dropped price controls, and public information is apparently favored over demand-restraint, it is instructive to summarize an effort in the country to measure public beliefs about gasoline shortages.

Some insight on Dutch public sentiment was provided by a 1979 government-sponsored study of motorists' attitudes towards fuel conservation and crisis management (1). The survey revealed that most motorists blamed the government for situations that tended to waste fuel (including the relative unattractiveness of less fuel-intensive public modes, which forced them to drive). Given an absolute need for a 10 percent reduction in gasoline consumption, the respondents found 100 km/h speed limits, gas guzzler taxes, compulsory engine tuning, and shop-parking restraint preferable to extra non-compensated fuel taxes and curtailment of service station hours. The motorists were split in favoring extra taxation on cars for business use, work-parking restraint, driving bans, 90-km/h speed limits, and fuel taxes offset by reductions in annual vehicle fees. However, the same respondents believed that a number of unpopular restraint measures would be effective, including strict enforcement of lower speed limits, a ban on driving two Sundays a month, carless days, and work-parking restraint with transit alternatives. Under an unavoidable 30-percent shortage, rationing was the most favored measure and nonrebated fuel price increases the least favored. The researchers concluded that many measures would require massive explanatory publicity before the public would accept them.

A number of other countries have been gathering similar information, and I look forward to comparing popular sentiment across countries in the same way that we attempt to compare government policies.

CONCLUSIONS

In this cursory look at the noncommunist, industrialized world, we have seen that four-fifths of the gasoline in IEA countries is sold in 7 countries that do not control the price and one-fifth is sold in 14 countries that do control the price. The one-fifth that is controlled amounts to two-thirds of IEA gasoline consumption outside the United States. I have used the term interventionist to describe those 14 countries that control the price of gasoline, but it is clear that all IEA countries expect to be interventionist to some degree in a supply shortfall. The degree of potential intervention is not necessarily lower in all the countries I have labeled market-oriented, and vice versa.

I hesitate to draw conclusions about the level of contingency preparedness in a large number of countries based on variable sources of information; however, it appears that some of the stricter potential demand-restraint measures are on the books of those countries that have experienced, or were in realistic danger of experiencing, abrupt fuel shortages in the last decade. Moreover, this appears to hold true regardless of the extent to which those countries espouse a free market approach to fuel allocation. It might be argued that the United States, which was realistically threatened with import shortages, does not fit this generalization, but the continuation (without federal aid) of contingency planning efforts in states especially dependent on imports could be considered analogous to national responses elsewhere.

There is an aspect of contingency planning, however, in which the expressed intentions of countries are more consistent with their interventionist or market orientation, namely the purpose of demand-restraint measures in the overall management of a fuel shortage. In most cases, the free market countries regard demand-restraint at the end-user level as a measure to be used only after efforts to allocate crude oil or petroleum product have proved insufficient.

The interventionist countries, by contrast, tend to see demand-restraint as a measure to be implemented early in a crisis to reduce the need for allocation and rationing. Thus, it is possible to explain the apparent anomaly of free market countries planning some of the most extreme interventions. By the same reasoning, the interventionist countries are much more likely to implement demand-restraint in any given size of shortage, and they therefore must be more sensitive to public resistance to the content of their contingency plans. As the debate on those plans evolves, I suggest that several decades of traffic-restraint policy in some of the older urban areas in Europe will provide a substantial body of relevant experience on which we may draw.

The transport sector is no doubt the most politically volatile during a fuel shortage. Most of the IEA countries, regardless of economic persuasion, are actively engaged in persuading the public that the recent oversupply of fuel should not be interpreted as an indication that shortages will not recur. The global energy picture remains serious: if northern economies continue to expand, and if less developed countries attain desired improvements in their economic well-being, competition for the remaining reserves will be intense indeed, well inside the 1985-1995 timeframe suggested by Alluisi as the period during which worldwide shortages will become critical (2). Agarwal (3) discussed a current illustration of the consequences of higher energy prices: serious destruction of vegetation is resulting from the increased use of wood as a cooking fuel in the poorest countries.

It is difficult to imagine there not being serious strains in coming years on the share of oil now allocated to our transport needs. It is my overall impression that the IEA countries have gained valuable lessons from the relatively minor shortfalls of the past decade, but few countries are in a position to rapidly implement contingency measures that are equal to the management of a protracted fuel shortage in excess of 10 or 15 percent.

REFERENCES

1. Van den Broecke, Social Research, V.V. A Study of Attitudes Toward Energy Saving in the Use of Private Cars. Projectbureau Integrale Verkeers en Vervoers Studies, Ministerie, Van Verkeer en Waterstaad, Amsterdam, Jan. 1980.
2. E.A. Alluisi. Oil, Energy and Human Factors. Proc., 25th Annual Meeting of the Human Factors Society, Rochester, N.Y., 1981.
3. A. Agarwal. The Forgotten Energy Crisis. New Scientist. Vol. 97, Feb. 10, 1983, p. 377.