

119193

STUDY BY THE STAFF OF THE U.S.

General Accounting Office

The Changing Structure Of The International Oil Market

During the past 10 years, the international oil market has experienced periods of acute shortages and surpluses; producers have taken title to oil produced in their countries and the role of the major oil companies is now limited primarily to marketing, distribution, and refining operations. Moreover, despite recent decreases in imports to 30 percent of total consumption, the United States is importing relatively more Middle Eastern oil today than it did in 1973.

What if there is another oil supply emergency? The United States, with its present market-oriented energy policy deemphasizing Government intervention, appears to have three strategies for coping: (1) continued unilateral development of a strategic petroleum reserve, (2) bilateral agreements with other consuming and producing countries to ensure access to supplies, and (3) multilateral cooperation with other oil consuming countries through organizations such as the International Energy Agency to coordinate stock and emergency sharing policies and programs.



119193



GAO/ID-82-11
AUGUST 11, 1982

023087

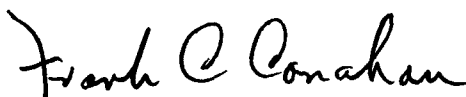
P R E F A C E

Prior to the 1970s, the international oil market was characterized by inexpensive and abundant supplies of crude oil. The 1970s saw shortages and rapidly escalating prices. More recently, however, the market has reflected an oversupply, price concessions, and uncertainty. This study focuses on the changes in the structure of the market during the past decade. The changing roles of producers, oil companies, and governments of consuming countries, particularly in the United States, are of major significance.

This study is intended to be informational in nature and is designed to provide Congress, the executive branch, and other interested parties with current data on the changing structure of the international oil market and its impact on continued access to crude oil. The study provides a perspective of the events leading up to the changes which affected the market both in times of acute shortages, such as occurred in 1979 and 1980, and in times of surplus conditions, such as occurred in 1981. Access to oil supplies among Western consuming countries and Japan has become a major domestic security issue.

Our study was made in the United States and in other principal oil consuming nations. Representatives of international organizations, such as the International Energy Agency, and producing nations at the Organization of Petroleum Exporting Countries headquarters were consulted. We interviewed officials in both the public and private sectors and reviewed pertinent literature on the subject.

We believe that the information we gathered identifies the changes taking place within the international oil market and demonstrates past and current trends as well as providing a basis for assessing future implications.



Frank C. Conahan
Director
International Division

D I G E S T

The primary change in the world oil market during recent years has been a shift in power from the major international oil companies to the producing countries.

According to the International Energy Agency (IEA), prior to the 1973 Arab Oil Embargo the major oil companies, under long-term contracts, marketed 75 percent of all crude oil traded internationally. By 1978 their share had fallen to 50 percent and by 1981 to 42 percent. The governments of producing countries or their national oil companies now market increased portions of their crude oil production for themselves. Specifically, oil producing countries in 1981 marketed directly almost 13 million barrels of oil per day (mmbd) compared with only 2.4 mmbd in 1973. This shift has occurred at the wellhead (the place where oil is produced), resulting in the major oil companies' sharply reducing third-party sales to the independent oil companies. The major companies have retained access to oil for their own markets. Consequently, independent companies are now purchasing more oil directly from the producing countries. Despite this change, by the time oil is imported into the principal oil consuming countries, the major companies continue to control about the same percentage of oil. Overall, however, producers have gained significant control of the international oil market during the past decade. (See pp. 7, 9, and 15.)

OIL CONTRACT RESTRICTIONS

Another change that has taken place in the oil market is the virtual disappearance of long-term contracts. This change works to the interest of producers in a tight market when prices are rising and to the benefit of consumers when the market is in surplus and prices are falling.

Producers have also extended their control over the market through restrictive contract clauses. These clauses may appear in basic contracts or in "side letters." Commonly used restrictive clauses include those pertaining to destination, resale, and transportation. These restrictive clauses, particularly destination clauses, could affect the consuming countries' ability to respond to an energy shortage by preventing the IEA's Emergency Sharing System from functioning properly in making allocations of crude oil. According to the IEA, by the end of 1980 between 3 mmbd and 6 mmbd of Organization of Petroleum Exporting Countries (OPEC) oil (15 percent to 25 percent of production) was subject to restrictions of the severer types under which resale is normally prohibited.

Clearly, the ability of producers to impose and enforce restrictions is greater in a tight market than during a slack period. Some producers have linked access to crude oil during tight market periods to investment and exchange of technology and/or exploration.

The effect of tied sales has been to limit the flexibility of the market and to increase the indirect costs of crude oil. This pressure is clearly greatest in a tight market. Moreover, producers' interests in obtaining investment, technology, or exploration may tend to favor large, integrated oil companies at the expense of smaller ones. Producers' preferences for political or economic concessions may work to the advantage of major industrialized countries, particularly those prepared to enter into country-to-country deals. (See pp. 11 to 14.)

REFINING CAPACITY

Producing countries see development of refining capacity as a means of capturing a greater portion of the ultimate value of petroleum products at the consumer level and of expanding their domestic industrial bases and accelerating economic development. As a first priority, the OPEC nations are building or acquiring facilities to meet their internal needs, but some of them are seeking to increase exports as well.

The refining capacity of OPEC and of other producing nations is substantial in terms of meeting their own needs. Nevertheless, in the opinion of trade experts, this capacity does not represent a short-term threat to European or U.S. refining interests. Producer countries' refinery needs are rising rapidly. (See p. 15.)

OIL COMPANIES' REACTIONS

Oil companies' reactions to producer-oriented changes in the international oil market have been diverse and significant. Major oil companies reacted sharply by reducing, and in some instances terminating, sales to unaffiliated suppliers (third-party sales); such sales were reduced from 6.7 mmbd in 1973 to about 0.8 mmbd in 1980. As a consequence, independent producers, refiners, traders, and brokers have increased their roles in the international oil market. This development, like the greater role for government-to-government transactions, flows logically from the diminished role of the major oil companies.

In the final analysis, the international petroleum industry as a whole has proven resilient in the face of change. Despite losing ownership of crude oil to producer countries, the major international companies at this time remain the principal marketers of crude oil and oil products as well as the principal refiners of producing countries' oil. (See pp. 16 to 18.)

CONSUMING COUNTRIES' REACTION

Governments of oil consuming countries have taken three basic approaches in response to changes in the international oil market: (1) collective initiatives, such as founding the IEA, (2) bilateral steps, such as direct government involvement in securing supplies, and (3) oil reserve or stock management activities.

Primarily in response to the 1973-74 oil embargo, major oil-consuming countries organized the IEA as an energy policy coordinating forum, now comprising 21 countries. They also established the IEA's Emergency Sharing System, which is designed to provide oil supply sharing among all participating countries in the event of a 7-percent or greater supply disruption. Additionally, IEA members have agreed upon general long-term principles, including increased conservation efforts, reduced import dependence, and expanded research and development.

Some governments, such as those of Austria, Italy, France, and Japan, have increased their involvement in the procurement of oil, particularly during the 1979-80 period, as the reduction in third-party sales by the major oil companies created supply problems for these countries. Consequently, government involvement of consuming nations in the international oil market has increased significantly. The IEA estimates that between 1978-80, 3 mmbd to 4 mmbd of oil worldwide was shifted from private contracts to some degree of government involvement. For IEA countries as a whole, direct or indirect government involvement increased from 25 percent of crude oil imports in the first half of 1979 to somewhat over 30 percent in the second half of 1980.

IEA member governments, particularly the United States, Japan, and Germany, have moved to establish emergency oil reserves to decrease their vulnerability to oil supply disruptions and other forms of producer control of the market. (See pp. 18 to 24.)

United States

Despite the changes in the structure of the international oil market, the United States has had relatively continuing access to foreign crude oil. Although access was disrupted in 1973-74 and 1979, the U.S. market-oriented system, even with the existence of domestic price controls in the 1970s, appears to have adjusted to these changes.

The seven major oil companies continue to supply 46.5 percent of U.S. crude oil imports, but most of this goes to meet their own refining and marketing needs. They virtually dropped out of the market for third-party sales in 1979. In the recent slack market, they seem to have resumed these sales on a limited basis but have not resumed long-term contracts.

The system of controls which characterized U.S. Government energy policies during the 1970s has either been dropped or allowed to lapse. As a result, U.S. oil prices reflect those of the world market. Similarly, independent refiners are no longer guaranteed access to crude oil at favorable prices, which matters little during the recent supply glut, but the consequences of which will need to be tested in future tight markets. (See pp. 44 to 47.)

CONTINUED U.S. VULNERABILITY

Whether the changed structure of the international oil market will have any effect on the United States in the future depends to a large extent on supply and demand. Certainly in periods of market glut, such as that which recently existed, producer control of the market is minimal. However, if tight supply reemerges through gradual reduction in production, an increase in demand by producers, and/or some form of major supply disruption similar to that of 1973 or 1979, the growth of producer control of the market may increase the threat to consumer access to oil supplies. Some experts believe another supply disruption could occur sometime during the 1980s. Continued increases in non-OPEC sources of oil production in the North Sea and Mexico could lessen the impact of such disruptions.

The fact remains that, regardless of the supply situation, the governments of producer countries now hold title to the oil produced in their countries and major international oil companies' control of the market is currently limited to marketing, distributing, and refining operations. What is also clear is that,

despite recent decreases in imports to 30 percent of total consumption, the United States imported relatively more Middle Eastern oil in 1981 (41 percent of total U.S. crude oil imports) than it did in 1973 (37 percent). Also, imports from Saudi Arabia increased from 600,000 barrels per day in 1973 to 1.1 mmbd in 1981. This import dependence could increase dramatically if the the current economic downturn is reversed and/or conservation and alternative fuel efforts slow. (See p. 47.)

U.S. STRATEGIES

Within the U.S. market-oriented energy policy deemphasizing Government intervention, strategies presently available to the United States for dealing with a contingency appear to be (1) continued unilateral development of a Strategic Petroleum Reserve, (2) bilateral agreements with governments of other consuming and producing countries to assure access to supplies, and (3) multilateral cooperation with other oil consuming countries through organizations such as the IEA to coordinate stock and emergency sharing policies and programs. (See pp. 47 to 54.)

C o n t e n t s

	<u>Page</u>
DIGEST	i
CHAPTER	
1 INTRODUCTION	1
Implications of a changing market	1
U.S. response	3
Current market	4
Objectives, scope, and methodology	4
2 ANALYSIS OF STRUCTURAL CHANGES IN THE INTERNATIONAL OIL MARKET	7
Sociopolitical factors	8
Producer actions	9
National oil companies in selected countries	9
Contract restrictions	11
Changes in refining activities	15
Impact of structural changes on the international petroleum industry and industry response	16
Consumer government reactions	18
The spot market: its role as barometer and instrument of change	24
Recent glut and structural change	26
Observations	27
3 COMPARATIVE ANALYSIS OF CONSUMING NATION RESPONSES TO CHANGING OIL MARKET	29
France	29
Great Britain	32
Federal Republic of Germany	35
Austria	38
Japan	38
Canada	41
4 IMPACT OF MARKET CHANGES ON THE UNITED STATES	44
Increased Government involvement	44
U.S. oil company responses	44
Shift away from Government involvement	46
Return to surplus market conditions	46
Continued U.S. vulnerability	47
U.S. strategies	47

ABBREVIATIONS

Aramco	Arabian American Oil Company
DOE	Department of Energy
EEC	European Economic Community
IEA	International Energy Agency
MITI	Japan's Ministry of International Trade and Industry
mmbd	million barrels per day
OECD	Organization for Economic Cooperation and Development
OPEC	Organization of Petroleum Exporting Countries
SPR	Strategic Petroleum Reserve

CHAPTER 1

INTRODUCTION

The international oil market is critical to a smooth-functioning world economy. Oil accounts for a significant percent of the value of all commodities exchanged in world trade--17 percent in 1978, 20 percent in 1979, and almost 25 percent in 1980. (According to the World Bank, at \$35 a barrel, the entire Organization of Petroleum Exporting Countries' (OPEC) trade in oil is worth \$300 billion a year and world oil trade approximately \$500 billion; total world merchandise trade has reached \$2,000 billion a year.) Any changes in the international oil market profoundly affect both producers and consumers. For example, the Department of Energy and the International Energy Agency (IEA) noted that the 2 million barrels a day disruption resulting from the Iranian revolution of 1979 precipitated a 160-percent increase in world petroleum prices over a 2-year period. This occurred despite the fact that the quantity was made up by increased production from other sources.

The experience of the past decade has shown that not only is the price of oil highly volatile but also that the structure of the market is subject to rapid and fundamental changes. A significant increase in producer control of the market through governments taking title to the oil produced in their countries, establishing national oil companies, and developing multiple contractual restrictions has decreased the role of major oil companies and resulted in more government-to-government contracts. This increase in power is confirmed by a January 1982 IEA study which shows that the producer governments' ownership of OPEC oil rose from 2 percent in 1970 to 20 percent in 1973 and to 80 to 90 percent by the end of 1980. Our study focuses on these structural changes and their effects on the United States and other oil consuming countries.

By structure we mean who is involved in the distribution of oil, from producer to consumer; i.e., major international companies, governments, brokers, agents and traders, ship owners, refiners, and marketers. Where oil is obtained involves the point of origin; i.e., by the lifter, buyer, refiner, or seller or at sea or at the point of import. How concerns the terms under which oil is traded; i.e., under long- or short-term contracts with or without restrictions, by traditional buyers or sellers, or possibly by agents acting for governments. We also discuss the market's efficiency and whether all parties have freedom to purchase oil from producers or to distribute oil or oil products to consumers.

IMPLICATIONS OF A CHANGING MARKET

Prior to the 1970s, the international oil market was characterized by inexpensive and abundant supplies. The 1970s saw

shortages (in 1973-74 and again in 1979) and rapidly escalating prices. More recently the market reflects an oversupply, price concessions, and uncertainty. The overconfidence of the early 1970s was quickly dissipated by the Arab embargo in 1973 and the subsequent price increases. The years 1974-78 saw a return to market stability and to declining prices. The real price of oil declined 2.9 percent a year between 1974-78, and oil consumption by the Organization for Economic Cooperation and Development (OECD) countries grew again, from 37.5 million barrels of oil per day (mmbd) in 1975 to 41.3 mmbd in 1979. This calm was again shattered by the 1979 crisis in Iran and further sharp price increases evolved. As a whole, the decade reflected much higher oil prices and a shifting of market power away from consumers, particularly the Western-controlled multinational oil companies, to producer countries, led by OPEC.

The dominance of U.S. and other Western multinational oil companies in the international market was challenged by the increasing presence of national oil companies. In 1979, oil producing countries, through their national oil companies, marketed directly almost 13 mmbd compared with only 2.4 mmbd in 1973. Producer government ownership of OPEC oil increased from 2 percent in 1970 to 80 to 90 percent by the end of 1980, and direct export by OPEC countries increased from a negligible amount to 50 to 55 percent. Also, since 1973 the amount of OPEC crude oil traded by the major oil companies has dropped from over 75 percent to around 42 percent. In 1981 the IEA calculated that the major oil companies owned only 9.7 mmbd of crude oil produced compared with 25.5 mmbd in 1973. The producers, having obtained basic ownership of their reserves, are in a much better position, particularly in a tight market, to shift supplies from one consumer to another as well as into the spot market (See p. 24 for definition of spot market.) Long-term contracts which assure relatively stable access to oil supplies have given way to short-term agreements which are subject to renegotiation at any time and which contain restrictions affecting such issues as price, destination, and end use. Despite this change at the source, the major oil companies' market share of 40 percent of oil product sales has declined only marginally. Therefore, the West continues to control the refining, distribution, and marketing infrastructure.

The increase in producer control of the crude oil market is significant when consuming countries' dependence on foreign oil imports, particularly OPEC oil, is considered. As of 1981, OPEC accounts for 59 percent of non-Communist world oil production compared with 65 percent in 1973. In 1981 OECD countries relied on OPEC oil for 75 percent of their imports compared with over 85 percent in 1973. In 1980 OECD countries imported 62 percent of the oil they consumed compared with 68 percent in 1973. The oil import bill of these countries rose from \$30 billion in 1973 to \$140 billion in 1978 to \$290 billion in 1981. Partic-

ularly striking is the U.S. import bill, which grew from \$8.3 billion in 1973 to \$82 billion in 1981.

Although dependence on OPEC oil has begun to decrease, OECD's dependence on a few OPEC states is increasing. In 1981 Saudi Arabia accounted for more than 40 percent of OPEC production compared with less than 25 percent in 1973 and 16 percent in 1970. Oil dependence is particularly significant for the United States, whose imports now total 30 percent of consumption, with 25 percent of the imports coming from Saudi Arabia compared with 17 percent in 1973.

The United States relies almost exclusively upon private oil companies to meet its needs for imported oil. The IEA Emergency Sharing System also depends on the private sector to allocate scarce supplies during major market disruptions. The extension of oil producing countries' control over oil production, prices, and final destinations, which were traditionally controlled by the large multinational companies, could present a real challenge to the ability of the United States and other industrial nations to assure themselves of a reasonably secure oil supply and, particularly, to respond to crisis situations.

U.S. RESPONSE

The United States reacted to the changing market both internationally and domestically. Energy became a major issue. The U.S. Government took the initiative in establishing the International Energy Agency in 1974 and remains an active member. The IEA is intended to coordinate the international energy policies of major consuming nations and to promote cooperation and sharing in the event of a major oil supply interruption. Domestically the U.S. Government increased its involvement in the energy market by forming the Department of Energy (DOE) in 1977 and setting up a system of regulations to control the domestic energy sector; it created and has begun to fill the Strategic Petroleum Reserve. Perhaps most importantly, American consumers, both private individuals and industry, have reduced demand for oil. U.S. imports in 1981 were about 6 mmbd compared with a high of about 8.8 mmbd in 1977.

The current administration has abolished or let expire most controls and has announced its intention to dismantle DOE. It has also stated that it intends to rely primarily on the free market in the future, both in normal times and in crises, permitting market forces to work with only minimal Government involvement. The administration intends to continue to participate in the IEA and to fill the Strategic Petroleum Reserve.

CURRENT MARKET

Since the first quarter of 1981, the international oil market has moved toward a reversal of the tight supply demand situation that characterized its condition in 1979. Today, IEA countries' oil consumption has decreased by 17 to 19 percent, at least in part as a result of the termination of price controls in the United States, improved conservation and fuel switching by governments of consuming countries, and the overall recession among industrialized nations. This decline in demand has stalled and even reversed OPEC's influence and increasing control of the international oil market, as its production dropped from a high of 31 mmbd in 1979 to a recent level of 17 mmbd. The average price of oil has decreased from a high of \$35 a barrel in late 1980 to a recent level of about \$33.

According to IEA, U.S. Government officials, and trade sources, these recently changed market conditions have led to a decline in growth of government-to-government transactions, general relaxation of producer contractual restrictions, and the reemergence of producer interest in more traditional long-term contracts. It has also slowed the already limited initiatives of producers to diversify through increasing their refining, marketing, and distribution activities.

Despite the relaxation of the tight-supply situation, which had acted as a catalyst for producer interests in gaining more control over the market, producers have retained their control at the wellhead and have long-term intentions of gaining further control of the international oil market.

OBJECTIVES, SCOPE, AND METHODOLOGY

This study is designed to provide Congress, the executive branch, and other interested parties with information on the changing structure of the international oil market and its effect on continued access to crude oil. Even though the current administration has allowed much of its authority in the energy area to lapse and has emphasized the use of market forces, Congress will still need to make decisions concerning this area. For example, some experts consider that an accidental or intentional interruption in the flow of oil from a major producer remains a likely possibility. Our September 29, 1981, report, "The United States Remains Unprepared for Oil Import Disruptions" (EMD-81-117), indicates that the United States is not adequately prepared for such a contingency.

On an international level, our September 8, 1981, report, "Unresolved Issues Remain Concerning U.S. Participation In The International Energy Agency" (ID-81-38), raises questions about consuming countries' abilities to meet their obligations under IEA emergency sharing provisions, particularly in the light of

the changing oil market structure, including government-to-government transactions and contractual restrictions. Our present study grows out of this previous work and is intended to contribute to the knowledge which forms the context for important future congressional decisions.

Our study focuses primarily on the structure of the international oil market since 1978; it deals primarily with crude oil, although sales of oil products are discussed when they affect the market for crude oil. The period following the onset of the Iranian revolution, the second energy shock of the 1970s, saw the emergence of some of the structural changes identified in chapter 2. The period before 1978 is background. The short time after the beginning of 1981, the most recent glut era, may indicate whether the structural changes are permanent and relevant to a market characterized by surplus supplies.

Our study was made in the United States and in other principal consuming nations, and representatives of producing nations at OPEC headquarters in Vienna were also consulted. We interviewed officials in both the public and private sectors and reviewed pertinent literature on the subject. In the United States we talked with officials of the Departments of State and Energy and the National Security Council. We also spoke with officials of the major multinational and large and small independent oil companies and with traders, brokers, consultants, and academic authorities.

We consulted international organizations, such as IEA, and government and non-governmental officials in England, Germany, Austria, France, and Japan. In addition, through the Department of State, we asked American Embassies in oil producing countries for the views of their host governments concerning specific questions on the structure and functioning of the international oil market.

In talking with officials, we used a structured interview technique which enabled us to develop comparable information for several countries as well as followup questions. We also drew on data and statistics provided by DOE, IEA, OPEC, and major oil companies and on published documents of the Central Intelligence Agency.

Although we did not review individual oil contracts, DOE provided us with summary information of some contractual data and we obtained additional contract-related information through interviews with oil company officials. Other general contract information was obtained through trade publications, consultants, and international organizations. Because of the dynamic nature of the international oil market and the practical limit on access to oil contracts, it was virtually impossible to gather precise information on the extent of change at any particular time.

However, we believe that the information we gathered on the market identifies the real changes taking place and demonstrates past and current trends as well as providing a basis for assessing future implications.

CHAPTER 2

ANALYSIS OF STRUCTURAL CHANGES

IN THE INTERNATIONAL OIL MARKET

The principal change in the world oil market during recent years has been a shift in power from the major international oil companies to the producing countries. The companies have lost assured access to crude oil in producing countries; they still hold concessions in a few instances, but by and large they are now purchasers of oil. For example, according to IEA calculations, before the first oil crisis in 1973 the major oil companies accounted for 75 percent of all crude oil traded internationally. Since their refinery runs were only about 23 mmbd, these companies had access to about 7 mmbd more than they needed for their own refineries. They, therefore, sold this excess crude oil to third-party customers on a long-term basis. In subsequent years, the major oil companies lost a substantial portion of their equity and contract crude oil. For some time in 1979--except for two Arabian American Oil Company (Aramco) partners, Standard Oil of California (Socal) and Texaco--none of the companies could fully cover their refinery needs with equity or term contract supplies. The balance between total crude oil availability and total oil product sales for these companies swung from plus 5.7 mmbd in 1973 to minus 0.8 mmbd in 1980. The principal aim of the major international companies now seems to be to ensure the supply of oil to their own affiliates.

The governments of producing countries or their national oil companies now market increased portions of their crude oil production for themselves. They sell not only to the major oil companies but also to national oil companies of industrialized and developing consuming countries, independent oil companies, and traders. They have also sold large volumes of crude oil on the spot market during periods of market disruptions, particularly when spot prices were significantly above contract prices. However, this shift in power has occurred only at the wellhead (the place where oil is produced). By the time oil is imported into the principal oil consuming countries, it is again firmly controlled by the major international oil companies. The IEA noted that for the past 3 years little if any shift has occurred in the percent of oil imported into industrialized countries by major oil companies. Essentially, these companies continue to control the flow of oil as it crosses the borders of consuming countries.

Largely as a result of this loss of access to crude oil at the wellhead, in 1979 the major oil companies drastically reduced third-party sales of crude oil. According to U.S. Government and IEA officials, this action in turn led the companies' former customers as well as the governments of several

industrialized countries to enter into direct marketing relationships with OPEC and non-OPEC producing countries.

Thus, the picture of the current international oil marketing system emerges. OPEC and non-OPEC producer countries control production decisions. There are significantly more players in the game, both producers and purchasers, including producing countries, national oil companies, independents, and traders. In a tight market, as opposed to the current supply situation, distribution has possibly become less flexible and efficient. Furthermore, access to crude oil has become a central issue, and the general public and government leaders worldwide have become more aware of its importance.

During the 1970s, the early impetus for change rested primarily with the OPEC producers. The United States and other industrialized oil consuming countries generally had every reason to be satisfied with an efficient, flexible system which, until roughly the early 1970s, provided an inexpensive and reliable source of energy. Actions of oil consuming country governments (such as establishing emergency reserves, bilateral transactions, and increased multilateral cooperation), although admittedly important in determining the condition of the market, have tended to be responses to changes initiated by producer governments, primarily those of OPEC. Producers for their part have been able to affect changes primarily during times of shortage, whether artificially induced as was the 1973-74 embargo or resulting from uncalculated interruptions such as those caused by the Iranian revolution of 1979 and the onset of the Iran-Iraq war in September 1980.

The early 1980s contrast sharply with the preceding decade. As discussed in the following section, the opening years of the 1980s have seen a shift in the balance of supply and demand. There has not been sufficient time to determine whether this shift is long term or whether the structural changes of the 1970s will be reversed.

SOCIOPOLITICAL FACTORS

The major oil producing countries, with the exception of the Communist bloc, the countries bordering on the North Sea, Canada, and the United States, are emerging developing nations. Oil is their principal national resource, and they are determined to control and use it in their national interests as they see them. In most cases, they aim at rapid economic development. For these reasons, the governments of OPEC nations, and of other producers as well, are determined to control the production of oil and have frequently formed their own national oil companies. They also seek to set the price of oil in international markets, using OPEC as their primary instrument. Moreover, they have tried to control or influence their customers' use and distribution of oil through contract restrictions.

In addition, some oil producers, such as Iran, are undergoing rapid social change. Others, while ostensibly internally stable or conservative, are located in or around the Persian Gulf, a highly volatile area.

Among governments of oil consuming countries, the response to oil market changes has been cooperative and multilateral as well as bilateral and nationalistic. The former approach is seen in consultations at the "summit" level and in cooperation through IEA, OECD, the European Common Market, and other institutions, such as the World Bank. The latter response is reflected in the establishment of national oil companies by consuming countries and the proliferation of government-to-government deals.

PRODUCER ACTIONS

Most producing countries have made control over their domestic oil resources a critical objective and have largely replaced the major oil companies in this role. Producer governments have achieved this position by outright nationalization of foreign oil companies or by progressive participation in operations. The IEA estimated in January 1982 that producer government ownership of OPEC oil increased from 2 percent of production in 1970 to 20 percent in 1973, 70 to 80 percent in 1979, and 80 to 90 percent by the end of 1980. The IEA also estimated that direct export of oil by OPEC national oil companies increased from 5 percent in 1973 to 45 percent in 1979 and 50 to 55 percent by the end of 1980. Generally, the foreign oil companies that remain in these countries are purchasers or act as contract service companies operating oil fields or exploring for oil for the host governments.

Producer governments, through national oil companies or other agencies, also seek to determine crude oil prices and disposition. Unlike private corporations, the motivation of the governments of producing countries is not exclusively directed toward maximizing financial returns but is also aimed at achieving political and economic development objectives. In a tight market such as that of 1979-80, they were able to achieve substantially both aims as world oil prices rose 160 percent. As the market demand slackened in 1981, producer governments seemed to lose their ability to fully control crude oil prices and to decide who would buy their crude oil. The recent glut found them cutting prices and searching for customers.

NATIONAL OIL COMPANIES IN SELECTED COUNTRIES

To illustrate the evolving role of national oil companies, we selected Saudi Arabia as a major Arab OPEC producer, Nigeria as a major non-Arab OPEC producer, and Mexico as a major non-OPEC producer. As of December 1981, these three countries ranked 1st, 2d, and 3d, respectively, in supplying the United States with about 55 percent of its crude oil imports.

Saudi Arabia

Saudi Arabia is the non-Communist world's major oil producing nation. It is also the world's largest oil exporting nation. It has the largest known reserves in the world, and Aramco and its participating partners, Exxon, Texaco, Mobil, and Socal, played a key role in developing the oil fields and marketing the oil. The Saudi Government effectively makes all major decisions on pricing and production. Marketing, however, is shared by the former Aramco partners and by PETROMIN, Saudi's state oil company.

Crude oil in the ground is the property of the Saudi nation. The Saudi Government has purchased 100 percent of Aramco from the former partners; the agreement for full Saudi takeover has been negotiated and is in effect. Aramco itself now operates virtually as a service company. When oil is loaded for export to the former partners, title is simultaneously transferred from the government to PETROMIN to the buyer. PETROMIN markets the crude oil and the oil products which the Saudi Government wishes to sell directly and is its instrument for government-to-government transactions.

The October 1981 OPEC decision to establish a uniform price of \$34 a barrel was the result, in part, of Saudi efforts to link regular price increases or decreases to rises in productivity and inflation in the major industrial nations. Paradoxically, surplus conditions in the world market seems to have favored this Saudi aim conditioned on their long run interests while a tight market benefits other OPEC nations which have relatively low reserves and want to maximize revenues in the near term. The Saudis have extensive reserves and fear that consuming countries will react to higher short-term prices by accelerating development of alternative fuels, thus reducing their dependence on OPEC oil. Recently the Saudis have lowered their production from a high of 10.5 mmbd to around 7 mmbd in an effort to dry up the excess in world supply and to stabilize declining world prices which could threaten their financial stability.

Mexico

PEMEX, Mexico's national oil company, was formed in 1938 as a result of Mexico's nationalization-expropriation of foreign oil companies. It is a public agency wholly owned by the government and is exclusively responsible for developing Mexico's hydrocarbon resources.

From 1938 through 1976, PEMEX's essential operational goals were to provide national energy self-sufficiency and to promote industrial development through subsidized, even below-cost, energy. Since 1976, the discovery of gigantic new fields and PEMEX's impressive technical achievements have made Mexico a major exporter of oil, whose production averaged 1.9 mmbd in 1980 and rose to 2.5 mmbd in late 1981. As the glut on the world oil market continued

into 1982, trade journals reported that Mexico cut its prices by \$1.50 to \$2.50 a barrel to compete for a continuing share of declining demand. In March 1982 Mexico was selling its higher quality Isthmus crude oil at \$32.50 a barrel and its lower quality Mayan crude at \$25 a barrel.

Mexican petroleum policy, and therefore that of PEMEX, rests on the traditional concept that mineral rights, including petroleum, rest with the sovereign state and should be used to benefit the state. PEMEX, therefore, justifies exports only in order to promote development; it is seeking to diversify its trading partners, a policy which limits exports to the United States, and to develop bilateral agreements offering oil in exchange for access to technology, development assistance, training for Mexican workers and technicians, and other projects. Currently, it has agreements with the Governments of the United States, Canada, France, Brazil, Japan, Spain, and Israel.

Nigeria

The Nigerian National Petroleum Corporation was formed in 1977. It is the majority shareholder in virtually all crude oil production, including the two remaining market companies, and owns all refinery and distribution operations and planned petrochemical facilities. Production and exploration are performed by a number of oilfield service companies.

A number of foreign companies are active in Nigeria through Nigerian-registered subsidiaries which usually have majority participation by the national company. Because of the demands of its developing economy, Nigeria has encouraged foreign participation in exploration and production but has not been entirely successful. Companies own a percentage of production commensurate with their equity participation. Concurrently, they have contractual rights to purchase certain amounts of the national corporation's equity oil. Marketing is thus shared by foreign oil companies and the national corporation. During the recent glut, trade journals reported that Nigerian production dropped from 2.1 mmbd to 1.3 mmbd and that Nigeria reduced its prices in some instances to below the OPEC benchmark of \$34 a barrel.

CONTRACT RESTRICTIONS

Another structural change in the international oil market that seemed to reach its peak in 1979 and 1980 was the rigid contractual terms under which the major producing countries sold crude oil. During this period, long-term contracts assuring relatively stable access to oil supplies yielded to short-term agreements subject to renegotiation by the producing country at any time. The short-term contracts also have a wide variety of restrictive clauses, affecting everything from price to destination. Producers used direct sales to reach economic and

political objectives as well as to extend their control over international markets for crude oil and its products.

Contracts provide the legal framework for reconciling objectives of the buyers and sellers. They include side letters (contract attachments which could include credit terms, boycott clauses, performance bonds, or major issues of government policy (e.g., the use of sellers' ships)), which are used to negotiate further and to accommodate special needs of both parties. Both contracts and side letters reflect the balance of the market power between the contractual parties.

Standard contracts specify types of crude oil, time frames for delivery, quantities, lifting tolerances, prices and price reviews, credit terms, penalties, use and destination restrictions, and loading and other logistical conditions. Producing countries are prepared to negotiate certain points which appear in the side letters.

The slack market conditions that prevailed between 1974 and mid-1978 moved sellers to press for secure markets. This end was achieved through contracts with large buyers, who then had enough bargaining power to successfully moderate standard contract requirements. Tight market conditions favor the seller, who no longer needs the guarantees offered by the large buyers. Instead, sellers seek the ability to move with the market and to stabilize production. Thus contract terms showed a variety of measures geared toward such ends.

Restrictive clauses

Oil industry officials as well as studies and publications have described contract restrictions and indicated that most producing countries adhere to practices, involving:

- Direct premiums, sales of longer term contract oil at higher than official prices are made a part of a package incorporating oil at lower official prices--usually as a condition for the sale.
- Exploration fees (or requirements), charges added to the price of crude oil and intended to increase and finance exploration in the producer country.
- Incentive crude, access to crude oil offered in return for foreign investments.
- Mandatory purchases, a purchaser must buy petroleum products or lower quality crude oil, often at high prices, to ensure access to its usual crude oil supply.

- Processing requirements, efforts by producers to increase involvement in refining or petrochemical activities.
- Destination clauses, one type prohibits shipment to certain countries and a second requires shipment to a particular refinery, port, or country.
- Requirements, usually applied to major integrated companies, that the crude oil be processed and sold by the buyer or its affiliates.
- Resale restrictions, generally prevent the buyer from reselling the crude oil and give the seller control over swaps (a frequent practice whereby refiners obtain lower transport costs and a suitable quality of crude oil for their facilities) and prevent sale on the spot market.
- Transportation restrictions, which either prohibit the use of certain flag vessels or require that oil be shipped in vessels owned or preferred by the producer.

A January 1982 IEA analysis of the changing structure of the international oil market summarized the picture as follows.

"The ability of producers to impose destination restrictions was greatly enhanced in the tight oil market in 1979/80. By imposing destination restrictions, producer countries gain greater control over crude oil flows. One of the stated objectives of the producers was to prevent speculative resales of crude oil flows. Thus although restrictions are more frequently applied to contracts with direct government involvement, state companies or nationally based private companies, they also apply to some contracts with the private international oil companies.

"It is estimated that by the end of 1980, between 3 and 6 mmbd of OPEC oil (15% to 25% of production) was subject to restrictions of the severer types under which resale is normally prohibited. These restrictions considerably reduce the flexibility of individual state or private companies, and thus diminish the ability of the entire supply system to balance out company and regional imbalances.

"Since then, the slack oil market has greatly loosened these restrictions and even though the standard contract clauses continue to exist, they are not being strictly applied."

Prices

In the past, oil was mostly sold at an official government selling price. Price variations reflected quality and transportation differences. During 1979 and 1980, prices were no longer tied to the price of Saudi crude oil, which was looked upon as the base price for crude oil; thus there was no assurance that contracted prices would parallel the general level of prices. The market witnessed various prices for the same type of crude oil as well as an array of premiums added to the official prices. One example of a premium is the \$3.00 a barrel exploration surcharge required by Algeria.

Tied sales

OPEC and non-OPEC producers alike often lift more than one type of crude oil; some have refining capabilities that exceed domestic needs. Therefore, sellers may have less desirable ("heavy" or "sour") crude oil or oil products they wish to market. They may also seek to link sales of crude oil to other policy goals. For these reasons, producers frequently tie the sale of desirable crude to other purchases or actions. For example, Mexico produces heavy and light crude oil and the government requires buyers to take both types in roughly the proportions in which they are produced. In tight markets, producers have linked contract crude oil to purchases of higher priced "spot" crude oil. Some purchasers reported having to buy their way to gain access to a country's crude oil by purchasing such oil at spot market prices.

Some producers have linked access to crude oil during tight market periods to investment and exchange of technology and/or exploration. Mexico and Venezuela have sought mass transportation equipment and services in this manner. Some U.S. oil corporations have sought preferred access to Saudi crude oil through investment in that country. Some producer countries, such as Algeria, sought exploration clauses. Finally, some producing countries have sought political or military concessions; Nigeria's nationalization of British Petroleum holdings was at least in part politically motivated, as discussed in the trade press, because of Britain's foreign policy in Southern Africa. France's relationship with Iraq involves the provision of nuclear technology.

The effect of tied sales has been to limit the flexibility of the market and to increase related costs of crude oil. This pressure is clearly greatest in a tight market. Moreover, producers' interests in obtaining investment, technology, or exploration may tend to favor governments and national oil companies as well as large integrated oil companies at the expense of smaller ones because of their capacity to provide a wide variety of needed services.

CHANGES IN REFINING ACTIVITIES

Producing countries see diversification into refining as a means of capturing a greater portion of the ultimate value of petroleum products at the consumer level and of expanding their domestic industrial bases and accelerating economic development. As a first priority, OPEC nations are building or acquiring refining facilities to meet their internal needs, but some of them are seeking to increase exports of refined products as well.

OPEC's refining capacity and that of other producing nations is substantial in terms of meeting their own needs. Nevertheless, in the opinion of trade experts, this capacity does not represent a short-term threat to U.S. interests. Producer countries' refinery needs are rising rapidly. Excess world refinery capacity makes this segment of the oil business unprofitable at the present time. OPEC nations find that refinery construction within their borders is expensive and that transporting refined products is inherently more complex and costly than shipping crude oil. Some producing countries are anxious to acquire refinery and marketing facilities in consuming countries; others are wary, realizing that acquiring real assets outside their borders would, in some circumstances, make them vulnerable to foreign pressure.

According to the IEA, international oil companies and major consuming countries have successfully adapted their refining systems to the changed market structure. Although free world oil consumption increased between 1973 and 1980 from 47.9 mmbd to 49.3 mmbd, the major international oil companies reduced their refinery throughput by 5.4 mmbd and their product sales by 3.9 mmbd. These companies' share of free world refining decreased from 51 to 38 percent over the entire period with smaller independents increasing their share. The process has, however, slowed down since 1978. The major oil companies' share of product sales fell from 51 to 41 percent during the entire period but by only 3 percent since 1978.

This development can be seen as a response mainly to two factors--the loss of preferential access to crude oil and the low profitability of refining, marketing, and distribution operations in a number of countries in the 1970s, except for short periods in 1973-74 and after the Iranian revolution in 1979.

Apart from this company-specific change, the free world refinery system in general is adapting to changing product demand trends. A large amount of conversion capacity is being constructed which will enable companies to increase the proportion of light oil products and reduce unwanted heavy oil products. This investment will also have the effect of increasing the companies' flexibility in crude oil purchases and thus make up for lost flexibility at the wellhead.

IMPACT OF STRUCTURAL CHANGES ON
THE INTERNATIONAL PETROLEUM
INDUSTRY AND INDUSTRY RESPONSE

The international petroleum industry as a whole has proved resilient in the face of changes in the world oil marketing system. This resiliency is more remarkable in view of the facts that many producer initiatives were aimed at eliminating foreign private industry control of production and reserves and that the people and governments of many consuming countries often blamed the "companies" for rising oil prices and for causing shortages. The major oil companies, as noted above, lost their dominant position as producers or "lifters" of crude oil but, in large part, retained the refining, marketing, and distribution operations. Independent oil companies, their numbers swelled by traders and other new entrants to the market, actively participated in the international oil market. The system may have lost some flexibility as a result of the loss of the major oil companies third-party role; 1/ on the other hand, some flexibility may have been regained through increased third-party activity; moreover, at the refinery level, a large amount of conversion capacity has been and is being built, thereby increasing crude oil purchasing flexibility.

Responses of major oil companies

The seven major international oil companies (British Petroleum, Exxon, Gulf, Mobil, Shell International, Socal, and Texaco) lost title to a large proportion of crude oil and, thus, control of production from 1973 to 1979. In 1979 and 1980 they largely abandoned third-party sales. Nevertheless, they retained, for the most part, a large share of their refining, marketing, and distribution operations.

As IEA points out, in 1973 the major oil companies' offtake was 30 mmbd, which accounted for about 75 percent of internationally traded crude oil and consisted largely of equity and preferential oil. Since their refinery runs were only about 23 mmbd, they sold their excess crude oil to third-party customers, primarily through long-term contracts. Since 1973, successive nationalizations and other actions have taken over the disposition of crude oil liftings. This change affected the major oil companies in two important ways.

1. The amount of crude oil directly available to them decreased and a substantial portion of the oil they had previously produced was sold not to them but to other oil companies, including some of their former customers.

1/ Sales to a buyer other than an affiliate or end user.

2. The price of much of the crude oil available to them for purchase was considerably higher than their cost to produce the same crude on an equity or concession basis, thereby shrinking the margin for this part of their operation. Thus, the profitability of trading oil to third parties was diminished.

As a result, the major oil companies reduced their third-party sales from 6.7 mmbd in 1973 to about 0.8 mmbd in 1980 and their refinery runs by almost 5.4 mmbd, from 51 to 38 percent of the world total for the same period of time as independent and national oil companies increased their market share. Some of this latter reduction was replaced by oil product purchases. During the period following the 1973 embargo, changes and adjustments occurred in a relatively orderly process, facilitated by the fact that many producer countries, although they eliminated equity rights, granted preferential positions to their former concessionaries.

In contrast, the period during and immediately after the Iranian revolution was characterized by price escalation and rapid change. Faced with heavy losses of Iranian oil in early 1979, the major oil companies cancelled or reduced almost all of their remaining third-party contracts and, with few exceptions, were forced to look for new supplies to meet their own refinery needs.

In 1982 the major oil companies remain the principal movers, processors, and marketers of crude oil in the industry, although their access to crude oil on an equity or preferential basis has been significantly reduced. They retain their unmatched ability to explore for and develop sources of crude oil; but in regions where most of the world's proven reserves are located they are buyers.

Increased role of the independents

Independent oil producers, refiners, traders, and brokers have increased their role in the international crude oil market. This development, like the greater role for government-to-government transactions, flows logically from the diminished role of the major oil companies, particularly their reduction of third-party sales. Many of the major oil companies' former customers, such as independents, distributors, and governments of oil consuming countries, particularly Japan, entered the market directly to replace crude oil cutoff by the major companies. Moreover, traders and brokers, seeing unsettled conditions, entered the market in the hope of advancing their own financial interests.

Many independents were thrust into the international markets during a period of uncertainty and rising prices. Some complained about problems in obtaining access to crude oil; some lacked the

experience of the major companies in foreign transactions; and, since oil is an expensive commodity, their relative lack of financial resources has been a major disadvantage.

Independents have reacted to changed market conditions in various ways. Some small refiners have successfully formed buying consortiums. At least one refiner has turned to a prominent trader to fulfill its needs. Other small- and medium-sized companies have continued to explore for and to produce oil abroad.

Some spokesmen for the major oil companies assert that the entry of independents into the market, particularly during periods of relative shortage, has accelerated price increases. This view suggests that, in times of shortage, independents, because of their relatively vulnerable positions, bid up prices.

The entry of independents may have affected the efficiency of the world oil distribution system. An independent may have greater difficulty optimizing its refinery slate in dealing directly with producers than it did as a third-party customer of a major oil company. On the other hand, by their sheer numbers, the independents may have made up some of the flexibility lost by the major companies. Their direct, although restricted, contracts with producers may have increased the volume amount of "dedicated oil." In its January 1982 study, the IEA observed that:

"As a result of the elimination of the majors as crude oil traders the producing countries are now dealing with a larger number of smaller buyers. With diminishing contract size, the buyer possesses less negotiating power in a tight market. The segmentation of buyers into smaller units also increased competition and contributes to a higher degree of uncertainty and nervousness in a disturbed oil market. On the other hand, the market has also become more volatile on the downward side in a surplus situation [the more recent market situation]."

CONSUMER GOVERNMENT REACTIONS

Governments of consuming countries have taken three basic approaches in response to changes in the oil market.

1. Multilateral initiatives, such as founding the International Energy Agency.
2. Bilateral steps, such as direct government involvement in securing oil supplies.
3. Oil reserve or stock management activities.

Multilateral initiatives

Primarily in response to the 1973-74 oil embargo, the 21 developed oil consuming countries ^{1/} organized the IEA as an energy policy coordinating forum. In addition, the IEA Emergency Oil Supply Sharing System provides for sharing supplies in the event that one of the IEA members experiences a shortfall of 7 percent or more. IEA members have agreed on general long-term principles, including increased conservation efforts, reduced import dependence, and expanded research and development.

How viable the IEA sharing arrangements may be in the changing international oil market, however, is in question. The system does not accommodate shortfalls of less than 7 percent. Also, in 1979-80, producer leverage and the proliferation of direct government-to-government oil purchasing agreements limited market flexibility and raised concerns about the industry's ability to shift supplies in actual oil emergencies. For example, increasing volumes of oil became subject to restrictions imposed by producers and direct sales to governments and refiners led to greater amounts of dedicated oil. The staff of the IEA studied this problem and concluded that enough flexibility remained in the system to enable the sharing mechanisms to work effectively in an emergency. However, IEA officials have difficulty defending this conclusion when confronted with the fundamental point that contract restrictions are more enforceable during periods of shortages, which are precisely when the Emergency Sharing System would be implemented. IEA operations and problems are discussed in detail in our report of September 8, 1981, "Unresolved Issues Remain Concerning U.S. Participation in the International Energy Agency (ID-81-38) and in chapter 4 of this report.

Bilateral steps

Some governments, such as Austria, Italy, France, and Japan, have long been involved in the procurement of crude oil abroad, largely for national security reasons, but government-to-government deals and other forms of government involvement were accelerated generally by market conditions in 1979 and 1980 and specifically by the severe reduction in third-party sales. (See ch. 3.) The national security implications of dependence on imported oil demonstrated to consuming countries the importance of increasing their government participation in securing these imports. Generally, government involvement ranges from indirect intervention, such as providing a favorable political-economic atmosphere for private transactions, to government-to-government negotiations.

^{1/}Australia, Austria, Belgium, Canada, Denmark, Greece, Ireland, Italy, Japan, Luxembourg, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, United Kingdom, United States, and West Germany.

The IEA has developed what might be called "unofficial" definitions of various types of government involvement in international oil transactions. These cover not only direct government purchases but also the indirect effects of government activities on crude oil purchases by private entities. The IEA has identified and analyzed categories of transactions in which:

1. Government policy provides a favorable framework or umbrella for agreements among companies and producing governments for oil purchases, such as when economic, technological, or military cooperation between consuming and producing countries induces the latter to supply oil.
2. Import of oil is provided by partly or wholly state-owned or state-controlled companies. The degree of government involvement may vary under such transactions. Those contracts which resulted due to some government action or negotiations with producers are included in this definition.
3. The government or one of its agencies negotiates or is party to the contract for purchase of oil directly from a producer.

The first category is vague, and transactions falling under it are often difficult to identify. In many instances, it is virtually impossible to state with any certainty that government relations with a producing country contributed to the conclusion of a favorable agreement on oil imports by a private firm. On the other hand, in certain instances the connection between favorable or unfavorable consumer-producer country relations and the outcome of private firms' oil contract negotiations is obvious and, occasionally, openly stated. Direct purchases of oil by the Japanese seem to fall within this category. The Japanese Government played a role in influencing oil negotiations with Iran in 1979-80; it provided strong administrative guidance and was even involved in price negotiations. Similarly, the German Government played an important role in promoting a small group of its independent refiners' efforts to obtain oil directly from Saudi Arabia.

The second category also contains some ambiguities. The degree of government involvement in such transactions may vary, depending upon the degree of control the government exercises over the company. In countries such as Canada, Italy, and Spain, the state companies often receive direct government instructions, so their transactions would fall within this category. In other countries, government-owned or controlled companies (for example, British Petroleum in the United Kingdom and CFP in France) conduct oil transactions as though they were private firms.

Category 3 admits little ambiguity. In some cases the consumer government actually negotiates the oil contract. On occasion, the consumer government is a party to the contract. For example, the Japanese Government provided loans for industrial development as part of an agreement to purchase crude oil from Mexico.

Consumer government involvement has increased significantly. However, while government-to-government transactions in IEA countries were increasing, net oil imports for these countries were decreasing. The IEA estimates that between 1978 and 1980, 3 mmbd to 4 mmbd of oil worldwide was shifted from private contracts to contracts with some degree of government involvement. For IEA countries as a whole, direct or indirect government involvement increased from 25 percent of crude oil imports in the first half of 1979 to somewhat over 30 percent in the second half of 1980. This shift is equivalent to about 1.6 mmbd to 2 mmbd.

According to the IEA, the increased involvement in crude oil imports by governments has so far not visibly reduced the overall market share of the major oil companies in IEA countries. IEA countries which have acquired more crude oil with government involvement in the last 2 years have either (1) done it at the expense of the independent companies (Italy) or (2) sold the crude oil or the products refined from it to established operators (Belgium, Denmark, Ireland). In the longer term, however, there may be a tendency toward greater government participation in refining, marketing and distribution activities if state crude oil acquisitions continue to grow or if the major oil companies voluntarily reduce these activities in certain countries.

Two countries present interesting case studies of the role of government in the import of oil. In Austria, the state oil company, OeMV, accounts for 60 to 70 percent of imports. The Austrian Government views government-to-government arrangements as an important element of diversification of supplies. Since 1968, OeMV has made a strong effort to gain long-term oil and gas contracts directly with producer countries. The Austrian Government, through OeMV, was the first European country to negotiate contracts with the Soviet Union and also the first to negotiate a state-to-state agreement with Iraq. Austria is attempting to expand its government-to-government agreements and to diversify its oil sources. OeMV was involved in negotiations with Venezuela and Mexico in 1981.

Austria prefers government-to-government agreements for oil because it believes that such contracts result in lower prices and longer term, more secure oil supplies. In the past, the country relied heavily on multinational oil companies; it still wants to preserve the participation of these companies in supplying crude oil. Austrian officials have stated that, in addition

to straight purchasing agreements, they are willing to trade steel products and armaments for crude oil.

In response to the major oil companies' cutbacks in third-party sales, the Japanese Government oriented its domestic and foreign operations and policies to enable close cooperation and consultation with private industry and to cultivate a dialog with the producing countries. One outcome of this policy has been the development of "package deals" which take the form of national projects and include financial and technical assistance to producing countries in return for access to crude oil. These arrangements are complex, and opinions may vary on the degree of government involvement. These deals are usually set up in one of two ways--the government will establish a general negotiating framework and then let companies take over or it will negotiate directly and then make arrangements for the oil companies to act as importers. Japan has succeeded in negotiating an arrangement with other countries, including Indonesia, Mexico, Nigeria, Iraq, Qatar and Abu Dhabi. The arrangement with Mexico involves a consortium of Japanese companies which includes banks, steel companies, trading companies, and oil refiners. The Ministry of International Trade and Industry (MITI) orchestrates these projects but leaves the details of the arrangements to private companies. MITI's main objectives are to diversify oil sources and channels of supply. For this reason, MITI does not claim to favor one channel over the others; it has, however, encouraged Japanese oil refiners to use the trading companies as go-betweens in negotiating direct deals.

Oil reserve or stock management activities of selected countries

By building up domestic oil stocks, both government and private, governments of oil consuming countries hope to decrease their vulnerability to oil supply disruptions and oil "blackmail."

Japan

Japan's oil stockpiling policy was instituted in 1972 and has proceeded in three stages. The first stockpiling target set by MITI for the Japanese oil companies was a 60-day reserve supply in 1974. At the time, this constituted 15 days of emergency stocks and 45 days of regular commercial inventory. When Japan joined the IEA in 1974, it agreed to establish, as did other IEA members, a 90-day supply of oil stocks by 1980. This higher level prompted MITI to acquire formal legislative approval and authority to require the companies to hold these stock levels. Japan's Petroleum Stockpiling Law of 1975 requires MITI to set oil stockpiling objectives. These objectives must be defined to designate the stockpile requirements of importers, refiners, and marketers. By late 1981, government and private oil stocks in Japan rose to levels in excess of 125 days supply. The storage goal will be different each year, since the volume of oil in the reserve will depend on oil consumption.

To further industry efforts, the Japanese Government provides various forms of assistance, such as financing, cost-sharing, and land for plant siting, and it authorized its national oil corporation to establish a government-owned stockpile to supplement the 90-day private stockpile. The corporation has set a stockpiling goal of 120 million barrels by the end of fiscal year 1982, with 60 million barrels to be held in idle tankers. This program has lagged behind schedule because of difficulty in finding storage sites and obtaining oil under past tight market conditions.

West Germany

The West German Government has traditionally preferred minimum regulation of the domestic oil industry and has shown a strong preference for a market economy under a private enterprise system. This "competitive neutrality" is difficult to maintain with regard to a storage policy. The stockpiling system operates largely under coordinated industrial management.

Emergency stockpiles consist of a government crude oil reserve of 25 days, an industry reserve of 25 days, and a public storage corporation or consortium reserve of 65 days for a total of 115 days national reserve. The consortium, EBV, was established by law in 1978 and membership is mandatory for all companies that import or refine oil in West Germany. EBV arranges all storage facilities for the emergency stockpiles and is responsible for managing the stocks. A 1978 law requires refiners to hold the equivalent of 25 days of their production from imported crude oil in the prior year; the government and the consortium are required to hold a combined total of 90 days of oil consumption. EBV buys the 65 days worth of oil out of debt financing, and storage costs as well as interest are paid out of a special tax fund.

One of the most important aspects of the EBV program is the special financial arrangement that removes obligatory (emergency) stocks from the balance sheets of the oil companies--they do not have to borrow money or use retained earnings to carry this "dead asset." EBV is completely debt-financed through the normal government loan guarantees given to any German company. Interest on loans is paid through "storage taxes" on petroleum product sales collected from the individual companies and is ultimately passed on to the consumer. The arrangement not only relieves the oil industry of the financial burden of these reserves, but also separates the oil administratively so that government authorities can constantly monitor emergency reserve levels. For this reason, the West German program is stricter and more effective than those of other countries because it specifically excludes all commercial inventories.

The government also encourages consumers to hold reserves in excess of legal requirements. Consuming sectors of the

West German economy have been asked to maintain additional emergency stockpiles of at least 14 days consumption.

United States

The United States has recently increased the fill rate of the Strategic Petroleum Reserve and plans a total volume of 750 million barrels by 1990. We have issued a series of reports on this subject. 1/ The method of financing the Reserve is still under discussion by the executive branch and the Congress. (See pp. 48 and 49 for additional comments on the Reserve.)

Summary

The effectiveness of national stockpiles has not been tested in practice. Relying on integrated emergency reserves held by the oil industry, such as the French and Italian systems do, may be risky because there is no way of knowing what emergency reserves, as distinct from normal commercial inventories, will be available to satisfy emergency demands. Contingency reserves, such as those of Japan and West Germany, may be preferable. Nevertheless, the beneficial role of inventories is clear. In 1979, industry's stocks were low and uncertainties arising from the Iranian revolution precipitated a rapid escalation of prices. In contrast, higher inventories at the outbreak of the Iran-Iraq war in September 1980 helped to maintain market stability.

THE SPOT MARKET: ITS ROLE AS BAROMETER AND INSTRUMENT OF CHANGE

Part of the changing structure of the international oil market has been the role of the "spot" market. Price changes in this market are important because:

- They are highly visible.
- Larger quantities of crude oil and oil products change hands on the spot market in times of supply-demand imbalance.
- Both producers and consumers assert that spot prices influence the price of the bulk of world oil sold on a contract basis.

The spot market is hard to define, particularly since the traditional long-term contract has become rarer as a result of events in 1979-80. It is usually thought of as a process, or

1/See "Strategic Petroleum Reserve: Substantial Progress Made, But Capacity and Oil Quality Concerns Remain," (EMD-82-19) Dec. 31, 1981.

informal auction market, through which cargoes of crude oil or quantities of oil products are exchanged on a day-to-day basis rather than under a term contract. A spot market in crude oil and oil products has existed for years in such centers as Rotterdam, Houston, and Singapore. It is an informal network of buyers and sellers, ranging from major oil companies and representatives of producing and consuming countries to dealers whose assets represent little more than a telephone or a telex machine and a list of contracts.

In 1979, moreover, the term "spot market" came to characterize additional kinds of transactions not previously common in the world crude oil market, including the so-called entry fee sales by which companies purchased expensive cargoes of crude oil hoping to obtain a term contract as well as other transactions which "tied" spot purchases to contract sales.

Quantities traded on a spot basis are estimated at between 5 and 20 percent of the market, depending on world supply and demand conditions. Our August 21, 1980, study "The United States Exerts Limited Influence Over the International Crude Oil Spot Market" (EMD-80-9), found that spot transactions represented about 9.4 percent of total crude oil purchases for import into the United States between April 1979 and February 1980.

When world oil markets are stable--that is, when supply and demand are roughly in balance--the spot market provides a balancing mechanism. It enables sellers to rid themselves of surpluses of crude oil or oil products and buyers, consumers, or refiners to purchase small volumes to meet immediate needs or to avoid economically inefficient reductions in refinery runs.

Problems arise, however, in the absence of stability, including price volatility and the effect of spot prices on longer term contracts. The spot market, representing only a small share of the world market, tends to overstate fluctuations in supply and demand for oil. In a tight market, prices can and have jumped rapidly, as they did in 1979. Furthermore, according to industry authorities, these spot price increases were quickly reflected in the contract prices of crude oil. The impact is the so-called ratchet effect.

It is too early to describe in detail the role of the spot market in glut conditions, such as that of the last quarter of 1981 and the first quarter of 1982. Crude oil has been traded on the spot market at a considerable discount from the official "OPEC" benchmark price of \$34 a barrel. For example, Arabian light has been quoted on the Rotterdam market as follows.

<u>3d Quarter</u> <u>1981</u>	<u>4th Quarter</u> <u>1981</u>	<u>Jan.</u> <u>1982</u>	<u>Feb.</u> <u>1982</u>	<u>March</u> <u>1982</u>
\$31.17	\$32.74	\$31.85	\$29.88	\$29.00

Furthermore, press reports indicate weaknesses in the contract price for oil, but a cause and effect relationship, while logical, is difficult to prove.

RECENT GLUT AND STRUCTURAL CHANGE

As of early 1982, a glut existed in the world oil market. Statistics differ in detail but they tell the same story. IEA estimates indicate that OECD ^{1/} oil consumption for 1982 may be 3 to 4 percent below the preceding year, and since 1979 a total decline of OECD consumption of 17 to 19 percent has taken place. At the same time, April 1982 OPEC production was about 17.5 mmbd compared with about 22 mmbd in the 4th quarter of 1981 and 31.6 mmbd at its annual peak in 1979. DOE reports that as of December 1981 maximum sustainable OPEC crude oil productive capacity was 32 mmbd.

These indications are confirmed by price trends. Falling prices have tended to lag behind declines in world consumption and, perhaps, do not yet reflect the current world balance of supply and demand. For example, when consuming country consumption dipped 3.2 mmbd in 1980, the world oil price reached a peak in late December 1980 of \$35 a barrel and, despite another reduction of 2.9 mmbd in 1981, dropped only to \$34 a barrel, the price set by OPEC in October 1981. As consumption in 1982 continues to decline, some members of OPEC are undercutting the official uniform price of \$34 a barrel in an effort to compete for shares of a diminishing market.

A number of indicators point to the conclusion that the recent excess of supply over demand may, to a significant degree, be the result of a fundamental shift in the world energy market; that is, a permanent or long-term change which has become part of the system as opposed to a decline in demand reflecting only the economic slowdown currently affecting most developed countries. For example, from 1973 to 1980, the real gross domestic product of OECD countries increased by 20 percent while total energy requirements increased by only 4 percent and oil requirements decreased by 3 percent.

The changes described in this chapter are fundamentally those imposed by sellers in a tight market and the protective reactions of oil consumer governments. They have had the broad impact of making the market less flexible, particularly under conditions of tight supply. While it is too early to say whether these changes are permanent, they clearly are less important under more recent circumstances than they were as recently as 18 months ago. Thus, a general observation of the changing structure of the world oil market arises out of this oversupply

^{1/} Organization for Economic Cooperation and Development.

situation. Clearly an abundance of supply favors buyers in a way analogous but converse to the advantage which a shortage gives to sellers.

OBSERVATIONS

There is little likelihood of a return to the status quo of either pre-1973 or even pre-1979. Governments have increasingly entered the oil market. The major oil companies are unlikely to regain their former positions of dominance. Because the recent glut does not arise primarily from the fact that the major oil companies have found more oil, these companies have not significantly expanded their markets. In fact, where it was relevant to speak of producers and consumers 2 years ago, the terms buyers and sellers are now more appropriate. The international exchange of oil has become more a market and less an instrument of power in anyone's hands.

Some changes which represented producing country strengths in a tight market are something quite different in today's market. For example, one form of producer diversification is for a producing country to refine its oil in a refinery of a developed country for its own account. In a tight market, this procedure enabled the producer to control the distribution of products refined from its oil. In today's market, it often is a means of disguised price-cutting because it avoids the issue of the official selling price for crude oil.

In the mid 1970s, development of refining capability seemed to be a major aim of certain OPEC countries in order to dominate the world oil market; this seems even more remote now, although it never was viewed as much of a threat. Decreasing demand has exacerbated the world oversupply of refinery capacity and resulted in refining cutbacks.

Conversely, efforts of oil consuming governments to increase world crude oil production are not growing. Industrialized nations have no high priority interest in international efforts, such as those of the World Bank, to stimulate exploration and production in less developed countries nor are consuming countries entering into exploration agreements with producers. Also, private sector exploration efforts which were increasing in 1979 and 1980 have decreased as the glut depressed prices and precluded some exploration efforts as being uneconomical.

Finally, OPEC appears to have lost at least a degree of control over the market. During the earlier tight market, non-OPEC producers by and large followed OPEC prices upward; now however, as recent reports of the sale of North Sea and Mexican Oil indicate, they seem to be willing to make the price adjustments necessary to sell their oil. OPEC, in contrast, has tried,

so far unsuccessfully, to regulate production and maintain prices. Consequently, OPEC seems to have lost some of its market share and control of price.

Continued political unrest in the Middle East cautions against unwarranted optimism, and experience since 1973 leads one to expect a high degree of uncertainty. Although decontrol and high prices have led to increased oil exploration in North America, which has marginally slowed the rate of decline in domestic production, other factors lead to a less favorable outlook. Development of alternative and synthetic fuels requires a long lead time and appears less economically justifiable. The basic supply-demand outlook, therefore, points to continued consuming country dependence on imported oil for the foreseeable future.

CHAPTER 3

COMPARATIVE ANALYSIS OF CONSUMING NATION

RESPONSES TO CHANGING OIL MARKET

This chapter reviews the policies and actions of France, Great Britain, The Federal Republic of Germany, Austria, Japan, and Canada. Each country is different; none can be called typical of consuming nations; however, taken as a whole, this group can be said to present a comprehensive picture. Governments of consuming nations have not been mere passive victims of change; in certain respects they have played an active role. Their actions are important. During 1979-80, when many of the structural changes in the market occurred or at least became manifest, four generalizations concerning the impact of their roles emerged.

1. Most industrialized consuming nations have obtained adequate supplies of crude oil and oil products.
2. The actions of some governments in turning to increased use of government-to-government deals may have contributed to certain rigidities in the international oil market and increased the politicization of oil.
3. Reliance on the spot market in some cases may have contributed to the sharp run-up of prices following the Iranian revolution.
4. The governments of the consumer countries discussed here, and probably those of most consuming nations, have increased their interest in and authority over oil stocks.

FRANCE

France depends heavily on imported oil, much of which comes from OPEC. Oil meets 54 percent of France's energy needs, yet in 1980 its domestic production of crude oil accounted for less than one percent of its energy requirements.

In 1976, the French Government established the Energy Conservation Agency, which adopted a policy that sought increased security of supply, diversification of oil sources, better use of refinery capabilities, intensified exploration, and an overall reduction of oil imports. French strategy relies heavily on conservation and nuclear power to achieve a significant reduction of imports.

Source of imports

Two French companies (Companie Francais des Petroles (CFP) and ELF-Aquitaine) account for 50 percent of imports. The French Government owns 35 percent of CFP and 67 percent of ELF and reserves 50 percent of the domestic market for them. The companies' officials state adamantly that their firms are run as private companies; outside observers frequently see them as instruments of the government and guided by its policy. The government also established a national oil company, SOFRACOP, in 1979 in order to participate in certain bilateral deals. SOFRACOP is jointly owned by CFP and ELF, which market its oil at the retail level. In addition to SOFRACOP contracts, many of the companies' transactions bear all the earmarks of government-to-government deals. The remaining 50 percent of the French market is in the hands of Shell, Exxon, British Petroleum, and Mobil, and the government has no plans for decreasing this share.

Control of domestic market

The French Government's control over the oil market is based on a 1928 law which established the principle that the " * * * import of crude oil, its derivatives and its residues is to be carried out under the control of the state." Under this law, the government issues licenses allowing individual companies to import crude oil and petroleum products. Crude oil import licenses, known as A-10s because they are valid for 10 years, determine the amount of imported crude oil a company may refine. They affect mainly gasoline and certain lubricants. Crude oil destined for export in the form of finished products is exempt from these quotas. Product licenses, A-3s valid for 3 years, establish import quotas for petroleum products. In effect, the government holds a monopoly over the marketing of oil products which it delegates to companies through this system of licenses.

The government also maintains price controls on regular and premium gasoline, home heating oil, and diesel fuel. Keeping France's oil bill as low as possible is a major goal of the government's pricing policy.

Reserve stocks

France relies totally on the oil industry to stockpile petroleum for non-military emergencies. Government-established stockpile requirements of 90 days have been in effect for almost 25 years and industry seems to have accepted the requirements as a cost of doing business in France. The stockpile program was established because of France's major import dependence and the feared consequences of a supply disruption.

France was the first major industrial nation to establish a petroleum emergency reserve. A 1928 law established the

principle of government control of oil. Stockpiling obligations were imposed on the oil industry by a series of subsequent decrees. In 1951, refineries were requested to maintain the equivalent of 10 days of average crude oil imports. A 1958 decree required all importers to maintain a stockpile equivalent to 25 percent of their inland sales during the preceding 12 months. This obligation is widely referred to as the "90-day" requirement. An additional requirement of 9 percent was added in 1980 because of the supply disruption resulting from the Iraq-Iran war.

Six major oil companies which comprise 95 percent of the French oil market are responsible for 95 percent of the stockpile. The emphasis is on product stockpiling, but companies are authorized to substitute excess crude oil for finished products to some extent. Oil product stocks are preferred because they would be more readily available for distribution. Emergency petroleum stockpiles are commingled with the operational stocks of oil companies in storage facilities widely disbursed throughout the country.

A system or plan for drawing down emergency reserves in France is not public. However, the Ministry of Industry is responsible for declaring an emergency and distributing stocks. Instead of drawing down emergency stocks in 1980 as a result of the Iraq-Iran war supply disruption, the government responded by increasing the stock requirement.

International sharing arrangements

France is the only major industrialized nation that is not a member of the IEA. It is the only member of the European Economic Community (EEC) that declined to participate in a joint IEA/EEC test of oil sharing arrangements in the fall of 1980. In an actual emergency, France knows that it could not be left out of any sharing program of the industrialized or European nations. In the past, France regarded the IEA as American-dominated, counterproductive, and confrontational. French authorities do not oppose sharing in principle and now believe that the IEA serves a useful function as a forum for discussion. France submits data to the EEC that could be used for crude oil allocation purposes but sees no reason to join the IEA at this time.

Reactions to events of 1979-80

France was severely affected by events in 1979-80. Prior to the Iranian revolution, Iran was a major supplier of crude oil to France. As production in Iran declined rapidly, France increased its dependence on Iraq. French access to crude oil was, therefore, again threatened by the Iran-Iraq war in the

fall of 1980. France reacted in two ways--by engaging in oil diplomacy and by attempting to impose further controls on stocks. The first of these efforts was successful, the second proved unnecessary.

Since the 1973-74 oil crisis, France has negotiated government-to-government deals. It has offered nuclear technology, weapons, computers, reciprocal investments, and other incentives as a means of securing access to crude oil. During the 1979-80 period, France intensified its efforts in oil diplomacy.

Prior to the outbreak of the Iran-Iraq war, Iraq supplied 25 percent of total French oil imports. A large part of this supply was lost at the outbreak of hostilities. As a result of intense French diplomatic efforts (the president of France visited several oil producing countries, including Kuwait, the United Arab Emirates, and Mexico), a number of countries increased sales to France to offset this shortfall. Kuwait agreed to supply 30,000 barrels of oil per day and Saudi Arabia 120,000 barrels per day. According to trade sources, the Saudis sold this oil under Iraq price terms (higher than the Saudi posted price) and gave the difference to Iraq to aid in the war with Iran.

These events illustrate both the dangers and advantages of government-to-government arrangements. France heavily depended on its governmental relationship with Iraq. On the other hand, its diplomatic efforts enabled it to quickly replace lost crude oil, but at a higher price. In the recent surplus market, France finds itself in the situation of being saddled with many high-priced, government-to-government oil contracts entered into under tight-supply conditions.

With regard to stocks, on October 31, 1980, the French Government directed refiners to hold additional stocks of gasoline and distillates--equivalent to 9.4 percent of 1979 sales--over and above the legally required 90-day stock level. Industry officials objected strongly to this additional requirement. At that time companies were holding 6 million tons (equivalent to 44 million barrels of oil) above the 90-day level, equal to about 22 days of consumption. Consequently, the companies were released from their obligation to increase stocks gradually and this additional requirement has been relaxed.

GREAT BRITAIN

With the discovery and production of North Sea crude oil, Britain has become roughly self-sufficient in oil but retains a major role in the international oil market because:

- Its refineries are designed to handle lower grade, Middle East crude oil, so it remains a major importer while exporting light, high-quality, North Sea crude oil.

--Two of the major international oil companies, British Petroleum and Shell International, have principal administrative offices in the United Kingdom.

Exports and imports

All crude oil imported into the United Kingdom is obtained through private companies, primarily the major multinationals. Because of Britain's traditional association with the Persian Gulf, its refineries were built to handle this crude oil and most of its imported crude oil still comes from this area.

British exports, too, are largely handled by private companies, which are controlled by government license. In essence, government works closely with the petroleum industry. In practice this control has not proved onerous, since the government has usually granted licenses for legitimate commercial or operational reasons. The British national oil company, as a participant in much of the North Sea oil operations, has considerable flexibility in allocating oil to companies and, therefore, could indirectly control exports. The Labour Government formed the national company, a wholly government-owned corporation, which enables it to participate more fully in the North Sea oil operations. The national company has a stake in all oil fields found on the British continental shelf. The government also believed that the company would improve the government's ability to control the rate of oil field development and upgrade its ability to analyze technical information. Since the Conservative Party took office in 1979, the national company's powers have been reduced. It retains its equity in other companies, maintains participation agreements, and performs a trading role. It has no refining capability; instead, these facilities are privately owned. British Petroleum, Shell International, and Exxon control 65 percent of domestic refining capacity.

The national oil company has negotiated to sell oil on a government-to-government basis on two recent occasions: (1) to Greece in connection with a sale of coal-fired electrical generating equipment, but the deal fell through for reasons not related to oil, and (2) to the Government of Iceland.

The British Government has expressed in formal guidelines that North Sea crude oil should go only to IEA or EEC members. The national oil company itself has no direct oil commitment to IEA or EEC. The government does not attempt to control spot market activities of private companies operating in the North Sea. Some of this oil has been sold on the spot market by smaller companies with no refining, marketing, or distribution operations. The national oil company did not enter the spot market; it has a gentleman's agreement with the United States and the EEC to stay out of this activity.

The oil role of the British Government reflects the party in power. Under the Labour Party, the government tended to manage the activities of the petroleum industry; under the Conservative Party, it presides over such activities. In the field of production, the government controls leasing of British areas of the North Sea.

Reserve stocks

As of January 1981, petroleum stocks in Britain were equivalent to 100 days supply. Moreover, power stations held minimal additional stocks. These stocks exceed those required under EEC guidelines (75 days based on previous year's consumption) and those of IEA (90 days). Private companies hold stocks and pay all storage costs, which are passed on to the consumer as market conditions permit.

International sharing arrangements

The British Government does not expect to have large amounts of oil available for IEA-EEC sharing. Britain's partners in these organizations want assurances that they will achieve increased supplies in an emergency--assurances the government has resisted. Government policy, however, dictates that Britain's North Sea oil go to "traditional" markets during an emergency. Britain is, of course, a major trading partner of other EEC and IEA nations and wishes to meet their legitimate needs.

Reactions to events of 1979-80

During the events of 1979-80, Britain took three actions; it (1) increased production, (2) refined North Sea oil domestically, replacing its customary imports, and (3) effectively raised the price of North Sea oil.

In 1979 Britain went beyond good oil field production practice to increase production. It achieved maximum short-term production at the expense of making deeper reserves more difficult to recover in the future.

For many years, refiners operating in the United Kingdom claimed that North Sea crude oil could not be processed in existing domestic refineries. During the perceived shortage of 1979, however, British refineries did process North Sea oil, demonstrating that it can, if necessary, refine this oil into all the products needed for its own use, except for heavy lube oil. The costs of refining North Sea oil domestically, however, are higher than Britain's usual refining costs.

In the summer of 1979, the British national oil company effectively raised the price of its oil by using forward sales, requiring full payment before delivery for the entire contract

amount without offering any discount for advance payment. This practice was used again in the fall of 1980. Britain's trading partners objected to this practice because they feared it might spread to OPEC.

FEDERAL REPUBLIC OF GERMANY

The Federal Republic of Germany, the largest oil consumer in Western Europe, imports 93 percent of its oil. Nevertheless, it experienced no crude oil supply disruptions in 1973-74 or in 1979-80. Germany achieved this success by relying on a market-oriented energy policy. The German market is highly accessible; import licenses are given to any company that requests them, and there are few government regulations and no price controls. The Germans believe that this system ensures maximum flexibility with respect to market conditions and that international oil companies will not divert supplies to more profitable markets during supply disruptions.

Source of imports

Germany, the largest energy consumer of Western Europe, imports about 60 percent of its energy requirements. Oil represents 51 percent of this energy demand.

In 1973, 95 percent of Germany's crude oil imports came from OPEC countries. By 1980 this figure had fallen to 76 percent. The government has adopted an "away from oil" policy which encourages conservation, maintains the use of coal, increases the use of gas, and allows limited nuclear growth. Nevertheless, Germany is expected to remain heavily dependent upon oil.

The major oil companies handle 60 percent of the oil imported into Germany. Other international oil companies, independents, and traders handle 25 percent; and VEBA, a holding company 44 percent controlled by the government, handles 15 percent. The leading suppliers are subsidiaries of Exxon, Shell, Texaco, British Petroleum, and Mobil. Since the 1973 energy crisis, the government has attempted to preserve a 75:25 ratio between the share of international oil companies and that of domestic German companies, respectively.

The government generally believes that the responsibilities of government and industry for obtaining imported crude oil should remain separate. Nevertheless, it has "sensitized" its foreign policy to events in the Middle East and, on occasion, has supported German companies seeking oil or other companies importing oil into Germany. The IEA, in fact, regards some VEBA transactions as government-to-government deals.

Control of domestic market

The German market-oriented approach extends to the domestic industry as well as to the procurement of crude oil on the international market. Nevertheless, in 1979 the government, through its Energy Security Law, gave itself broad emergency authority to control production, transportation, storage, distribution, delivery, purchase, use, and prices of oil, oil products, and all other sources of energy. In addition, the government can obtain access to all financial and physical records of oil companies operating in the country. This authority has never been used and no implementing directives have been written.

Subsidiaries of international oil companies control 70 percent of total domestically refined oil. Most third-party sales are for oil products rather than crude oil.

VEBA, originally founded in 1929, was designated as the nucleus of the reorganization of German oil interests in 1973. The government has also sought to make VEBA strong enough to compete with the major international oil companies, but neither the government nor VEBA company officials regard VEBA as a state oil company. Correspondingly, German officials do not consider that Germany takes part in government-to-government deals.

Reserve stocks

To reduce its vulnerability to and the impact of an oil supply disruption, the German Government has established an oil reserve system composed of three programs: a government crude oil reserve of 25 days; an industry reserve of 25 days; and a publicly financed oil storage corporation or consortium reserve of 65 days. These three programs are designed to provide Germany with approximately a 115-day oil reserve.

In 1970 Germany created a government-owned crude oil reserve that provides a flexible means of responding to the country's most urgent needs. The government does not plan to use the reserve until all other program stockpiles have been depleted. The target level of this reserve is 8 million tons of oil, which is equivalent to 25 days current consumption. In early 1982, the reserve held about 7.3 million tons--equivalent to 53 million barrels--valued at \$1.86 billion and stored in caverns in Northern Germany.

Since 1978, refiners operating in Germany are required to hold 25 days of oil product (or crude equivalent) stocks. These stocks cannot be used for operational flexibility so, according to a Ministry of Economics' official, refiners in early 1982 held about 62 days of stocks--25 days as required and 37 days for operational flexibility.

In 1978, the government formed the compulsory storage corporation, EBV, to hold a 65-day petroleum reserve. The function of this corporation is to relieve industry of much of the financial burden of holding stocks. Although companies still hold much of the oil on their premises, EBV purchases or leases the obligatory stocks with funds borrowed from the public sector. Storage and other costs are ultimately paid by importers and refiners in the form of storage fees, but companies pass those costs on to consumers to the extent the market permits.

The Ministry of Economics is the ultimate supervisory authority over EBV, but most decisions are made by a board of directors, one-third of whose members represent the public sector. The other two-thirds are equally divided between the major oil companies and independent oil importers.

As of early 1982, EBV holds oil in storage equivalent to 74 days consumption, 9 more days of stocks than required.

International sharing arrangements

Germany is an active member of both the IEA and EEC. Government and industry officials agree on the necessity of international cooperation and a coordinated energy policy among nations with significantly different industries, policies, and traditions. IEA and EEC provide the institutional framework for this cooperation.

The oil industry, however, believes that strengthening this institutional framework should not result in government direction of its operations. Consistent with their market-oriented philosophy, industry officials are opposed to formal mechanisms for managing less than emergency situations, believing that the government should intervene in the market only when absolutely necessary, and then to a very minimum extent.

Reactions to events of 1979-80

As indicated above, Germany relied upon market and industry sources for supplies during the crises associated with the Iranian Revolution and the Iran-Iraq war. To the extent that Germany experienced no shortages, these policies were successful. There were however some disadvantages. Some of Germany's trading partners complained that German spot market purchases in 1979 helped lead in part to increased world oil prices. Furthermore, local German independents complained that their market activities were restricted by high spot prices. Most important, however, was the effect that high oil prices and import levels had on Germany's balance of payments.

AUSTRIA

Austria imports 69 percent of all its energy needs and 85 percent of its oil. It relies on the Soviet Union for 25 percent of its oil imports and on OPEC for 75 percent. Austria has only 3 or 4 years supply of oil and gas reserves. When necessary, it supplements its primary sources with purchases of North Sea crude oil, usually on the spot market.

Austria's national oil company, OeMV, is wholly government owned. OeMV owns the country's only refinery, which processes about 10 million metric tons of oil per year, equivalent to 73 million barrels. Direct government-to-government deals negotiated by OeMV account for 90 percent of the oil entering the refinery; multinational oil companies supply the remaining 10 percent.

Since 1968, the government, through OeMV, has made concerted efforts to obtain long-term oil and gas contracts with producers. Austria was the first non-Communist country to negotiate contracts with the Soviet Union and the first to conclude a government-to-government crude oil contract with Iraq. Austria has tried with mixed success to diversify its sources of oil.

Prior to the Iran-Iraq war, Austria relied heavily on Iraq for crude oil. When this source was cut off, the country turned to Saudi Arabia; fortunately OeMV had previously negotiated a long-term contract with the Saudis.

JAPAN

Of all major industrial nations, Japan is one of the most dependent upon imported energy, importing 75 percent of all its energy needs. Moreover, it relies on imports for 99 percent of its crude oil. Until 1979, Japan sought to limit the role of foreign oil companies--in practice the major multinationals--in the domestic industry while relying on them as suppliers of crude oil. As a consequence, Japan was a major third-party customer of the multinationals. When the major oil companies lost Iranian crude oil in 1979 and reduced third-party sales, Japan was hard hit. Japanese transactions with these companies declined from 1.5 mmbd in 1978 to 400,000 barrels a day in 1980; and further reductions of such sales were forecast by British Petroleum, Caltex, and Exxon. Japanese strategy since 1979 involves coordinated government and industry efforts to increase the amount of crude oil received directly from producer countries through Japanese channels.

Source of imports

Japan imports 75 percent of its oil from the Middle East, primarily from OPEC members. In 1978, foreign oil companies,

principally the majors, accounted for 3.2 mmbd or 70 percent of imports. By the first quarter of 1980, the majors were supplying 2.3 mmbd or 48 percent of imports.

Increasingly, Japan receives oil from producing countries' national oil companies through Japanese trading and oil exploration companies. This shift represents the acceleration of a trend initiated as far back as the 1960s, when the Ministry of International Trade and Industry attempted to strengthen independent Japanese oil exploration companies and expand their overseas activities. In 1967, at MITI's recommendation, the Japanese Government established the Japan Petroleum Development Corporation (now the Japanese National Oil Corporation), to promote oil exploration and development programs. MITI's goal is to have 30 percent of Japan's crude oil imports supplied from Japanese-developed projects by 1985.

Control of domestic market

MITI, under the Japanese Petroleum Industry Law, issues guidelines which cover the entire range of industry operations-- price adjustments, inventory levels, purchase and sales levels, spot market purchases, and refinery expansion. Every 6 months MITI reviews plans submitted by oil companies covering production and sales. According to one U.S. oil executive, MITI not only monitors all oil company actions but also dictates what specific oil companies must accomplish. For example, after Japan was criticized in late 1979 for purchasing crude oil on the spot market at high prices, MITI began to regulate the price at which trading companies and refiners may purchase oil.

For the most part, Japanese oil exploration companies do not refine oil and Japanese refiners do not explore for oil. According to a U.S. Government official, most Japanese oil companies lack the financial strength needed to support integrated operations.

In the early 1960s, foreign oil companies controlled directly or through affiliates approximately three-fourths of Japan's refining capacity. Since the 1960s, MITI has attempted to promote a higher degree of autonomy for the Japanese oil industry and to insure that foreign affiliates gain no more than 50 percent of the Japanese market.

Reserve stocks

Japan initiated its stockpiling policy in 1972. It has proceeded in three stages. The petroleum industry was initially required to raise oil stockpiles from a 45-day to 60-day supply during fiscal years 1972-75. Soon after the oil crisis in 1973, however, the government announced a second-stage, 5-year program to raise industry stockpiles from a 60-day to a 90-day supply

during 1975-79. The purpose of this plan was to strengthen national security and to meet the target for oil stockpiles set by the IEA.

The third phase began in 1976 with the implementation of the oil stockpiling bill, which requires MITI to set yearly stockpiling targets for the following 4 years. Refiners, distributors, and importers are required to raise their stockpiles by a 5-day supply each fiscal year until the program is completed. As part of this overall stockpiling policy, legislation was passed in fiscal year 1978 changing the Japan Petroleum Development Corporation to the Japan National Oil Corporation and expanding the scope of its activities. In addition to assisting oil exploration projects, the Corporation now also finances the petroleum stockpiling program by supplying equity capital and loans to the private sector and by stockpiling oil on its own account. It anticipates stockpiling a minimum of an additional 63 million barrels of petroleum on its own account between 1980-82. According to a Japanese oil company executive, MITI would like to raise the stockpile level above the present 90-day requirement.

The government's plan to increase its oil stocks entered a new phase recently with announcement of construction of a permanent 35-million barrel storage facility in northern Japan, due to be completed in March 1983. This 70 percent government-owned oil storage project includes floating storage complexes in which Japan's shipbuilding technology will be employed. Until these facilities are completed, Japan will continue its policy of offshore tanker stockpiling. In September 1981, the Japan National Oil Corporation had 33 million barrels of oil stored in 20 idle tankers offshore.

The momentum for increased stockpiles has come from MITI and, indirectly, from the Japan National Oil Corporation. The government has continued to make stockpile purchases even under tight oil market conditions. The government, less concerned with price and not willing to place primary reliance on IEA's emergency sharing plan, has given first priority to reducing vulnerability through oil stockpiling and is also seriously considering stockpiling coal and liquefied natural gas.

Reactions to events of 1979-80

Japanese response to the major oil companies' reduction in third-party sales came in two stages. In early 1979, the Japanese were able to make up their deficit by replacing the major oil companies' Iranian supplies with sharply increased purchases from the National Iranian Oil Company and with slightly greater lifting from other national oil companies, notably from Indonesia and Iraq. In 1979, direct deals accounted for approximately 33 percent of Japan's total crude oil imports, about 1.5 mmbd,

an increase of 600,000 barrels a day compared with 1978. Direct sales in the 4th quarter of 1979 surpassed 2.1 mmbd, 45 percent of Japan's total crude oil imports. Direct deals under contract for 1980 were slightly higher and increasing.

When the major oil companies cut supplies further at the end of 1979, the Japanese were obliged to purchase crude oil on the spot market. Their spot market purchases rose from 5 percent of daily consumption in 1977-78 to 14 percent in October 1979 and to 18 percent in January 1980.

The government also embarked on a policy of "resource diplomacy" and "package deals." These package deals, which take the form of national projects, involve financial and technical assistance to producing countries in return for access to crude oil. Thus far, Japan has made deals with Indonesia, Mexico, China, Iraq, Qatar, Abu Dhabi, and Nigeria. These agreements combine both normal commercial and government-to-government arrangements.

CANADA

The Canadian provinces own and control most of the natural resources, including oil, within their jurisdictions. At the time of the Middle East crisis of 1973-74, Canada was a net exporter of oil. Western Canada, primarily Alberta, produced more oil and gas than it consumed and exported about half of this production to the United States. The Eastern provinces relied on imports from Venezuela and the Middle East. Moreover, coincidentally with the embargo, the Canadian oil industry drastically lowered its optimistic assessment of Canada's oil resources. The Canadian Government recognized the need for secure supplies of oil and decided to place greater reliance on domestic production and to reduce, and eventually end, oil exports. To accomplish these ends, it set out to improve oil transportation facilities from Western to Eastern provinces and to play a bigger role in energy. It established Petro-Canada, the national oil company, in 1975 and announced its most recent national energy program in 1980.

Control of domestic market

Canada enjoys substantial domestic oil resources and production, the oil industry, which is largely in the hands of the private sector, differs from that of the United States in two important ways. Before the establishment of Petro-Canada in 1975, the oil industry was dominated by foreign capital, primarily from the United States; in fact, roughly 95 percent of the industry consisted of subsidiaries of foreign oil companies. Natural resources are owned by the Canadian provinces under enumerated rights vested in them by the British North American Act of 1867.

The Canadian Government has moved to strengthen its role in energy, particularly in oil. It founded Petro-Canada to

- explore for and develop hydrocarbons and other types of fuel or energy;
- engage in fuel and energy research and development projects;
- import, produce, transport, distribute, refine, and market hydrocarbons of all descriptions; and
- engage or invest in ventures or enterprises related to the exploration, production, import, distribution, and marketing of fuel, energy, and related sources.

Debates prior to the creation of Petro-Canada indicate that the government also wanted to

- increase Canadian participation in the oil industry;
- provide itself with more reliable information on Canada's resources and on the oil industry and its activities; and
- encourage and stimulate investment by private companies in certain areas through government participation.

Significantly, Petro-Canada's first major act was to purchase Atlantic Richfield Canada in August 1976 for \$342.4 million. It has since made other important acquisitions.

Canada's national energy program has the broad aims of achieving energy self-sufficiency by 1990, increasing ownership and control of the energy industry, increasing emphasis on exploration of Canadian lands, and altering the distribution of energy revenue. This last aim has met opposition from the Western provinces and is subject to current litigation and the cause for ongoing political activity.

Reserve stocks

The Canadian Government has held no emergency stocks other than normal operating inventories nor does it currently impose requirements or offer incentives for stockpiling by private companies. Domestic production on a net basis supplies over 90 percent of consumption. Oil imports originate principally from Saudi Arabia and Venezuela. Since 1973, the government has taken steps to improve transportation facilities for oil from the Western provinces to markets in the East. The national energy plan includes price regulation, which has generally kept Canadian energy prices below that of world markets. Therefore,

the prospect of price deregulation may result in investment profits and, thus, some incidental incentives to stockpiling.

Reactions to events of 1979-80

Canada's vulnerability to cutoffs of foreign oil was demonstrated anew during the Iranian crisis of 1979. At that time, Exxon instructed its Canadian subsidiary, Imperial Oil, to transfer some imports from Venezuela to one of Exxon's other customers in Europe. Shortly thereafter, the Governments of Canada and Mexico reached a bilateral agreement which, among other items, called for Petro-Canada to import 100,000 barrels a day of crude oil. Later the Government of Mexico unilaterally decided to halve this amount. In 1980, Canada's average daily oil consumption was 1.8 mmbd; its average gross crude oil imports were 558,000 barrels per day. Therefore, 50,000 barrels a day of Mexican crude oil represents only 3 percent of Canada's daily consumption and 9 percent of its daily gross crude oil imports. The significance of this transaction, however, is the willingness of the Government of Canada to enter into a government-to-government deal and its use of Petro-Canada as its operative agent.

CHAPTER 4

IMPACT OF MARKET CHANGES ON THE UNITED STATES

Traditional U.S. access to inexpensive and abundant petroleum ended in 1973 with the imposition of the Arab oil embargo, as producers exercised their newly gained control of the market. The United States was again jolted in 1979 following the Iranian revolution and resultant market disruption which witnessed a 160-percent increase in the world price of oil from December 1978 through December 1980. These crises demonstrated a growing vulnerability to market disruptions, which became increasingly more threatening as U.S. oil demand and dependence on oil imports mushroomed. In 1977, at the height of import dependence, the United States imported 8.8 mmbd, approximately 50 percent of its consumption. Nevertheless, the United States has had relatively continuing access to foreign crude oil. The U.S. market-oriented system, even with the temporary imposition of domestic price controls in the 1970s, appears to have adjusted to the changing structure of the international oil market.

INCREASED GOVERNMENT INVOLVEMENT

The U.S. Government, which had relied almost totally on the major international oil companies and the private sector to supply its petroleum needs, intervened in the domestic oil market in an unprecedented manner during peacetime. Following limited efforts to consolidate Federal energy activities in 1973 and 1975, the Government in 1977 established a single omnibus agency, the Department of Energy, to be responsible for energy affairs. Under its charter, DOE is responsible for implementing price controls and conservation programs; establishing and managing a Strategic Petroleum Reserve; managing emergency petroleum allocation programs; representing the United States in international energy forums, such as the IEA; and, in conjunction with the private sector, funding the development of alternative fuels.

The intervention of the U.S. Government in the oil market was predicated on the assumption that tight petroleum supplies would continue to characterize the national and international oil market through the rest of the century and that producer control of the oil market would continue to grow, thus giving rise to continuous supply uncertainty. Concurrent with this assumption was the belief that U.S. domestic oil production would continue to decline. The sum of this view was that world oil production would be exceeded by growing demand unless appropriate measures, such as increased development of alternative fuels and conservation, were carried out.

U.S. OIL COMPANY RESPONSES

The effect on and the response to increased producer control and the changed structure of the international oil market did

not have as great an impact on major oil companies' involvement in the U.S. energy market. Despite the producing countries' outright takeover of ownership of crude oil, the major international oil companies continued to be the principal marketers of crude oil, thus retaining their dominance as importers of oil to the United States.

Our analysis of U.S. oil import data provided by DOE's Energy Information Administration shows that there has been no significant change in the structure and composition of the U.S. oil import market from 1977 through 1981.

The seven major oil companies' 1/ percent of U.S. crude oil imports remained essentially unchanged (49 percent in 1977, 46 percent in 1978 and 1979, 50 percent in 1980, and 47 percent in 1981). In fact, all 16 significant U.S. crude oil importers 2/ as a group maintained a similar pattern but at a significantly higher percent of imports (78 percent in 1977, 74 percent in 1978, 76 percent in 1980, and 74 percent in 1981). The total number of companies importing crude oil into the United States has changed minimally (96 in 1977, 81 in 1978, 92 in 1979, and 88 in 1980 and 1981). Total U.S. crude oil imports decreased from 2.5 billion barrels in 1977 to 2.4 billion in 1978 and 1979, 2.0 billion in 1980, and 1.6 billion in 1981.

Oil products, which represent about one-fourth of total U.S. oil imports, also remained generally constant in terms of percent of total oil imports (24 percent in 1977, 23 percent in 1978, 22 percent in 1979, 23 percent in 1980, and 25 percent in 1981). Despite this, the number of oil product importers in the United States has grown dramatically from 221 in 1977 to 359 in 1981. The major oil companies' share of product imports decreased from 25 percent in 1977 to 17 percent in 1981. The increase in the number of product importers is particularly interesting in light of the decreased involvement of the major oil companies in the product import market and the absolute decline in product import volume (0.8 billion barrels in 1977, 0.7 billion in 1978 and 1979, and 0.6 billion in 1980 and 1981).

Increased producer control did affect the prices the companies paid for oil and ultimately affected U.S. demand for

1/British Petroleum Company, Ltd.; the Exxon, Gulf Oil, and Mobil Oil Corporations; Shell Oil Company; Standard Oil Company of California; and Texaco Incorporated.

2/ The seven major oil companies plus Ashland Oil Incorporated; the Atlantic Richfield, Continental Oil, Getty Oil, Marathon Oil, Phillips Petroleum and Sun Oil Companies; Standard Oil Company (Indiana); and Union Oil Company of California.

oil. The increase in oil prices from \$3 a barrel in 1973 to \$35 a barrel in January 1981 was managed domestically to some extent by U.S. Government price controls during the mid and late 1970s. However, the increases in prices, particularly after the termination of price controls in 1980 and 1981, did result in decreased oil consumption, particularly of gasoline.

Producers' contractual restrictions and efforts to increase government-to-government sales did not have a major impact on the operations of U.S. oil companies in the domestic market. Through the flexible use of their global marketing system, these major companies were able to comply with contract restrictions in periods of tight supply (1973 and 1979) and to provide relatively uninterrupted supplies of petroleum to the U.S. market.

After 1973, the major oil companies initiated a move to reduce their third-party sales in the United States to insure an adequate supply of oil for their own affiliates. This trend accelerated in 1979 following the Iranian supply disruption. Because of cuts in third-party sales, some smaller oil companies in the United States went out of business, some sought to enter direct relations with petroleum exporting countries, and others employed the services of traders and brokers to acquire supplies. The U.S. Government provided assistance to small U.S. refiners through the "Buy-Sell Program" which assured them crude supplies they otherwise would have not received. The Government deemed the continued existence of these independents essential to U.S. energy security throughout the late 1970s.

SHIFT AWAY FROM GOVERNMENT INVOLVEMENT

The onset of the Iranian revolution in 1979 and the resultant world supply disruption challenged the viability of the newly established U.S. energy policy. The domestic disruption that resulted from the application of allocation programs and the continued existence of price controls in 1979 had some influence on the reversal of U.S. energy policy and efforts to cope with the changed structure of the international oil market. A market-oriented energy policy reemerged, emphasizing decontrol of the energy sector. With this shift in policy came the phasing out of price controls in 1980 and 1981 and the termination of small refiner assistance programs and expiration of emergency petroleum allocation programs in September 1981. More recently, the proposed dismantling of the Department of Energy and transfer of many of its reduced functions to the Departments of Commerce and Interior represents the culmination of the move away from Government involvement.

RETURN TO SURPLUS MARKET CONDITIONS

The era of surplus supplies that has emerged over the past 18 months (see ch. 2) has essentially slowed if not totally stopped

or reversed producer momentum toward increased control of the international oil market. The structure of the U.S. oil market remains dominated by the major oil companies, which provided about 47 percent of U.S. crude oil imports in 1981. The manifestations of increased producer control which exhibited themselves in tight supply situations during the past decade, such as contractual restrictions and government-to-government sales, do not seem to concern the United States during a slack market. U.S. major oil companies in today's changed environment of reduced demand seem to be more concerned with streamlining their refinery operations and liquidating high-priced surplus inventories.

CONTINUED U.S. VULNERABILITY

Whether the changed structure of the international oil market will have any effect on the United States in the future depends to a large extent on supply and demand. Certainly in periods of market glut, such as existed recently, producer control of the market is minimal. However, if tight supplies reemerge through gradual reduction in production and/or increase in demand or through some form of major supply disruption similar to 1973 or 1979, the growth of producer control of the market may once again be a threat to consumer access to oil supplies. Such a prospect is seen by prominent oil experts as a likely occurrence during the remainder of this decade. The facts remain that, regardless of the supply situation, producers have taken over ownership of oil in their countries and major international oil companies' control of the market is now limited to marketing, distribution, and refining operations. What is also clear is that, despite recent decreases in imports to 30 percent of total consumption, the United States is importing more Middle Eastern oil today than it did in 1973. U.S. oil imports from Middle Eastern Countries increased from 1.3 mmbd (or 37 percent) of total U.S. crude oil imports in 1973 to 1.8 mmbd (or 41 percent) in 1981. Also, U.S. oil imports from Saudi Arabia increased from 600,000 barrels per day in 1973 to 1.1 mmbd in 1981. This import dependence could increase dramatically if the current economic downturn reverses and conservation and alternative fuel efforts slow in response to the decline in market prices. As stated in chapter 2, world oil prices slipped below the OPEC benchmark price of \$34 a barrel in 1982 and could go even lower, despite a March 1982 OPEC decision to reduce production to 17.5 mmbd.

U.S. STRATEGIES

The United States continues to be dependent on imported oil and, consequently, vulnerable to supply disruptions resulting from increased producer control of the market. What strategies does the United States have for dealing with disruptions, given the market-oriented energy policy deemphasizing Government intervention in existence at this time? There appear to be

three strategies: (1) continued unilateral development of the Strategic Petroleum Reserve for use in a major supply disruption, (2) bilateral agreements with other producing countries to assure access to supplies, and (3) multilateral cooperation with other oil consuming countries to coordinate stock and emergency sharing policies and programs.

Strategic Petroleum Reserve

The Energy Policy Conservation Act of 1975 authorized the creation of a Strategic Petroleum Reserve (SPR). As of May 1982, the United States had 255 million barrels of oil in the SPR, with a stated goal of 750 million barrels by 1990. The SPR increases supplies available during a crisis by accumulating and holding stocks publicly; holding large inventories reduces the need for panic buying and provides the flexibility to redirect crude oil temporarily.

An argument can be made that to have an effective emergency reserve system, stocks must be accumulated and distributed through the market channels that normally distribute crude oil and oil products. A good system also requires a plan which essentially spells out when stocks will be purchased, how they are to be priced and allocated, and when they will be drawn out. Also, as the National Petroleum Council suggests, a good system requires a deactivation trigger which should set in motion an evaluation of conditions, the effects that the supply disruption is having on the nation, and the manner in which the SPR inventories can be used in light of the potential for an extended disruption. The Council believes that an SPR deactivation trigger should be in place and emphasizes the importance of an interim assessment of the need to use SPR inventories, considering that once the SPR is used, it may be several years before it can be refilled.

A large strategic stockpile is difficult to create in a short period of time because of the time involved in creating storage capacity and rates of fill. Market events may also affect SPR filling rates; for example, during the worldwide shortage of oil in early 1979, purchases for the SPR were suspended. Economic or political factors must also be considered. Economic considerations restrained U.S. purchases in 1979, since additional oil demand for the SPR in a tight market creates price pressures that affect not only the United States but also its allies. Political considerations included fears that Saudi Arabia might cut back its production if the United States rapidly filled the SPR. The United States has resumed filling the SPR, taking advantage of the current excess situation. It has entered into an agreement with Mexico to provide some oil for the SPR (see p. 51).

Another concern was, who should pay for the SPR? Congress debated various financing mechanisms which would result in reducing financing through appropriated funds. Options discussed include

issuing a new type of Government bond with value linked to the world price of oil, having industry contribute oil to the reserve, and borrowing money earmarked for synthetic fuels to buy petroleum reserves instead.

The proposals have been criticized by current administration officials. During congressional hearings in 1981, Treasury officials stated that the SPR should be financed through conventional debt instruments guaranteed by the credit of the United States. For fiscal year 1982, an off-budget SPR account of \$3.9 billion was created within the Treasury Department.

Bilateral agreements

Many countries rely on government-to-government procurement of oil, contending that such arrangements are more secure. The U.S. Government, however, finds that the security of such arrangements depends upon the continued friendly relations between the countries involved and often compromises oil consuming country governments in other foreign policy areas. Furthermore, it considers the unique integrated logistical, technological, and managerial system of the U.S. oil companies an important national asset. However, Government reliance on the private sector does not preclude a bilateral approach.

A major segment of U.S. international energy policy is to assure access to the Persian Gulf resources. According to a senior State Department official, the United States has a critical interest in how these producers approach their production and pricing decisions. To achieve the U.S. objective of access to adequate supplies at "reasonable prices," the United States uses its bilateral relationships with friendly producers in an attempt to influence their pricing and production decisions. This is especially apparent with Saudi Arabia, with which, according to a Department of State official, the United States has a "very active" bilateral policy. Frequent visits by cabinet-level officials, including the Secretaries of State, Treasury, Defense, and Energy, during the past several years illustrate this bilateralism.

The U.S. Government does not, as a general policy, enter into direct negotiations with producers but pursues its national oil interests through an overall strategy which stresses economic and military considerations.

In our September 8, 1981, report, "Unresolved Issues Remain Concerning U.S. Participation in the International Energy Agency," we noted that the United States uses its bilateral relations with producing countries, particularly Saudi Arabia, to support IEA decisions. For instance, to help stabilize the international market during the 1979 Iranian disruption, the United States

urged the Saudis not to cut production or raise prices. It made a similar request in 1980 following the disruption caused by the Iran-Iraq conflict. We concluded that in both cases the U.S. bilateral relationship with OPEC moderate producers was helpful in preventing major supply disruptions and triggering of the IEA's formal Emergency Sharing System.

The U.S. approach to oil acquisition is to allow the private oil companies to negotiate essentially all elements. Department of State officials said that the Government does not participate in such commercial transactions, which are viewed as beyond its purview.

Perhaps the most significant advantage of depending on the traditional private sector-oriented system is its flexibility--its capacity to adapt to changes in the market without a major disruption to the supply system. This continuity depends on the ability of highly integrated oil companies to absorb market disruptions in a balanced manner. Studies made by the U.S. Congress and the European Economic Community concerning oil company reactions to the 1973-74 supply crisis attest to the flexibility of the private-sector-oriented system to adapt to an oil crisis of significant proportions. However, as private oil company control of crude oil at the wellhead has decreased over the past several years, there is some doubt as to whether the same degree of flexible response would exist, particularly in a tight market situation when immediate action is critical to the supply security of consuming nations.

Another important advantage of allowing the oil companies to negotiate with OPEC and other producing countries is the tendency to remove the negotiations from the political environment. Additional advantages include expertise in energy matters, which can be beneficial in price bargaining, and a much greater capacity to fulfill complex contractual arrangements.

A disadvantage is that, due to vertical integration, the companies' incentives may differ from those of agents who are primarily buyers. According to officials of one major consuming country, the fundamental changes in the structure of the oil market have limited the flexibility of the major international oil companies. Specifically, these companies in many instances have ceased to supply independent refiners, and their access to oil through concessional and preferential agreements and long-term contracts has been reduced to the point that they have difficulty obtaining oil for their affiliates and subsidiaries. In such instances, these companies are likely to discriminate more frequently in favor of channels and markets that provide high marketing, distribution, and refining profits. Such discrimination is in the companies' interests if certain countries (i.e., Sweden, Italy, and the United States) artificially maintain domestic prices below existing unregulated world market prices, as they have done in the past.

Although a significant shift toward bilateral government-to-government transactions has occurred among consuming countries, such transactions have created additional rigidities in the world oil market as well as further politicizing that market. The Iraq-Iran war demonstrated the difficulties inherent in government-to-government deals. Countries, such as France, Spain, Brazil, Turkey, and Portugal, that were heavily dependent on Iraq oil via government-to-government contracts were thrust into temporary difficulties as they rushed to obtain supplies from alternative sources.

United States-Mexico agreement

In August 1981, the U.S. Government entered into a 5-year purchasing agreement with the Government of Mexico to buy 110 million barrels of petroleum. This will be used to help fill the SPR. Purchases will average 60,000 barrels per day through August 1986.

This is the first major government-to-government petroleum supply agreement entered into by the United States. Because the sale was negotiated during a world oil supply glut and when Mexico's exports had dropped dramatically, the United States was in a position to purchase a significant amount of petroleum for the SPR at prices below the world average. The transaction, in effect, provides a relatively assured source of supply for the SPR over a prolonged period of time at a relatively stable price shielded from dramatic short-term fluctuations in world oil prices.

Multilateral cooperation

Stock management coordination

The 1973-74 supply emergency focused attention on oil security and on the need for international arrangements for sharing available supplies. The United States could not be the emergency supplier of crude oil to its allies. Arrangements for stockpiles and standby rationing plans were formulated through IEA calling for member nations to maintain 90 days of import reserves, a program for allocating available oil in an emergency, and a demand restraint program. Related objectives include developing a comprehensive oil market information system and improving consumer-producer relations.

Beginning January 1, 1980, each IEA country agreed to maintain emergency oil reserves equal to 90 days of net oil imports. The IEA describes emergency reserves as including crude oil and oil products held in refining tanks, bulk terminals, pipelines, barges, oil tankers in port, inland ship bunkers, and storage tank bottoms. Working stocks held by industry and large consumers are also included. DOE, U.S. oil companies, and some IEA officials believe that this definition is too broad and does not truly

reflect real reserves which could be used in an emergency. They said that industry inventories are primarily the working stocks necessary to ensure normal operations and that only stocks above this level are pure emergency reserves.

IEA officials stated that the broad definition of emergency reserves was a political compromise to achieve a consensus on establishing a quantifiable commitment. They said some IEA members were opposed to a more strict (and realistic) definition of emergency reserves because of the cost of establishing government reserve programs, or the political difficulty in passing the costs on to the consumer by forcing the oil industry to maintain and finance additional stocks.

DOE officials told us that the U.S. oil industry holds stocks sufficient to meet IEA emergency reserve obligations. However, officials from several major U.S. oil companies told us that they have little oil reserves which could be used in an emergency and that the SPR is meant to meet U.S. obligations. Industry officials contend that their oil stocks are part of working inventories and that very little oil is available as a pure emergency reserve. In fact, all the companies we contacted said they had no stocks available or set aside for IEA purposes.

The IEA, with little success, has attempted to strengthen stock management among its members, which consists of using stocks in response to supply disruptions of less than 7 percent. This has raised some members' concerns, particularly those of the United States, over the extent to which the international market should be managed by mechanisms other than market forces.

The IEA members target their stocks to offset short-term cutbacks of 60- to 90-day duration. Considering that cutbacks are likely to be less than 100 percent, 60 to 90 day stocks together with reduced consumption should provide protection by allowing time for any necessary demand actions to become effective and permitting greater flexibility in foreign policy options.

Informal IEA measures

IEA's system for handling disruptions below the formal trigger threshold of a 7-percent shortfall in consumption was developed in response to the 160-percent increase in price resulting from the disruption of Iranian supplies in 1979. The informal sharing system implemented after the further disruption in supplies following the outbreak of hostilities between Iran and Iraq in September 1980 was designed primarily to moderate potential market pressures on prices during the latter part of 1980 and the 1st quarter of 1981.

After further discussion and negotiations among member countries, the IEA Governing Board at its December 10, 1981,

meeting issued expanded general guidelines for managing a sub-crisis. The IEA decision was intended to provide a flexible framework for responding to a sub-crisis while at the same time giving individual countries the right to abstain in any sub-crisis action that would not be authorized under their national laws or that they consider to be inconsistent with the International Energy Program. The decision provides that sub-crisis actions could vary on a country-to-country basis while aimed at achieving the overall result desired on an integrated basis.

The U.S. Government does not support a mandatory informal (sub-crisis) allocation of oil supplies. It has noted that U.S. law currently does not cover U.S. oil companies' participation in any sub-crisis oil-sharing arrangements.

Although indicating a reliance on market forces, the informal system consists of consideration of the following supplemental measures: discouragement of abnormal spot market purchases or other undesirable purchases; lowered consumption; short-term fuel switching; high levels of indigenous production; stocks and stock policies, through governmental consultation with oil companies; and informal efforts to minimize and contain the effects of supply imbalances.

Although the United States supported the December 1981 IEA decision, the official U.S. position remains the same as that articulated in the July 1981 policy paper "Domestic and International Emergency Preparedness."

"It is not appropriate to develop a system that would commit the United States in advance to a specific course of action in responding to small oil interruptions *** measures can be formulated at the time of the crisis to meet specific needs."

While the administration does not "rule out" the possibility of future coordinated actions, it favors a reactive and ad hoc approach over developed standby measures and will rely on market forces to mitigate the effect of small disruptions.

However, the IEA Executive Director, testifying on July 14, 1981, before the Subcommittee on Energy, Nuclear Proliferation and Governmental Process, Senate Committee on Government Affairs, defended the need for a planned, standby multilateral response to minor crises. Instead of relying solely on the market, he urged "better forward planning so that appropriate responses tailored to actual events that might arise can be implemented quickly and effectively" by the IEA Governing Board to supplement market forces. Many private energy consultants, IEA members, and U.S. oil industry officials agree that advance planning is essential.

Formal IEA measures

The development and refinement of the Emergency Sharing System was and continues to be the primary objective of the IEA. Crucial to this System is each participating country's willingness to subject its oil supplies to international allocation during an emergency. Each member has a direct interest in ensuring the viability of the System to act as a means of collective security during severe oil shortages that can threaten each member's economic and political well-being.

To "trigger" the Emergency Sharing System, the IEA Secretariat must make a finding that a member country, or the group as a whole, is experiencing or can be expected to experience a 7-percent or more supply shortfall below a base period level of consumption. (The base period is the most recent four quarters, with a delay of one quarter necessary to collect information.) Within 8 days the finding to activate the system must be rejected by the Governing Board or it will go into effect. If confirmed, IEA members are expected to implement the prescribed measures within 15 days.

Emergency information and data systems developed by the Secretariat permit it to determine total quantities of available oil supplies. Once the Emergency Sharing System is triggered, the Secretariat calculates individual country allocation rights (to receive oil) and obligations (to give up oil) using a complex allocation formula. The formula determines how much oil each country is entitled to after subtracting its demand restraint obligation (either 7 or 10 percent of historical consumption) and its emergency reserve drawdown obligation. The emergency reserve drawdown obligation assumes that each country will draw down those reserves at a rate based on the participating country's imports as a percent of total imports of the IEA group. The Emergency Sharing System assumes that each participating country maintains (1) emergency reserves (governmental and/or private) equivalent to at least 90 days of net imports to be used during an oil disruption, (2) an effective demand restraint program which can be activated to reduce oil consumption--7 percent if supplies are cut by at least 7 percent and 10 percent if supplies are cut by 12 percent or more, and (3) an effective national emergency oil sharing organization to carry out its obligations under the System.

In our September, 1981 report on the IEA we concluded that IEA member efforts to cope with future oil supply disruptions and disruptions stemming from war or civil unrest--widely considered a likely prospect sometime in the 1980s--indicates that IEA members have not taken strong enough action to meet this likelihood. IEA members have established an institutional framework and developed broad policy objectives to meet the threat of future oil shortages, but they have yet to limit their vulnerability to such shortages. Our assessment showed that IEA's complex Emergency

Sharing System suffers from data problems, lack of an adequate price dispute settlement mechanism for member countries, and a misleading representation of emergency reserves, which raise serious questions about the System's work-ability and contributes to a reluctance to use it except in severe oil disruptions, such as those experienced in 1973-74.

The United States has a stake in the success of IEA members' efforts to meet future oil shortages. Under non-embargo supply disruption scenarios involving the Emergency Sharing System, the United States would likely be obligated to divert oil imports to other IEA countries. Sharing supplies during an emergency is the heart of the IEA system and represents the broad economic, foreign policy, and national security interests of the United States. Without IEA, the United States would be forced to compete with many of its allies for scarce oil supplies, with potentially harmful effects to its relations with them. The IEA Secretariat has noted that:

"* * * another scramble for oil supplies would produce yet another huge price explosion with catastrophic economic consequences. And the nature of the oil market is such that when prices go up they do not quickly come down even if they are gradually eroded in real terms between supply interruptions. The U.S. is now fundamentally tied into the world economy and therefore has a major interest in avoiding anything which may lead to further economic disruption."

(488040)