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OPEC: Implications of Increased Refining and Product Marketing Activities

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An Intelligence Assessment

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GI 85-10125
May 1985

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This paper was prepared by

Office of Global Issues. 25X1

Comments and queries are welcome and may be directed to the Chief, Strategic Resources Division, OGI, 25X1

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OPEC: Implications of Increased Refining and Product Marketing Activities

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Key Judgments

Information available as of 1 April 1985 was used in this report.

The combination of a weak oil market and growing competition from OPEC suppliers has forced the closure of some 8 million barrels per day (b/d) in non-Communist refining capacity since 1980. By 1990 we believe an additional 7 million b/d of capacity could be mothballed as a result of the continued weak oil demand and a planned expansion in LDC refining capacity that probably will add nearly 2 million b/d in OPEC product exports. The shift in refining capacity from major consuming countries to oil exporters has caused concern among several OECD countries about the energy security implications of growing product exports from OPEC and the organization's increased ownership of refineries and distribution networks in developed countries. Japan, for example, has long argued that the loss of domestic refining capacity and increased product imports would reduce its flexibility to cope with an oil supply disruption.

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In our view, expanded refining capacity and product exports from OPEC pose little threat to the energy security of oil-importing countries in the near term because we expect non-Communist refining capacity outside OPEC to remain sufficiently flexible to meet demand requirements through 1990. OPEC's main threat to energy security remains its ability to control the production of oil:

- As long as the consuming countries are dependent on OPEC oil—and OPEC now supplies more than 40 percent of non-Communist oil needs—it is largely irrelevant as a security concern whether the oil is in the form of crude or product. Dependence on increased product imports would heighten vulnerability to a disruption only if it leads to refinery closures that impair a country's ability to process domestic production and stocks.

- OPEC ownership of refineries and distribution networks in developed countries poses little threat because these facilities still could be used during a crisis and some oil exporters might have a vested interest in their continued operation.

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Although we believe that additions to OPEC refining capacity probably are not a security issue through the end of this decade, a new series of expansive refinery additions by OPEC during the 1990s could alter the longer term outlook, especially if a significant portion is concentrated in the Persian Gulf. Supplies could then be curtailed by damage to refining capacity in exporting countries as well as by damage to any other part of

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the production and export systems. To minimize the security risks associated with such trends would require importing countries to maintain enough domestic refining capacity to process domestically produced crude plus what might be drawn from strategic crude stockpiles.

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A potential issue stemming from growth in OPEC product exports is the increased risk of an oil price decline. Because prices for product exports are not controlled by the organization, members will be tempted to discount prices in a weak market. In the absence of stringent controls on crude production, such action would undermine the official price structure for crude oil and could result in a collapse in oil prices. Although a price decline would present consuming countries with potential economic gains, sharply lower prices and reduced revenues might create political and economic unrest in several oil-producing countries that could lead to a disruption in oil supplies.

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On the trade front, the impact of rising OPEC refining capacity and product exports will depend in large part on any policies adopted by importing countries to protect their refining industries. Pressures for restrictions on oil product imports are mounting in several developed countries, and some refiners claim that OPEC's access to low-cost crude supplies will lead to unfair competition. In our judgment, these additional OPEC product exports will not increase dependence on OPEC oil because product sales will replace some OPEC crude, and these volumes can be readily absorbed if shared among the various consuming areas. Japan, however, has restrictions on product imports that could force more products into other regions, and some West European nations may enforce or strengthen existing restrictions—particularly if Japan resists taking more products. We believe policies to restrict OPEC products would ultimately be ineffective because OPEC controls a significant portion of world crude oil supplies needed to support refining operations in the consuming countries. If Western Europe and Japan opt for protectionist measures, pressure on the US refining industry will intensify.

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OPEC: Implications of Increased Refining and Product Marketing Activities

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Introduction

OPEC countries control nearly 80 percent of proved non-Communist oil reserves and last year provided more than 40 percent of the West's oil needs. In an attempt to use this comparative advantage in energy and diversify their limited industrial base, a number of OPEC countries have adopted a long-term strategy of building refineries and replacing crude oil exports with refined products. As the world's residual supplier of oil, OPEC can ensure that its products are sold by limiting oil production and setting product prices that are attractive relative to those for crude.

Despite the continuing weakness in the world oil market and a large surplus of refining capacity, OPEC members—primarily Saudi Arabia, Kuwait, and Libya—could add about 3 million barrels per day (b/d) to their refining capacity by 1990.[1] Although refined products make up a growing share of OPEC exports, they are still a small part of Western oil supplies. Even if all the projects under way were completed, OPEC product exports would only grow from about 4 percent of OECD consumption at present to about 8 percent in 1990.

The prospect of these additional increases in OPEC refining capacity and product exports has heightened concern in several oil-importing, developed countries about the impact on their refining industries and security of oil supplies. The effects of this trend on the Organization for Economic Cooperation and Development (OECD) and other oil-importing countries will depend on the marketing strategies adopted by the oil exporters and the willingness of consuming nations to absorb these exports. In the current weak oil market, increased competition in product markets also could add to downward price pressure and price instability, depending on how aggressively OPEC countries try to push these exports on the market. Over the longer run, a strengthening of the oil market and increasing Western dependence on OPEC oil supplies in the 1990s could spur a new round of expansion of downstream refining and product marketing activities by OPEC.

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The Problem of Excess Refining Capacity

Investment by OPEC countries in new refineries is beginning to add capacity at a painful time for the refining industry. Oil consumption has plummeted by 7 million b/d from a peak of 52 million b/d in 1979 when refinery improvements and changing product demand were altering the type of capacity needed. Oil companies have responded by shelving plans to add capacity and by closing down or reducing less efficient existing plants, causing non-Communist distillation capacity to drop by almost 8 million b/d since 1980 (table 1 and figure 1). Despite this cutback, excess capacity persists and utilization rates remain low. In 1984 non-Communist consumption of about 45 million b/d contrasted with refining capacity of 57 million b/d; the refinery utilization rate was less than 75 percent, which was the lowest in more than 30 years.

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Virtually all of the fall in refining capacity occurred in OECD countries, which currently account for about 74 percent of non-Communist oil consumption and 67 percent of refining capacity. Even with a rebound last year, OECD oil use declined almost 4 million b/d between 1980 and 1984, and refining capacity dropped by about 8 million b/d to 38.5 million b/d. Utilization rates in OECD countries have averaged less than 70 percent since 1980 (figure 2):

- In Western Europe 30 refineries have been closed since 1980, causing distillation capacity to decline 23 percent to 15.6 million b/d at the end of 1984. Utilization rates at remaining facilities continue to average only about 60 percent, however, the lowest rate in the OECD.

[1] Unless otherwise noted, refining capacity refers to primary capacity, or the capacity of the crude distillation unit(s), in barrels per calendar day. This excludes secondary processes such as catalytic and hydrocracking.

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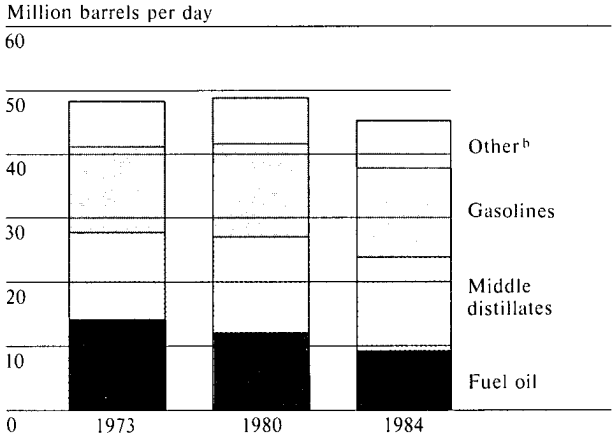
Table 1
Non-Communist Refining Capacity

Million b/d

	1980 [a]	1985 [a]
Non-Communist world	65.0	57.3
Of which:		
OECD	46.8	38.5
Of which:		
Western Europe	20.3	15.7
Japan	5.5	4.8
United States	17.7	15.4
Other	3.3	2.6
LDC	18.2	18.8
Of which:		
OPEC	5.6	5.9
Non-OPEC	12.6	12.9

[a] As of 1 January. Source for OECD and non-OPEC LDC is the *Oil and Gas Journal*. OPEC figures are CIA estimates.

Figure 1
Non-Communist Oil Consumption: Trends by Major Product[a]



[a] Consumption excludes refinery gain; total oil consumption for 1984 is preliminary and consumption by product is estimated.

[b] Includes refinery gas, liquefied petroleum gases, bunkers, and refinery fuels and losses.

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- Japanese refining capacity declined 13 percent to 4.8 million b/d over the period, because of an effort led by the Ministry of Trade and Industry (MITI) to consolidate and streamline facilities. Nevertheless, use of primary capacity remains at about 65 percent.

- Attempts to improve profitability have forced the closure of 87 refineries in the United States since 1980, causing distillation capacity to fall 18 percent to 15.4 million b/d at yearend 1984. Utilization rates—which averaged less than 75 percent in the early 1980s—rose to about 85 percent in 1984.

Refinery Modernization

Relatively attractive prices for heavy crude oils and a shift in demand for refined products away from heavier products, such as fuel oil, and toward lighter fuels, such as gasoline, have led to sizable capital investments to upgrade OECD refineries. Many refiners have added units capable of processing a wide range of crude oils into a higher proportion of light products and fewer heavy products. Overall, non-Communist upgraded capacity increased by 30 percent to 22 million b/d in the last five years, increasing about 50 percent in the OECD.[2] The upgraded plants have a competitive advantage over older refineries, particularly when crude oil price differentials remain wide. The push to run these plants at maximum rates has exacerbated product oversupply and added to downward pressure on product prices.

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OPEC's Move Downstream

Policies adopted by OPEC nations to accelerate activities in refined product markets are just beginning to be felt in the oil market. Refining capacity in OPEC

[2] Upgraded refining capacity includes thermal and catalytic cracking and catalytic reforming.

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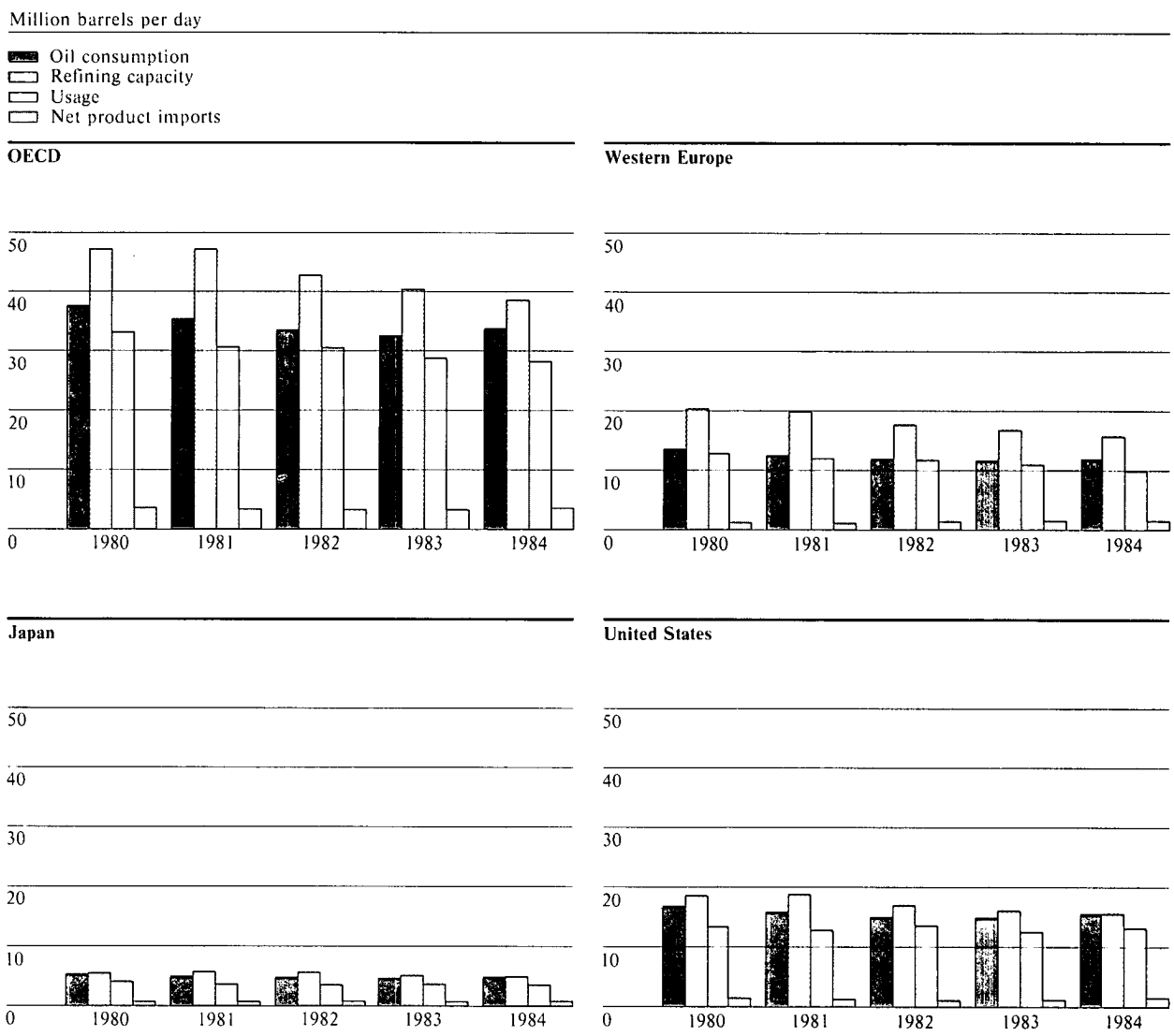
Figure 2
OECD: Trends in Oil Consumption, Refining Capacity and Usage, and Net Product Imports, 1980-84[a, b]



[a] Oil consumption figures are annual and exclude refinery gains.
[b] Net product imports include bunkers.

Note: Refining capacity numbers are calendar day as of 31 December. 1984 figures are preliminary.

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A Primer on Refining

Crude oil must be treated, either by using gravity and heat or by more sophisticated heating and chemical processes, to transform it into usable oil products such as gasoline, jet fuel, kerosene, and fuel oil. In addition to these major products, the refining process must also allow for the manufacture of a wide range of other oil products, some with very rigid specifications to meet consumer requirements and government regulations. As a result, a number of factors dictate refinery design, including the fact that complex refineries, although more flexible, have higher operating costs and require a substantially higher initial investment.

The first or primary process for refining crude oil is distillation. Basically, petroleum products are compounds containing carbon and hydrogen that can be recovered by heating crude oil yielding fractions or "cuts" according to boiling ranges. In a hypothetical topping plant, which consists primarily of a crude distillation unit, a relatively light crude, such as Saudi Arabia's Berri Light, yields a greater proportion of light products while a heavier oil, like Arab Heavy, run through the same refinery, yields a greater proportion of heavy products (figure 3).

Modernizing or upgrading a refinery by adding more sophisticated secondary processing equipment, such as a cracking plant, allows heavy fuel oil or other feedstock to be transformed into products in the middle distillate range. This increases operational flexibility by allowing the use of a wider slate of crude oils, and yields a more marketable mix of oil products (figure 4). For example, the same barrel of Arab Heavy run through an upgraded refinery would yield almost the same product mix as the Arab Light processed in a simple refinery, but at a savings in feedstock costs—based on 1984 prices—of $3 per barrel. As a result, refining capacity and flexibility are dictated by oil product demand because refineries must be able to shift to available crudes and feedstocks and still meet oil consumption patterns. These factors, in addition to the location of a refinery, determine the competitiveness and profitability of specific refineries. 25X1

The continued slump in refined product prices has cut deeply into refiner margins and can make purchases of crude oil at official prices extremely unattractive. Refiners are able to determine the relative value of a particular crude by calculating the market value of the product mix the crude will yield when run through the refinery. Refining and transportation costs and profits are then deducted from the value of the product mix to determine the value of that crude. If the price of crude exceeds its value to the refiner, the refiner may choose to purchase oil products. 25X1 25X1

countries has increased by about 300,000 b/d since 1980 despite the loss of about 1 million b/d in Iran and Iraq because of the war. By yearend 1984, OPEC refining capacity was approximately 6 million b/d. Despite a sizable fall in the demand for OPEC oil, the sophistication of new refineries in OPEC countries and the easy access of these countries to crude supplies allowed utilization rates to average about 75 percent from 1980 to 1984. Net product exports increased to nearly 1.5 million b/d last year, up over 400,000 b/d since 1980 (figure 5).

Refinery expansion and construction by oil-exporting nations is the outgrowth of investments planned during the late 1970s, when rapid increases in oil prices boosted revenues and spurred investments designed to promote economic growth and industrialization. The move into refining also was part of a strategy to allow these OPEC countries to meet domestic oil consumption without product imports and to capture the "value added" from processing crude oil into petroleum products. Several OPEC countries with relatively low populations also were attracted to refining by a belief that their comparative advantage in international trade lay in capital-intensive investments. In recent years a number of OPEC countries have been pushing product exports more vigorously because product prices are not set by the cartel, giving exporters more flexibility in a weak market. 25X1 25X1

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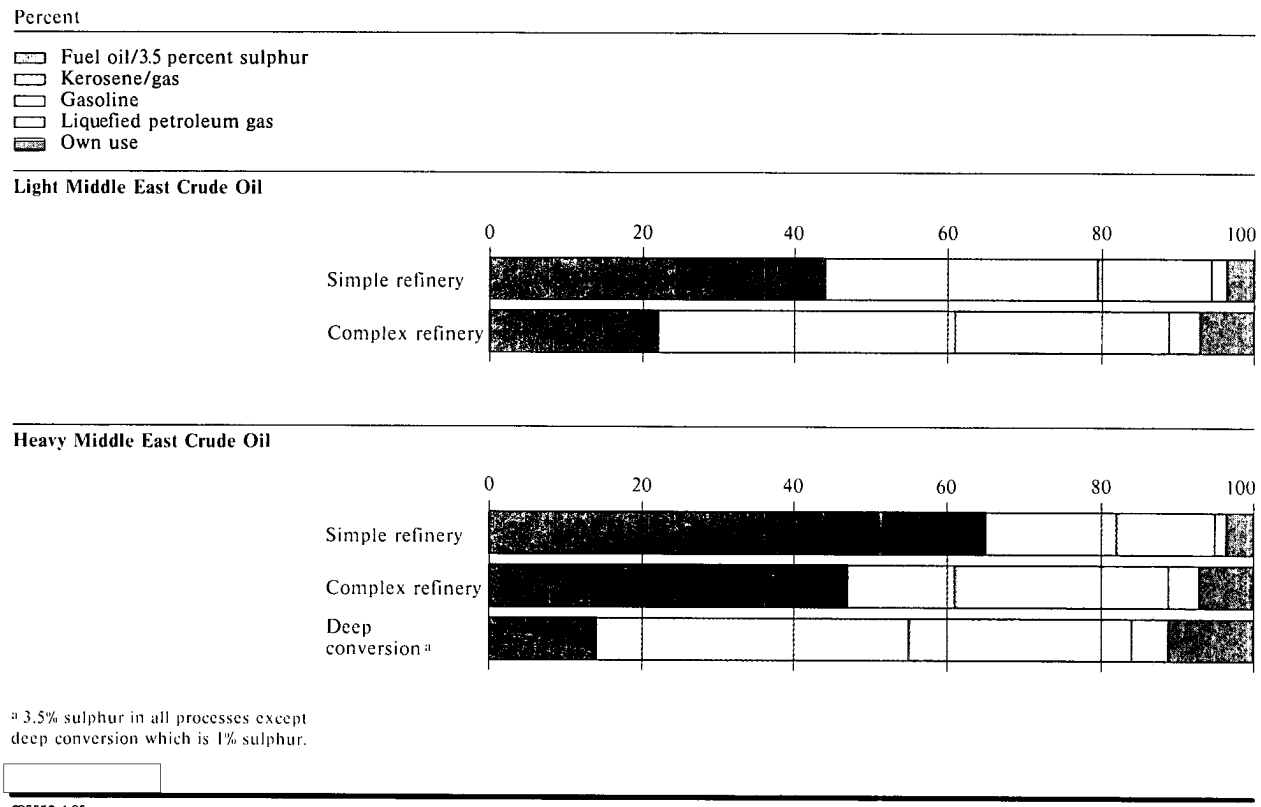
Figure 3
Refining Processing Yields



[a] 3.5% sulphur in all processes except deep conversion which is 1% sulphur.

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Although OPEC refining capacity has risen in the last two years or so, completion of many new plants planned during the late 1970s will give a large boost to capacity over the next several years. OPEC projects could add about 3 million b/d of additional capacity by 1990, accounting for over 60 percent of the growth we expect in less developed countries' (LDCs) refining capacity. Not all of this planned capacity may be completed, however. Saudi Arabia, for example, has canceled two domestic refineries for budgetary reasons, and more cancellations could follow. The major projects are concentrated in the Middle East and North Africa:

- Capacity totaling 1.2 million b/d is planned in the **Persian Gulf**—primarily in Saudi Arabia and Kuwait—and could yield an additional 600,000 b/d of product exports by 1990.
- In addition, Saudi Arabia will have almost 600,000 b/d of capacity at two export refineries on the **Red Sea** by 1987.
- Libya and Algeria could expand capacity almost 600,000 b/d before the end of the decade.

Because much of the new capacity incorporates the most recent refining technology and upgrading capability, we expect the refined product export mix to be heavily weighted toward lighter products—gasoline, kerosene, jet fuel, and diesel oil. 25X1

In addition to expanding refining capacity, three OPEC members have acquired a total of 515,000 b/d of refining capacity and 3,075 marketing outlets located in Western Europe:

- In 1983 and early 1984 Kuwait purchased 240,000 b/d of refining capacity and 3,075 retail outlets in the Benelux countries and Italy through Kuwait Petroleum Corporation.

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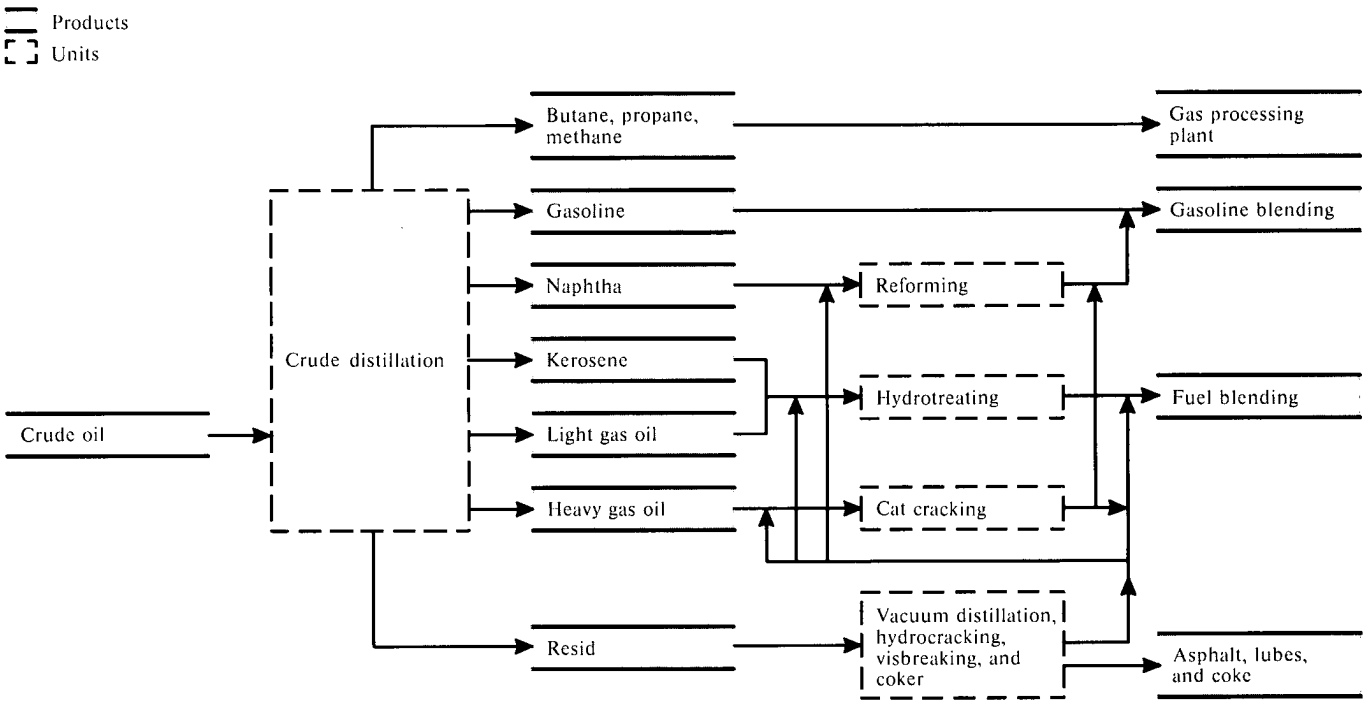
Figure 4
Simplified Refined Product Stream From a Refinery



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- Saudi Arabia, through the private buyers First Arabian Corporation and Arabian Sea First, acquired 170,000 b/d of refining capacity in Italy and Switzerland during 1983. In February 1985 First Arabian Corporation announced plans to purchase Chevron's refining and marketing operations in Italy, including 1,700 service stations.

- Venezuela entered into a joint venture in December 1983 with the West German firm Veba to purchase half interest in the 210,000 b/d Gelsenkirchen refinery.

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We believe that foreign acquisitions reflect policies designed to capture downstream markets and ensure retail outlets for OPEC members' oil exports. In our judgment, oil exporters are primarily interested in acquiring distribution networks and in some cases view purchases of refineries as a cost.

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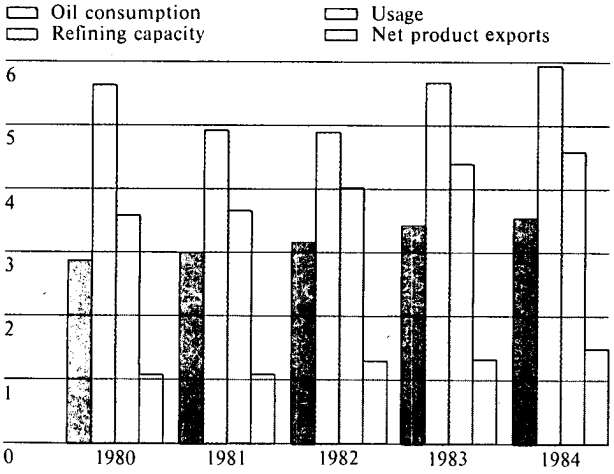
Figure 5
OPEC: Trends in Oil Consumption, Refining Capacity and Usage, and Net Product Exports, 1980-84[a]

Million barrels per day



[a] 1984 figures are preliminary.

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Effects on Product Trade and the Oil Market

OPEC exports of refined products are being marketed at prices that are generally more favorable than crude oil exports and are having little difficulty penetrating product markets. Despite the small volumes involved, these product prices already are contributing to downward pressures on crude oil prices. Moreover, we believe OPEC product exports could rise by nearly 2 million b/d to about 3.2 million b/d during the balance of the decade, accounting for nearly all of the increase in refined product exports among non-Communist countries. Such an increase assumes no further cancellations of new OPEC refineries and is based on an 80-percent utilization rate and an estimated OPEC oil consumption of 4.5 million b/d in 1990 (table 3).

Although OPEC exports of refined products are small in volume, they are contributing to a readier availability of competitively priced products that is causing a general rise in oil product trade. Net imports of refined products into OECD countries increased by

Non-OPEC LDCs

Non-OPEC LDCs may be divided into two groups: those with significant oil production and interests similar to OPEC countries that plan to expand refining capacity and those such as Singapore and the Carribean nations that have built refineries to supply major consuming areas. Refining capacity in non-OPEC LDCs has increased 300,000 b/d to 12.9 million b/d since 1980, despite a net decrease of 650,000 b/d in Latin America—primarily in the Caribbean. We estimate that non-OPEC LDC oil consumption increased 13 percent to about 8 million b/d in this period and was only about 62 percent of total non-OPEC LDC refining capacity in 1984 (figure 6). A substantial portion of non-OPEC LDC capacity in excess of domestic consumption is located in Singapore and the Caribbean and historically has been used to balance seasonal fluctuations in demand for the developed countries. This capacity will be under increasing pressure from the 3 million b/d of new OPEC refining capacity and, to a lesser extent, from 1.8 million b/d of other non-OPEC LDC capacity to be added by the end of the decade (table 2). About 90 percent of the increase in non-OPEC LDC refining capacity over this period will occur in Mexico, India, Egypt, and Tunisia and will be used primarily to meet increased domestic oil demand. 25X1 25X1 25X1

The effect of rising OPEC capacity on the overall non-OPEC LDC refining industry by 1990, however, could mirror the closures experienced by the OECD countries since 1980 and would be greatly magnified if current OECD refined product trade restrictions are enforced or increased. Should this occur, we would expect Latin America—primarily the Caribbean—to encounter the most pressure from new OPEC product exports because Latin America's refining capacity is over 40 percent greater than its local consumption, and is, therefore, dependent on relatively free access to nearby product markets. 25X1

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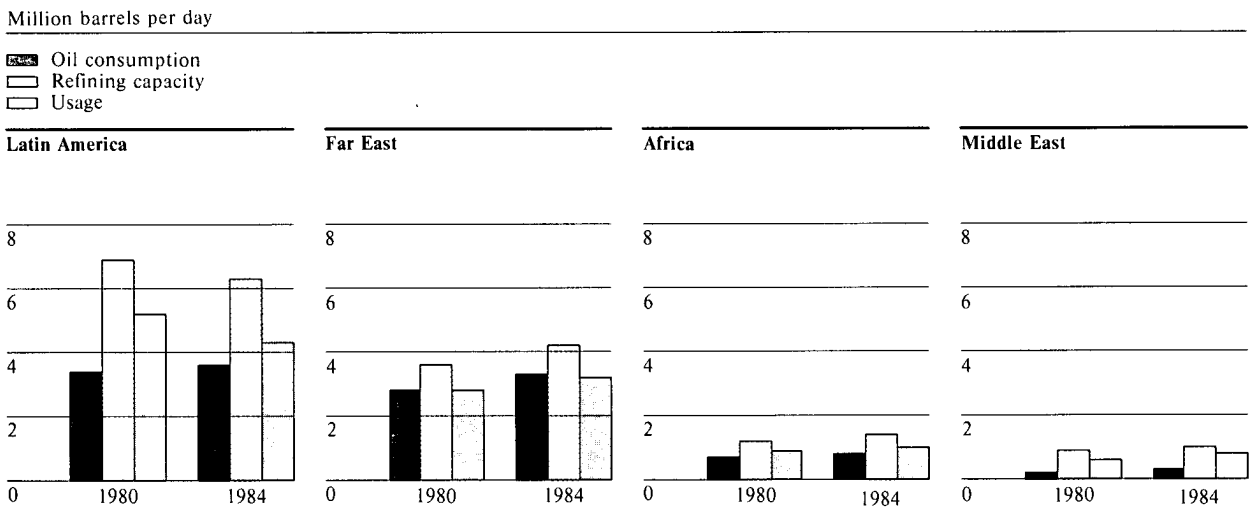
Figure 6
Non-OPEC LDC's: Oil Consumption, Refining Capacity and Usage[a]



[a] Estimated.

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Table 2
Non-OPEC LDCs' Refining Capacity [a]

Million b/d

	1980	1984	1985-87 Increase	1988-90 Increase
Total	**12.6**	**12.9**	**0.8**	**1.0**
East Asia	3.6	4.2	0.1	0.3
Of which:				
India	0.5	0.7	0.1	0.2
Other	3.0	3.5	0.1	NEGL
Middle East	0.9	1.0	0.1	0
Africa	1.2	1.4	0.2	0.5
Of which:				
Egypt	0.2	0.5	0.2	0.2
Tunisia	NEGL	NEGL	0	0.3
Other	1.0	1.0	NEGL	NEGL
Latin America	6.9	6.3	0.4	0.3
Of which:				
Mexico	1.4	1.3	0.3	0.3
Other	5.5	5.0	0.1	NEGL

[a] Capacities are as of 31 December. Sources: *Oil and Gas Journal* and *Hydrocarbon Processing.*

less than 1 percent between 1980 and 1984, but the increase since 1982 averaged nearly 5 percent per year. The largest gains occurred in Europe where net product imports rose by 300,000 b/d or 25 percent over the period 1980-84, primarily from OPEC members Kuwait and Algeria and from Communist countries. Japanese product imports increased less, about 3 percent per year on average because of product import restrictions, but approximated 17 percent of consumption in 1984, compared to about 13 percent in 1980. Despite last year's sharp increase of about 300,000 b/d in product imports into the United States, which to some extent reflected the general trend of rising product trade, US product imports increased only about 5 percent from 1980-84 because of decreased industrial demand for residual fuel oil imported from the Caribbean (figure 7).

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Demand Growth Unlikely To Help Out

Industry forecasts of only small increases in non-Communist oil consumption—perhaps 1 percent per annum or less through the early 1990s—indicates that further adjustments to the refining industry in other

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Table 3
OPEC: Refining Capacity, Consumption, and Net Product Exports [a]

Million b/d

	1984	1987	1990
Refining capacity			
OPEC	5.9	7.7	8.8
Of which:			
Persian Gulf	2.4	3.1	3.6
North Africa/Red Sea	1.1	2.0	2.2
Other Africa	0.3	0.4	0.4
Latin America	1.3	1.4	1.4
East Asia	0.8	0.8	1.2
Domestic consumption [b]			
OPEC	3.5	4.0	4.5
Of which:			
Persian Gulf	1.7	1.9	2.1
North Africa/Red Sea	0.7	0.7	0.8
Other Africa	0.2	0.3	0.3
Latin America	0.5	0.5	0.6
East Asia	0.5	0.5	0.6
Estimated net product exports [c]			
OPEC	1.5	2.8	3.2
Of which:			
Persian Gulf	0.5	1.1	1.1
North Africa/Red Sea	0.3	0.9	1.0
Other Africa	0.01	0.1	0.1
Latin America	0.5	0.5	0.5
East Asia	0.1	0.2	0.5

[a] See appendix B for a breakdown by individual OPEC members.
[b] Domestic consumption numbers are estimated based on a number of factors and include refinery fuels and bunkers.
[c] Net exports in 1987 and 1990 are estimated based on 85 percent of consumption being met by refined products and on refineries being used at 80 percent capacity, with the exception of Iran, which was given a 95 percent capacity utilization rate, and Venezuela, which was given a utilization rate of 70 percent.

Note: Numbers may not add due to rounding.

areas of the world probably will be required to offset additional gains in OPEC capacity. Without such adjustments, we estimate that total non-Communist refining capacity would rise to almost 62 million b/d by 1990. On the basis of oil consumption forecasts for 1990 ranging from 47 to 49 million b/d, however, a total capacity of about 55 million b/d probably would be more than adequate to meet non-Communist requirements and provide an ample margin of excess capacity for additional flexibility. Under this scenario, refining capacity in OECD and other oil-importing countries could fall an additional 7 million b/d by 1990. The location and extent of the adjustments that actually occur will depend in large part on trade patterns that develop for new product exports, the amount of refining capacity actually brought on stream, and on policies adopted by oil-importing countries to influence such trade.

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The Shape of Future Adjustments

OPEC product exporters will be able to price their products competitively and force additional adaptations in refining capacity in other areas of the non-Communist world because of their access to low-cost crude supplies and the advanced capabilities of their refineries. These advantages enable OPEC exporters to offset the added cost of shipping products rather than crude. In fact, large product tankers have narrowed the difference in cost between shipping crude and products from the Persian Gulf—except for fuel oil and heavier products—to about $1.50 per barrel. Adjustments in refining capacity in countries outside OPEC may be heavily influenced by any trade restrictions undertaken by importing countries to protect domestic refiners. In the absence of such policies, product flows and losses in refining capacity will be determined by a number of factors including OPEC product prices, the proximity of refineries to consuming areas, and the marketing strategy of major oil companies that are joint-venture partners in new OPEC refineries.

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We believe the major consuming areas most vulnerable to a further influx of OPEC oil products are Western Europe and Japan, primarily because of their proximity to the Middle East, their concentration of markets, and their relatively low domestic oil production capabilities. The refining industries in Singapore and Rotterdam also may lose a substantial portion of their market as OPEC product availability increases. Indeed, the refining industry in Singapore and other

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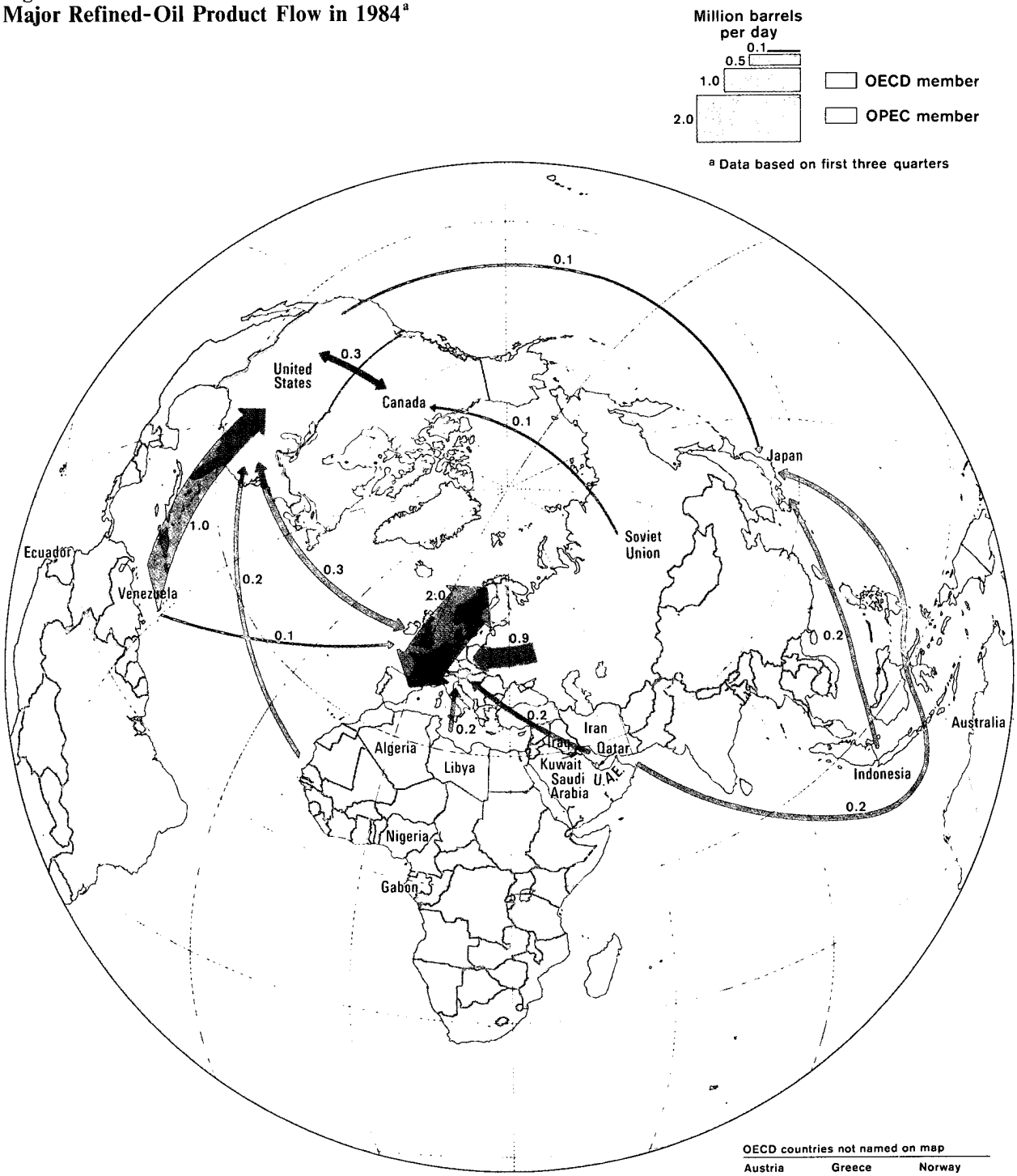
Figure 7
Major Refined-Oil Product Flow in 1984[a]



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balancing centers probably also will be affected because OPEC countries that previously had processing deals with refiners in these areas now will be able to meet domestic needs from new refining capacity. North America is in a relatively better position because of its larger domestic production, more buoyant demand, and the fact that much of the adjustment process already has been completed.

Impact on Regional Markets

West European refining capacity of almost 16 million b/d is almost 35 percent higher than current domestic oil consumption. As several governments and companies are aware, additional retirement of some of the older and less efficient refineries probably will be necessary. West German and Italian officials have said that they believe their capacity probably will fall at least an additional 17 and 50 percent, respectively, over the balance of the 1980s. Major oil companies that are partners in the Saudi export refineries already have taken steps to integrate products from the Middle East into their European operations; Kuwait has acquired European refineries and retail outlets to take advantage of the potentially large product market available in Western Europe. We believe that Western Europe is a likely market for much of the refined products from the 600,000 b/d of new Saudi refining capacity on the Red Sea and from the additional 600,000 b/d planned in new North African capacity, and some of the products from other new capacity planned by Persian Gulf countries.

In the **Far East**, Japan is a natural market for much of the new products from a possible 400,000 b/d refining capacity increase in Indonesia and a substantial portion of the products available from the 1.6 million b/d of new refining capacity planned by Persian Gulf countries. Tokyo, however, anxious to protect its domestic refining industry, is reluctant to allow increases in product imports. Without a presence in the Japanese market, new refiners could be hard pressed to gain entry; Saudi joint-venture partners Shell and Mobil, however, already have large import and distribution systems in Japan.

In the **Western Hemisphere**, about 600,000 b/d of new capacity is planned by 1990, primarily to serve domestic needs in Mexico and Ecuador. We believe the small volume of product exports from these refineries would move most easily into Latin or North American markets. North America probably will also absorb a relatively small share of new product exports—mostly light products—from added capacity in North Africa and the Middle East. 25X1

Some **less developed countries** also may provide an attractive market for new OPEC oil products. Many industry analysts believe a number of developing countries will show significant growth in oil demand through the end of the decade. A large percentage of LDC refining capacity consists of small, unsophisticated, and costly to run plants that will have particular difficulty competing with OPEC refineries. Moreover, some smaller LDCs probably will receive refined products as a form of financial aid. Although protective of their own nascent oil industries, we believe some large non-oil-exporting LDCs—India and Pakistan, for example—may elect to meet growing consumption with imported products rather than investing scarce capital in expanding their refining sectors. Establishing outlets in the LDCs will take time and could be expensive, however, particularly given the inability of many Third World countries to pay for their oil imports. 25X1 25X1

Security Issues

Refining

Our analysis indicates that new OPEC product exports probably could be easily absorbed if shared among various consuming areas. The increase in product imports in recent years and the potential for even greater increases in the next few years, however, have caused several governments in major oil-consuming countries to examine the energy security aspects of rising product imports. The primary concerns are: 25X1

- Competition from foreign refiners will cause the shutdown of domestic refineries and some related service industries.
- In the event that foreign product supplies are curtailed, the domestic industry will lack the capacity to process domestic crude, alternative sources of foreign crude, or crude oil from stocks.

Although poor economic conditions will continue to force closures over the near term, we do not believe this loss of capacity will be a problem in the next few 25X1

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Contrasting Approaches: Kuwait and Saudi Arabia

Kuwait and Saudi Arabia, leaders in the OPEC move into refining and marketing operations, have taken different approaches to accelerate their involvement in these operations. Kuwait's strategy to develop its oil industry has been one of vertical integration, mirroring the approach of most of the world's major multinational oil companies. Where appropriate, Kuwait has built new facilities, but, to speed the process, Kuwait has purchased existing plants and retail outlets. Moving outward from its already well-established production base, Kuwait Petroleum Corporation (KPC) began upgrading and expanding its domestic refineries, and in 1981 purchased Santa Fe International, an international exploration and drilling company. A Santa Fe subsidiary, C. F. Braun, also is strong in oilfield engineering and construction, and gives KPC a significant presence in the oil services sector.

It has been in the marketing area, however, that KPC has made its most publicized moves, acquiring a large portion of the European assets of Gulf Oil—now part of Chevron—including refineries in the Netherlands and Denmark, and approximately 3,100 service stations in the Benelux countries, Scandinavia, and Italy. Acquisition of this distribution network gave Kuwait immediate entry into the European refined products market, and the refineries—while less desirable—may yield some political windfall for KPC. With an infusion of new capital and secure oil supplies available to keep these plants operating, the obvious benefits—particularly in the preservation of jobs—for the affected countries may make them willing to accommodate increased imports of Kuwaiti refined products.

The Kuwaiti strategy contrasts with the Saudi Government's program of cautious expansion of its petroleum industry, where each step has come slowly and in joint-venture partnerships with established international companies. The process—which has been concentrated within the kingdom—has allowed the Saudis to gradually build up experience in new technologies while assuring a sales outlet through the marketing arm of the joint-venture partner for at least a portion of the final oil product. It does not, however, ensure that Riyadh will have a secure market for the Saudi portion of product exports. Indeed, this is a concern in the case of the two Saudi export refineries at Yanbu al Bahr and Al Jubayl. Plans call for half of the output—about 250,000 b/d—to be marketed by Mobil and Shell in their company systems, but the Saudis are currently hard pressed to sell their share of refined products without undercutting prices in an already depressed oil product market. As a result, the Saudis probably will have to juggle carefully a number of sometimes competing factors in setting oil product prices to avoid protests from distressed refiners in importing countries while also averting additional downward pressure on both product and crude oil prices.

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years because we expect non-Communist refining capacity outside OPEC to be adequate to meet any contingencies at least through 1990. Most major consumers are dependent on foreign oil supplies for at least a part of their needs. As a result, we believe it is largely irrelevant from a security standpoint whether oil imports consist of crude or refined product because OPEC countries supply 40 percent of non-Communist oil consumption and a disruption probably would affect both crude and product supplies. If at some future time refinery closures do impair a country's ability to process domestic production and strategic stocks, however, dependence on product imports would increase and could heighten vulnerability to an oil supply disruption.

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Retail Outlets

Acquisition by oil-producing nations of refineries and distribution systems located in the developed countries—particularly the purchase by Kuwait and Saudi Arabia of some refineries and marketing outlets in Europe—also has caused some concern about energy security. In our judgment, however, facilities located in the consuming countries probably are less risky than export refineries concentrated in the Persian Gulf countries—or other oil-exporting nations—because facilities in consuming countries would be at the

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disposal of the host country government during a national emergency. Acquisition of existing OECD facilities also could allow some of these facilities to remain operational and may encourage new investment to renovate the plants. Moreover, oil exporters with investments in OECD refineries and retail outlets could have an incentive to continue to supply these markets during a "political" disruption and, because the oil-sharing agreement among International Energy Agency members provides a mechanism to allocate oil supplies among members, this in turn could increase supplies to the developed countries.

Beyond 1990

Although we believe that additions to OPEC refining capacity probably are not a security issue through the end of this decade, a new series of expansive refinery additions by OPEC during the 1990s could alter the longer term outlook. To further threaten oil security, however, the expansion would have to be considerably greater than the current one. Even if OECD refining capacity were to fall by 7 million b/d to 31.5 million b/d by 1990, it would still be considerably larger than OECD production, which will probably be close to 15 million b/d. Concentration of a large portion of new OPEC refining facilities in the Persian Gulf also could heighten vulnerability—supplies could then be curtailed by damage to refining capacity in exporting countries in addition to the possibility of disruption by damage to any other part of the production and export systems.

To minimize the security risks associated with such trends would require importing countries to maintain enough domestic refining capacity to process domestically produced crude plus what might be drawn from strategic crude stockpiles. Japan and most of Western Europe have refining capacity far in excess of their low domestic production. The United States, however, accounts for most of OECD oil production and has the largest strategic crude stockpile, and therefore has a much smaller cushion. Additional options to minimize risks might include increasing strategic stocks of oil products, or, perhaps, allowing purchases of existing facilities in consuming countries as an alternative to construction of new refineries located in the producing nations.

A Near-Term Issue: Price Instability

Growing oil product exports by OPEC countries increase the risk of sharp price fluctuations or a general decline in crude oil prices by making it more difficult for the cartel to control prices. OPEC does not mandate refined product prices in part because the volume of product exports has been relatively minor—only about 10 percent of total OPEC oil sales in 1984—and, more important, because it lacks an effective means to determine "official" prices for the myriad of products on the market. OPEC product exporters are free to price products to ensure sales, and such members as Venezuela, Kuwait, and Algeria have become adept at using product sales to circumvent OPEC price agreements. OPEC product sales at competitive prices put pressure on crude prices, however, because refiners in consuming countries resist purchasing more expensive crude when less costly products are available.

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OPEC's dilemma is to determine product prices just low enough to ensure sales without undercutting official crude oil prices as members begin to move significant new volumes of oil products into an already weak oil market. Although most refiners prefer to sell products under long-term contracts, so far most of OPEC's product sales have been single cargoes at spot prices. Saudi efforts to secure long-term contracts have been only marginally successful despite Riyadh's willingness to tie contract prices to spot market quotations in Rotterdam and Singapore.

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The willingness of OPEC members to sell products at discount prices will exacerbate downward price pressure and could force a sizable drop in oil prices as product exports continue to grow. But we believe OPEC at least will probably be able to prevent a sudden, precipitous slide in crude oil prices—by controlling oil production—that would seriously threaten producing country revenues and the financial and perhaps political stability of some oil-producing nations. Should such a slide occur, however, consuming countries probably would gain economic benefits

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from higher economic growth and lower inflation in the short-to-medium term—despite some possible financial dislocations. In the near term, however, the potentially destabilizing political and economic effects of oil price instability or a price collapse probably pose the greatest risk to security associated with increased OPEC product exports. Such heavily indebted countries as Mexico and Nigeria would have particular economic and political difficulties weathering a sharp price drop. Venezuela and Indonesia would also have severe problems contending with much lower oil prices.

Trade Issues and Protectionist Sentiment

If several countries choose to protect their domestic refining industry for "security reasons," the outlook for oil product flows and further adjustments in refining capacity could be substantially altered. The degree of protection now afforded the refining industry varies by country and region. In Western Europe, the European Community (EC) has in place oil product import ceilings for gasoline, kerosene, gas-oil, and fuel oils that range from 500,000 b/d to 3 million b/d depending on the product type and point of origin.[3] When these limits are exceeded—and an EC member government formally complains—applicable duties ranging from 3.5 to 6 percent can be invoked.[4] Although feedstocks or unfinished oils for further refining from any source enter with no duty or restriction—as does crude oil—restrictions are greatest on the lighter oil products that are most likely to be available from OPEC refineries.

Several non-EC members, including Spain, Portugal, and Turkey, also have oil product import restrictions in place. Although no duties have been imposed by the EC on refined oil product imports since 1979, pressure is mounting for EC-wide action, including stricter application of existing restraints, because of the decline in refining capacity in several European countries in recent years. According to embassy reporting, EC members have indicated they will consider stronger measures if Japan fails to take its share of new product imports. 25X1

In Japan, only naphtha and fuel oil imports are permitted on a regular basis, and, despite recent pressure from the Foreign Ministry and the Consumer Union of Japan, MITI is resisting attempts to significantly liberalize the Japanese market for reasons of national security. Should Tokyo maintain this policy, pressure on the European market—and on the United States and some developing countries—would increase significantly as product exports backed out of the Far East are forced into other regions. The acceleration of refinery closures and refined product imports last year already has increased the call by some industry members in the United States for actions to limit product imports; for example, boosting the existing—although minor—tariff on gasoline or imposing import quotas. Restrictions by both Japan and Western Europe would force an even larger share of new product imports into the US market, further squeezing already low refining profit margins and spurring more pressure from refiners to curb product imports. 25X1 25X1

If some oil-importing countries attempt to protect their domestic refining industries, OPEC countries could react in a number of ways in the short-to-medium term:

- OPEC product exporters could opt to reduce utilization of refineries to lessen the increase in product exports.
- They might attempt to maximize exports of heavy products or feedstocks, which are less subject to restrictions, and could also complement the needs of the OECD refining sector. 25X1
- OPEC countries could also choose to force oil products into reluctant markets by reducing the availability of crude or by reducing product prices, or both.

Forcing modifications in the volume or type of OPEC oil product exports by imposing trade limitations will at best delay further refinery closures in some areas or cause other developed or developing countries to make

[3] Members include Belgium, Denmark, France, West Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, and the United Kingdom.

[4] Oil products enter the EC free of quota or tariff from "former territories of the Community," the European Free Trade countries, and 10 North African and Mediterranean nations that have association agreement with EC. Oil products from other non-European countries generally are subject to duty.

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the adjustments. We believe such policies would be ineffective in limiting OPEC oil product exports over the longer term—particularly in the 1990s—because OPEC countries control a significant portion of crude oil supplies necessary to support refining operations in the consuming countries.

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Appendix A

OPEC: Planned Refinery Capacity Increases 1985-90

Thousand barrels per day

	1985	1986	1987	1990 [a]	Total Increase
OPEC	**512**	**926**	**325**	**1,044**	**2,807**
Algeria					90
Sonatrach			90		
Ecuador					70
Esmeraldas			35	35	
Gabon					0
Indonesia				400	400
Iran					200
Arak		200			
Iraq				200	200
Kuwait					256
Mina' al Ahmadi		100			
Mina' 'Abd Allah		156			
Libya					482
Ra's al Unuf	220				
Other	42			220	
Nigeria					145
Port Harcourt		100			
Warri		45			
Qatar				39	39
Saudi Arabia					725
Al Jubayl	250				
Rabigh		325			
Other				150	
United Arab Emirates					200
'Ajman			200		
Venezuela					0

[a] Refining capacity plans could easily be delayed or canceled for a variety of reasons; for example, lack of funds or a slower-than-anticipated rise in domestic consumption.

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Appendix B

OPEC Refining Capacity, Consumption, and Product Availability—1984-90 [a]

Thousand barrels per day

	1984	1985	1986	1987	1988	1989	1990
OPEC							
Refining capacity	5,943	6,455	7,380	7,705	7,705	7,705	8,750
Consumption	3,539	3,660	3,810	3,965	4,105	4,270	4,450
Product availability	1,504	2,140	2,540	2,775	2,670	2,545	3,250
Algeria							
Refining capacity	471	471	471	560	560	560	560
Consumption	149	155	160	165	170	175	180
Product availability	275	245	240	310	305	300	295
Ecuador							
Refining capacity	88	88	88	125	125	125	160
Consumption	90	95	95	100	100	105	110
Product availability	15	10	5	15	10	10	35
Gabon							
Refining capacity	44	44	44	44	44	44	44
Consumption	14	14	14	15	15	16	16
Product availability	12	25	25	25	20	20	20
Indonesia							
Refining capacity	816	816	816	816	816	816	1,215
Consumption	500	500	515	530	545	565	580
Product availability	110	230	215	200	190	175	480
Iran							
Refining capacity	580	580	780	780	780	780	780
Consumption	620	650	690	730	770	810	860
Product availability	30	30	30	120	85	50	10
Iraq							
Refining capacity	362	362	362	362	362	362	560
Consumption	231	235	240	250	260	265	275
Product availability	70	90	85	75	70	65	215
Kuwait							
Refining capacity	547	547	800	800	800	800	800
Consumption	186	185	190	195	200	205	205
Product availability	324	390	480	475	475	470	465
Libya							
Refining capacity	137	400	400	400	400	400	620
Consumption	97	100	105	110	115	120	125
Product availability	70	235	230	225	220	215	385

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OPEC Refining Capacity, Consumption, and Product Availability—1984-90 [a] (continued)

Thousand barrels per day

	1984	1985	1986	1987	1988	1989	1990
Nigeria							
Refining capacity	247	247	390	390	390	390	390
Consumption	218	220	235	250	270	290	300
Product availability	−5	10	115	100	85	70	60
Qatar							
Refining capacity	61	61	61	61	61	61	100
Consumption	14	16	17	18	19	20	22
Product availability	34	35	35	35	35	30	60
Saudi Arabia							
Refining capacity	1,140	1,390	1,715	1,715	1,715	1,715	1,865
Consumption	900	950	990	1,030	1,050	1,090	1,135
Product availability	50	305	530	500	480	445	530
United Arab Emirates							
Refining capacity	195	195	195	395	395	395	395
Consumption	120	125	127	131	136	141	145
Product availability	18	50	50	205	200	200	195
Venezuela							
Refining capacity	1,255	1,255	1,255	1,255	1,255	1,255	1,255
Consumption	400	415	430	445	460	475	500
Product availability	500	500	500	500	500	500	500

[a] 1984 figures are estimated. Product export availability for 1985-90 is based on 85 percent of consumption met with refined products and on refinery utilization rates of 80 percent except for Iran, which was estimated at 95 percent, and Venezuela, which averaged about 70 percent.

Totals may not add due to rounding.

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