CONFIDENTIAL

PHP
ESC
DVR
(cc NA & SA)
7426

NATIONAL INTELLIGENCE ANALYTICAL MEMORANDUM

INTERNATIONAL PETROLEUM PROSPECTS

CONFIDENTIAL
NIAM 3-73
11 May 1973

№ 32

THIS DOCUMENT IS SUBMITTED BY THE DIRECTOR OF CENTRAL INTELLIGENCE AND CONCURRED IN BY THE UNITED STATES INTELLIGENCE BOARD.

The following intelligence organizations participated in the preparation of the document:

The Central Intelligence Agency and the intelligence organizations of the Departments of State, Defense, the NSA, the Treasury, and the AEC.

Concurring:

The Deputy Director of Central Intelligence

The Director of Intelligence and Research, Department of State

The Director, Defense Intelligence Agency

The Director, National Security Agency

The Special Assistant to the Secretary of the Treasury

The Director, Division of International Security Affairs, Atomic Energy Commission

Abstaining:

The Assistant Director, Federal Bureau of Investigation, the subject being outside of his jurisdiction.

WARNING

This material contains information affecting the National Defense of the United States within the meaning of the espionage laws, Title 18, USC, Secs. 793 and 794, the transmission or revelation of which in any manner to an unauthorized person is prohibited.

Classified by 011454
Exempt from general
declassification schedule of E.O. 11652
exemption category 5B(2),(3)
Automatically declassified on
Date Impossible to Determine

NIAM 3-73

INTERNATIONAL PETROLEUM PROSPECTS

Approved For Release 2011/02/24 : CIA-RDP10X00001R000100010013-2

CONTENTS

ge
6
7
16
21
5
8
9
9
6
7
3
1
9
5
9

INTERNATIONAL PETROLEUM PROSPECTS

PRÉCIS

A. Energy requirements will increase by about six percent a year world-wide through 1980. Demand for oil, which fills half the energy need, will keep pace, reaching about 88 million barrels per day. One-third of the non-communist world's oil supply will come from Saudi Arabia and Iran combined and another third from other members of the Organization of Petroleum Exporting Countries (OPEC).[1] (*Paragraphs 2-5*)

B. Saudi Arabia has the world's largest reserves of oil, is already the largest exporter, and soon will be the largest producer. King Faisal or another member of the Saud family will probably rule through the decade. **While it now seems likely that Saudi oil will remain available in growing quantity through the decade, internal developments or a further deterioration of Arab-Western relations could alter this favorable outlook.** (*Paragraphs 18-24, 67*)

C. **Iran will have no interest in interrupting supply.** Oil revenue is necessary to fund the Shah's increasingly expensive industrialization program. Either he or a successor government will seek maximum oil revenues. (*Paragraphs 16-17*)

[1] Saudi Arabia, Iran, Kuwait, Iraq, Abu Dhabi, Qatar, Indonesia, Venezuela, Nigeria, Algeria and Libya.

D. **There probably will be some small interruptions of oil supply during the 1970s.** Those most likely to occur involve such states as Libya and Iraq; each will be producing less than five percent of world oil supplies. Oil shortages of this magnitude could be managed, albeit with substantial inconvenience. **A major and sustained embargo on oil shipments by the Arab states working in concert is highly unlikely.** (*Paragraphs 25-29*)

E. **The USSR is not likely to become a key participant in the international oil trade.** By 1980 total Soviet oil sales—from domestic production and from foreign procurement—probably will amount to only three to five percent of that trade. The USSR's interest in extended economic relations with Western Europe and the US, as well as its recognition of the risk of confrontation with the US, **make a Soviet attempt to interfere with international oil supplies highly unlikely. The USSR might in certain circumstances, including support of other foreign policy objectives, be prepared to play on Western uneasiness about the security of oil supplies.** (*Paragraphs 35-46*)

F. **The cost of oil imports will be huge.** Even if prices remained constant, the world's aggregate oil import bill would reach $55 billion (in 1973 dollars)[2] in 1980; the US, Western Europe, and Japan combined would be paying $45 billion of this. The cost could be much more, depending on the increases in oil payments that OPEC states manage to get and the rate of inflation. If the price reached $5 per barrel, the 1980 bill would come to $90 billion for the world. (*Paragraph 48*)

G. The producers, in the aggregate, will get much more revenue than they spend or give away to client states. **This surplus will mount to at least $27 billion by 1980 (at today's prices) and two or three times as much if per barrel revenues rise rapidly.** (*Paragraphs 54, 59*)

H. Most of the accumulation will be in Saudi Arabia, Kuwait, and Abu Dhabi. They probably will invest the bulk of it abroad. **So far as investment is concerned, the large and flexible markets of the US will prove very attractive.** Oil producing states with large liquid balances will have considerable potential for aggravating unsettled

[2] Throughout this paper, 1973 dollars are used. In those instances where the distinction is relevant, the dollars are post-February 1973 devaluation dollars.

monetary conditions, but they will also have a strong interest in maintaining world monetary stability. (*Paragraphs 56-60*)

I. **The oil consuming countries as a group cannot break even on current account transactions with oil producers. The US, deriving large profits from overseas oil operations and importing only half its oil requirements, can—if oil prices do not rise too rapidly and if US exports maintain or increase their share of producer-country markets.** Western Europe will run a deficit on oil-related transactions, but not necessarily one of staggering proportions. Japan will have a deficit on oil transactions that will be a burden even to an otherwise strong payments position. (*Paragraphs 51-53*)

J. **Intensified rivalry among the US, the West European countries and Japan for (1) oil, (2) extended export markets to pay for oil and (3) investments from oil producers will run serious risk of causing deteriorating terms of trade for all consumers and also of embittering political relations among major industrial countries.** And bad political relations would in turn intensify economic rivalry. (*Paragraphs 62-65*)

DISCUSSION

I. WORLD ENERGY AND OIL IN 1980

1. The world-wide demand for energy has been growing at an impressive rate, doubling about every 12 years since the 1940s. Oil became the leading source of energy in the 1960s. It will maintain that position through the 1970s and beyond. The US relies on oil for about 45 percent of its energy needs, Western Europe for over 60 percent and Japan for about 75 percent. The increasing dependence of these areas on a few producing countries and the expected rise in the cost of oil pose the fundamental political and economic issues that are the subject of this National Intelligence Analytical Memorandum: (a) the reliability of the oil-rich countries as suppliers, (b) the huge balance of payments burden of oil imports and (c) the consequences that will flow from accumulation of enormous amounts of money by the oil producers.

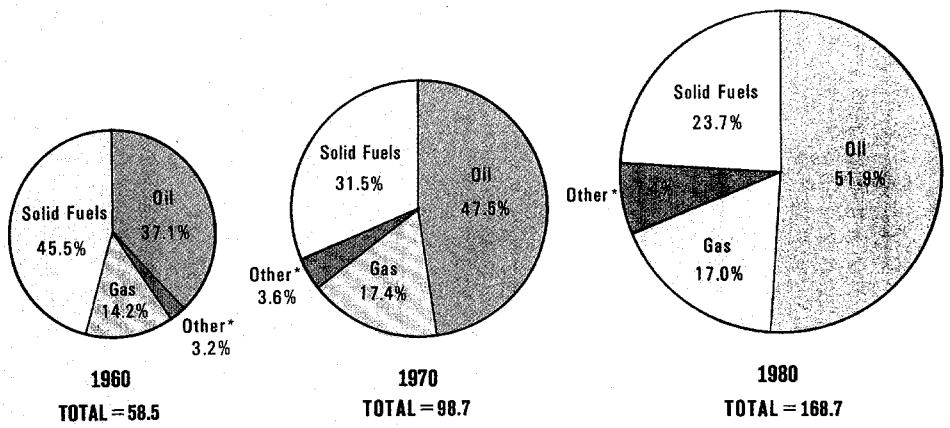
2. Table I contains a projection of the demand for energy in 1980. Forecasting demand this far ahead is hazardous, as the past record shows; predictions of the particular energy mix—oil, gas, solid fuels etc.—are even more hazardous. The Table is based on a broad survey of expert opinion. It assumes, *inter alia*, the continuation of present policies and practices with regard to energy, as well as full employment and no major war. It contains reasonable orders of magnitude, not precise forecasts. The important point is that even if the projections are off by 10 percent or so in either direction, the issues on which this paper focuses remain.

3. Table II projects world oil production in 1980 by country. It is, in effect, the geographic distribution of output that would result from the current plans of international oil companies for installing producing capacity. These plans rest on assumptions concerning a number of determining factors—technical ones such as the producing capacity of oil fields and the costs of production and shipment and politico/economic determinants such as the anticipated policies of the producing countries in regard to conservation of resources, desire for revenues and willingness

Figure 1

WORLD PRIMARY ENERGY DEMAND

(In million barrels per day of crude oil equivalent)



*Hydroelectric and nuclear.

515453 2-73

to do business with Western oil companies. As indicated by the two tables, the USSR and the communist countries, taken as a group, are self-sufficient in oil, and they are expected to remain so in 1980. The West European countries and Japan will continue to depend on imports for most of their oil supplies; collectively they will import about 30 million barrels per day (bpd) of the 50 million bpd of oil expected to be moving in world trade in 1980.[3]

4. The US was virtually self-sufficient in oil until recently. By the end of this decade, however, it will be importing roughly half of the oil it is expected to consume—about 11 million bpd out of a total of some 22 million bpd. Canada and Venezuela together will probably furnish about four million bpd; most of the rest will have to come from the Eastern Hemisphere. The 22 million bpd projection of US oil demand in Table I is what now appears the most reasonable of a range of possibilities. Most estimators are in fairly close agreement on US demand for energy in 1980, but assessments of the likely mix of fuels—coal, gas, oil, nuclear and hydroelectric power—vary. Two major uncertainties are the trend of gas prices and gas import policies, which can lead to a wide range of estimates of gas availability, and the effect of environmental constraints on coal availability. Estimates that anticipate little growth in gas or coal availability anticipate large requirements for oil. The figure in Table II for US oil production might prove high—if exploitation of Alaskan fields lags—or low—if

[3] Transportation of 50 million bpd in world trade is not likely to present major difficulties. The existing tanker fleet, supplemented by ships now building or on order, is more than adequate to meet transportation requirements for the oil demand forecast for 1975, and the shipyard capacity of the world is larger than anticipated needs in the years beyond.

TABLE I

ESTIMATED PRIMARY ENERGY DEMAND 1960–1980

Crude Oil Equivalent, Million Barrels Per Day*

	1960	1970	1980	Average Annual Percentage Change 1961–1970	1971–1980
US—Total	21.5	32.7	48	4	4
Of which: oil	9.7	14.4	22	4	4
Western Europe—Total	12.3	21.1	35	6	5
Of which: oil	4.1	12.7	22	12	6
Japan—Total	1.7	5.6	14	13	10
Of which: oil	0.6	4.1	11	21	10
USSR, China, Eastern Europe—Total	15.2	24.9	41	5	5
Of which: oil	2.8	6.6	13	9	7
Others—Total	7.8	14.4	32	6	8
Of which: oil	4.5	9.1	19	7	8
World—Total	58.5	98.7	169	5	6
Of which: oil	21.7	46.9	88	8	6

* Totals for 1980 do not add because of rounding. For sources, and a fuller discussion of the assumptions, caveats and methodology underlying these demand forecasts, see Annex A, which also gives projections of demand for the main types of energy.

rising oil prices result in additional output. Since oil is the swing fuel and oil imports are the residual source of oil supply, any variation of demand or supply from the projection would be reflected in oil imports.

5. The world has 600 billion barrels of proved oil reserves, more than enough to meet the demand through 1980 and well beyond. The 11 states comprising the Organization of Petroleum Exporting Countries (OPEC)[4] now control more than 75 percent of these reserves. Half of the total is in the countries around the Persian Gulf; Saudi Arabia alone possesses a quarter of the total. Hence, the share of world oil production provided by the Persian Gulf states will rise dramatically in the years ahead.

6. Along with this, the historic domination of the international oil trade by American and European firms will be further eroded during the 1970s. Saudi Arabia, Qatar, Abu Dhabi and Kuwait have made agreements with the oil companies which awarded them 25 percent ownership of concessions now, and majority control on 1 January 1982. Similar arrangements are likely to be reached with other OPEC states. The national oil companies of the producing countries are making their initial moves into marketing on a small scale; for some years, however, most of the world's oil will be sold by the international oil companies.[5]

7. Upwards of $300 billion of investment will be required during the remainder of the decade to produce and market the oil

[4] The OPEC members are: Saudi Arabia, Iran, Kuwait, Iraq, Abu Dhabi, Qatar, Indonesia, Venezuela, Nigeria, Algeria and Libya.

[5] Oil reserves, facilities and ownership are discussed at greater length in Annex B.

TABLE II

WORLD CRUDE OIL PRODUCTION, 1960–1980 [a]

	Million Barrels Per Day			Average Annual Percentage Change	
	1960	1970	1980 Projected	1961–1970	1971–1980 Projected
Western Hemisphere	*12.3*	*18.1*	*21.5*	3.9	1.7
United States	8.0	11.3	11.5	3.5	0.2
Canada	0.5	1.5	3.0	11.6	7.2
Venezuela	2.8	3.8	3.5	3.1	−0.8
Others	1.0	1.5	3.5	4.1	8.8
Eastern Hemisphere	*6.3*	*21.8*	*54.5*	13.2	9.6
Middle East	5.2	13.8	37.5	10.3	10.5
Abu Dhabi	—	0.7	4.0	19.9 [c]	19.0
Iran	1.1	3.8	9.0	13.2	9.0
Iraq	1.0	1.6	3.0	4.8	6.5
Kuwait [b]	1.7	3.0	4.0	5.8	2.9
Saudi Arabia [b]	1.3	3.8	15.0	11.3	14.7
Others	0.1	0.9	2.5	24.6	10.8
Africa	0.3	6.2	10.5	35.4	5.4
Algeria	0.2	1.0	2.0	17.5	7.2
Libya	—	3.3	3.0	22.0 [c]	−1.0
Nigeria	Negl.	1.1	4.0	31.0 [c]	13.8
Others	0.1	0.8	1.5	23.1	6.5
Indonesia	0.4	0.9	2.5	8.4	10.8
Other (including North Sea)	0.4	1.0	4.0	11.6	12.8
Communist Countries	*3.4*	*7.7*	*13.0*	8.5	5.4
USSR	3.0	7.0	11.0	8.8	4.6
Eastern Europe	0.2	0.3	0.5	4.1	5.2
China	0.2	0.4	1.5	7.2	14.1
WORLD	*22.0*	*47.7*	*89.0*	8.0	6.4
OPEC	*8.6*	*23.3*	*52.0*	10.5	8.4
OAPEC [d]	*4.4*	*13.9*	*34.0*	12.2	9.4

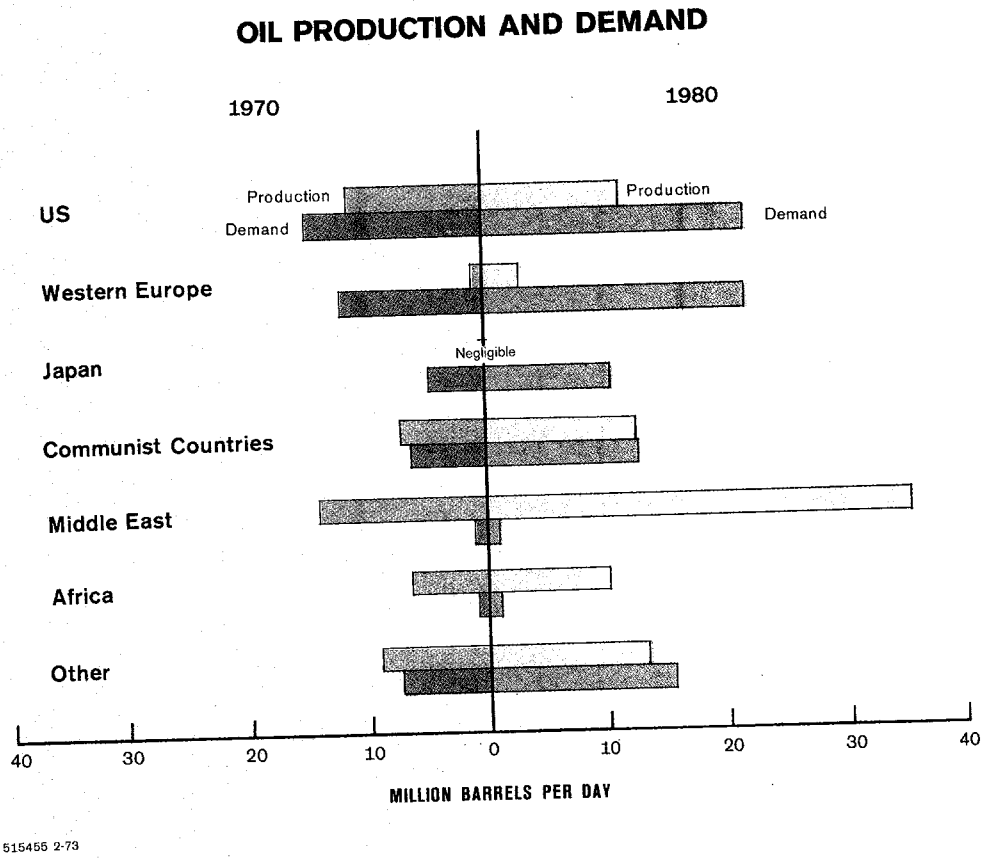
[a] Based on oil industry projections, with 1980 production data rounded to the nearest 500,000 bpd. Totals may not add due to rounding.

[b] Including half of output from the Saudi-Kuwait Neutral Zone.

[c] For the period 1966–1970.

[d] Organization of Arab Petroleum Exporting Countries: Arab members of OPEC, plus Egypt, Syria and Bahrain.

Figure 2



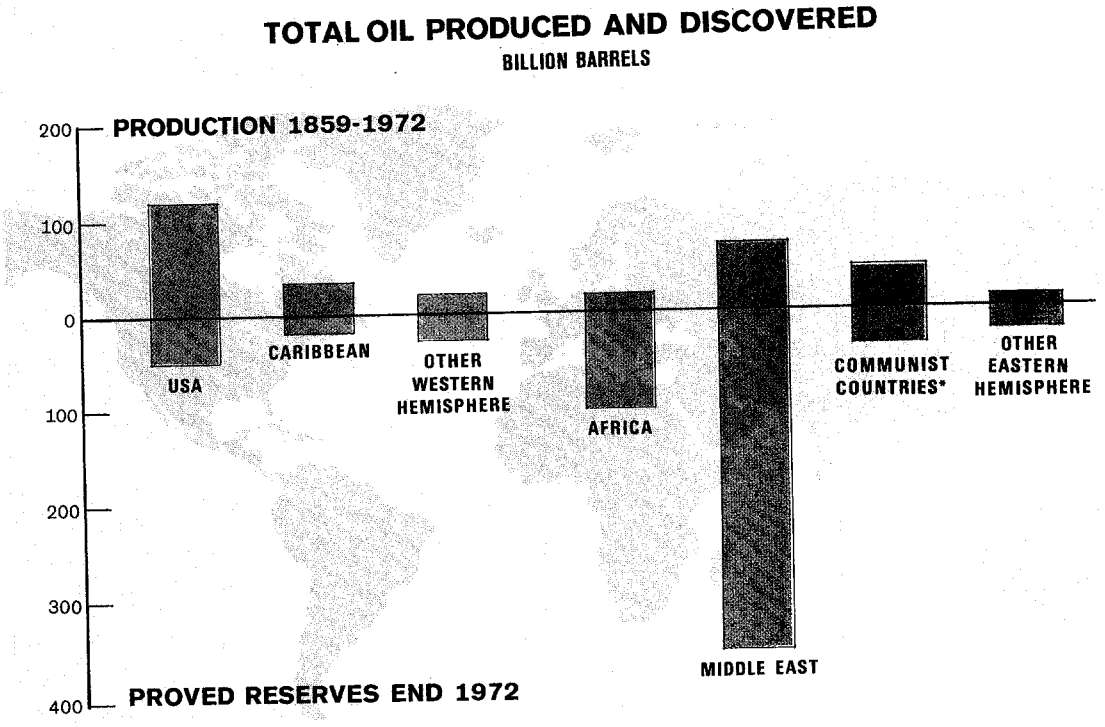
needed in 1980. Most will be spent in consuming countries. The industry will generate some of its requirements from internal sources, but the trend of the past decade toward borrowing will continue. An important new development will be the use of funds provided by the producing states, which will be accumulating from the sale of oil more money than they can use.

II. THE PRODUCING STATES: FACTORS AFFECTING RELIABILITY OF SUPPLY

A. General Considerations

8. The bulk of the world's oil reserves are found in underdeveloped states. All were very poor until oil production started; some still are. Wealthy or not, they retain the mindset of the underdeveloped, agricultural poor facing the modern, industrialized rich. Most OPEC countries were formerly under Western domination. The citizens of these countries believe, with varying degrees of intensity, that international oil companies, with government backing, have in the past milked the producing states of profits that belonged to them. They have won both increased revenues and greater control in the course of years of confrontation with the Western oil companies. Enjoying a seller's market, they could curtail the flow of oil to get higher prices, to conserve

Figure 3



*Excluding reserves in People's Republic of China.

515454 2-73

their principal natural resource, to enforce political demands or—in a few special cases—to avoid piling up excess financial reserves.

9. All OPEC countries rely heavily on oil revenues; some have more compelling reasons for producing ever greater quantities of oil than others. Countries such as Iran and Algeria are deeply committed to massive development programs that will require large—and growing—sums of money over an extended period of time. For others (Abu Dhabi and Kuwait are examples), doing without a large part or even all oil revenues for a year or two would be more of an inconvenience than a disaster. Saudi Arabia—which will increasingly be the key oil producer—will be in this position before the end of the decade.

10. The political makeup of the regimes governing OPEC countries will also loom large in producer country decisions about oil. Typically, an OPEC government is ruled by one man or a small clique and has no provision for the orderly transfer of power except in the case of a dynastic succession. Military governments such as Iraq or Libya lack even that. Such concentration of power makes for effective authority during the lifespan of a regime, but it also carries a large chance of

major change without warning. As it happens, the states that will collectively produce the bulk of Eastern Hemisphere oil—Iran, Saudi Arabia, Kuwait and Abu Dhabi—are led by traditional heads of established ruling families. These rulers have, on the whole, seen political benefits for themselves as well as economic benefits for their countries in staying on good terms with the US and Western Europe, even though bargaining hard for greater oil revenue from Western-owned oil companies. Iraq and Libya, on the other hand, have tended toward an adversary relationship with the West since ousting their respective monarchs.

B. The Key Producers

11. The policies of three states are of particular importance. Venezuela has special significance to the US as a major supplier of oil. Iran and Saudi Arabia together will produce about a third of the non-communist world's oil supply and will have a substantial share of spare producing capacity. If production ceased in either, there would be extensive disruption of supply. Though any forecast that depends on political developments as far ahead as 1980 is hazardous, a major interruption of supplies from any one of these three countries does *not* now appear likely.

12. *Venezuela.*[6] Although in many respects not a typical OPEC country—Venezuela has political parties, elections and popular participation in government—this largest Western Hemisphere oil exporter does share many of the attitudes of its sisters in the organization. Venezuela considers that foreign oil companies exploited the country for years; its strong pressure on the oil companies over the past decade has stemmed in large part from a desire to redress what it regards as earlier wrongs. Caracas has succeeded in raising its per barrel and overall revenues considerably, but its tactics have caused the oil companies to curtail new investment. Exploration has dropped off and the discovery of new reserves has lagged.

13. The Venezuelan Government is aware that reserves will not support production at current levels for more than a dozen years or so, that more oil must be found if the country's economic health is to be maintained beyond the 1970s. It has been receptive to US suggestions that the two countries enter into a long-term comprehensive energy treaty, designed to promote development of the heavy oil[7] of the Orinoco tar belt, to provide a dependable source of oil imports into the US, and to give Venezuela increased financial benefits and secure markets. The US wants any treaty to be formally ratified by the Venezuelan Congress and to include firm guarantees both for investment and for a reasonable profit. The Caldera government is planning a detailed survey of the tar belt's potential, to be conducted under the aegis of the government-owned Venezuelan Petroleum Corporation. Assuming confirmation of adequate recoverable reserves,[8] the US is considering some form of preferential import treatment for this heavy oil if and when it becomes available.

14. The Venezuelans are likely to press hard for preferential treatment in the US market for their existing production as well as for future production of heavy oil from the tar belt. The Venezuelan Government will seek provisions for generous periodic price

[6] See NIE 98-72, "Venezuela: The Politics of Oil", dated 19 October 1972, SECRET, for a more detailed analysis of that country's oil situation.

[7] So called because it has a high specific gravity and is too viscous to be produced or handled by normal methods.

[8] Estimates of the size of reserves run from a few billion to many tens of billions of barrels. This oil is *not* included in the Table, *Proved Oil Reserves,* in Annex B, page 36, or Table II, *World Crude Oil Production, 1960-1980,* page 7.

and tax increases. It is likely to resist pressures for greatly expanded production from existing fields until it is clear that production from new fields can provide for Venezuela's financial needs well beyond the present decade. It will want to influence production levels from new fields and will probably press for joint venture arrangements.

15. As the continuing need for sizable income in the years ahead has become more apparent to Venezuela's political leaders, oil has become less of an issue between the two major parties. It will, however, continue to be a target for nationalistic and opportunistic politicians. An energy agreement probably will not be concluded before the presidential elections of December 1973. But an administration headed by either major party would be likely to push for completion of an agreement during 1974. If an agreement is reached, there would almost certainly be periodic nationalist pressure for revising some terms in Venezuela's favor. Demands for a complete revision of a US-Venezuelan energy treaty and even a rupture of the treaty ties are possible in the years ahead. But the benefits of an agreement in terms of increased foreign investment, employment and the like tend to work against such a contingency.

16. *Iran.* A continuing and growing supply of oil from Iran, up to the limits on production imposed by field capacity, appears as certain as anything can be in an uncertain world. The Shah has striven consistently, over the many years he has dominated Iran, to establish his country as a reliable supplier; at every opportunity, he has emphasized what he perceives as the contrast between his own attitude and the intemperate actions and words of his mercurial Arab neighbors. At the same time, he has been extremely demanding in financial terms; one of his driving objectives is to maximize Iranian revenues over the next decade or two, in order to maintain and accelerate Iran's impressive economic development program and to pay for the sizable military forces he believes Iran must have to carry out its declared mission of guardian power in the Persian Gulf. Under the new arrangements being worked out with the Consortium, Iranian oil revenues—which have doubled in the past two years—will continue to expand at a healthy rate. Iran will have no trouble spending its oil income, even if it grows at 20 percent a year (through doubling of per barrel revenues) through the 1970s.

17. The Shah's death or deposition might lead to turmoil in Iran, but it probably would not interfere significantly with oil output. The overthrow of the monarchy, combined with a complete change of Iranian goals and political orientation, is highly unlikely in the near term. The succession might involve a struggle for power, either among supporters of the monarchy or between royalists and revolutionaries. In any event, central government control probably would be somewhat weakened, since no successor government is likely to have anything like the vast personal power of the Shah. But political struggles are likely to be centered in Tehran, 300 miles or more from the oil producing areas; unless the country were racked by civil war, oil production facilities probably would not be endangered. And any successor government almost certainly would be anxious to continue receiving oil revenue, which has become central to the Iranian economy and which is likely to be even more crucial as ambitious industrialization programs are pursued. Thus, the odds will continue to favor a sustained flow of oil.

18. *Saudi Arabia* is the key country in the international oil future. It has a quarter of all proved reserves and is now the world's largest oil exporter. In all likelihood, it will become the world's largest producer before the end of the 1970s, with output of at least

15 million bpd by 1980. Saudi Arabia is governed by a regime which has been willing to see oil production expand at a dramatic rate and so far has been able to spend most of the income this production generates.

19. King Faisal is both the major strength of the Saudi political system and its principal weakness. Under his leadership, both the family and the country have a clear sense of direction, factionalism is minimal, and progress along certain—mostly economic—lines is steady and substantial. The government's position has been strengthened by its enlistment of comparatively young and well-educated Saudis—both princes and commoners. But Faisal is slow to delegate authority and very hesitant to make detailed provisions for his own death or incapacity. Faisal is in his late 60s, and the nature of successor governments is problematical. If he rules in full possession of his faculties and then dies suddenly, the Saud family would probably unite behind an agreed successor. The succession is less likely to go smoothly if Faisal should undergo an extended decline in health and mental capacity. Such circumstances would raise the chances of intrafamily dispute over the sharing of power and present opportunities for antimonarchical elements to strike at the family's supremacy.

20. All things considered, the chances seem reasonably good that another King of Saudi Arabia will follow Faisal and will rule for some years at least. Over the longer run, however, the problems of the monarchy are likely to increase. The Saudi royal family has many weaknesses that could become far more troublesome when Faisal's strong hand is gone. And Saudi society already exhibits signs of deepening schisms and problems. A young, educated Saudi can expect generous financial rewards and high status if he cooperates with the regime. But cooperation entails rigid public conformity to the appearances required by an especially strict form of the Muslim religion—a form that a great many Saudis do not personally espouse. Cooperation also requires acquiescence to the dictum that all forms of political organization are subversive and that almost any criticism of the social system verges on the treasonable. Any Saudi with a substantial formal education has been exposed to very different concepts acquired during schooling abroad or from foreigners. The result is a great deal of pretense and hypocrisy and an atmosphere of repressed desires and clandestine dealings that breeds contempt for the law and for the authorities that impose it.

21. Saudis have plotted the overthrow of the regime in the past; they will no doubt try again. There simply is no way of estimating whether a coup might succeed and bring to power a vastly different set of people—a group prepared to manipulate oil production in pursuit of political goals. Such people cannot always be spotted in advance, as Libya's Qadhafi was not. Saudia Arabia is less vulnerable than many countries to the sort of political turmoil that would cast doubt on the availability of oil; the Saudis have no bitter memories of imperial proconsuls or of oil company presidents threatening to "ask my government for troops;" they do have the record of having led the Middle Eastern oil countries to their most famous victories—the 50-50 profit split of 20 years ago and participation today.

22. The Saudis realize that their growing wealth from rising oil output may to an increasing degree attract the attention of covetous neighbors. To protect his regime from interference by other Arabs, Faisal relies more on financial outlays than on strictly military defenses. Since 1967, he has paid out $150 million annually to certain Arab states—notably Egypt ($100 million) and Jordan ($40 million). As Saudi income rises, so will Saudi

generosity. Egypt will be the principal beneficiary; it will have great need for foreign exchange and the means to apply military or subversive pressure on the Saudis. But Cairo will prefer to remain on good terms with Riyad. It would be aware that the success of an Egyptian military attempt to seize control of Saudi Arabia or its oil fields would be highly dubious, even against the Saudis alone. And it would recognize that the attempt would risk provoking counteraction from Iran or a Western power, while depriving Cairo of Saudi subsidies.

23. A number of interrelated economic and political issues will affect the future course of Saudi oil policy. The Saudis must decide if they wish Saudi Arabia to accumulate steadily growing amounts of money—sums which are virtually certain to outrun the country's ability to spend by a wide margin. The Saudis are convinced that continued close cooperation with the US is in the best interest of their country. But they believe that the importance of Saudi oil and of a responsible Saudi oil policy have not been adequately recognized even by the US. They are troubled by the lack of a US response to the Saudi suggestion of last September for a special relationship with the US on oil matters. They have expressed their displeasure at stories that the oil consuming states intend to band together to deal with the producing countries.

24. King Faisal has repeatedly said that he would not use oil as a political weapon. But Saudis are not isolated from the stresses of the Arab-Israeli situation. They believe that the US continues to favor the Israeli side; and they want to display a strong position alongside their fellow Arabs. In this circumstance, Saudi Arabia will use public reminders of the growing US need for Middle Eastern oil as a means of pressing the US to modify its policy. Over time, if the Saudis perceive no change in US policy—and especially if the Arabs were gravely humiliated by Israeli blows or if the Saudis suffered from extensive fedayeen sabotage of oil installations—they would consider moving beyond words to action. Such action might eventually include limitations on production or threats to suspend oil shipments to the US.

25. *Other Producers.* There are seven other oil producing states which each contribute over a million bpd or will do so in the near future—Algeria, Kuwait, Indonesia, Nigeria, Abu Dhabi, Libya and Iraq. As a group, they will provide about 22 million of the 50 million bpd expected to be moving in international trade in 1980. Most of them rely heavily on oil revenues to run their governments and to develop their economies. They range in reliability as suppliers from Algeria, which is eager to develop economically and likely to continue to make its oil policy decisions on commercial grounds, to Iraq, where governments have at times impeded the growth of oil production and which has a record of political instability. During the 1970s, interruptions of oil flow from one or another of these lesser suppliers are almost certain to occur, but most stoppages are likely to be of short duration. No one of these states alone is in a position to cause a disruption in oil supply that would create unmanageable problems for consuming countries.[9]

C. Collective Arab Action—A Political Embargo

26. The Arab countries have long been aware that their collective importance to world oil supplies is a potential source of leverage over the industrialized West. Arab leaders, including Sadat of Egypt and Qadhafi of Libya, frequently discuss the possibility of collective action designed to deprive the West of oil in

[9] These states are discussed in greater detail in Annex C.

order to bring pressure on Israel. In years to come, threats of embargo no doubt will be repeated frequently. The fact remains, however, that the Arab world has never undertaken an embargo on all oil shipments or a sustained embargo on any large share of them.

27. In the absence of renewed or imminent Arab-Israeli hostilities, a collective Arab embargo aimed at forcing the Great Powers to impose a settlement is highly improbable. Saudi participation, vital to an effective embargo, would be virtually out of the question in this set of circumstances certainly while Faisal is actively in charge, and probably under his designated successor. (In the event of a more radical regime, the prospects would be more uncertain.) The mutual trust necessary to bring about an embargo does not exist among the Arab states; nor would they be able to agree on the objectives of any such action.

28. However, the Arab-Israeli situation is volatile, subject to change because of developments in Israel, in Egypt, in Jordan, in Saudi Arabia, or in the policies of the Great Powers. It would be imprudent to assume that the decade will pass without some kind of crisis, involving hostilities or a level of tensions so high that some Arab governments would seek ways to strike at the US. It is possible that the cycle of terrorism and reprisal, sustained over time, could lead to interruptions of the flow of Arab oil. And in circumstances of Arab-Israeli hostility, certain governments would almost certainly act unilaterally to suspend shipments to the US and in addition attempt to organize an Arab-wide embargo. Only as the 1980s approach, and non-Arab exporting countries reach their limits of producing capability, would an Arab boycott of the US alone, coupled with an equivalent decrease in output, be sustainable. In these circumstances, the oil withheld from the market could not be readily replaced and not only would the Arabs have substantial financial reserves, but they would continue to export enough oil to cover their current expenditures.

29. Before then, an Arab-wide embargo of oil shipments extensive enough to bring *effective* pressure on consuming countries, even in highly charged circumstances, is unlikely. To mount an effective embargo, the Arabs would have to suspend shipments to Europe as well as the US, harming many countries that have helped the Arabs with political support, arms sales, and economic aid and injuring their own economic interest. Many Arab leaders would be reluctant to do this. Despite the ability of the Arab oil producing states to continue paying the import bills of the entire Arab world, while doing without oil income in whole or in part for an extended period, the Arab states would fear that consumers could freeze their assets and deny them needed imports. Finally, although the animosities and suspicions that hamper joint Arab action in normal times tend to subside when the Arabs believe that they are being humiliated by—or on behalf of—the Israelis, they do not disappear. In sum, an Arab-wide embargo of oil shipments to Western Europe and the US could happen, but it is only a slim possibility.

30. Were all the necessary triggering events to occur and bring on an Arab-wide embargo of all oil shipments, the impact on consuming countries would be serious. A total Arab suspension of shipments would cut off roughly half of the oil normally moving in world trade at present and about 60 percent of what is expected to be moving in 1980. The effects would vary widely, depending on timing (year and season), tanker availability, stockpiles in consuming countries, ability to increase production in non-Arab producing countries and the rapidity with which Arab unanimity began eroding. In a purely theoretical *worst* case—complete embargo of all Arab exports and a poor stockpile situation—the industrialized

countries as a group would be able to maintain *normal* oil consumption for only about three months.

31. But an Arab decision to treat Japan and the smaller consumers on the same footing with the US appears very unlikely; if the Arabs were stung into declaring a sweeping embargo, they would at most cut off shipments to the US and West Europe. And, when realistic assumptions about US, West European and oil company reactions to an embargo are taken into account, it becomes clear that energy consumption can be reduced and oil supplies can be stretched out, although not without severe dislocations in some embargoed countries and very considerable difficulties in all of them. Output of operating oil fields can almost always be increased by five to 10 percent by making adjustments in techniques and in maintenance schedules. Certain steps to reduce oil consumption and increase the energy produced from other fuels can be taken fairly quickly. The US, for example, probably could save a million barrels a day by cutting oil-fueled transportation by 10 percent. A portion of US generating and industrial facilities are equipped to burn either oil or other fuels or can be converted readily; a million bpd or so could be saved over a few months by switching them from oil. Relaxation of pollution controls would yield more final energy from inputs of either oil or coal.

32. After taking such initial measures, the embargoed nations as a group would find themselves with about 85 to 90 percent of the *energy* needed to maintain their essential activities, and they could do somewhat better if oil shipments were diverted from other customers.[10] The US, with greater flexibility in its choice of energy sources, would be somewhat better off than Europe, even while sharing Western Hemisphere oil with Europe to spread the impact. To cope with the remaining shortfall (amounting to about 10 million bpd of oil in 1980), the US and West Europe would have other options—notably rationing—and stocks of about 3.6 billion barrels of oil to draw on. The consequences—in unemployment, pollution, money costs and other disruptions of normal life—would be very severe, but they would be manageable. (If Western Hemisphere oil were not made available to Europe or if the US alone were embargoed, the US would at worst retain about 90 percent of its normal energy supplies *before* making any of the adjustments in production, consumption, or fuel sources cited in paragraph 31.[11])

33. The support of non-Arab producers for any Arab-led embargo designed to punish the West for its policies toward Israel is virtually inconceivable. Each producing country has its own interests and desires; the Shah of Iran, for example, has in the past been eager to increase Iranian oil production in order to make up for shortfalls in Arab oil caused by politically inspired cutbacks. Venezuela, Indonesia, Nigeria and other West African states are not at all likely to sacrifice vitally needed oil revenues to promote the political goals of Arab governments. In short, non-Arab producers would see considerable opportunity in such circumstances both for increasing their income and for enhancing their position as suppliers.

34. *In sum*, the producing countries' appreciation of the need for revenue to run their governments and develop their economies will insure that most oil will flow to market most of the time. But there can be no guarantee that all oil needed will flow all the time. Interruptions to the flow of oil from the smaller suppliers are almost certain to occur—they are quite likely in some (e.g., Libya

[10] The details of this calculation are shown in Annex D.

[11] These cases are discussed in greater detail in Paragraph 4 of Annex D, page 52.

and Iraq) and possible in all. Hence those who produce, market and transport oil will probably have to cope with shortfalls of something like two to four million bpd (up to five percent of normal world demand) on a few occasions in the 1970s. The system can cope with shortfalls of this magnitude, albeit with considerable inconvenience.

D. The Multiple Roles of the Soviet Union

35. The USSR has so far had a marginal involvement in the international oil trade. The political and economic changes affecting this trade and the USSR's current pretensions to play a role as a world power raise new questions about its future involvement. Will Moscow become a substantial importer and therefore a competitor for the available supply? Will it compete with the international oil companies either in international marketing or in oil exploration and production? Will its role as a power factor in the Middle East permit it to interfere politically or militarily with Western access to oil?

36. The Soviet Union ranks second only to the US in both production and consumption of oil, though it consumes only about one-third as much as the US. Crude production is planned to rise from seven million bpd in 1970 to nearly 10 million bpd in 1975, with most of the increase coming from West Siberia. (See Table III.) During 1976-1980, output should rise less rapidly, probably reaching about 11 million bpd. Present planning in the Soviet economy does not suggest that consumption will increase rapidly enough to catch up with production; the USSR will, therefore, continue to have an export surplus.

37. If, in the longer run, Soviet oil production lags and domestic requirements grow, the Middle East could provide an alternative source of oil. A decision to rely extensively on external supplies for a vital commodity would, however, be a major policy change and one that seems improbable in the light of past doctrine and practice. In any event, potential Soviet needs for oil would be small relative to world demand in 1980, and Soviet oil procurement would not infringe much on oil supplies to the West.

TABLE III

ESTIMATED OIL PRODUCTION AND DEMAND IN THE USSR

Crude Oil Equivalent, Million Barrels Per Day

	1970	1975	1980
Production	7.0	9.7	11.0
Consumption	5.2	7.2	9.2–9.5
Available for Export from Domestic Production [a]	1.8	2.5	1.5–1.8
To: Communist Countries [b]	.9	1.5	1.5–1.8
To: Non-Communist Countries	.9	1.0	

[a] Excludes an additional 100,000 bpd (procured on a barter basis from non-Communist countries) which the USSR delivered to other Communist countries in 1970.
[b] Includes Cuba.

38. The Soviets have exported increasing quantities of oil since the mid-1950s. In 1970, the USSR exported 900,000 bpd to other communist countries and another 900,000 bpd to the West—primarily Europe, where Soviet oil constituted around six percent of supply. Oil exports are the Soviets' largest single source of hard currency earnings—some $570 million in 1971. The export surplus is expected to grow to 2.5 million bpd by 1975, as production far outstrips consumption, and then shrink as the growth rate of production falls off.[12]

[12] The main constraint on Soviet output is the country's technology, which is inadequate for exploiting reserves in inhospitable areas of Siberia. This deficiency will eventually be overcome; sooner if deals with the US or Japanese firms to develop West Siberia (Tyumen fields) and offshore areas in the Soviet Far East are signed in the next year or so, later if the Soviets act alone.

Just how the USSR will choose to divide the 1.5 million bpd or so it will have to export in 1980 is far from clear, but need for hard currency could cause it to sell the larger portion to the West. Thus, after 1975, the growth in East European requirements will probably have to be met increasingly from non-Soviet sources; the Soviet Union has already advised Eastern Europe to seek more oil from other sources, particularly the Middle East.

39. In recent years the Soviet Union itself has used Middle East and North African oil both to earn foreign exchange and to meet its export commitments to communist countries. In 1970 and 1971 the USSR obtained about 100,000 bpd, primarily from Algeria and Egypt; most was delivered directly to Cuba and to communist countries in Eastern Europe. Since the nationalization of IPC in 1972, about 150,000 bpd of Iraqi oil from the nationalized Kirkuk fields has gone to Eastern Europe on Soviet account. The oil was procured on a barter basis or as debt repayment and made additional Soviet domestic oil available for export to non-communist states. The Soviet Union will undoubtedly take advantage of such opportunities to increase its hard currency earnings in the future.

40. Transport constrictions and hard currency shortages limit the USSR's ability to procure and resell foreign oil. Although the USSR continues to build tankers—three of 150,000 DWT each are under construction—its tanker fleet remains small: 185 ships making up only 2.5 percent of world tonnage. The Soviets must charter additional tonnage to move the small amounts of oil they currently export and procure from abroad. To the extent that the USSR can get oil on barter arrangements and sell it in the West, it stands to gain in foreign exchange. But the oil producing states, preferring to purchase Western goods, want to be paid in convertible currencies. In order to broker any sizable quantities of oil, the Soviets would have to borrow hard currency to buy oil and to charter tankers; in competition with large and experienced oil companies, the Soviets are unlikely to make much profit on such transactions.

41. The Soviets probably will continue to play only a limited role in oil operations in the Middle East. The USSR has, in the course of its efforts to establish a position of power and influence in the area, forged fairly close ties with only one major oil exporter, Iraq. The Soviet Union extends technical assistance for exploration and development of oil fields to some other producers, e.g., Libya and Algeria. But the Soviets cannot compete with the Western oil industry in exploration and production techniques, or in drilling and production equipment. Arab governments and petroleum technicians have consistently shown a preference for Western over Soviet methods and will probably continue to do so. The governments of the Middle East now in power (or likely to gain power) would resist any Soviet effort to acquire a measure of control over the production and distribution of their oil, and the transport facilities for moving the 37 million bpd that the Middle East will be producing in 1980 will be owned or controlled by the producers and their primary customers.

42. The USSR has a strong general interest in maintaining the reputation it has painstakingly built for itself as a reliable trading partner of the industrial West. In a variety of relatively small oil deals, Moscow acts like a good capitalist company, selling its oil at competitive prices. It is tied into dealings with at least one of the major international companies, providing oil to British Petroleum (BP) in Eastern Europe, getting BP oil east of Suez and reducing transportation costs for both parties. It also has a gasoline marketing operation in the UK, sells oil in conjunction with two Belgian companies in the Benelux region, and is showing interest in other Euro-

pean countries. It is involved in deals with Iran and Afghanistan to import low cost gas from them for the Soviet market, which makes Soviet natural gas available for sale to Europe at high prices.

43. Thus, the USSR is not a key participant in international oil trade, nor is it likely to become one. It will have only relatively small quantities of its own oil to export. While the quantity of foreign oil that the Soviets procure is likely to grow in the years ahead, it will not be very large—probably on the order of one to two percent of oil moving in world trade in 1980. Total Soviet oil sales, from domestic production and foreign procurement, thus might amount in 1980 to three to five percent of the total moving internationally.

44. The USSR is nonetheless a force to be reckoned with in the Middle East, deriving influence from the political position it has established and from its substantial military presence. Moscow is aware of the concerns frequently expressed by oil consuming states about access to oil supplies and might in certain circumstances be prepared to play on this Western uneasiness—e.g., by dropping hints about oil in the course of negotiations with the US or with European countries on unrelated subjects. But at present and probably for some time to come, anything much along this line is unlikely because it would clearly jeopardize interests far more important to the USSR. Over the past year or two Moscow has given growing evidence that it regards extended economic relations with Europe and the US as a desirable political as well as economic goal. This is likely to be a major Soviet interest for some time.

45. The Soviets will remain in a position to lend political and propaganda support to the Arab oil-producing states if any of the latter should undertake moves to limit or stop oil production. In these circumstances, Moscow probably would not expect such support to damage fundamentally its important relations with other countries. The Soviets would expect their military presence in the area to be a deterrent to any Western action to secure oil by military means. And they are without doubt keenly aware of the political and strategic advantages that could accrue to them from their growing capability to interfere physically with the flow of oil to NATO or Japan in a changed climate of international relations.

46. A change in Soviet policy toward the West from détente to antagonism, for whatever reason, would remove only one of the inhibitions—albeit an important one—on Soviet attempts to interfere with Western access to oil. The resource constraints, the risk to Soviet relations with the oil producing countries and the risk to its reputation as a reliable trading partner in the international commercial community would remain. Most important, the USSR would recognize that moves toward physical interference with international oil supplies would bring a major confrontation with the West.

III. THE CONSUMING SIDE

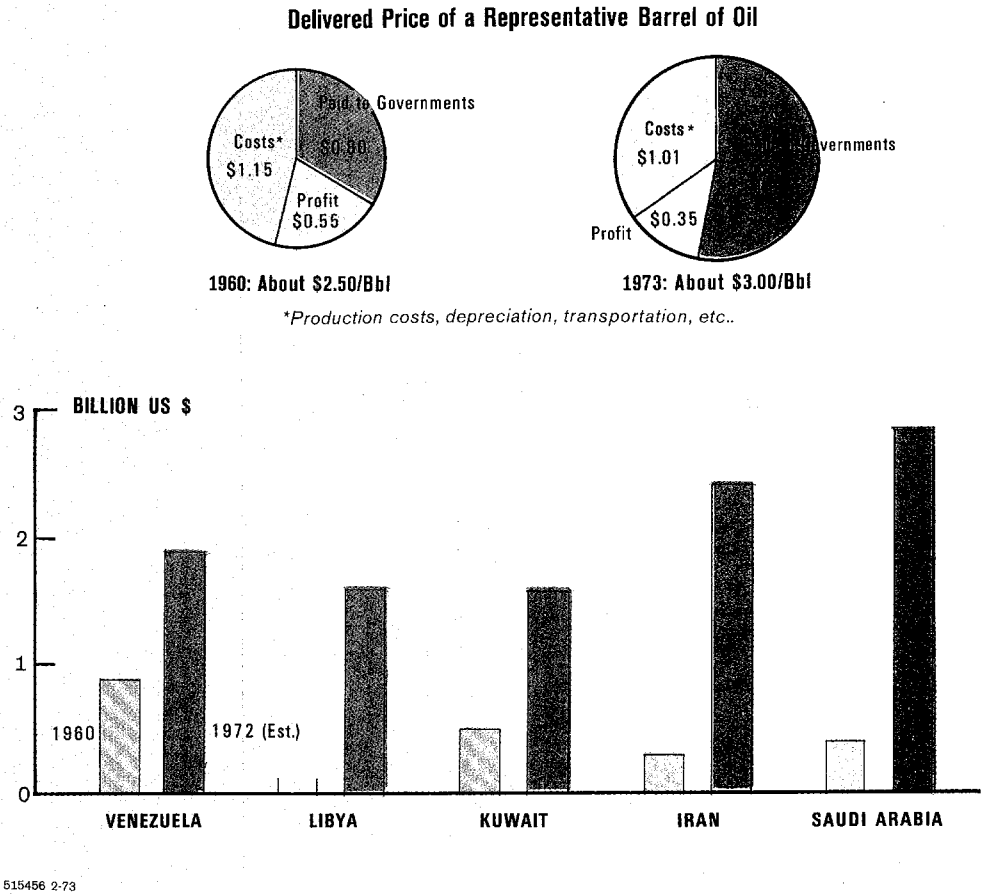
47. For the industrialized West, growing dependence on imported oil is certain to be the source of very substantial financial problems; it may also become the source of new and bitter difficulties in international relations. The economic problems lie both in paying for oil and in attracting capital investments from the oil producing countries. The potential political ones are more complex, stemming largely from an inescapable conflict of economic interest among the consumers.

A. Financial Impact on the Consuming Countries: General Considerations

48. Imports of more and more oil will be costly. Even if the price of oil moving in world trade remained fixed at the 1973 level of about $3 per barrel, world imports in 1980 would cost $55 billion—including $12 billion each

Figure 4

OIL REVENUES OF SELECTED GOVERNMENTS



from the US and Japan and nearly $21 billion from Western Europe.[13] (The world total for 1970 was $20 billion.) But the price is unlikely to remain steady, either in constant or in current dollars. The OPEC countries expect to extract ever higher revenues per barrel from increasingly dependent consumers. Moreover, the cost of energy of all kinds, as well as the general price level, will probably continue rising. An estimate of the 1980 price in 1980 dollars is not possible, but the actual dollar figure certainly will differ from the 1973 price. A figure of $5 per barrel is frequently cited as one possibility. It could be reached in a number of ways—for example, through a com-

[13] Throughout this Memorandum, with the exception of the end of this paragraph, 1973 dollars are used. In those instances where the distinction is relevant, the dollars are *post-February 1973 devaluation dollars*. References to the 1973 price of oil are to the price of oil likely to prevail in mid-1973, after an OPEC-wide approach to shifting currency values has been applied to the payments to producing country revenues per barrel of oil produced. For further details see paragraphs 5 and 6 of Annex F, page 62.

bination of a 50 percent increase in per barrel payments to producing countries and a general inflation rate of four percent a year. At $5 per barrel, world oil imports in 1980 would cost some $90 billion; the US, Western Europe, and Japan collectively would pay over $70 billion.

49. The US has for a long time had certain advantages over other major consumers, but these are diminishing in importance. As late as 1970, oil company profit remittances exceeded the combined cost of oil imports and new investment in overseas oil operations, and the oil business constituted a plus factor in the overall payments balance. As the oil import bill grows, profit remittances will also grow, but they will cover less and less of the total. As the producing countries' share of ownership increases and their revenues per barrel rise, the oil companies will find it ever more difficult to maintain profits per barrel. Moreover, the US has been importing oil principally from Venezuela and Canada, which normally get more than half their total imports from the US. In the future it will buy more and more oil from Saudi Arabia, Iran, and the other Persian Gulf producers—which import principally from Europe.

B. Balance of Payments: Current Account Transactions

50. Because of the many variables involved, it is not possible to make a confident estimate of the balance of payments impact of oil transactions for a period as far ahead as 1980, either for the consuming countries as a whole or for the US alone. It is, however, possible to illustrate the way in which the impact will vary in response to changes in key variables. Table IV isolates the two key factors in a postulated current account balance for the US in 1980—the cost of oil and export performance—and illustrates the magnitudes that will be involved for various combinations of the two. It treats the quantity of imports, determined by demand and supply projections above, as fixed. It makes a number of assumptions about other variables—including the total imports of the oil producing countries and of the clients to whom they transfer funds, the size and distribution of oil company profits, and the ownership of oil tankers. The illustrative range of current account balances attributed in the Table to price variations and exports alone is, however, large enough to encompass most effects that changes in the other variables are likely to have.[14]

51. The US could expect to spend (in 1973 dollars) some $12 billion for the 11 million bpd of oil it is likely to be importing in 1980 if there is no increase in the price of oil and $19 billion if the price is forced up rapidly by a doubling of per barrel revenues. (All other components of the cost are assumed to be fixed.) After crediting the US with transport receipts and company profit remittances totaling some $7 billion in 1980, a figure somewhat more likely to prove high than low, the direct effect of oil transactions on the current account balance of the US in that year amounts to an outflow of from $5 billion to $11 billion.

52. If the US, in these favorable circumstances, can maintain its present share of the markets created by oil revenues (i.e., the import markets of the oil countries and of the clients to whom the oil countries transfer money) it can cover most or all of the cost of importing 11 million bpd of oil at any of the prices postulated.[15] If it can expand its share of these markets by 25 percent, it can earn a surplus of as much as $2 billion (1973 dollars) on these oil-related transactions. (The

[14] A detailed explanation of assumptions and calculations underlying the analysis in this Section appears in Annex F.

[15] A change of one million bpd in imports, along with a stable market share, would change the results shown in Part III of Table IV by $800-$1,300 million.

TABLE IV

ILLUSTRATIONS OF POTENTIAL IMPACT OF OIL TRANSACTIONS ON THE CURRENT ACCOUNT IN THE UNITED STATES BALANCE OF PAYMENTS IN 1980 [a]

	1970 Actual (Billion 1970 Dollars)	1980 Potential (Billion 1973 Dollars)			
Price of Oil [b]	$2.14/ Bbl.	$3.00/ Bbl.	$3.41/ Bbl.	$3.82/ Bbl.	$4.64/ Bbl.
I. OIL TRANSACTIONS					
Oil Imports, c.i.f.	−3	−12	−14	−15	−19
Less: Transport Charges [c]	[d]	2	2	2	2
Equals: Oil Imports, f.o.b.	−3	−10	−11	−13	−16
Less: Company Profit Remittances [e]	3	5	5	5	5
Equals: Direct Effect of Oil Transactions	0	−5	−7	−8	−11
II. POTENTIAL ADDITIONAL US EXPORTS GENERATED BY OIL REVENUES					
US Market Share [f]					
1—Up 25%	2	7	8	10	11
2—Stable		6	7	8	9
3—Down 25%		4	5	6	7
III. RESULTANT EFFECT ON BALANCE OF PAYMENTS (Current Account) [g]					
1—Expanded Market Share	2	2	2	1	0
2—Stable Market Share		1	0	−1	−2
3—Smaller Market Share		−1	−2	−3	−5

[a] Because of rounding, components may not add to totals shown.

[b] 1970 price in 1970 dollars; all other prices in post-devaluation 1973 dollars. $2.14/barrel was the average c.i.f. price of oil moving in world trade in 1970. Averages for importers were: US-$2.83, West Europe-$2.23, Japan-$1.78. $3.00 is the price of Arabian Light crude oil of 34 API gravity, c.i.f. Rotterdam, which is expected to prevail in mid-1973. It is used to represent the average 1973 price of oil. A price of $3.41/barrel would result from a 25 percent rise in revenues per barrel to producers in the Persian Gulf and adjustments in the revenue payments to other producers that would make the final price of their oil competitive with Persian Gulf oil. The $3.82/barrel price reflects a 50 percent rise in per barrel revenues in the Gulf and the $4.64/barrel price a 100 percent rise in per barrel revenues in the Gulf—both with suitable adjustments for other producers. All other cost elements are assumed to remain constant.

[c] Assumes that transport payments accruing to the subject country are in the same proportion as that country's share of world oil imports (for the US, 22 percent in 1980).

The Department of the Treasury believes this assumption of a zero net impact on the balance of payments from the total complex of transportation account transactions associated with the projected large increases in oil imports is too optimistic in the case of the US.

[d] Less than $500 million.

[e] Assumes that profits per barrel handled remain at recent levels (about $0.35/barrel) and that US companies receive and remit about 60 percent of the oil industry's world-wide total profits, West European companies about 30 percent, and Japanese companies about five percent.

[f] The "market," for this purpose, is the import potential of the oil producing states—and recipients of gifts and loans from them—directly attributable to the oil revenues. The figures for US earnings from exports are based upon: (1) a US share of these markets 25 percent larger than the share the US enjoyed in 1971; (2) a US share identical to that of 1971; and (3) a US share 25 percent smaller than that of 1971. Figures for Western Europe and Japan in Annex F Tables F-V and F-VI, are based on stable shares or on sharing equally in the market share lost or gained by the US.

[g] This Table does not take into account investment flows, which are completely unpredictable and might be a very large factor, either positive or negative. It does not reflect the impact on the US balance of payments of either investment by oil producing states in the US or the outflow of profits resulting from these investments. Nor does it reflect new outflows of capital from the US for investment in the petroleum industry, which amounted to about $635 million in 1970.

The Department of the Treasury concurs in the omission from the Table of the capital-account flows associated with the projected oil trade, because it feels that these flows are likely to be largely offsetting. The Department of the Treasury feels, however, that the current account estimates should include, along with the estimated receipts of oil company profits, some reasonable allowance for US payments of "investment income" on the rather large long-term investments which the paper anticipates the oil countries will make in the US. If as much as 75 percent of the $27–$81 of accrued oil country holdings—projected for 1980 in paragraph 59—were to be invested in the US at an assumed stock yield of 3½ percent, this would involve a dividend outflow of some $750 to $2,250 million.

actual 1970 surplus was about $2 billion.) If its share slips 25 percent, it cannot break even under any of the assumptions about oil prices and might run a deficit of as much as $5 billion (in 1973 dollars). The sort of export performance that would cause the US share of producer country markets to fall 25 percent would imply either that the US was at a severe disadvantage—for political or economic reasons—in the specific markets of producing countries or that the total US balance of trade was in dismal shape. The kind of export performance required to bring about a 25 percent increase in the US share of producer markets would almost certainly reflect a very strong overall US balance of trade position—one in which the deficit or surplus with the oil countries would be small.

53. The US is the only major consumer of oil that appears to have any prospect for maintaining a current account balance *so far as oil-related transactions alone are concerned.* Outlines of the effects of alternative price and market share assumptions on balance of payments accounts for Western Europe and Japan can be constructed; the arithmetic involved is provided in Annex F. For Japan and Western Europe, oil will represent a sizable balance of payments outflow, which sales to oil countries will not offset. Japan, in particular, will be hard pressed by rising oil bills. Japan's current account on oil transactions in 1970 was in deficit by about $1 billion, which was very comfortably covered by Japan's overall export surplus. But the deficit on oil transactions in 1980 could run from $6 billion to $13 billion (1973 dollars)—sums that would be a burden even to an otherwise strong payments picture. European goods now capture almost half the import markets of the oil producing countries; if that position is maintained as oil-financed imports grow, Europe can keep the size of its oil deficit close to recent levels except at the highest of the prices postulated.

C. Balance of Payments: Capital Transactions

54. As a group, however, the consumer countries *cannot* break even on current account transactions with the oil producers and the beneficiaries of their largesse, because the producing countries as a group will be unable to spend all of their income, and they are unlikely to give away all of their surpluses. Even without any increase in revenues per barrel the producing countries would receive oil revenues of about $32 billion (1973 dollars) in 1980. Of this, they could spend perhaps no more than $24 billion in imported goods and services.[16] They might give or loan as much as $3 billion—mostly transfers from rich Arab countries to poor Arab countries—though this assumes a very high level of generosity. Under these very conservative assumptions they would accumulate about $5 billion in the year 1980 alone, and the more revenues rise, the farther spending will lag behind revenues in certain countries and the larger the surplus will be. If per barrel revenues double, the funds remaining to the producers after imports and gifts would reach $20 billion for the year 1980.

55. Most of this accumulation will be held by Saudi Arabia, Kuwait, and Abu Dhabi; they probably will choose to put much of it in longer-term portfolio and direct investments. If they invest heavily in the consuming countries, links between the two groups would be strengthened. To the extent such investments are profitable, they would in time add to producer country income, but in the first instance they would contribute to balancing the accounts of the major consuming countries.

[16] This figure represents maximum import levels and, like that for transport receipts and company profits, is more likely to be too high than too low. Annex F discusses the subject more fully.

56. Although the oil countries with surplus funds will be interested in geographic diversification, they will make portfolio investment decisions mainly on the basis of the receptivity and attractiveness of the various world financial centers. The US has a huge and flexible capital market in which foreign investors are free to buy stocks, bonds and notes. The financial markets of Europe and Japan are much smaller in size and scope.[17] And they are hemmed in by a variety of restrictions and controls, which are frequently changed. For these reasons, the US is likely to receive a large share of long-term portfolio investment.[18]

57. Direct investment (e.g., in downstream oil operations) in Europe and Japan probably will also be small, relative to direct investment in the US, at least for some years. Direct investment will be drawn to the US by market size, ease of access, and an opportunity to participate in advanced oil technology. Traditionally, Japan has severely restricted foreign investment, though it has begun to relax these curbs. West European countries also will probably become more willing to permit direct investment by the oil producing countries. In time, the size and distribution of direct investments will be determined not only by questions of profitability and safety but also by other inducements—particularly pledges of equal or preferred treatment for the oil of the investor/producer in the markets of the consumer seeking investment funds. Consumer countries without large domestic oil industries will be in the best position to offer such incentives.

58. A host of Less Developed Countries (LDCs) around the world would be eager for investment by oil-rich Persian Gulf states. These LDCs are short of foreign exchange and will be very hard hit by rising oil prices. For a country such as India, which in 1969 spent nearly $200 million (about nine percent of total import costs) on foreign oil, any rise in the price of oil will constitute a considerable additional burden. The same would be true for dozens of other LDCs, from Afghanistan to Zambia. Yet these LDCs are likely, with a few notable exceptions, to be most unattractive as places to invest surplus cash, though even a relatively small investment could buy consderable good will and influence. If the oil-producing states provide neither investment funds nor cheap oil to the LDCs, the latter may grow increasingly antagonistic toward the producers.

59. It is unlikely that the major oil producers will put all their surplus into long-term investments, however, since the sums will grow very rapidly. Overall, their combined holdings of investments and foreign exchange are likely to rise to at least $27 billion (in 1973 dollars) by 1980, and could be three times as high at the highest per barrel revenue assumption. Even if 80 percent of the surplus funds of the oil countries were devoted to direct and portfolio investments, the remainder would total $5-$15 billion. These sums would be kept in liquid form—cash and short-term certificates of indebtedness.

60. Thus, a few oil-rich countries—some potentially unstable—would have consider-

[17] At the end of 1971, total US corporate and government debt of all types amounted to $1.6 trillion and the market value of all equities outstanding totaled $1.1 trillion. Government and corporate bonds and stocks newly issued in the US in 1971 absorbed over $150 billion. In contrast, international bonds (ones sold outside the country of the borrower) newly issued outside the US in 1972 totaled some $8 billion, of which $6 billion were Euro-bond issues. Syndicated Euro-currency bank credits in 1972 amounted to $6 billion. The UK stock market—the largest outside the US—accounted for some $1.5 billion in new equity issues in 1972. In money markets of small size, transfer of very large sums from one form of investment to another can be difficult.

[18] For investors taking a portfolio ownership position, rates of return and ease of entry and exit, rather than fluctuations in currency values, are the key considerations.

able capacity for creating or aggravating unsettled conditions in money markets by shifting large sums about. Indeed, the money managers of the oil-rich states, acting to conserve the value of their assets, have contributed to recent financial crises. They will keep their money geographically dispersed in normal times, but they will be reluctant to maintain large liquid balances in any currency threatened with devaluation or the imposition of curbs on captial movements. On the whole, they probably will desire monetary stability and cooperate to maintain it—but not at great risks to the value of their own holdings.

61. Moreover, if confidence in the dollar or the pound were further eroded over time, by influences independent of oil matters, the major producing countries might decide that they no longer wanted to conduct the bulk of the oil business in one or both of these currencies. If they succeeded in shifting into some other currency or combination of currencies, the demand for dollars or pounds—now used widely to pay taxes and royalties to the producers, to pay for oil imports, and as an investment medium—would fall. This could, in turn, reduce the relative value of the currency and produce a corresponding increase in the cost to the US or UK of oil imports.

D. Competition or Cooperation Among Consumers

62. As oil imports grow, each consuming country will strive to minimize its own deficit on current account, and this could lead to self-defeating rivalries among the consuming countries. The difficulty is that although a *single* consuming country might hope to escape a deficit, consuming countries as a group cannot, because the oil-producing states *as a group* will be unable to spend all of their income or give it away to client states. Thus, a single country can expand its exports to the oil-producing countries only at the expense of other consuming countries—in effect, by shifting its deficits to them. Under these circumstances, a trade war could result, involving competitive cuts in the price of exports, competitive devaluations, and the like, which would leave the consuming countries worse off than before.

63. As indicated above, the US is well positioned to balance its oil-related *current* account in the 1970s, and—in competition with other major money markets—it is likely to attract a disproportionately large share of the money invested by the oil producers. If the investment flow, combined with US export earnings, greatly strengthens the dollar and begins to create severe difficulties for Western Europe and Japan, they will feel compelled to take countermeasures. These might be restricted to the encouragement of investment from the oil-producing countries, but they would probably also entail attempts to increase their own exports at the expense of the US. Japan, with a postulated deficit in 1980 on oil-related transactions of $6 billion to $13 billion (1973 dollars) would likely be even more aggressive in promoting its exports.

64. Fears of oil shortages run the risk of intensifying rivalries among consumers seeking assured access to oil. When oil scarcities have come about abruptly in the past, consumers have cooperated. The oil companies, with diversified sources and a variety of customers, have spread the impact so that no one country was badly damaged. If consumers cooperate in the future, producers' opportunities to force up prices will be minimized. Should fears of scarcity engender intense competition for guaranteed long-term supplies, oil prices would be driven up rapidly. Europeans, accepting a special US interest in Venezuelan oil, have already hinted that Europe should have first call on Middle East and North African oil. Should the US respond

favorably to Saudi Arabia's proposal for special access to the US market, European consumers would probably attempt to conclude preclusive arrangements with other oil producers. Japan will continue to make long-term deals with Persian Gulf states. Its willingness to pay heavily will offer the oil producers new opportunities to play off the consumers against one another, as Iraq has in the past played off the French member of its major concessionaire against the US and British members and as the Shah has played off US companies against British ones.

65. The consuming countries recognize that the competition for exports, investment and oil supplies could be highly injurious. They are already talking among themselves about arrangements for sharing oil in times of scarcity and for taking a concerted position against OPEC. Such endeavors may prove useful, particularly in crises of short duration. But in a prolonged and increasingly tight sellers' market, the strong drive of each major consuming country to protect its own position will put a severe strain on cooperation. In the end, the forces making for competition are likely to outweigh those working for cooperation. And such rivalry will spill over into the political relationships among consuming countries.

E. The Contingency of Limitations on Production

66. If such states as Saudi Arabia, Kuwait and Abu Dhabi cannot find ways to employ their excess revenue usefully, say in portfolio investments or in building tanker fleets, they would consider limiting oil output. Kuwait has already imposed a modest limitation, although it will probably relax it in the years ahead. Saudi Arabia, which is more or less committed to vast increases in oil production, will eventually reconsider this policy. And in view of its great reserves and importance as a supplier, it will be the key country to oil availability.

67. Saudi Arabia—and almost any other producing country— would approach the issue of limiting production very cautiously. The Saudi Government's decision would reflect the weight it gave to retaining the good will of consuming states, especially the US. It would be reluctant to risk political or economic retaliation by consuming countries in response to oil shortages. It will probably be able to find attractive investment opportunities for a number of years. As revenues continue to mount rapidly, the Saudis will become more inclined to place significant limits on production; eventually they will do so. Whether this decision comes sooner or later will depend not only on calculations of economic advantage, but probably also on political developments, those internal to the Saudi kingdom and those arising from the general state of Arab-Western relations.

68. If production slowdowns or shutdowns did occur, some consuming states might be tempted to try to ensure access to oil by establishing physical control over one or more producing regions. But consuming countries will probably not move beyond consideration to action of this kind, at least within this decade. Consumers would have to be in desperate need of energy supplies for military action to have much appeal. And there would be formidable difficulties involved in putting such an idea into practice. The European countries—for whom an acute shortage is at least a theoretical possibility—have only very limited capabilities for carrying out this kind of military operation as far away as the Persian Gulf (though they probably could successfully occupy Libya). They could not acquire a substantially increased capability in short order without direct support from the US. And even a successful action would have potential costs that would require careful consideration—e.g., extensive destruction of oil facilities, reactions of other producing countries and the response of the USSR. Depend-

ing on the circumstances of such an attempt, the USSR might be in a position to impede it, to gain considerable political advantage or merely to make propaganda points.

IV. CONCLUDING OBSERVATIONS

69. The major consuming states have a strong interest in seeking ways now to reduce future dependence on imported oil. Western Europe, the US and Japan are precisely the regions possessing the technological innovativeness to devise substitute sources of energy. (The US has, in addition, the potential to sustain a very high level of conventional petroleum output if it chooses to pay the financial and environmental costs.) And, in fact, these regions have moved ahead in developing new technology, for example, in nuclear power generation and in converting coal to liquid and gas fuels. The USSR is now putting into operation the world's first breeder reactor. Western Europe and the US are not far behind. More exotic processes for obtaining energy are being explored.

70. But the big decisions in energy technology are yet to be taken. The potential consequences of exponential growth in energy use in terms of balance of payments, fouling of air, water and landscape, dependence on foreign suppliers and the like have only attracted the attention of decision-makers in the big industrial countries within the last few years. What they decide, within the next four to five years, to do in regard to such matters as offshore oil exploration, research on new energy sources and stimulating [illegible] discouraging the growth of energy demand will have enormous impact for many years ahead.

71. The choices consuming states make over the next several years will have an impact on the OPEC states. If the major consumers proceed as if they expect to import increasing quantities of oil for decades, OPEC states would probably reason that their own position as suppliers and their ability to keep raising prices could not be seriously challenged. At the other extreme, an all-out effort by consuming states to reduce dependence on external sources of energy as far and as quickly as possible would tend to erode the confidence of OPEC governments in their own economic power.

72. In practice, developments are not likely to reflect either extreme. While depending on oil as their major energy source, the industrial nations—impelled by rising cost, by real or feared unreliability of suppliers and by the physical problems of handling increasingly massive quantities of oil—will seek new energy sources. And the pace at which consuming states do move in this direction will inevitably be affected by the manner in which OPEC states conduct themselves. Few developments would do more to increase the attention given to research on unconventional energy than recurrent interruptions of oil flow which seemed to consumers to stem from a producer's capriciousness or excessive greed and which caused hardship.

ing on the circumstances of such an attempt, the USSR might be in a position to impede it, to gain considerable political advantage or merely to make propaganda points.

IV. CONCLUDING OBSERVATIONS

69. The major consuming states have a strong interest in seeking ways now to reduce future dependence on imported oil. Western Europe, the US and Japan are precisely the regions possessing the technological innovativeness to devise substitute sources of energy. (The US has, in addition, the potential to sustain a very high level of conventional petroleum output if it chooses to pay the financial and environmental costs.) And, in fact, these regions have moved ahead in developing new technology, for example, in nuclear power generation and in converting coal to liquid and gas fuels. The USSR is now putting into operation the world's first breeder reactor. Western Europe and the US are not far behind. More exotic processes for obtaining energy are being explored.

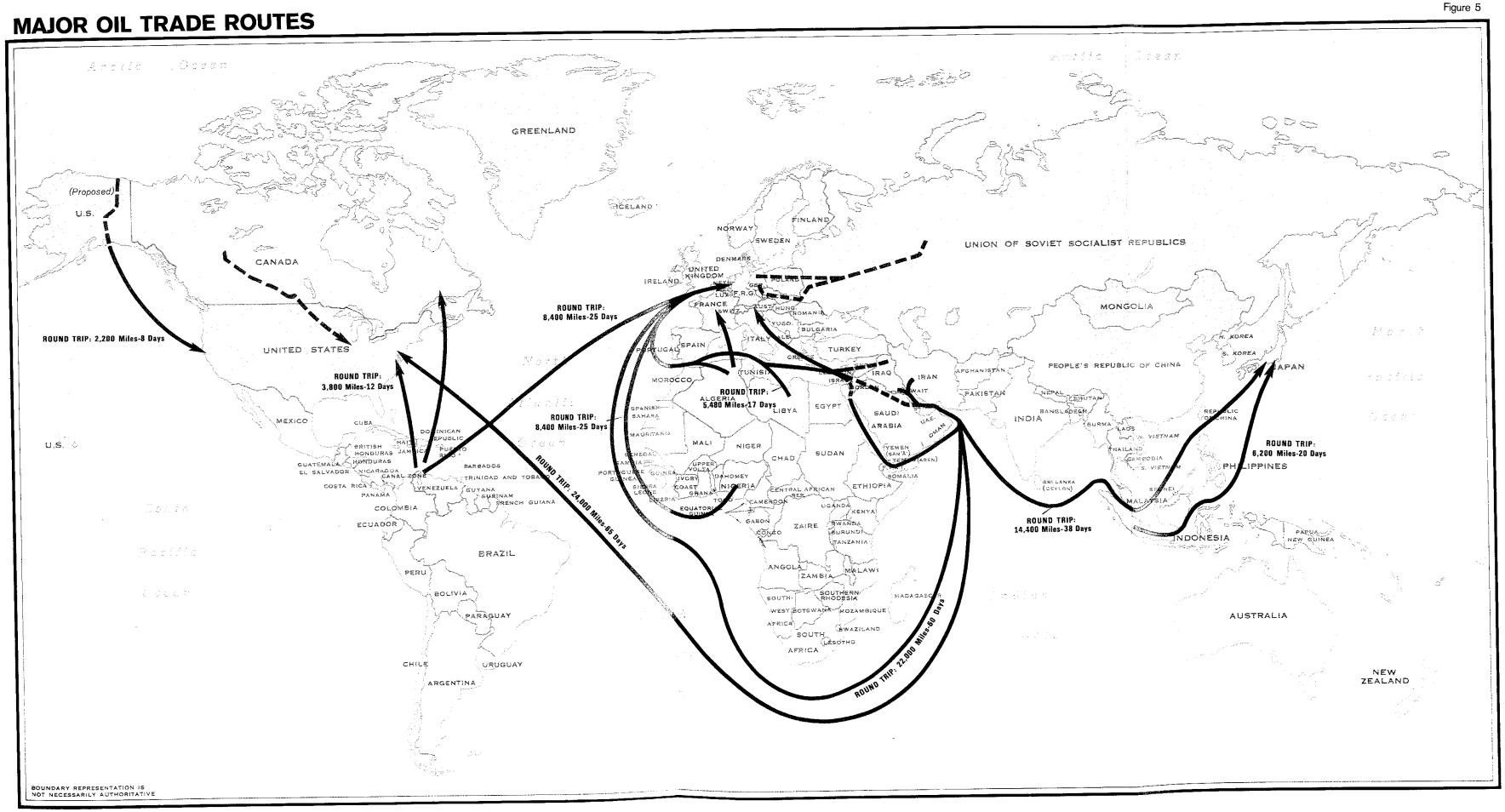
70. But the big decisions in energy technology are yet to be taken. The potential consequences of exponential growth in energy use in terms of balance of payments, fouling of air, water and landscape, dependence on foreign suppliers and the like have only attracted the attention of decision-makers in the big industrial countries within the last few years. What they decide, within the next four to five years, to do in regard to such matters as offshore oil exploration, research on new energy sources and stimulating or discouraging the growth of energy demand will have enormous impact for many years ahead.

71. The choices consuming states make over the next several years will have an impact on the OPEC states. If the major consumers proceed as if they expect to import increasing quantities of oil for decades, OPEC states would probably reason that their own position as suppliers and their ability to keep raising prices could not be seriously challenged. At the other extreme, an all-out effort by consuming states to reduce dependence on external sources of energy as far and as quickly as possible would tend to erode the confidence of OPEC governments in their own economic power.

72. In practice, developments are not likely to reflect either extreme. While depending on oil as their major energy source, the industrial nations—impelled by rising cost, by real or feared unreliability of suppliers and by the physical problems of handling increasingly massive quantities of oil—will seek new energy sources. And the pace at which consuming states do move in this direction will inevitably be affected by the manner in which OPEC states conduct themselves. Few developments would do more to increase the attention given to research on unconventional energy than recurrent interruptions of oil flow which seemed to consumers to stem from a producer's capriciousness or excessive greed and which caused hardship.

Figure 5

MAJOR OIL TRADE ROUTES



515457 9-73

ANNEX A

THE DEMAND FORECAST: DETAILS, METHODOLOGY, ASSUMPTIONS AND CAVEATS

1. The projected demand for energy in 1980 reflected in Table I of the text and the expanded Table A-I here is based on estimates of demand in the major consuming areas drawn up by national officials. Because of the diversity of authorship, efforts at standardizing the basic assumptions underlying the projection may have been less than completely successful. In any event the internal consistency of the projections is open to some questions which cannot be resolved. Prior conversions of differing factors from other units used in primary sources, e.g., BTUs, kilocalories, hard coal equivalents, and metric tons, appear to be another potential source of inaccuracy. Those components which appear most open to question have been adjusted as described in the note to Table A-I.

Assumptions and Caveats

2. Events between now and 1980 will, in all likelihood, vary from those assumed in making these forecasts of energy demand. We think it important therefore to be explicit about the main factors that may cause the actual 1980 energy requirements to differ noticeably from present projections. Each of the major assumptions, and the factors likely to affect them, will be discussed in turn.

3. *Full Employment.* Projected demand for 1980 is in each case based on the assumption of full employment as defined by the government or governments in question. All major industrial countries today are committed to the pursuit of rising living standards and full employment, and we have no reason to expect such goals to change within the period of the estimate. If, however, at any particular point in time, one or a number of major consuming countries are operating at less than full employment, together with the equivalent level in national income that this implies, then the demand for energy in that year is likely to fall below that projected.

4. *Government Energy Policies.* Government policies affecting the demand for energy directly (rather than indirectly through income growth) have varied somewhat in scope among different consuming countries but in general most governments have *not* attempted, except through the price system,[19] to manipulate the demand for energy either in the aggregate or among primary energy sources. Projections of demand to 1980 assume that the governments of the major consuming countries will not adopt policies that will succeed in slowing down the rate of growth of energy use.

5. If the governments of major industrial countries do undertake policies of energy conservation, they would almost certainly be successful over time. So far, however, there are few indications that governments of industrial nations have begun to question the validity of the policy of perpetual growth. As the magnitudes of exponential growth (twice as much of everything every decade or two), are more and more thrust before government leaders—e.g., a single year's oil import bill of at least $45 billion and perhaps much more for the industrialized West in 1980, and one growing by several billion with each succeeding year—some countries may decide to curb the growth of energy consumption. It is conceivable that such policy changes could lower the energy demand for 1980.

6. *Consumer Preferences.* The projections assume no major changes in consumer prefer-

[19] Taxes and tax preferences might well be the tools chosen by governments for implementing a conservation policy. Because taxes and subsidies exert their effect on prices their impact is encompassed in the following discussion of the constant price assumption.

TABLE A–I

WORLD: PRIMARY ENERGY REQUIREMENTS
1960–1980

Crude Oil Equivalent, Million Barrels Per Day

	1960	1970	1980	Average Annual Percentage Change 1961–1970	Average Annual Percentage Change 1971–1980
United States	*21.5*	*32.7*	*47.5*	4.3	3.8
Solid Fuels	4.8	6.3	8.0	2.8	2.4
Oil	9.7	14.4	22.4	4.0	4.5
Gas	6.3	10.7	11.8	5.4	1.0
Hydroelectric/Nuclear	0.7	1.3	5.3	6.4	15.1
Western Europe	*12.3*	*21.1*	*34.8*	5.5	5.1
Solid Fuels	7.5	6.1	4.8	−2.0	−2.4
Oil	4.1	12.7	21.9	12.0	5.6
Gas	0.2	1.4	4.6	21.5	12.6
Hydroelectric/Nuclear	0.5	0.9	3.5	6.1	12.5
Japan	*1.7*	*5.6*	*14.1*	12.7	9.7
Solid Fuels	0.9	1.2	2.1	2.9	5.8
Oil	0.6	4.1	10.7	21.2	10.1
Gas	0.1	0.1	0.3	0.0	11.6
Hydroelectric/Nuclear	0.1	0.2	1.0	7.2	17.5
USSR, China, Eastern Europe	*15.2*	*24.9*	*40.8*	5.1	5.1
Solid Fuels	10.9	13.6	17.7	2.2	2.7
Oil	2.8	6.6	13.2	9.0	7.2
Gas	1.0	3.9	8.0	14.6	7.4
Hydroelectric/Nuclear	0.5	0.8	1.9	4.8	9.0
Others	*7.8*	*14.4*	*31.5*	6.3	8.1
Solid Fuels	2.5	3.9	7.4	4.5	6.6
Oil	4.5	9.1	19.4	7.3	7.9
Gas	0.7	1.1	4.0	4.6	13.8
Hydroelectric/Nuclear	0.1	0.3	0.7	11.6	8.8
World	*58.5*	*98.7*	*168.7*	5.4	5.5
Solid Fuels	26.6	31.1	40.0	1.6	2.5
Oil	21.7	46.9	87.6	8.0	6.4
Gas	8.3	17.2	28.7	7.6	5.3
Hydroelectric/Nuclear	1.9	3.5	12.4	6.3	13.5

NOTE:

Demand for the communist countries has been derived from CIA analysis. Other data are based primarily on OECD's *New Oil Report*, Chapter 1, May 1972, and on the US Department of the Interior's *United States Energy Through the Year 2000*, with the projections for 1980 modified to reflect events that have transpired since the basic source documents were prepared.

In the US, actual consumption of oil in the late 1972-early 1973 period was running ahead of amounts for that period implicit in the Department of Interior projections for 1980. The effect of the adjustment of US figures is a projection in this Table of US oil consumption in 1980 of about 1.5 million bpd more than the figure for oil consumption projected by Interior, and a corresponding decrease of 1.5 million bpd in the figure for US gas consumption in 1980.

Projections of US oil demand in 1980 by experts in public and private institutions vary widely, because of the use of different assumptions. Most lie in the range of 20 to 25 million bpd. Major differences in oil consumption figures are generally matched, in large part or entirely, by offsetting differences in gas consumption figures.

In any given year, oil production usually exceeds demand. Demand is growing constantly, and production at any point in time is geared to the larger demand of future months.

ences for type of energy or for energy in comparison with other goods and services. A reduction in demand for energy might occur, even if conservation measures were not instituted by government bodies, in reaction to environmental concerns that are already in evidence. It could produce either a slowdown in the growth of total energy consumption, or shifts among primary energy sources, e.g., away from petroleum and toward nuclear or solar power. Such shifts in consumer preferences would cause our projections to be either too high in toto or too high in one component while too low in another. On the other hand, environmental concerns could produce an opposite result. An effort to reduce or clean up pollution without curtailing the activity doing the polluting is likely to raise energy requirements. On balance it is impossible to say whether likely shifts in consumer preferences will cause our projections to be too high or too low.

7. *Constant Relative Price of Energy.* Potential shifts in relative prices, while highly likely over the period of the estimate, play havoc with the process of forecasting. Thus, to make the problem manageable, almost every estimate of future energy demand assumes constant prices relative to other goods and services. This is not only because analytical complexity multiplies when price changes are included but also because too little is known about the effect of price changes on demand for energy.

8. It is generally agreed that demand for energy is price inelastic (i.e., that the quantity purchased will change less than proportionately to a change in its price). Consumers are slow to change habits, industry and utilities are stuck, at least for a while, with existing plant and equipment, and the cost of energy is a relatively small factor in overall spending. In the longer run, however, large users of energy can adopt energy-saving technology and can, even more easily, switch from one form of energy to another less expensive one.

9. In the case of oil, informed industry sources have suggested that if, between now and 1980, the price of crude oil (in constant dollars) should increase by 100 percent, purchases would decline by 10 percent below what they would otherwise have been (assuming other prices and especially the prices of other fuels remain unchanged). A doubling of petroleum prices between now and 1980 is not out of the question. Indeed, a substantial rise is likely, but it is also likely to be accompanied, *not* by general price stability, but by rising prices for other kinds of energy and also by a general price rise. Such relative price shifts would cause our 1980 projections for world energy requirements to be somewhat too high in the aggregate, and especially for oil. The impact of these price changes on our forecast, however, is not likely to be as much as 10 percent.

10. *Technological Breakthrough.* The projections assume no major technological change in energy production or consumption, although this is a highly unrealistic assumption for so technologically vibrant an industry. Some advances clearly will be made in methods of extraction, processing, transporting and converting energy sources. Stimulated by rising energy prices, private industry and governments are sponsoring research (and will increasingly do so), some of which is virtually certain to result in cost-saving techniques; gasification of coal is already being intensely explored. Thus, in time, we expect that new methods will make economically available sources of energy which are now not used or only insignificantly tapped—geothermal, solar,

nuclear fusion are potentials. Conceivably some of these changes could come by 1980, but it is highly unlikely that they would be employed widely enough by then to have a great impact on our forecast.

11. *Contingencies.* Finally, the projections for nuclear power as an energy source to meet 1980 demand involve very large annual increases in nuclear generating facilities. Similarly, the growth in gas demand assumes extensive increases in production. Any shortfalls in these two energy sources would have to be made up from other types, specifically oil and coal, raising the relative and absolute share of both. Oil for this purpose would be imported, since domestic resources in the US and Western Europe would be fully employed.

ANNEX B

OIL RESERVES, FACILITIES AND OWNERSHIP

A. Reserves

1. The world's proved oil reserves are more than adequate to meet the huge and growing demands expected through 1980 and even well beyond. Cumulative demand for 1971-1980 amounts to 250 billion barrels as against proved reserves of about 600 billion barrels. (See Table B-I.) But this oil is not evenly distributed nor equally accessible. The 11 states comprising the Organization of Petroleum Exporting Countries (OPEC)[20] now control more than 75 percent of the world's proved reserves and produce most of the oil entering world trade. There is nothing to indicate that this situation will alter to any significant degree in the years up to 1980. The 25 percent of proved reserves lying outside of OPEC includes 37 billion barrels in the Soviet Union and Eastern Europe and 104 billion barrels in non-communist countries, of which 44 billion are in the US.

2. While new discoveries continue to add to reserves, such additions are not likely to be large enough to influence the present geographic distribution to any considerable degree by 1980. (The rate of discovery of new reserves in recent years has been declining outside of the OPEC countries and the Soviet Union.) The best prospects for the discovery of new deposits lie in offshore areas, especially in water up to 200-250 meters deep. Areas beyond this depth look geologically promising and no doubt will be tested as technology permits. Within the 200 meter depth in the North Sea, substantial oil and gas deposits have been proved and production has begun, even though exploitation of this petroleum is relatively expensive. Alaskan offshore potential also appears to be considerable, although operating conditions, which are even more difficult than the North Sea, will make exploration and development even slower and more expensive. While the Asian continental shelf seems geologically promising, so far little actual exploration has been undertaken. Neither oil nor gas has been discovered in the East China or Yellow Seas, although the Chinese Communists have found some oil just northwest of the Yellow Sea in the Gulf of Pohai.

3. Recent significant onshore discoveries have been limited to the North American Arctic, Ecuador and Peru east of the Andes and Siberia; these areas have additional potential and are likely to be the main centers of further onshore exploration and development through the late 1970s. Elsewhere, exploration is just beginning in the Black and Baltic Seas and off the east coast of North America. Exploration of such areas as the western coast of Africa, that of the Indian subcontinent, and the Indonesian archipelago will probably result in discoveries of at least local importance. Even if major finds are made, however, production in the 1970s would be relatively limited due to the time needed to develop facilities. In sum, it is highly unlikely that large deposits of oil will be found in locations that would substantially reduce the world's dependence on present suppliers in the period before 1980.

4. Hence, the vast bulk of the world's reserves will continue to lie in OPEC countries, particularly those around the Persian Gulf. Saudi Arabia, Kuwait and Iran possess nearly half of the entire world's current proved oil reserves. Large additions to the world's *proved reserves* are likely to come from technological advances that will increase the amount of oil

[20] The OPEC members are: Saudi Arabia, Iran, Kuwait, Iraq, Abu Dhabi, Qatar, Indonesia, Venezuela, Nigeria, Algeria and Libya.

TABLE B-1

PROVED OIL RESERVES, YEAR-END 1972 [a]

	Billion Barrels	Percent of Total
TOTAL (Excluding Peoples Republic of China)	613	100
Eastern Hemisphere	*526*	*86*
Middle East	*356*	*58*
Abu Dhabi	21	3
Iran	65	11
Iraq	29	5
Kuwait [b]	73	12
Saudi Arabia [b]	146	24
Others	22	4
Africa	*106*	*17*
Libya	30	5
Algeria [c]	47	8
Nigeria	15	2
Egypt	5	1
Congo	5	1
Others (including Angola, Gabon, and Tunisia)	4	1
Asia-Pacific	*15*	*2*
Indonesia	10	2
Others	5	1
Western Europe	*12*	*2*
Norway	2	Negl.
United Kingdom	5	1
Others	5	1
Communist Countries	*37*	*6*
USSR [d]	36	6
Eastern Europe	1	Negl.
Peoples Republic of China	*na* [e]	*na*
Western Hemisphere	*87*	*14*
North America	*57*	*9*
United States	44	7
Canada	10	2
Mexico	3	Negl.
South and Central America	*30*	*5*
Venezuela	14	2
Equador	6	1
Others	10	2

[a] The data in this Table, with one exception, were taken from the 25 December 1972 issue of the *Oil and Gas Journal*, rounded to the nearest billion barrels and the nearest full percentage, USSR data were provided by CIA. Because of rounding, components may not add to the totals shown. *Any estimate of "proved" oil reserves must be treated as a rough approximation.* No country publishes official oil reserve estimates nor is there a consistent rigorous definition of oil reserves. In the US, proved reserves include only the crude oil and natural gas liquids recoverable from known deposits under existing economic and operating conditions. Moreover, the volume of oil in place even in a well-delineated field can never be precisely measured; estimates of commercially recoverable oil are usually made not by reference to existing methods of technology but to the production system currently in use, and even this can provide only an approximation. Assessments of proved reserves therefore do not mean absolute world availability; their value is in giving an indication of the location of known oil reserves at a particular point in time and in giving an estimate of the quantity of oil available with present techniques and at current costs and prices. Estimates of reserves called "probable" would add very substantially to "proved" reserves as given in this Table.

[b] Reserves in the Saudi-Kuwait Neutral Zone are apportioned half to each country.

[c] This figure is highly questionable; the Algerian national oil company claims reserves of only 10 billion barrels—a much more realistic number.

[d] There is a substantial body of opinion which believes that Soviet reserves are considerably larger. Exxon, e.g., recently estimated Soviet proved *and probable* reserves as 80 billion barrels. The USSR's own method of calculating reserves is not identical with the US "proved" reserves concept, and direct comparisons are impossible.

[e] There are *no reliable figures* for reserves for China. A.A. Meyerhoff, in the *Bulletin* of the American Association of Petroleum Geologists, vol. 54, no. 8, p. 1573, has estimated proved and probable reserves in known fields at seven billion barrels. In addition, he has estimated *potential* reserves in known but untested structures at 5.6 billion barrels and *possible* reserves in partly explored basins at seven billion barrels. The sum of proved plus probable plus potential plus possible gives reserves of 19.5 billion barrels. His is the only study of the subject available.

[f] Includes natural gas liquids of seven billion barrels.

that can be recovered from the presently discovered fields in the Gulf region, where today's *proved reserves* allow for the recovery of only 25-30 percent of the oil underground. Because of this, the share of the world oil production provided by the Persian Gulf states will rise dramatically in the years ahead. The oil production needed to meet the demand forecast for 1980 will come from fields already producing oil or in the process of being developed.

B. Facilities

5. A very large increase in physical infrastructure will be required to produce, transport, process and sell all this oil. Facilities are being built to permit vastly increased production and export of oil in both Saudi Arabia and Iran; by 1980, the two are expected to supply half of the 50 million bpd of oil moving in international trade, as against the third they produced in 1970. The two will probably also have considerable spare producing and loading capacity. Smaller Persian Gulf states such as Abu Dhabi are also increasing their capacities. In the consuming countries, very large unloading, transshipment, and storage facilities will be needed.

6. An unprecedented level of investment will be required during the remainder of this decade to produce and market the oil. Estimates of the amount range between $285 billion and $365 billion—a world-wide requirement that will be heavily concentrated in consuming rather than producing countries. During the 1960s, oil company capital expenditures totaled about $150 billion, mostly in consuming countries for refining and distribution facilities. For example, almost one-half of oil company capital investment during the 1960s was in the US. During that time, total investment in the Middle East—mostly for production facilities—was only about $6 billion, or four percent of the total.

7. The industry has normally generated most of its capital requirements from internal sources—in 1960, the industry borrowed only 16 percent of its capital requirements. By 1970 the share of borrowing had risen to around 30 percent. The trend toward this type of financing is likely to continue and the companies will almost certainly look to money markets in the US, Western Europe and Japan for the bulk of the financing they need, although they will continue to generate as much of their own capital requirements as possible. Under the recently signed participation agreements, the producing countries have investment obligations commensurate with their equities in producing facilities. The substantial increase in producing facilities in the Persian Gulf area will, therefore, be financed partly by the host governments. Some of the producing countries will decide to invest in downstream operations as well—that is, in refining and distribution.

8. The existing tanker fleet, supplemented by ships now building or on order, is more than adequate to meet transportation requirements for the oil demand forecast for 1975. Beyond the mid-1970s, the tanker fleet's size will depend on policy and investment decisions made in the next few years by oil companies, governments and independent shipowners. It may be that the tanker market will become tight at some point, but such a development would very likely be temporary; the shipyard capacity of the world is larger than anticipated needs. An enormous growth in tanker tonnage is in prospect. To take but one example, moving 35 million bpd of

oil (projected exports from the Persian Gulf in 1980) around Africa to Europe and/or the US would require the equivalent of full time use of about 1,000 tankers of 300,000 deadweight tons (DWT) each. Vessels of this size are now coming into use in appreciable numbers.

9. Even if the Suez Canal is reopened in the course of the 1970s, this would not affect oil transport much.[21] Before its closing in mid-1967, one-third of the world tanker fleet could transit the Canal fully loaded at the 38-foot depth then available. While the volume of oil traffic through the Canal in 1966 corresponded to about 45 percent of Persian Gulf production in that year, that same volume of traffic would correspond to only about 20 percent of Gulf production in 1972 and only about 10 percent of the production forecast for 1980.

C. Ownership of Producing Facilities

10. Historically, most oil entering world trade has been produced, shipped and marketed by American and European firms, which produced it from wholly-owned concessions in oil-rich countries. Indeed, in the late 1950s, seven international oil companies controlled 90 percent of the oil moving in international trade. In the past dozen years, smaller Western firms have taken over nearly a third of the international oil trade. Over the same time, oil producing states have increased their own role in the production of oil. Virtually all concession agreements made in recent years between an oil producing country and a Western firm have provided for the former to own up to half of the producing field and its installations. In addition, service contracts make the expertise of Western oil companies available to producing countries. In the past year, the OPEC countries have turned their efforts to getting a share of the older concessions still wholly owned by foreign companies.

11. The agreement negotiated by Saudi Arabia in late 1972 for participation in the ownership and operation of the older concessions held by the international oil companies is a step on the way to majority ownership. The bulk of oil from OPEC countries is produced from concessions of this sort. The Aramco [22]-Saudi Agreement set the pattern for Abu Dhabi, Kuwait and Qatar. It awards the countries a 25 percent interest now and control of the concessions (51 percent) on 1 January 1982.[23] Each state has agreed to pay compensation for the 25 percent equity based on "updated book value" to allow for inflation since the investments were made. Saudi Arabia will pay about $500 million for its initial 25 percent share, Kuwait $150 million, Abu Dhabi $156 million, and Qatar $72 million. Compensation for the following increments of participation may be proportionately more costly.

12. The several oil companies also agreed to repurchase a portion of the producing countries' share of the oil produced which come

[21] The role of the Suez Canal was treated comprehensively in CIA Intelligence Memorandum No. 1265-71, "The Suez Canal Reopened: Prospects and Implications", dated 16 February 1971, Secret/No Foreign Dissem. That part of NIE 20/30-70, "Security of Oil Supply to NATO and Japan", dated 14 November 1970, SECRET, that treats the prospects for reopening the Suez Canal is still valid.

[22] A corporation of Standard Oil Company of New Jersey (Exxon), Standard of California and Texaco with a 30 percent share each, and Mobil with a 10 percent share.

[23] The schedule for increasing the participation interests is: 25 percent through 1977, 30 percent on 1 January 1978, 35 percent on 1 January 1979, 40 percent on 1 January 1980, 45 percent on 1 January 1981, and 51 percent on 1 January 1982.

to them as part owners.[24] Many national oil companies in the producing states do not now have large markets, but as participation proceeds, very large quantities of oil will accrue to them as part owners. The "buy back" price lies between the tax paid cost of the oil and the posted price upon which royalties to the producing countries are paid;[25] it is designed to permit the companies to make a profit for marketing, but a much smaller one than on their own oil.

13. The participation agreements will result in a general rise in the cost of oil to the consumer. Each OPEC country will get about as much income per barrel as those making participation agreements, though the mechanisms will be different. The companies, which will continue to market most of the oil, will attempt to maintain their preparticipation per barrel profits (now about 30-35 cents on the average), but this will be difficult, especially as the countries approach majority ownership through the participation agreements. The companies will probably have considerable success in raising their overall income as the volume of oil they handle rises year by year. The cost increase attributable to the initial 25 percent participation will probably be in the neighborhood of 10 cents per barrel handled, which the companies will endeavor to pass on to the consumer.

14. Two other OPEC countries will seek to follow the participation route, at least in part; Nigeria will insist that benefits granted by the companies to other OPEC members be extended to it in some form. Iraq has indicated that it wishes to arrange for participation in its southern fields. But Iraqi oil company negotiations have recently concentrated on the northern concessions, which Baghdad nationalized in June 1972.[26] After months of hard bargaining, an accord was reached 28 February 1973. Under the agreement, the Iraq Petroleum Company (IPC) will receive oil worth about $300 million as compensation for all its claims against the government, including those stemming from nationalization of certain concession areas 10 years ago. IPC will, in turn, pay Iraq about $350 million to settle Iraq's back tax claims, which had accumulated as a result of Iraq not winning the tax increases achieved by other producers in the mid-1960s. The parent oil companies also agreed to make every effort to more than double production from their southern (BPC) Iraqi oil fields by 1976. Negotiations on Iraqi participation in BPC operations have been postponed until October 1973. The government reportedly has agreed in principle to the participation accord reached by other Arab Persian Gulf countries, but is balking at some of its provisions.

15. Libya has announced that it wants 51 percent participation in all wholly-owned concessions; it is actively negotiating with the oil companies. Due in large part to the tempera-

[24] This repurchasing falls into two categories. The first, "bridging crude" is that portion of the governments' oil which the governments are *obligated* to sell back to the companies so that the latter can meet existing supply commitments. "Bridging crude" is of only three years duration. The second, "phase-in" crude, is that portion of the governments' oil that the companies are *obligated* to buy back from the governments if the governments desire it. The percentage to which the companies are so *obligated* declines at about 10 percent a year.

[25] The posted price originally was the market price at export points for crude oil moving in international trade. In recent years, it has almost always exceeded actual market prices and is more or less arbitrarily fixed for calculating taxes and royalties due to the producing country.

[26] Both concessions belonged to the same group of oil companies (Exxon, Mobil, British Petroleum, Shell and CFP), but under two names; the northern is Iraq Petroleum Company (IPC) and the southern Basrah Petroleum Company (BPC).

ment of its leader, Libya probably will not tamely follow any other oil producer's example in reaching agreements with the companies or necessarily act consistently. Although in a strong financial position, Libya is no longer able seriously to disrupt oil supply to Western Europe (as it could in 1970 when a shortage of tankers made short-haul oil especially useful). Although the low-sulphur content of Libyan oil makes it particularly desirable, at least half of Libya's current 2.2 million bpd production could in most circumstances be replaced from spare capacity elsewhere. The Libyans are aware of this; their hasty nationalization of British Petroleum's concession in 1971 has proved awkward for them, and they have not managed to operate it with much success.

16. Not all of the OPEC countries will push for participation in the way the Arab group of Persian Gulf countries has done. The Shah elected to make a separate agreement, which he views as better fitted to his goals, with the Iranian Oil Consortium.[27] Before the participation negotiations began, the Shah and the Consortium had reached a tentative agreement that would have extended the Consortium's tenure to 1994. That agreement influenced the participation negotiations; once announced, it set a floor for OPEC demands.

17. But the Shah reopened negotiations in December 1972 because he did not wish to have Iran seem to lag behind the Arabs in gaining control over the domestic oil industry. He offered the companies a choice of an immediate change to a long-term contract arrangement with continued preferential access to the oil or continuation of the existing relationship until its expiration in 1979, with no special privileges thereafter. Although final details of the ensuing agreement have yet to be worked out, the Shah and the companies have settled on a five-year operating contract (which is renewable) and a 20-year sales contract. Under the operating contract, the companies retain a degree of management authority and initiative, but its extent is unclear. Under the sales contract, the companies will buy oil for a price designed to give Iran the financial equivalent of the Persian Gulf participation agreement.

18. Algeria already controls about 80 percent of its own oil production and has a majority interest in each company operating there. Venezuela will gain entire ownership and control when the concessions run out, beginning in 1983. It will, however, probably make service contracts or other new arrangements with a number of oil companies to exploit its existing fields after the concessions expire. Indonesia already holds majority ownership in all concessions negotiated during the past few years, and future government participation with CALTEX—the largest concession holder—already has been agreed on.

[27] Shareholders are British Petroleum (40 percent), Royal Dutch Shell (14 percent), Compagnie Francaise des Petroles (6 percent), Exxon, Mobil, Gulf, Texaco and Standard Oil of California (7 percent each) and a group of small US companies (5 percent).

ANNEX C

AVAILABILITY OF OIL FROM THE SMALLER PRODUCERS OF THE EASTERN HEMISPHERE

1. Aside from Iran and Saudi Arabia, seven Eastern Hemisphere countries can be classed as major oil producers—Kuwait, Libya, Nigeria, Iraq, Algeria, Abu Dhabi and Indonesia. Taken together these seven are vital to an adequate supply of oil on world markets, producing at the end of 1972 about 17 percent of the world's normal oil supply (compared to 25 percent in 1970). No one of them, however, currently produces more than 5 percent of the total, and the vast increases of output expected from Iran and Saudi Arabia in the 1970s will further diminish the role played by each of the smaller producers in the total world picture. Of the group, Kuwait is the largest producer; it, and Abu Dhabi, are small, weak states, which will of necessity give considerable weight to the desires of their larger Persian Gulf neighbors. Libya's geographic position near European markets is such that a cut off of Libyan oil would temporarily at least be about as disruptive to world normal supply and shipping patterns as a cut off of larger quantities from the Persian Gulf. By the end of the decade, if production proceeds roughly as anticipated in these countries, Nigeria will be as important as Kuwait in quantity terms and somewhat more important than Libya when both quantity and location are taken into account.

2. The production forecasts for 1980 are based principally on the expectation of Western companies currently producing in the countries cited. As such, they are a netting out by the companies of a number of factors—technical ones such as the known availability of oil in the ground and the cost of producing it and shipping it to market, and politico/economic ones such as the anticipated policies of the host governments with regard to conservation of resources, desire for revenues, willingness to continue doing business with

TABLE C–I

OUTPUT OF SMALLER EASTERN HEMISPHERE PRODUCERS 1960–1980

Million Barrels Per Day

	1960	1970	1980* Projected
Abu Dhabi	—	0.7	4.0
Iraq	1.0	1.6	3.0
Kuwait	1.7	3.0	4.0
SUBTOTAL	*2.7*	*5.3*	*11.0*
Algeria	0.2	1.0	2.0
Libya	—	3.3	3.0
Nigeria	Negl.	1.1	4.0
SUBTOTAL	*0.2*	*5.4*	*9.0*
Indonesia	0.4	0.9	2.5
TOTAL	*3.3*	*11.6*	*22.5*

* Rounded to nearest 500,000 barrels per day.

Western oil companies and ability to maintain internal security. The latter two matters, which are essentially political, are impossible to forecast with confidence—they depend heavily on reactions—emotional or rational—to unforeseeable contingencies. Our judgments take into account what we can foresee in the way of change in this decade; inevitably, however, they assume a continuity that almost certainly will *not* prevail in all cases.

3. Sabotage against oil installations by a dissident group—e.g., the Palestinian terrorists—can occur virtually anywhere at almost any time. The facilities for producing and transporting crude oil are, however, fairly simple. The damage that can be done by an explosive charge or a handful of disaffected workers is usually small; repairs can normally be effected quickly, so long as the host government is anxious or willing to see the damage repaired. Serious damage to oil installations would require well-trained, well-organized personnel, knowledgeable about oil facilities and able to

gain access to them. Hence, we believe it highly unlikely that sabotage alone (i.e., without international complications) will be responsible for any significant interruption of the normal flow of oil to consumers from producers.

4. *Algeria* produces only a moderate amount of oil, but its output may about double by the end of the decade. Moreover, Algeria is slated to become a major source of natural gas for export—to the US and to Europe. It is a relatively large country, with a population that is well-educated by area standards and a wide variety of resources—minerals, arable land and tourist attractions—that can, with time and money, be developed. Its leadership has chosen to exploit moderate oil reserves and huge gas reserves as rapidly as possible and to use oil and gas revenues to finance development of the rest of the economy. Having made that choice, the regime has consistently pursued it. The government has moved in a gradual but determined manner to take over operation of almost all industrial facilities formerly controlled by foreigners; the Algerian state oil company now controls more than three-quarters of the oil produced. Gas production is and will be carried out entirely by Algerian entities, with foreign involvement confined to transporting and marketing a portion of the liquefied gas sold abroad. All the producing and transporting equipment in Algeria will be Algerian-owned. In these circumstances, there is no reason to anticipate a crisis between Algeria and foreign commercial interests; if and when the Algerians desire, they can nationalize the remnants of foreign ownership of oil facilities without meeting any effective opposition.

5. As a matter of principle, Algeria supports and encourages anti-imperialist revolutionary movements of many hues. Generally speaking, however, the Algerian Government does not involve itself directly in the internal affairs of other countries; from the Algerian point of view, revolution is supposed to be carried out by natives of the country concerned. The Algerians are, in fact, intent on doing the best they can for those who live within the borders of present-day Algeria and they are not about to risk their own security and prosperity in the interests of foreigners. Even on the Israeli issue, their active assistance (as opposed to their propaganda line) is extremely limited; they train some fedayeen and ship small amounts of equipment to fedayeen units on occasion, but they are adamant in their conviction that the Palestine issue should be addressed and solved principally by Palestinians.

6. Yet the Algerian situation has its uncertainties. The present political system is highly dependent on the continued personal leadership of President Boumedienne; the country has no institutional provision for choosing a successor. The official political party is so inherently weak and subordinate to the government as to make it a negligible political force. Marginal living standards and little popular participation in government add up to a potential for expressions of mass public unrest. We believe, however, that there is little chance that political upheaval would result in an extended interruption of shipments of fuels from Algeria. For the next several years, the Algerians will not be a significant enough source of supply to any one market to be able to do any real damage to a consumer country by withholding supplies. By 1976 or so, they could become very important to the US as a gas supplier, providing about 15 percent of East Coast requirements; but they will also have much of their own money and attention invested in the sale of gas. Another major Arab-Israeli crisis resulting in a decision on the part of the Algerian regime to withhold gas shipments cannot be ruled out, but we consider this unlikely.

7. In sum, we are quite confident that the Boumedienne government will continue producing oil and making its oil sales decisions on

commercial grounds. Though we cannot be as categorical about some other subsequent government or about gas shipments to the US in the event of a major Arab-Israeli crisis in the late 1970s, we believe the chances are very good that both oil and gas will continue to be shipped to all customers by any Algerian government.

8. *Kuwait* is so dependent on the international oil business that a unilateral decision by any Kuwaiti government to cease all oil production and exports for more than a short period is virtually inconceivable. It has accumulated very substantial financial reserves and could live off its savings for at least a year or two, so far as import needs are concerned. It cannot spend its current revenues and has recently decided to conserve oil in the ground by limiting production—which accounts for the small growth forecast for Kuwait production. Without oil production, however, economic activity would be drastically curtailed. Indeed, the almost entirely urban population would face grave difficulties if oil production were shut down completely for an extended period. Kuwait must keep extracting oil at 20 percent or so of current production in order to obtain associated natural gas, which provides almost all the small country's power, including the fuel for making the national drinking water supply from seawater. Kuwait has no quarrels—internal or external—of a magnitude to cause any Kuwaiti deliberately to bring on such drastic circumstances.

9. The Kuwaitis are concerned with Iraq's sporadically-voiced claim to sovereignty over Kuwait; they fear aggression from Iraq. The latter's recent occupation of a Kuwaiti border post and demand for control over two uninhabited islands fronting on the access channel to the Iraqi port of Um Qasr have reinforced these fears. Iraq does not, however, currently seem intent on taking over all of Kuwait. It has a wide assortment of more pressing problems of its own. Should Iraq at some time mount a full scale invasion of Kuwait, output of Kuwaiti oil probably would be suspended for a brief period. We expect, however, that Iraq would be able to overpower Kuwait in a matter of days—so long as there was no outside interference—and that oil production would resume shortly. The major motive for any such Iraqi move would be to seize Kuwait's oil and sell it for Iraqi benefit, not to hold it off the market.

10. In *Indonesia*, too, we see very little prospect of an extended interruption of oil exports through the end of this decade. The Suharto government—or something very similar to it—is likely to hold power; it will continue to need oil money to meet its debts, stabilize the economy and finance development. Suharto has clearly focused on economic betterment as the primary national goal and has decided on economic cooperation with Japan and the West as the best means to accomplish this goal. Operations of foreign oil companies earned Djakarta about $200 million in 1972 (20 percent of its total foreign exchange earnings); this amount may double in 1973 and will be much larger by 1980, as oil production climbs to about 2.5 million barrels per day (bpd). Indonesia already holds majority ownership in all of the concessions issued in recent years, and it has renegotiated the long-standing agreement with its major concessionaire to provide for similar government ownership participation in the future. Thus, a crisis over ownership of producing facilities can be ruled out. A dispute with Japan—which will become more dependent on Indonesia as a source of oil—cannot be excluded, but the relative strengths of the two countries are such that an Indonesian decision to pressure Japan by withholding oil seems highly unlikely. Oil export problems and occasional work stoppages could occur in periods of domestic stress, but the Indonesian Army could and would move quickly to protect the nation's oil installations.

11. Even the unexpected emergence of a new military leadership inclined toward Sukarnoist-style and anti-imperialist attitudes probably would not result in an extended interruption of the flow of oil. In such circumstances, we would expect foreign firms to experience harassment and irresistible demands for renegotiation of contracts on terms more favorable to Djakarta. We would not expect foreign companies to be expelled or oil shipments to cease.

12. *Nigeria's* policies designed to increase its control over its petroleum assets will continue. Participation by the Nigerian Government will be extended to the major producing companies, and any new concessions will probably be explored and developed by the Nigerian National Oil Company through contracts with various oil companies. The government will insist upon receiving any new benefits granted by companies to other OPEC members, whether or not it takes a leading role in confrontations with the companies. Nigeria will depend on oil for more than half of its foreign exchange earnings and government revenues for a long time to come. Although ethnic friction within Nigeria will continue, the military government is managing well enough—both in terms of control and in terms of spreading what resources there are to various tribes and areas—so that another major civil war is unlikely.

13. The biggest question mark in oil policy is a political one. Nationalist sentiment and distrust, even hostility, toward all things foreign have grown in the post-civil war period. Antiforeign sentiment could reach an explosive peak over time. A unilateral move by some Nigerian government against foreign oil interests is possible, especially in retaliation against the policies of a particular company or foreign country. On the other hand, Nigeria's economic dependence upon oil revenues will tend to increase along with increases in oil production. Thus, while a unilateral move by a Nigerian government against foreign oil interests or against one or another oil customer will remain possible, on balance, we consider it unlikely.

14. *Abu Dhabi,* the leading member of the Union of Arab Amirates (UAA), is the only one of the smaller southern Persian Gulf states that currently produces a substantial quantity of oil; its current output is expected to triple by 1980. Production began in *Dubai,* another UAA member, in 1969; to date, however, known reserves are small. The UAA's two little western neighbors—*Bahrain* and *Qatar*—have been small-scale producers for some time, but neither has large reserves. Oil has been discovered in commercial quantities in *Sharjah. Oman,* to the immediate east, may prove to be another story—production began in 1967 and increased rapidly. On the basis of known reserves, however, production is unlikely to go beyond half a million barrels per day.

15. The future of the small Gulf states is an uncertain one. Independence is new, the UAA, to which some belong, is new, access to money in large sums is new. Hostile feelings—between religious sects, between mini-states, between and among the Gulf principalities and their large Saudi and Iranian neighbors—are old. A small civil war has dragged on for years in the hinterland of Oman; oil revenues have made control of the government a more appealing and valuable prize than in the past, but they have given the government more means to resist. It is virtually inconceivable that oil production can continue in an orderly fashion from each of the Gulf producers over an eight year period, but it is impossible to say which state is the most likely or most imminent subject for trouble. So far as the world oil picture is concerned, however, Abu Dhabi's output is all that will matter in the 1970s. And Abu Dhabi is much like Kuwait in being attractive

for its oil revenues—and for little else. It is also small enough to be cowed by a larger neighbor such as Iran. We doubt that oil production would be stopped for an extended period by any regime which might turn up in power there.

16. *Libya*—like Kuwait and Abu Dhabi—is well-supplied with money and short of virtually every other asset necessary for development. Its people are few in number and generally backward by the standards of the region. It differs, however, in having a government that is fervent about causes and somewhat uncaring about the money spent or lost in the pursuit of its own particular ends. In the immediate aftermath of the September 1969 revolution, the Revolutionary Command Council (RCC) demanded and got the rapid removal of US and British military installations; in late 1970 and early 1971, it took advantage of its position as an important supplier close to the markets in a tight transport situation to wring two rapid increases in oil revenue payments from the oil companies. It is now preparing to confront the oil companies on the participation issue, believing that it can gain more for itself than the Gulf producers were able to obtain.

17. The President of the RCC, Colonel Qadhafi, is a 30-year old with a messianic complex looking for new worlds to conquer and bumping frustratedly against immovable obstacles to his cherished objectives of Arab unity, Islamic purity and the recovery of Palestine. With huge foreign exchange reserves, a strong bent toward conservation of known oil reserves and a leadership that alternates between frequent quarrels *in camera* and dramatic confrontations with one or another external antagonist, Libya could be in for a substantial amount of turmoil and trouble. Although Libya will probably find increasing uses for revenue and permit oil output to rise during the decade, the odds appear high that some event—coup or nationalization head the list of possibilities—will lead to curtailment or cessation of Libyan oil production at some point between now and 1980. There is no necessary reason, in the case of Libya, to expect an oil crisis to be of short duration. The oil companies clearly are hedging their bets; their projections show oil production from Libya in 1980 below the peak reached in 1970.

18. Egyptian-Libyan relations are in a state of flux that could—in two or three years—make Libyan fields a more reliable source of supply. The two states have formally agreed to merge in September 1973. On balance, we are inclined to doubt that a meaningful merger—vesting substantial authority over oil production, disposition of funds, and foreign affairs, in a single government—will occur. Such an outcome is, however, distinctly possible and it would create a new set of circumstances. There is very little doubt that Egypt would come to dominate such a merged entity in fairly short order. Cairo regimes have been, are now and will remain far more practical about goals and far more interested in money than the Qadhafi government. Should Egypt actually come to control Libyan oil, we would expect output from Libya to increase substantially beyond current projections and to be available to the world on normal commercial terms in most circumstances.

19. As to Iraq, no government has ever shut down oil production entirely, even though relations between the various Baghdad regimes and the internationally owned Iraqi Petroleum Company (IPC) have been at or near crisis level for over a decade. But production has repeatedly been curtailed, or production increases foregone, in the course of their running battle. Their chronic quarrel reached a new extreme with the 1 June 1972 announcement by Iraq of nationalization of the northern fields of IPC. Subsequently, vituperation les-

sened and all parties began yet another search for yet another *modus vivendi.* In February 1973, an agreement was reached under which companies and government will compensate one another for past claims and Iraq will operate the nationalized northern fields; an IPC affiliate is anxious to continue operating the southern fields under some form of participation arrangement, but the companies and the government have been unable to agree on the details. Further talks have been scheduled for October.

20. A deal permitting smooth operation of the nationalized fields, however, will only serve to put to rest—perhaps temporarily—one of the many problems that could interfere with the flow of oil from Iraq. The chronically restive Kurds of northern Iraq live alongside the oil facilities in that area; they could sabotage the pipeline from the northern fields to the Mediterranean. The Syrians could close down the pipeline on their own territory as they have in the past. Israel might have occasion to strike directly at Iraqi oil facilities or to attack the terminal facilities at the Syrian end of the pipeline from Iraq. Iraqi facilities also are vulnerable to direct action from Iran. Moreover, Iraqi governments are not notable for longevity, and a new regime might feel impelled to reinforce its nationalist credentials with some new punitive action against Western oil interests. All things considered, some politically-inspired disruption of oil shipments from Iraq during the next few years appears likely. Baghdad's acute need for money, however, leads us to believe that such disruptions would be of comparatively short duration—a matter, say, of three to six months.

21. Taken together, the various probabilities and uncertainties in the preceding paragraphs lead to a moderately reassuring assessment so far as world oil supplies are concerned. During the 1970s, interruptions to the flow of oil from the smaller suppliers are almost certain to occur—they are quite likely in some (e.g., Libya and Iraq), and possible in all. Most stoppages, however, are likely to be of short duration, and would probably not occur simultaneously. Those who produce, market, and transport oil probably will have to cope with sudden shortfalls of something like two to four million barrels a day (up to five percent of normal world demand) at various times; they are not likely to be faced with crises involving shortfalls of 10 or 15 percent of normal supplies for a period of months as a result of happenings in the smaller producing states alone. In short, the system can cope with supply problems the minor producers are likely to cause, although repeated or particularly troublesome shortfalls could have an impact on the oil import and consumption policies of consuming countries much greater than the absolute size of the disruption would seem to warrant.

ANNEX D

APPROXIMATE DIMENSIONS OF AN ARAB EMBARGO ON OIL SHIPMENTS TO THE UNITED STATES AND WEST EUROPE

1. The following tabulation sketches out in a general way the calculations underlying the discussion in paragraphs 31-32 of the text. The situation postulated is that in 1980, all Arab countries declare an embargo on oil exports to the US and West Europe while continuing to ship oil to Japan and other customers. Because the Arabs will be providing roughly 60 percent of the oil moving in world trade at that time, and the US and West Europe will be importing about 60 percent of the oil moving in world trade, the calculations allow for a 60 percent reduction in Arab exports—from about 31 million barrels per day (bpd) to about 12 million bpd—with the US and West Europe sharing the 19 million bpd short-fall about equally.[28] The effect is to leave the US with oil availability immediately after the crisis approximately equal to US domestic production plus one million bpd of imports and to assume that most Western Hemisphere exports, as well as the available non-Arab Eastern Hemisphere oil, would be provided to Europe.

2. The calculations do not attempt to reflect the many factors that might vary with only small effects on the totals or with indeterminate *net* effects. The situation could be made somewhat less serious for the embargoed countries than indicated in Table D-I through:

— Diversion of oil to the US and Europe from other destinations listed on ship manifests.

— Steps by other consuming countries (e.g., Japan) to curtail oil consumption and to free some additional oil for US and West European use.

— Conversion from oil to other fuels of facilities in sectors other than power generation and industry.

— The possible existence at the time of a crisis of more spare oil producing capacity in Iran, West Africa, Venezuela or elsewhere outside the Arab world than is postulated.

— Soviet willingness and ability to increase oil sales to West Europe.

The situation could be made more serious for the embargoed countries than indicated in Table D-I through:

— A tendency on the part of oil importing nations other than those embargoed to try to maximize their own imports and stocks as insurance against an energy crisis.

— Time lags inherent in decision-making, in conversion to greater use of coal and to increased coal mining and shipment, in curtailing transportation uses of oil, and in producing energy with methods that save fuel but are more environment-polluting.

— The occurrence of a crisis at a time which was particularly awkward with regard to spare producing capacity and tanker availability.

— Soviet moves to aggravate the situation by cutting off oil sales to West Europe, which could be running in the neighborhood of one million bpd.

3. The shortfall indicated in Section III of the Table is what would remain to be covered after the earliest and least disruptive adjustments to supply and demand were made. The figure for oil that the US could save by con-

[28] The effects on the US and West Europe of a total cessation of Arab production and exports would not be markedly different from those indicated in Table D-I, but a total Arab embargo would have very severe repercussions for Japan and the poor countries of the Eastern Hemisphere.

TABLE D-I

ILLUSTRATIVE MODEL OF AN OIL IMPORT CRISIS IN 1980

Crude Oil Equivalent, Million Barrels Per Day

	United States		Western Europe	
I. SUPPLY (Excluding Stock)				
Total Normal (pre-crisis) Energy		48		35
Of Which: From Domestic Oil	11.5		3	
From Imported Oil	10.5		19	
From Other Fuels	26		13	
Less: Arab Oil		10		9
Plus: Increase in oil imports obtained from 5% increase in oil output of non-Arab producers		1		1
Plus: Energy obtained by converting from oil to coal where suitable equipment exists in electric generating and industry uses		1		1
Equals: Energy Availability in Postulated Crisis		40		28
From Oil	13		14	
From Other	27		14	
II. REQUIREMENTS				
Total Normal (pre-crisis) Demand		48		35
Less: 10% of oil normally consumed in transportation sector. *Less:* Fuels saved by relaxation of pollution controls		3		2
Equals: Remaining requirements		45		33
III. BALANCE AFTER ADJUSTMENTS				
Total Demand after Adjustments		45		33
Total Supply after Adjustments		40		28
Shortfall		5		5
(As % of Demand after Adjustments)		(11%)		(15%)

verting from oil to coal is roughly the daily saving that could be attained within three months. The possible saving grows with time; for 1980, it probably would range from a few hundred thousand bpd almost immediately to 1.5 million bpd or more after six months. A 10 percent curtailment of use in the transport sector is about half of the reduction of oil consumption possible through a comprehensive program of voluntary curtailment of use in all sectors of the economy. The further major mechanisms that would be available for handling the shortfall would be (a) strict rationing of gasoline (which could save 3-4 million bpd of oil in the US and West Europe combined) and other fuels and (b) drawdown of fuel supplies on hand. At the beginning of a crisis, the US and West Europe could expect to have about 3.65 billion barrels of oil available for use (to meet a combined daily shortfall of 10 million bpd).

	Million barrels
US stocks—about six weeks consumption	950
West European stocks—80 days consumption	1,800
30 days of normal imports already enroute to the US	300
30 days of normal imports already enroute to West Europe	600
	3,650

4. A number of alternative assumptions could be made about the timing or the extent of an embargo and about the sharing arrangments among the consuming nations. Those

made in constructing Table D-I produce results for the US at least as serious as any other set of assumptions, and more serious than most. By 1980 the US will be more dependent on imports and on Arab oil than in any prior year. Any embargo that was not accompanied by a decrease of oil production and shipment would have only minor and temporary effects for consuming countries because shipments could be diverted. An Arab embargo aimed solely at the US would deprive the US of perhaps four or five million bpd of oil *if totally effective*—and less if embargo avoidance arrangements were undertaken. If 19 million bpd (60 percent of Arab output) were taken out of world trade and the US continued to import all available Western Hemisphere oil, the US would have available some 16-17 million bpd of oil before any increase in output of non-Arab producers. If the same 19 million bpd shortfall were shared between the US and Western Europe in proportion to their normal imports, the US would continue to receive about 3-4 million bpd of imports and have total oil availability of some 15 million bpd—again, before any adjustments. Either of the latter two assumptions would, of course, make the situation for Western Europe far more serious than indicated in Table D-I, and over time probably would not hold—the Europeans' need for oil would be so great that they would almost certainly outbid the US for significant quantities of oil.

ANNEX E

NATURAL GAS

1. Natural gas is an energy source of growing importance. Both the US and the USSR are endowed with large gas reserves. Elsewhere important gas reserves for the most part lie far from consumers, but no one area has a dominant position as the Persian Gulf does with oil. In the past, much gas, which frequently comes mixed with oil (termed "associated gas"), has been separated and burned as waste because the cost of handling it made marketing uneconomic. More recently, growing energy consumption, rising prices and environmental concern (gas is virtually nonpolluting when burned) have greatly increased the demand for gas, despite the high cost of transportation and distance from consuming markets.

2. The US accounts for 60 percent of the world's natural gas consumption, which now meets one-third of US energy needs, almost entirely from domestic resources. US gas reserves have declined and now equal only about 12 times annual consumption as opposed to a ratio of 26 to one in 1960. Despite the likelihood that new local discoveries will be made over the next decade, the US will import substantial quantities of gas in the coming years. A large part of this gas will probably come from Algeria and by 1980 it is likely that imports from there will supply about three percent of US demand. The Soviet Union has large quantities of gas that could and probably will be exported. The US has shown an interest in gaining access to this gas. Discussions are underway, and if agreement is reached Soviet gas could begin to reach US markets about 1980. Nigeria, Venezuela and Iran are among other potential sources.

3. During the 1960s, Soviet gas production and consumption grew rapidly. A small volume of gas has been exported to Eastern Europe and to Austria in recent years, but these have been offset by imports from Iran and Afghanistan. By 1975, however, the Soviet Union should become a net exporter of some 300 billion cubic feet of gas annually. Soviet net exports could approach 1 trillion cubic feet by 1980.

TABLE E-I

SOVIET GAS PRODUCTION, TRADE AND CONSUMPTION

Trillion Cubic Feet

	1970	Estimated 1975	1980
Production	7.0	10.0	13.5
Imports	0.1	0.5	0.5- 0.9
Exports	0.1	0.8	1.4- 1.7
Apparent Consumption	7.0	9.7	12.3-13.0

4. In Western Europe natural gas fills only seven percent of energy needs; however, this share will rise to about 13 percent by the end of the decade. Western Europe's gas reserves are far short of meeting present and prospective demand. Western Europe now imports a small amount of Soviet natural gas, but this will grow by 1980. Contracts already concluded indicate that the Soviets will divide their gas exports about equally between East and West Europe. Europe now imports small quantities of gas from North Africa, especially Algeria, and these imports probably will increase substantially in the years ahead. Japan, too, will increase its use of gas by 1980, but not very much; gas imported from a variety of sources accounts for about two percent of its energy requirements.

5. The balance of payments implications for countries importing gas are likely to be less serious than are those from importing oil. The quantities and values involved are far smaller. Also, the principal exporters of gas—Algeria and the USSR—are countries with a substantial appetite for goods and services obtainable only for hard currency. Neither is likely to pile up foreign exchange reserves for lack of ways to spend.

ANNEX F

THE OIL-RELATED CURRENT ACCOUNT TRANSACTIONS OF THE UNITED STATES, WESTERN EUROPE AND JAPAN

1. This Annex describes in more detail the assumptions and calculations set forth in the text in the Section entitled "Financial Impact on the Consuming Countries: Balance of Payments—Current Account Transactions," paragraphs 50 to 53 inclusive. It first establishes a range for the delivered cost, including freight and insurance, of the volume of world and area oil imports projected for 1980 in Section I. It next discusses the revenues that will accrue to oil producing countries under alternative price assumptions and attempts to determine how the revenues will be used. The ultimate objective is to ascertain, under assumptions to be discussed below, the possible balance of payments impact of *oil related transactions* on the US, Western Europe and Japan.

2. Table F-I shows the quantity and value of world oil imports in 1970 and 1980. Four sets of value figures are presented for 1980, reflecting different assumptions about the revenues per barrel (in the form of taxes, royalties and other fees) accruing to the oil producing countries: no increase over the levels of Spring 1973, and increases of 25 percent, 50 percent and 100 percent. All other components of the final price are assumed to remain unchanged, including freight and insurance costs per unit and average profits per barrel to the oil companies. Transportation charges can be very volatile, but available data suggest that tankerage on order is ample to meet anticipated demand at decreasing cost per barrel. Per barrel profits are somewhat more likely to fall as volume increases than to rise. Any bias introduced by holding these components fixed is, therefore, more likely to result in an overstatement of the final oil price derived by the stated variations in host government revenue than in an understatement.

TABLE F-I

WORLD OIL IMPORTS, 1970 and 1980*

Billion 1973 Dollars

	1970		1980				
				Value			
				Per Barrel Price of Oil			
	Quantity	Value	Quantity	$3.00	$3.41	$3.82	$4.64
	Million Barrels Per Day	Billion 1970 Dollars	Million Barrels Per Day				
United States	3.4	3.3	11.0	12.0	13.7	15.3	18.6
Japan	4.3	2.8	11.0	12.0	13.7	15.3	18.6
Western Europe (excluding intra-European trade)	13.0	10.6	19.0	20.8	23.6	26.5	32.2
Rest of World	4.7	3.1	9.0	9.9	11.2	12.5	15.2
WORLD	25.4	19.8	50.0	54.7	62.2	69.7	84.7

* Values on c.i.f. basis. Totals may not add because of rounding.

3. For purposes of price and value projections, we use only *constant 1973 dollars*. Any other approach involves assumptions about price trends throughout the world and price trends for particular goods and services. Most important, the use of 1973 prices serves to isolate the balance of payments impacts of rising volumes of oil moving in international trade. The increases agreed to under the Tehran agreement reached in February 1971 will add about $0.15 per barrel to producing countries' revenues—and hence to oil prices—during 1974 and 1975 combined. And, a further round of price negotiations upon the expiration of the Tehran agreement seems likely. However, an increase of $0.15 per barrel would be an increase of only about 5 percent over two years—which might *not* be an increase in the real price of oil relative to other goods. Thus a constant real price—or something close to it—is possible.

4. A doubling of producer government revenues-per-barrel produces a very high 1980 price. In the past, the price of crude oil on world markets has remained well below the well-head price in the US (about $3.75-$3.85 per barrel today) and the cost of alternative forms of energy. Producer governments have been concerned about possible consumer resistance to large and frequent price increases and about the effects that rapidly escalating prices might have on the overall energy policies of consumer governments. For the future, however, the speed with which producer governments press their bargaining advantage could conceivably result in a 10 percent annual rise in their real per barrel revenues—which is the rise implicit in a doubling of revenue per barrel by 1980.

5. Each assumption about the trend of revenues per barrel to producer governments leads to a specific average price for a barrel of oil—from $3.00 per barrel to $4.64 per barrel. Oil moving in world trade comes from many locations, is produced under different cost conditions, and varies greatly in the characteristics— weight, sulphur content, wax content, etc.—that make one variety particularly desirable and another particularly difficult to sell. We have followed industry practice of using the delivered price in Rotterdam of Arabian Light crude oil of 34 API gravity to represent the average price of oil.

6. The average price at the beginning of 1973 was about $2.87 per barrel, including revenue payments to the government of about $1.51 per barrel. When the dollar was devalued in 1971, the OPEC countries demanded, and got, a compensating increase in their per barrel revenues calculated in dollars. At that time, they insisted on automatic adjustment of their revenues in the event of future realignments of major currency values. As part of this arrangement, currency values are calculated quarterly, on the first of March, June, September, and December of each year. Significant fluctuations result in an increase in revenue payments to the government on the first of April, July, October, and January. According to the adjustment formula, the change in per barrel revenues resulting from the devaluation of the dollar in February 1973 probably will be about $0.13 per barrel. Hence, $3.00 or so per barrel is the price of Arabian Light oil delivered to Rotterdam that is expected to prevail in mid-1973. The $3.41, $3.82, and $4.64 per barrel prices assume respectively 25 percent, 50 percent and 100 percent increases by 1980 in the per barrel payments to Gulf producers for Arabian Light crude, or annual rates of increase of 3.2 percent, 6.0 percent and 10.4 percent.

7. To derive the revenues of major producers under various price assumptions, we cal-

culated the revenue for each country on a per barrel basis, working back from the figures for Arabian Light. Market forces work to maintain a differential in payments to various governments, reflecting differences in specific conditions of production, transportation costs and characteristics of the oil, and these were taken into account.

8. Table F-II shows the revenues that each major producer would receive at each illustrative price. It also calculates possible spending out of oil income on imports and gifts, for each country for each level of income. For some countries, the demand for imports is large relative to total earnings from oil. In such cases—Iran, Venezuela, Nigeria and "other" countries—we have assumed that all oil production revenues will be spent for imports (except in the cases of Venezuela and Nigeria at the highest level of income); the import data for these countries are, therefore, not maximum total imports but maximum imports financed from oil income. For Saudi Arabia, Kuwait, Libya and the group of smaller Persian Gulf producers, imports are projected on a basis of the past rate of increase (in real terms) adjusted for likely improvements in their ability to spend for development, consumption and/or military hardware. These are total imports and represent probable maximums, rather than minimum or mid-point levels.

9. Revenues minus imports represent the surplus the oil producing countries may realize in 1980 from the oil trade. The surplus after imports could be as low as $7.6 billion under the lowest price assumption or as high as $25 billion under the highest price assumption. It will be reduced, however, by whatever shares of their surplus the oil producers give or lend to their needier neighbors. In Table F-II, we assume that the richer Arab countries are very generous indeed to the poorer Arab states. It is likely that donors will increase their gifts and loans as their revenues rise, but they may not be as generous as the Table indicates.

10. Table F-III, derived from Table F-II, summarizes for those countries with surplus income, the funds available from oil revenues for investment or addition to reserves in the single year 1980 under the various price alternatives.

11. Illustrating the potential impact of these surpluses on the balances of payments of consumer countries involves an additional set of variables and many more assumptions. We make no attempt to calculate all possible combinations—varying only one major assumption is sufficient to illustrate the fact that, for any given consumer, the overall balance of payments impact of oil related transactions varies widely and depends to a great extent on the consuming country's export performance.

12. The delivered price of oil includes shipping and insurance charges, oil company profits and costs of production, as well as payments to producer governments. In a balance of payments sense, the consuming countries as a group get back most of what they spend for the first two categories of payments, as is shown in the balance of payments tables that follow. In the absence of any reliable information on either the beneficial ownership or the "banking home" of tanker owners in general, we have distributed receipts for transport charges among the major consumers—the US, Western Europe and Japan—in proportion to their oil imports in 1980. This calculation gives 22 percent of world tanker receipts to the US,

TABLE F–II

OIL REVENUES AND FOREIGN EXPENDITURES OF OIL PRODUCING COUNTRIES IN 1980

Billion 1973 Dollars

	Oil Revenue	Used For Imports of Civilian and Military Goods and Services	Used For Gifts and Loans To Other Countries	Difference (Available for Addition to Reserves or Investments)
Oil Price: $3.00/Barrel				
Saudi Arabia	8.9	4.5	1.5	2.9
Kuwait	2.3	2.0	.3	—
Iran	5.1	5.1	—	—
Other Persian Gulf	4.8	3.0	.6	1.2
Libya*	2.5	1.4	.5	.6
Nigeria	3.1	3.1	—	—
Venezuela	2.3	2.3	—	—
Other	3.0	3.0	—	—
Total	32.0	24.4	2.9	4.7
Oil Price: $3.41/Barrel				
Saudi Arabia	11.1	4.5	2.0	4.6
Kuwait	2.9	2.0	.5	.4
Iran	6.4	6.4	—	—
Other Persian Gulf	5.9	3.3	.7	1.9
Libya*	2.9	1.4	.5	1.0
Nigeria	3.6	3.6	—	—
Venezuela	2.8	2.8	—	—
Other	3.7	3.7	—	—
Total	39.3	27.7	3.7	7.9
Oil Price: $3.82/Barrel				
Saudi Arabia	13.3	4.5	2.5	6.3
Kuwait	3.4	2.0	.6	.8
Iran	7.6	7.6	—	—
Other Persian Gulf	7.1	3.5	.8	2.8
Libya*	3.4	1.5	.6	1.3
Nigeria	4.2	4.2	—	—
Venezuela	3.3	3.3	—	—
Other	4.4	4.4	—	—
Total	46.7	31.0	4.5	11.2
Oil Price: $4.64/Barrel				
Saudi Arabia	17.7	4.5	2.8	10.4
Kuwait	4.6	2.0	.8	1.8
Iran	10.2	10.2	—	—
Other Persian Gulf	9.5	4.0	1.0	4.5
Libya*	3.9	1.5	.7	1.7
Nigeria	5.3	4.3	—	1.0
Venezuela	4.2	3.9	—	.3
Other	5.9	5.9	—	—
Total	61.3	36.3	5.3	19.7

* Assumes no merger with Egypt.

TABLE F-III

NET FUNDS ACCRUING TO KEY OIL PRODUCERS IN 1980*

Billion 1973 Dollars

	Per Barrel Price of Oil			
	$3.00	$3.41	$3.82	$4.64
Saudi Arabia	2.9	4.6	6.3	10.4
Kuwait	.0	.4	.8	1.8
Iran	.0	.0	.0	.0
Other Persian Gulf	1.2	1.9	2.8	4.5
Libya	.6	1.0	1.3	1.7
Nigeria	.0	.0	.0	1.0
Venezuela	.0	.0	.0	0.3
Totals	4.7	7.9	11.2	19.7

* Revenues, less imports, less gifts and loans to other countries.

38 percent to Europe and 22 percent to Japan (the remainder is accounted for by the "rest of the world," which we do not discuss in this Annex). This methodology may somewhat overstate European transport earnings and understate those of Japan, but probably not by any large amount.

13. We have allocated oil company profits (assumed, as noted above, constant at $.35 per barrel) geographically on the basis of shares in oil production in the major producing states—60 percent to the US, 30 percent to Europe and 5 percent to Japan, leaving 5 percent for the rest of the world. The allocation reflects present ownership with allowance for a small shift of the ownership and operation of world oil producing and marketing facilities away from the US and Europe toward Japan and the producer countries. (In considering the question of profits, we have treated any additional income accruing to the host governments from "participation" as revenue to the producer government rather than as oil company profits.)

14. Production costs of the companies, averaging $0.30 per barrel under our constant price assumption, are included in the price of oil imports; in the 1980 figures, they total $1.2 billion for the US, $1.2 billion for Japan and $2.1 billion for Western Europe. They are not further accounted for in the balance of payments tables. They include many things, such as depreciation charges, salaries, payments for contractors' services, equipment maintenance and daily running costs; we have no basis for determining what portion of these costs returns as a credit to the balance of payments accounts of the consuming countries or how to allocate production costs among balance of payments categories and countries. Production costs also have an indirect effect on balances of payments; e.g., that portion spent in the producing countries increases the receipts of the oil producers and thus the money available for imports. Accounting for this factor would probably serve both to make the oil-related current account balances somewhat less unfavorable to the consuming countries and to provide for a somewhat larger increase in the reserves of some producing countries.

15. In Tables F-IV, F-V and F-VI, for the US, West Europe and Japan respectively, we have calculated in Part I a balance of payments resulting from the direct effect of oil transactions. As can be seen in Table F-IV, oil company profit remittances to the US offset a substantial part of the oil import bill, and the direct effect of oil transactions on the US in 1980 varies from a deficit of $4.9 billion to a deficit of $11.5 billion, depending on the assumed price of oil. The West European deficit varies from $14.4 billion to $25.8 billion (Table F-V) and that of Japan from $9.2 billion to $15.8 billion (Table F-VI).

16. There is, however, a very substantial indirect offset, which we show in Part II of

TABLE F–IV

ILLUSTRATIONS OF POTENTIAL IMPACT OF OIL TRANSACTIONS ON THE CURRENT ACCOUNT IN THE US BALANCE OF PAYMENTS IN 1980 [a]*

	1970 Actual (Billion 1970 Dollars)	1980 Potential (Billion 1973 Dollars)			
Price of Oil [b]	$2.14/ Bbl.	$3.00/ Bbl.	$3.41/ Bbl.	$3.82/ Bbl.	$4.64/ Bbl.
I. OIL TRANSACTIONS					
Oil Imports, c.i.f.	−3.3	−12.0	−13.7	−15.3	−18.6
Less: Transport Charges [c]	.5	2.4	2.4	2.4	2.4
Equals: Oil Imports, f.o.b.	−2.8	−9.6	−11.3	−12.9	−16.2
Less: Company Profit Remittances [2]	3.0	4.7	4.7	4.7	4.7
Equals: Direct Effect of Oil Transactions	0.2	−4.9	−6.6	−8.2	−11.5
II. POTENTIAL ADDITIONAL US EXPORTS TO OIL PRODUCING COUNTRIES GENERATED BY OIL REVENUES					
US Market Share [f]		7.1	8.4	9.5	11.4
1—Up 25%	1.7	5.7	6.7	7.7	9.2
2—Stable		4.3	5.0	5.7	6.9
3—Down 25%					
III. RESULTANT EFFECT ON BALANCE OF PAYMENTS (Current Account) [g]		2.2	1.8	1.3	−0.1
1—Expanded Market Share	1.9	0.8	0.1	−0.5	−2.3
2—Stable Market Share		−0.6	−1.6	−2.5	−4.6
3—Smaller Market Share					

*Footnotes correspond to those on Table IV in the text, which appears on page 21.

each Table, i.e., the expenditures of the oil producers out of oil income on imports from the US, Western Europe and Japan. Also included are the imports generated by the money which the producers give away; recipients of their largesse are likely to spend all they receive for imports on their own account. The industrialized countries will have an opportunity to earn back much of what they spend for oil by selling their own goods.

17. To indicate what sort of effects exports to oil-financed markets might have on the balance of payments of the industrialized countries, we calculated the shares of the markets in the producing countries that were accounted for by US, West European and Japanese goods in 1971. (The US share of the group of markets was 21 percent, the West European share 46 percent and the Japanese share 9.5 percent.) We went on to calculate in Table F-IV for the US, three possibilities: that the US share of the market of each country in 1980 remained the same as its 1971 share, or that the US *share* either rose 25 percent or fell 25 percent. The calculated change is illustrative only, but it does not appear out of the question under the particular conditions we are considering. Some of the Arab producers, for example, will be receiving rapidly increasing amounts of money and spending on many sorts of goods for which a change of suppliers is not difficult—e.g., limousines and air conditioners and even military equipment. Moreover, the Arabs have

TABLE F–V

ILLUSTRATIONS OF POTENTIAL IMPACT OF OIL TRANSACTIONS ON THE CURRENT ACCOUNT IN THE BALANCE OF PAYMENTS OF WESTERN EUROPE IN 1980 [a] *

	1970 Actual (Billion 1970 Dollars)	1980 Potential (Billion 1973 Dollars)			
Price of Oil[b]	$2.14/ Bbl.	$3.00/ Bbl.	$3.41/ Bbl.	$3.82/ Bbl.	$4.64/ Bbl.
I. OIL TRANSACTIONS					
Oil Imports, c.i.f.	−10.6	−20.8	−23.6	−26.5	−32.2
Less: Transport Charges [c]	2.5	4.0	4.0	4.0	4.0
Equals: Oil Imports, f.o.b.	−8.1	−16.8	−19.6	−22.5	28.2
Less: Company Profit Remittances [e]	1.4	2.4	2.4	2.4	2.4
Equals: Direct Effect of Oil Transactions	−6.7	−14.4	−17.2	−20.1	−25.8
II. POTENTIAL ADDITIONAL EXPORTS FROM WESTERN EUROPE TO OIL PRODUCING COUNTRIES GENERATED BY OIL REVENUES:					
European Market Share [f]:					
1—Down 6% (US Share Up 25%)		11.9	13.6	15.4	18.1
2—Stable	3.3	12.6	14.5	16.4	19.2
3—Up 6% (US Share Down 25%)		13.3	5.3	17.3	20.4
III. RESULTANT EFFECT ON BALANCE OF PAYMENTS (Current Account) [g]:					
1—Smaller Market Share		−2.5	−3.6	−4.7	−7.7
2—Stable Market Share	−3.4	−1.8	−2.7	−3.7	−6.6
3—Expanded Market Share		−1.1	−1.9	−2.8	−5.4

*Excludes intra-European transactions. Footnotes correspond to those on Table IV, which appears on page 21 in the text.

in the past been known to exclude non-essential goods from their countries for political, rather than commercial, reasons.

18. The various figures for the US all assume oil imports of 11 million bpd, and a change in oil volume would change the balance figures—though not by the full cost of the oil involved. Imports of an additional 1 million bpd would cost $1.09 billion at $3.00/barrel and $1.69 billion at $4.64/barrel. Of this, under the assumptions used in this Annex, the US balance of payments would recover $230 million (transportation receipts and the US share of profits on additional oil production). The "direct effect" therefore would amount to $860-$1,460 million, of which $90-$150 million would return as export earnings if the US market share remained stable. Thus, adding 1 million bpd of imports would add further foreign exchange costs, after the offset provided by a stable market share, of $770-$1,310 million; reducing oil imports would reduce foreign exchange costs by a similar amount.

19. In Tables F-V and F-VI, we have calculated data for Western Europe and Japan to match those for the US. In each case, we calculated their export earnings from oil-related markets if their shares of these markets remained stable at 1971 levels. For the varia-

TABLE F–VI

ILLUSTRATIONS OF POTENTIAL IMPACT OF OIL TRANSACTIONS ON THE CURRENT ACCOUNT IN THE BALANCE OF PAYMENTS OF JAPAN IN 1980 [a] *

	1970 Actual (Billion 1970 Dollars)	1980 Potential (Billion 1973 Dollars)			
Price of Oil [b]	$2.14/ Bbl.	$3.00/ Bbl.	$3.41/ Bbl.	$3.82/ Bbl.	$4.64/ Bbl.
I. OIL TRANSACTIONS:					
Oil Imports, c.i.f.	−2.8	−12.0	−13.7	−15.3	−18.6
Less: Transport Charges [c]	0.8	2.4	2.4	2.4	2.4
Equals: Oil Imports, f.o.b.	−2.0	−9.6	−11.3	−12.9	−16.2
Less: Company Profit Remittances [e]	0.1	0.4	0.4	0.4	0.4
Equals: Direct Effect of Oil Transactions	−1.9	−9.2	−10.9	−12.5	−15.8
II. POTENTIAL ADDITIONAL JAPANESE EXPORTS TO OIL PRODUCING COUNTRIES GENERATED BY OIL REVENUES:					
Japanese Market Share [f]:					
1—Down 27–28% (US Share Up 25%)		1.9	2.1	2.4	2.9
2—Stable	0.7	2.6	3.0	3.4	4.0
3—Up 27–30% (US Share Down 25%)		3.3	3.8	4.3	5.1
III. RESULTANT EFFECT ON BALANCE OF PAYMENTS (Current Account) [g]:					
1—Smaller Market Share		−7.3	−8.8	−10.1	−12.9
2—Stable Market Share	−1.2	−6.6	−7.9	−9.1	−11.8
3—Expanded Market Share		−5.9	−7.1	−8.2	−10.7

*Footnotes correspond to those on Table IV, which appears on page 21 in the text.

tions, we assumed that Europe and Japan would share equally in that part of the market lost by the US or would lose equally if the US market share rose 25 percent.

20. Clearly, any number of tables can be constructed, using any number of alternative assumptions about price or market shares or carrying the investigation of trade flows into second and third stages. On the basis of Tables F-IV, F-V and F-VI, however, some generalizations can be made. The US is the only major consumer of oil that appears to have any prospect for maintaining a positive current account balance, *so far as oil transactions alone* are concerned, and that chance depends upon maintaining or improving its export performance in the oil producing countries as well as upon the price of oil. It also depends very much on the level of profit remittances—here assumed to be constant—which the US actually receives from the oil companies' foreign operations. But oil transactions themselves will be only a small factor in the overall US payments balance; a trade surplus from other goods could cover the oil deficit fairly readily. On the other hand, a trade deficit on other goods could be greatly aggravated by the oil account.

21. For Japan and Western Europe, oil will represent a sizable balance of payments outflow, which sales to oil countries will not offset. To pay for oil, the Europeans and Japanese will have to sell their goods elsewhere—to each other, to the US and to the world at large. Japan, in particular, will be challenged to new export efforts. Japan's bal-

ance on oil transactions in 1970 was a deficit of about $1 billion, which was very comfortably covered by Japan's overall export surplus. But the deficit on oil transactions in 1980 could run from $6 billion to $13 billion—sums that would be a burden even to an otherwise strong payments picture.

22. However, the markets of the oil producers will be important enough to make a very substantial difference to the industrial countries in general and to the Europeans in particular. European goods now capture almost half the oil-related market; if that position is maintained as the markets grow, and if oil prices do not escalate too sharply, Europe will still be confronted with an oil deficit, but not one of staggering proportions in relation to the overall European trade balance.

CENTRAL INTELLIGENCE AGENCY

DISSEMINATION NOTICE

1. This document was disseminated by the Central Intelligence Agency. This copy is for the information and use of the recipient and of persons under his jurisdiction on a need-to-know basis. Additional essential dissemination may be authorized by the following officials within their respective departments:

a. Director of Intelligence and Research, for the Department of State
b. Director, Defense Intelligence Agency, for the Office of the Secretary of Defense and the organization of the Joint Chiefs of Staff
c. Assistant Chief of Staff for Intelligence, Department of the Army, for the Department of the Army
d. Director of Naval Intelligence, for the Department of the Navy
e. Assistant Chief of Staff, Intelligence, USAF, for the Department of the Air Force
f. Director, Division of International Security Affairs, for the Atomic Energy Commission
g. Assistant Director, FBI, for the Federal Bureau of Investigation
h. Director of NSA, for the National Security Agency
i. Special Assistant to the Secretary of the Treasury, for the Department of the Treasury
j. Director of Central Reference Service, CIA, for any other Department or Agency

2. This document may be retained, or destroyed by burning in accordance with applicable security regulations, or returned to the Central Intelligence Agency by arrangement with the Central Reference Service, CIA.

3. When this document is disseminated overseas, the overseas recipients may retain it for a period not in excess of one year. At the end of this period, the document should either be destroyed, returned to the forwarding agency, or permission should be requested of the forwarding agency to retain it in accordance with IAC-D-69/2, 22 June 1953.

4. The title of this document when used separately from the text should be classified: OFFICIAL USE ONLY

CONFIDENTIAL

CONFIDENTIAL