

**A STRATEGY FOR OIL PROLIFERATION:
EXPEDITING PETROLEUM EXPLORATION AND PRODUCTION
IN NON-OPEC DEVELOPING COUNTRIES**

A Staff Working Paper

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PREFACE

This paper represents a quick response to several key questions asked by the Energy, Nuclear Proliferation and Federal Services subcommittee of the Senate Committee on Governmental Affairs. As such, the paper does not represent a comprehensive analysis of the issue of energy policy and has not undergone the review customarily done for published CBO papers. The paper's aim is only to provide basic background on the well-publicized strategy for oil proliferation.

The paper was prepared by Craig Roach of CBO's Natural Resources and Commerce Divisions. The author thanks Jane D'Arista and Hazel Denton of CBO's National Security Division for their valuable assistance. In keeping with the CBO's mandate to provide objective analysis, this paper makes no recommendations.

Alice M. Rivlin
Director

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SUMMARY

Since the embargo and oil price increase in 1974, U.S. energy policy has had one clear goal--to cut oil imports. By eliminating or at least decreasing imports, the nation should be able to diminish its vulnerability to interruptions in foreign supplies, narrow the balance-of-trade deficits caused by oil importation, and slow the depletion of the world's known petroleum resources. In recent months, however, policymakers have begun to realize that, while import reduction would obviously help to achieve these goals, it is not the only way. One group of alternative programs has been collectively termed the strategy for oil proliferation.

The strategy calls for U.S. involvement in petroleum exploration and production in developing nations that are not part of the Organization of Petroleum Exporting Countries (OPEC). If the strategy led to new production, the world's overall petroleum supply would be increased, and the fear of depletion would be assuaged; new competition might also slow OPEC price increases and thereby lower U.S. payments for imported oil. Furthermore, by purchasing oil from these new producers, the United States would diversify its import sources and thus might lessen its susceptibility to supply interruptions. Finally, if the country could tie these oil imports from new producers to exports of U.S. goods--particularly machinery and technology--the balance-of-trade deficits caused by oil importation would be minimized.

MOTIVATIONS FOR THE STRATEGY

Four motivations for the strategy can be cited. First, proponents believe the prospects for large increases in petroleum production are very good. Second, private multinational oil companies, private international banks, and host national governments cannot be counted on to invest enough to realize the full potential of new resources. Third, the strategy compares favorably to other energy policies. And finally, the United States must determine whether it will be squeezed out of a future international oil market by other nations.

The Prospects

Geologists appear to agree that there is a good chance for at least some increase in oil production from developing countries, perhaps from the present level of four million barrels per day to 10 million barrels per day in 1990. (CBO projects total non-communist world supply will be about 69 million barrels per day by 1990.) There is some chance, according to Bernardo Grossling of the U.S. Geological Service, that potential production is much higher. This range of estimates, with higher probabilities for lower production levels and vice versa, should be expected; such a range is bound to crop up in the risky business of petroleum exploration.

Restraints

The extent to which private investments in developing countries have been or will be restrained is unclear. Companies and/or national governments have to some degree explored for oil in most of the developing nations, and private international banks have financed petroleum-related investments in at least some of these countries. But exploration has not increased nearly as much as one might expect since oil prices quadrupled in 1974. The likelihood of finding at least some overlooked resources seems great. A program under which the United States searches for missed petroleum opportunities could be worthwhile.

Comparison with Other Energy Policies

It would make economic sense to exhaust opportunities in developing countries to produce oil profitably at \$15 to \$20 per barrel before investing domestically in the inevitably more expensive synthetic fuels. While such investments in developing nations would be more economical, the security of the supply of imported oil compared to the security of domestic alternatives such as synthetics remains a matter for debate. Furthermore, unless new oil imports can be tied to exports of U.S. goods and services, investing in exploration in developing countries would worsen balance-of-trade deficits for the United States and would further weaken the dollar. Domestic projects such as the production of synthetic fuels would not have this flaw.

Squeeze Out

As the U.S. government debates the need for its involvement, the governments of Japan and most Western European countries already appear to have begun their own strategies for oil proliferation. Add to these - unilateral policies the recently approved World Bank program, plus potential investments from the United Nations, the Asian Development Bank, and the OPEC Funds, and the chances for adequate oil exploration without U.S. participation in developing countries seem quite good.

Unfortunately, although this flood of investment funds may mark the end of a problem for the non-OPEC nations, it may herald the beginning of a problem for the United States. If unilateral policies were actively pursued, the United States could find itself in a world in which all oil production is marketed according to government-to-government contracts complete with barter deals. Furthermore, guaranteed loans from the World Bank and other sources can only damage further the competitive position of the international oil companies--the suppliers on which the United States depends. At present, there is no problem, but the topic warrants consideration, especially in light of the recent courting of Mexico by Japan, France, Britain, and Canada.

POLICY OPTIONS

There are three alternative policy responses to the evidence on prospects and constraints: laissez faire, unilateral action, and multinational action. Each is briefly discussed below.

Laissez Faire

Before proposing U.S. government involvement, one should judge whether the efforts of private companies, private banks, and host national governments have been adequate. The three groups should explore and develop areas that they believe can produce petroleum to sell for a fair profit at the expected world oil price. U.S. government action is warranted if this standard appears unlikely to be met or if another standard requiring a greater effort is judged more appropriate.

A key concern is the extent to which government involvement would supplant the international oil companies. Some observers argue that, despite a few problems, the companies provide the most efficient worldwide system for petroleum exploration, production, and marketing. According to

this rationale, subsidizing competition from national governments would be damaging.

Unilateral Action

The U.S. government could become directly involved with petroleum investments in developing nations; this is termed unilateral action. The alternative would be to become involved in cooperation with other developed nations through an institution such as the World Bank; this is termed multilateral action.

Specific unilateral policies would have to be dictated by the nature of the deterrents they are designed to overcome. For example, if political risk is the deterrent to private investment, then a program of political insurance, such as that offered by our Overseas Private Investment Corporation (OPIC), is appropriate. The options and reasons for choosing them are listed in the Summary Table.

Multilateral Action

Directors of the World Bank recently approved a Program to Accelerate Petroleum Production in the Developing Countries. Over the next five years, \$3 billion is expected to be lent for exploration and production in non-OPEC developing countries. The United States supports this program.

From the perspective of the United States, the difference between unilateral and multilateral aid is the number of so-called "import risks" confronted. Multilateral aid could increase the world's petroleum supply and thereby lessen the risk of depletion and provide competition for OPEC. But in addition to increasing world supply, unilateral aid could assure new production for the United States so that U.S. oil imports would be diversified; the risk of supply interruptions could thereby be diminished. Furthermore, if bilateral trade were established in conjunction with a unilateral U.S. program, the problem of balance-of-trade deficits could be diminished. In sum, unilateral aid seems to have a more direct effect on the United States than any multilateral aid. Multilateral aid, however, demonstrates a willingness to cooperate with the nation's allies and could avoid trouble with poorer nations wary of U.S. intentions.

SUMMARY TABLE. RATIONALES FOR AND DESCRIPTIONS OF UNILATERAL
POLICY OPTIONS

RATIONALE FOR POLICY PROPOSAL	DESCRIPTION OF POLICY PROPOSALS
<p>The first three rationales are based on the belief that there are prospects for petroleum production at the current world price, but those prospects will not be realized because of one or all of the following restraints.</p> <p>I. POLITICAL RISKS: Oil companies and private international banks will not invest because they fear political instability in the host country. In addition, one assumes the host country is too poor to generate sufficient investment funds.</p> <p>II. OIL COMPANY POLICY: Oil companies will not invest because they are trying to restrain supplies. In addition, one assumes private banks will not lend funds because they want company involvement, and the host country is too poor to generate sufficient funds.</p>	<p>Since these reserves can be economically produced at the world oil price, none of the first three proposals require concessionary finance.</p> <p>I. POLITICAL INSURANCE: Expansion of OPIC-type insurance.</p> <p>MEDIATION: Plan to assist in negotiating, but not insure, deals between the governments of developing countries and private companies or banks.</p> <p>II. FINANCE THE HOST GOVERNMENT'S NATIONAL OIL COMPANY: Equity investment or loans would be made to the national oil companies of the developing nations. All stages of petroleum exploration and production would be financed.</p> <p>ESTABLISH A U.S. NATIONAL OIL COMPANY: Such a company could finance and perform any or all of the following activities: lease land for exploration; perform predrilling exploration; undertake exploratory drilling; produce petroleum; or market the petroleum.</p>

(Continued)

SUMMARY TABLE. (Continued)

RATIONALE FOR POLICY PROPOSAL	DESCRIPTION OF POLICY PROPOSALS
<p>III. NATIONALISTIC STANCE: Governments of developing nations refuse to deal with the international companies and banks, but they are too poor to generate sufficient investment funds.</p>	<p>III. (Same as II)</p>
<p>The final two motivations are based on the belief that the private sector and developing nations are doing all that, by their standards, is adequate. But it is in the national interest of the United States to do more. Concessionary financial aid might be called for in both cases.</p>	
<p>IV. OIL TRADE WAR: The United States is put in a defensive position because all other industrialized nations have actively pursued unilateral policies. In this case, the United States could find itself in a world in which all oil production is marketed on long-term intergovernment contracts.</p>	<p>IV. COOPERATION: The U.S. would end the war by establishing a cooperative arrangement within Organization for Economic Cooperation and Development.</p> <p>WORK THROUGH U.S. OIL COMPANIES: Arrangements would be made between the United States government and U.S.-based oil companies to match the unilateral efforts of other nations. If concessionary aid is being given, the United States could give tax breaks to the companies.</p> <p>ESTABLISH A U.S. NATIONAL OIL COMPANY: (Same as above.)</p>

(Continued)

SUMMARY TABLE. (Continued)

RATIONALE FOR POLICY PROPOSAL	DESCRIPTION OF POLICY PROPOSALS
<p>V. EXTRA BENEFITS: From the perspective of the private sector, it is proper to consider the expected profit of oil sales as the value of increased oil production. But for the United States as a large oil importer, the value of increased production from non-OPEC nations can mean more; it can lessen any or all of the four risks. In addition, increased supply could slow the rate of OPEC price hikes and the pay-off would be reduced U.S. oil bills. <u>a/</u></p>	<p>V. FINANCE U.S. OIL COMPANIES: Induce accelerated exploration and investment through tax policies.</p> <p>FINANCE THE HOST GOVERNMENT'S NATIONAL OIL COMPANIES: (Same as above.)</p> <p>ESTABLISH U.S. NATIONAL OIL COMPANY: (Same as above.)</p>

a/ For economists, all this discussion comes under the title of externalities: benefits that could accrue to a group (all U.S. citizens) are not realizable by an individual decisionmaker (private companies and banks) and therefore not properly considered in private investment decisions. The final external benefit, lower fuel bills, would be termed a "pecuniary externality" and many economists would not consider it a proper motivation for public involvement; it would be similar to subsidizing Ford to compete with Chrysler so prices would be lower.

CHAPTER I. INTRODUCTION

Since the oil embargo of 1974, all U.S. energy policy proposals have been judged in terms of their contribution to mitigating the risks in depending heavily on oil imports. Those risks include the following:

- o Physical depletion of the world's petroleum resources available to the United States,
- o Interruption of supply to the United States for political, logistical, or other reasons not related to depletion,
- o Erosion of the dollar in foreign markets because of U.S. dependency on oil imports, and
- o Imposition of constraints on U.S. foreign policy arising from the politics of oil.

Obviously, these risks can be diminished if oil imports are eliminated or at least cut back. For this reason, all U.S. energy policy in the last five years has had import reduction as its primary goal. In recent months, however, policymakers have realized that import reduction is not the only way to avoid the risks. Some alternative proposals, considered as a package, have been termed the strategy for oil proliferation.

The strategy calls for U.S. involvement in petroleum exploration and production in developing countries that are not part of the Organization of Petroleum Exporting Countries (OPEC) cartel. If the strategy led to new petroleum production, the world's oil and natural gas supply would be increased and the fear of depletion would diminish. The competition might also slow OPEC price increases and thereby lower the amount the United States spends on imported oil. Furthermore, by purchasing oil from these new areas, the United States would diversify its sources and thus might lessen its susceptibility to supply interruptions such as the halt in oil imports from Iran. Finally, if the United States could tie oil imports from the hypothetical producers in developing nations to exports of U.S.-made machinery and technology, the balance of trade deficits caused by oil imports would be minimized. Such an import-export tie can be termed trade bilateralism, countertrade, barter, or something similar.

In the following chapters of this paper, five key questions related to the oil proliferation strategy will be discussed:

- o What are the prospects for increased oil and gas production in non-OPEC developing countries?
- o What are the restraints to adequate exploitation of prospects by the private sector or the host government?
- o What government programs already provide funds for such investments?
- o What are the pros and cons of the strategy in general?
- o What specific alternative policies could be adopted?

CHAPTER II. PROSPECTS FOR OIL PRODUCTION-- COMPETING VIEWS

All observers agree there is some potential for increased oil production in developing countries. But differences of opinion arise over how much potential there is and whether current exploration and development activities are adequate to realize whatever potential exists. Unfortunately, the evidence is scattered and, since it deals with the inherent uncertainty of petroleum exploration, a final answer is difficult to reach. The state of knowledge on this topic is summarized in the following three analyses.

THE GEOLOGICAL ANALYSES OF BERNARDO GROSSLING

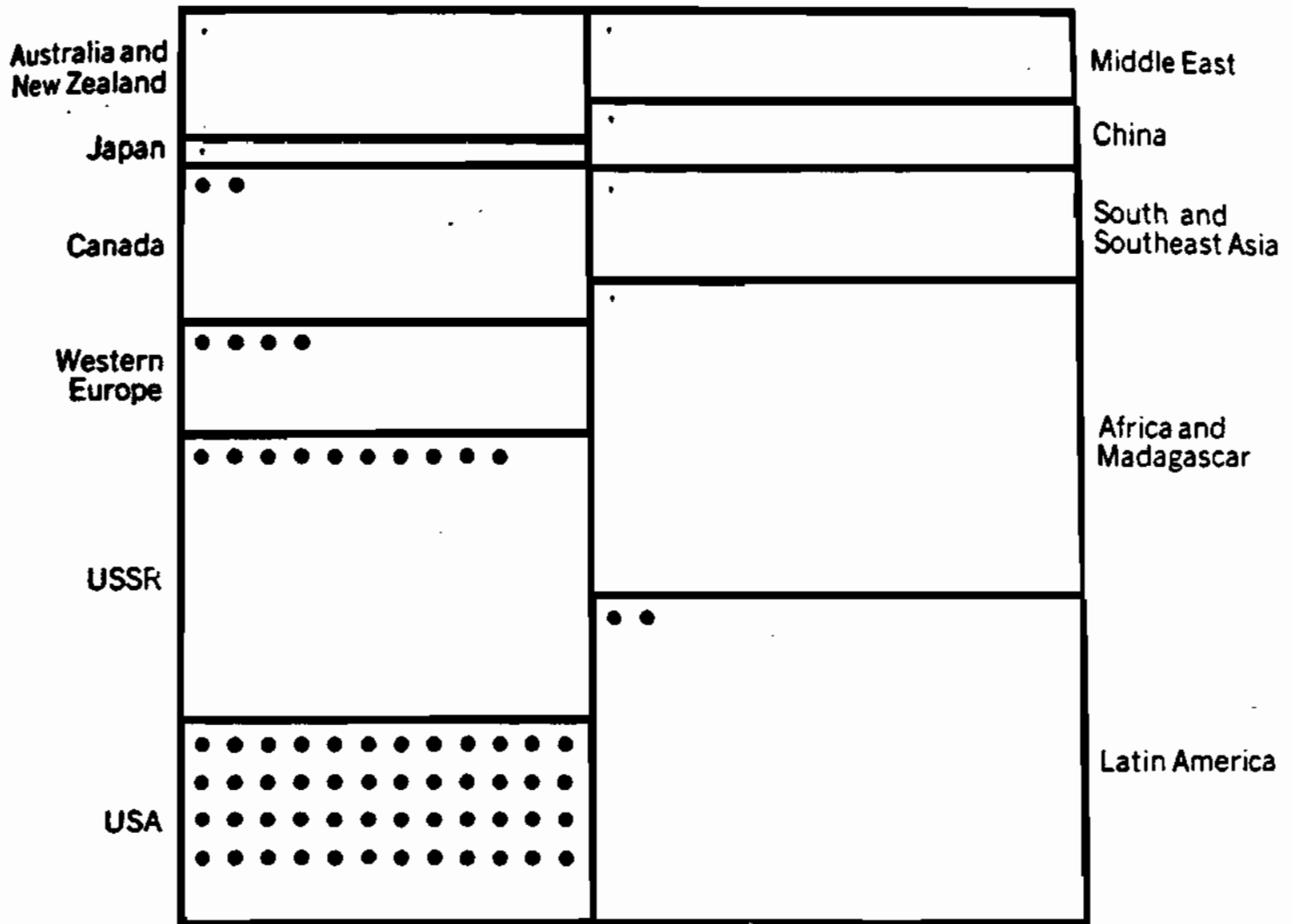
The analyses of Bernardo Grossling of the U.S. Geological Survey are often cited by people who claim that large, prospective petroleum-producing areas have been neglected. In a series of publications that began in 1974, Grossling has argued that large, prospective areas in Latin America and Africa have been inadequately explored. His analysis is best summarized by Figure L. The rectangles represent, to scale, his estimates of prospective petroleum-producing areas in various regions. Each full dot corresponds to 50,000 wells drilled for exploration or production; partial dots mean less than 50,000 wells have been drilled. The diagram, according to Grossling, reveals what he calls a "drilling gap." According to Grossling, "only 23 percent of all drilling for petroleum in the world has been done in countries other than the United States." ^{1/} Considering exploratory wells only, Grossling concludes ". . . in the developing countries, which account for about one half of the world's prospective area, only about 4.3 percent of the world's exploratory drilling has taken place." ^{2/}

Some perspective on the importance of the alleged drilling gap can be gained by comparing Grossling's estimate of ultimate world oil recovery and

^{1/} See Hearings before the Subcommittee on Energy, Joint Economic Committee, March 8, 9, and 21, 1978, p. 141.

^{2/} See Congressional Research Service, Project Interdependence: U.S. and World Energy Outlook Through 1990, Chapter XX (November, 1977), p. 651.

FIGURE 1. BERNARDO GROSSLING'S "WINDOW ON OIL"



SOURCE: Bernardo Grossling, "The Petroleum Exploration Challenge with Respect to Developing Countries," in R.F. Meyer, ed. The Future Supply of Nature-Made Petroleum and Gas: Technical Report (Pergamon Press, 1977).

similar estimates made by other analysts. Table 1 displays a variety of such estimates--mostly from oil companies--which tend toward 2 trillion barrels. Grossling's range for ultimate recovery of crude oil is between 2.6 and 6.5 trillion barrels. One point may be important in explaining the difference among estimates. The prevailing notion is that the best fields are always the first found, and that subsequent discoveries will always yield less oil for equivalent area explored. Grossling holds that this need not be the case; indeed, the opposite may be true. The obvious implication of Grossling's view is that the opportunity for great amounts of petroleum production is being missed.

Why is there a drilling gap? Grossling attributes the gap in Latin America, for example, to two factors. First, several countries take what he calls a "nationalistic stance" on natural resources so that "most of them have either prevented completely or restricted the access of foreign oil companies . . ." ^{3/} Second, countries may have ignored petroleum because "they have been able to rely on exports of other commodities to finance their economic development." ^{4/} In Africa and Southeast Asia, political instability has obviously been a deterrent to exploration. Also important, says Grossling, are the low world oil price and the lack of technology for offshore development.

EXXON'S VIEW

The Exxon corporation would agree that perhaps a third of the world's 600 so-called "petroleum basins" remain unexplored. In most cases, the reasons Exxon cites for this neglect, however, differ from Grossling's. Exxon's rationale is that these basins are in harsh environments, such as deep offshore or remote onshore locations, and exploration would be very expensive or, perhaps, technically impossible. ^{5/}

^{3/} Ibid. p. 655.

^{4/} Ibid. p. 655.

^{5/} This section is based on a briefing paper by the Exxon Corporation, "Exploration in Developing Countries," (June, 1978). It must be noted that Grossling and others like Exxon are not always referring to the same geographic area. For example, Grossling does not include in his analysis the polar regions or very deep offshore areas while Exxon probably does. A reconciliation of definitions was not possible.

TABLE 1. RECENT ESTIMATES OF ULTIMATE WORLDWIDE CRUDE OIL RECOVERY

Date of Estimate	Estimator	Organization	Billions of of Barrels
1962	L. G. Weeks	Consultant	2,000
1965	T. A. Hendricks	United States Geological Survey <u>a/</u>	2,480
1967	W. P. Ryman	Esso (Exxon) Corporation	2,090
1968	-	Shell Oil Company	1,800
1969	M. King Hubbert	National Academy of Sciences	1,350 to 2,100
1969	L. G. Weeks	Consultant	2,200
1970	J. D. Moody	Mobil Oil Company	1,800
1971	H. R. Warman	British Petroleum	1,200 to 2,000
1972	J. D. Moody and H. H. Emmerick	Mobil Oil Company	1,800 to 1,900
1972	Richard L. Jodry	Sun	1,952
1975	J. D. Moody and R. W. Esser	Mobil	2,030
1975	Not Available	Exxon Corporation <u>a/</u>	1,945
1977	M. King Hubbert	Congressional Research Service	2,000 <u>a/</u>

SOURCE: Petroleum Industry Research Foundation, The Outlook for World Oil Into the 21st Century with Emphasis on the Period to 1990 (May, 1978), p. 4-4.

a/ As reported by Oil & Gas Journal, May 26, 1975.

In addition, Exxon is not as optimistic as Grossling about prospects in areas that are only partially explored, since it adheres to the generally accepted notion of declining productivity. In other words, even if drilling in developing countries was as extensive as that in the United States, a lesser amount of oil would be found. Exxon also implies that the new oil would be very expensive since the cost of exploring for and then developing the capacity to produce a barrel of oil can be ten times greater in parts of Africa and Latin America than in the Middle East.

Exxon also seems to hold a different view of the role of drilling. For them, drilling is done after oil is found; it is at best a second stage of exploration. For other seekers, however, oil has to be seen to be believed and drilling is therefore essential for exploration. If Exxon's position is correct, a drilling gap needn't imply an exploration gap.

In July 1978, Exxon presented data on exploration that contradict the impression of neglect. Several points were made:

- o Of the 113 developing countries, 71 saw exploratory wells during the decade 1967-1976. Another 19 had predrilling explorations, and 23 were not explored because most were small islands.
- o Of the 71 developing countries, 16 found oil before 1967, and, therefore, 5,416 exploratory wells were drilled; 25 had encouraging drilling results from 851 wells; and 30 countries had no encouragement from 234 wells.
- o With this pace of exploration and cooperation from local governments, oil production in non-OPEC developing countries could increase from 4 million barrels per day in 1976 to 10 million barrels per day by 1990.

GIANT OIL FIELDS AND WORLD OIL RESOURCES: A REPORT FROM RICHARD NEHRING

Pessimism about prospects can also be based on a report by Richard Nehring of the Rand Corporation. 6/ In the report, Nehring argues that past increases in world oil reserves have depended primarily on the discovery of "giant fields"--that is, fields containing at least 500 million barrels of

6/ Giant Oil Fields and World Oil Resources (Prepared for the U.S. Central Intelligence Agency, June 1978), p. 54.

known recoverable petroleum. Today, such fields account for three-fourths of the world's known reserves and are located in only a few countries. Nehring's discouragement about future discoveries of giant fields implies pessimism, or at least less optimism than Grossling's, about future production in the unexplored or partially explored areas in developing countries.

Nehring agrees with Grossling that there are unexplored regions in the world. Of the 400 oil-bearing areas in the world, 275 have been at least somewhat explored. The other 125 have been bypassed, in large part, because they are in the harsh environments of the polar regions or in deep ocean basins.

What about the future of moderately explored areas? As noted, this depends on the prospects for discovering giant fields. Nehring believes one's estimate of future finds depends on whether or not one subscribes to the theory that the best sources were the ones first found. Nehring expresses the problem as follows:

A key question in this debate is whether modern petroleum exploration is an efficient process. If past exploration is assumed by the estimator to have been efficient, whether this assumption is made explicitly or implicitly, the prospects for future discoveries of significant amounts of oil in provinces that have been moderately to extensively explored are generally considered to be slight, and the resulting estimates of ultimate recoverable resources are likely to be pessimistic as well. If exploration is assumed to have been inefficient, significant future discoveries within most of the known producing provinces are still a real possibility and estimates of future discoveries can be optimistic.

Nehring believes the evidence supports the claim of efficiency. That is, giant fields are found quickly. "A well designed exploratory program," Nehring writes, "is likely to result in the discovery of 90% to 100% of the giant fields in any given province with the drilling of no more than 25 to 200 new-field exploratory wells." 7/ An issue worth further study is whether the amount of drilling Mr. Grossling finds inadequate is actually sufficient to determine the presence of important oil sources.

7/ Ibid. p. 54.

One can easily imagine why private international oil companies, private international banks, and the governments of developing nations are reluctant to invest in exploration for oil. A review of these deterrents is important, since it could explain why there might have been a "drilling gap" in the past. Furthermore, such a study could be the basis for a decision on whether petroleum prospects will be adequately exploited in the future. A brief discussion of possible restraints in the past and in the future follows.

WORLD PRICE OF OIL

Before 1973, the world price of oil probably did not justify exploring for and producing petroleum in many countries. For this reason, the concentration of effort in the giant, low-production-cost fields of the Middle East and in U.S. fields, which were protected by tariffs, should come as no surprise. The quadrupling of oil prices in 1973 drastically changed the economics of petroleum, however. The higher prices should stimulate a commensurate increase in production and exploration. Tables 2 and 3 display two rough indicators of the response. Table 2 lists production increases in non-OPEC developing countries for the period 1972-1978. With a few important exceptions, notably Mexico, a dramatic production response is not revealed. Table 3 displays one measure of exploratory effort in selected developing countries. The countries were selected because Grossling's estimates show they have large prospective petroleum producing areas. Once again, no dramatic increase is seen. After reviewing similar data other authors have also noted this lack of response (for example see Michel T. Halbouty, "Acceleration in Global Exploration--Requirement for Survival" The American Association of Petroleum Geologists Bulletin, May 1978, p. 739).

Although these general statistics reveal little response, anecdotal evidence suggests that at least some new exploration is slowly getting underway. The evidence includes the following items.

- o Mexico recently let the world know it had large oil resources; their reserve estimates seem to double every six months. PEMEX, the national oil company, plans to produce 2.3 millions of barrels per day by 1982 and most agree this is a very conservative

TABLE 2. OIL PRODUCTION IN NON-OPEC DEVELOPING COUNTRIES,
1972 AND 1978: IN THOUSANDS OF BARRELS PER DAY

Countries by Region	1972 Production	1978 Production	Percentage Change
Latin America			
Argentina	435.0	450.0	3
Barbados		0.7	
Bolivia	32.0	30.0	-6
Brazil	167.0	160.0	-4
Chile	32.5	20.0	-38
Colombia	192.0	130.0	-32
Guatemala		0.7	
Mexico	440.0	1,270.0	189
Peru	60.2	150.0	149
Trinidad and Tobago	143.0	240.0	68
Africa			
Angola	135.0	130.0	-4
Cameroon		10.0	
Congo	7.5	28.0	273
Egypt	227.0	490.0	116
Morocco	0.3	0.1	-67
Tunisia	80.0	100.0	25
Zaire		20.0	
Middle East			
Bahrain	72.0	56.0	-22
Israel	120.0	10.0	
Oman	280.0	320.0	14
Syria	120.0	170.0	42
Turkey	65.0	50.0	-23
Far East			
Burma	20.0	25.0	25
Brunei-Malaysia	278.0	420.0	51
India	151.0	230.0	52
New Zealand	2.7	13.0	381
Pakistan	9.5	9.3	-2
Thailand	0.2	0.2	
Total	3,070	4,533	48

SOURCE: Oil and Gas Journal: Worldwide Report (December 1973 and December 1978).

TABLE 3. EXPLORATORY WELLS COMPLETED IN SELECTED DEVELOPING COUNTRIES, 1968 TO 1977

Countries by Region	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977
Latin America										
Argentina	85	86	113	145	110	139	117	78	83	143
Bolivia	28	15	10	4	8	4	7	7	16	14
Brazil	115	86	100	87	80	78	86	87	105	100
Colombia	21	30	16	17	20	20	24	14	—	27
Mexico	115	134	130	129	143	NA	NA	NA	79	79
Peru	36	38	28	21	25	31	43	43	—	37
Africa										
Congo	—	1	3	2	7	4	6	NA	—	—
Egypt	—	—	—	22	26	15	12	20	34	30
Zaire	—	—	—	1	6	5	—	NA	2	1

SOURCES: Bulletin of the American Association of Petroleum Geologists and Oil and Gas Journal.

target. In the last year many Western governments have come to court the Mexicans and it appears the country can now get all the investment capital it wants.

- o Brazil's state oil company, Petrobras, has negotiated a wave of lease agreements with foreign companies for offshore exploration. By opening its doors to foreigners, Brazil has increased its chances for significant production increases.
- o Argentina recently approved a new system of risk sharing designed to attract both foreign and domestic private investors; the national oil company, Yacimientos Petroleros Fiscales, previously had a monopoly. Leases were open for bid in late 1977.

OIL COMPANY POLICIES

Transnational companies still play a major role in the international oil market. They are involved in the production, refining, and marketing of a large portion of the world's oil. Some observers argue that for at least two reasons the companies might deliberately ignore prospects in developing countries. First, by restraining supplies prices are kept high. The companies have made expensive investments assuming a continued, high world oil price; an abrupt discovery and supply increase might drive the price down and in the short run make these investments unprofitable. Second, the companies see their future as marketers for OPEC and do not want to jeopardize their status by negotiating with potential competitors.

CONDITIONS IN DEVELOPING COUNTRIES

Conditions in developing countries will affect the timing and intensity of oil exploration and development. Two points indicate that the prospects for increased oil production are good, since the deterrents to investment are severe. First, many of these countries are very poor and therefore generate little savings to finance investment; indeed, they may be dependent on external sources for all their capital needs. In developing nations with little capital, good energy investments could easily have gone unfinanced because they have lower priority relative to investments in basic needs such as agriculture. Second, some developing countries--those in Africa especially--have been politically unstable; this would of course preclude exploration as well as the involvement of foreign companies and banks.

Two other points must be raised here because they give some perspective on how much of any new production would be available for

export and how much the new oil will cost. First, much of the oil produced in developing countries might be consumed by their own burgeoning industries and so forth, instead of being exported. Indeed, oil use in developing countries might abide by Say's Law--oil supply begets oil demand. The constraint on internal consumption is a country's foreign exchange needs. Second, developing countries often have inadequate physical infrastructure (roads, buildings, and so forth) to handle significant exports. Oil exploration and development will be more expensive and may result in prices above the current world level.

Despite these conditions, the developing countries seem to have some access to the international financial markets. In the year ending June 1978, \$8.6 billion--9.8 percent of all Eurocurrency term credits and bonds--was lent for petroleum and natural gas projects. ^{1/} Table 4 outlines the distribution of lending by groups of countries and types of borrowers. A review of these loans revealed the following:

- o About one-half of all the loans were taken by industrialized and European countries; a significant portion was used to develop the North Sea fields. Private oil companies are the major borrowers here, but the role of state companies is still significant in countries such as Italy, Spain, New Zealand, Finland, and Yugoslavia.
- o Non-OPEC developing countries borrowed about 30 percent of all such loans. Loans to Mexico account for about 57 percent of this sum. Argentina was the only other country with substantial borrowing, but loans or bonds of about \$50 million each were arranged with Bolivia, Chile, Congo, India, Bahrain, Tunisia, Brazil, and other countries. Almost all the loans were to public sector borrowers.
- o After the industrialized and non-OPEC developing nations, OPEC countries accounted for the remaining 20 percent of the loans.

^{1/} The term Eurocurrency refers to a currency lent by (or deposited in) a bank outside the country of its origin.

TABLE 4. DISTRIBUTION OF BORROWING IN INTERNATIONAL CAPITAL MARKETS FOR PETROLEUM AND NATURAL GAS: IN MILLIONS OF DOLLARS a/

Countries by Type	Amount Borrowed	Private Borrowers	Public Borrowers
Developed and European	4,403.6	3,087.0	1,316.6
Developing	2,509.2	61.5	2,447.7
OPEC	<u>1,711.1</u>	<u>375.0</u>	<u>1,336.1</u>
Total	8,623.9	3,523.5	5,100.4

SOURCE: World Bank data.

a/ Covers the period 1977, third quarter, through 1978, second quarter.

CHAPTER IV. EXISTING GOVERNMENT PROGRAMS

Developing nations can obtain petroleum investment funds from several public institutions. In considering new programs, it is important to determine whether these existing, public sources of funds can adequately compensate for any shortfall of investment in the private sector or the nations where exploration is being carried on. Four general groups of institutions will be discussed here: the international development banks, the national oil companies of Western Europe and Japan, OPEC development funds, and U.S. agencies.

INTERNATIONAL DEVELOPMENT BANKS

With one possible but important exception--the World Bank--the international development banks appear unprepared to finance oil exploration in non-OPEC developing countries. ^{1/} In general, the opinion is that such activities belong to the private sector. The energy investments of these banks focus on electrical generation and, in recent times, the development of renewable fuel sources such as solar energy.

The Asian Development Bank (ADB) offers an example. Backed largely by Japan, the ADB recently began a program to assist developing nations in mineral exploitation. Funding levels could reach \$140 million per year by 1981. Planned are three types of projects: technical assistance loans or grants for resource surveys of non-fuel minerals and coal; so-called "seed capital" for production of non-fuel minerals and coal; and loans for rehabilitation or expansion of existing production and marketing of oil and

^{1/} The views of the banks were expressed to CBO through unofficial channels. Included in discussions were Inter-American Development Bank, African Development Bank, Asian Development Bank, and the International Bank for Reconstruction and Development (usually called the World Bank). Only the World Bank program will be discussed in detail. However, now that the World Bank has abruptly gotten involved with oil and gas projects, other banks may follow suit; a likely candidate is the Asian Development bank. The United Nations might also become involved.

gas. The ADB does not foresee a role in "high-risk, high-cost petroleum exploration." 2/

The United Nations recently received a report from a group of mineral and energy experts appointed in 1977. The group concluded that exploration in developing countries "can be expected to produce substantial resource discoveries" of energy-producing and other minerals. Furthermore, the group urged that consideration be given to the creation of a \$500 million revolving fund to finance petroleum exploration in oil-importing developing countries. 3/

Of all the development banks, the World Bank has expressed the most interest in financing an oil proliferation policy. In mid-January 1979 its directors accepted "A Program to Accelerate Petroleum Production in the Developing Countries." Table 5 displays the proposed amounts of loans for the five-year period. These loans can finance only a portion of the \$6.8 billion the bank expects developing countries to need each year for petroleum exploration and development.

The World Bank proposal actually represents an expansion of an effort begun in 1977. Under the earlier program, 22 projects were to be financed for \$930 million dollars over a three-year period. All of the projects financed production with more than half for the development of known but previously unexploited reserves of natural gas. Five projects had already been announced in Pakistan, India, Thailand, Turkey, and Zaire. 4/ The new program will fund a greater number of production projects, and in what is considered a controversial move, the World Bank will begin to support the risky business of exploratory drilling.

Implicit in the proposal is the bank's judgment that petroleum exploration and production in developing countries has been inadequate. Their explanation seems to be that, before 1973, the price of oil simply did not justify such actions. Even now, it is not in the interest of the oil companies

2/ Asian Development Bank, Quarterly Review, October, 1978.

3/ Report of the Secretary-General, Multilateral Development Assistance for the Exploration of Natural Resources, October 16, 1978.

4/ This includes projects of the International Finance Corporation, an affiliate of the bank.

TABLE 5. OIL AND GAS LOAN PROGRAM PROPOSED BY THE WORLD BANK, FISCAL YEARS 1979 TO 1983: IN MILLIONS OF 1978 DOLLARS

Stage of Petroleum Development	1979	1980	1981	1982	1983	Five-Year Total
Geological and Geophysical Surveys	3	10	20	25	25	83
Exploratory Drilling	—	60	100	130	160	450
Appraisal Drilling	—	45	90	135	190	460
Production	<u>138</u>	<u>432</u>	<u>450</u>	<u>500</u>	<u>550</u>	<u>2,070</u>
Total	141	547	660	790	925	3,063

to develop the typically small fields in developing nations. Consistent with their mandate, the bank's goal is to help poor countries cut the burden of high-priced oil imports. The production effects of the program are not projected to be surprising by 1985; as a group, the developing countries continue to be net importers although their production increases by almost 5 million barrels per day over the 1975 level, from 3.6 to 8.4 million barrels per day.

The World Bank identified countries with the best prospects. The group listed here includes those judged to have considerable resources or better, although exploration activities had been moderate or almost nil. The 16 countries are: Afghanistan, Argentina, Bangladesh, Colombia, Congo, Guatemala, India, Lebanon, Peru, Philippines, Sudan, Syria, Turkey, Vietnam, Yemen People's Democratic Republic, and Zaire.

UNILATERAL ACTION--WESTERN EUROPE AND JAPAN

A country can finance or encourage petroleum investments in other nations through a number of public institutions. The alternatives include foreign aid agencies, export-import banks, departments that administer tax breaks for overseas operations of private companies, and state-owned companies. This section deals only with national oil companies.

Both oil-exporting and oil-importing countries have national oil corporations. The rise of such companies in major exporting nations, at the expense of the multinational corporations, is of course a significant development in the international petroleum market. The small but growing role of national companies from the consumer nations, however, is also of interest for at least two reasons. First, such companies might invest in countries where private groups are not allowed or under conditions private groups would not accept. Second, such companies might enter contracts that guarantee oil supplies for their home states and initiate deals whereby these oil imports are tied to exports of goods and services. (So-called trade bilateralism, countertrade, barter, and so forth).

Japan and most Western European nations have national oil companies, but no two are alike. Unfortunately, information about whether they are subsidized or whether they engage in trade is incomplete. The following discussion of the Japanese and French companies gives some perspective on the range of national company policies.

Japan

The Japanese National Oil Company (JNOC), formerly the Japan Petroleum Development Corporation, has an extensive program for unilateral action. JNOC is wholly owned by the government and is designed to assist Japanese corporations in oil exploration, and in production both at home and abroad. There are six principal forms of aid:

- o Equity investments in exploration ventures overseas or in Japan's continental shelf;
- o Loans to companies for oil or gas exploration overseas or on the shelf; interest rates have been around 6 to 7 percent. Debts are usually forgiven if the venture is not successful;
- o Guarantees of the obligations of companies engaged in exploration and development overseas;
- o Tax deferrals or exemptions for overseas operations;
- o Equipment leasing for exploration; and
- o Geological and geophysical surveys, both for associated companies and on commission from the government and industry.

The JNOC deals not only with Japanese companies but with foreign governments or their national oil corporations. Since JNOC's start in 1967, it has made equity investments of \$744 million and direct loans of \$742 million; 92 percent of this nearly \$1.5 billion went for activity overseas. In 1977, total obligations guaranteed by JNOC were \$1.05 billion. The assistance was given with two conditions: that the equipment used in exploration or development was to be purchased from Japanese companies; and, if oil was found, a certain portion of production was to be guaranteed for Japan. A wide range of countries seem to be involved with JNOC. They include Abu Dhabi, Indonesia, Iraq, Saudi Arabia, and Zaire.

Two Japanese oil deals were well publicized last year. The first was with China. Japan agreed to import Chinese crude oil through 1985. The amount is to increase from about 0.1 million barrels a day the first year to 1 million barrels a day in 1985. Japan will finance development and thereby assure sales for its petroleum equipment industry. Involvement of JNOC is especially important here because special refinery equipment is required for the heavy, waxy Chinese crude oil and no private company would invest if the supply were not officially secured.

The second JNOC deal was with Mexico. Japan agreed to finance the construction of a crude oil pipeline to and an oil-terminal on Mexico's Pacific coast. The oil transported through this system would obviously be exported to Japan.

France

Societe Nationale ELF Aquitaine (SNEA) is the French National Oil Company; it is 70 percent held by a government agency. In addition, the French government is part owner of other companies such as Compagnie Francaise des Petroles (CFP). The SNEA seems to view the French government only as an important shareholder--that is, the government does not completely control or subsidize the company.

The status of SNEA implies certain conditions: the government demands and accepts dividends from the company; no low interest loans are given; tax regulations for SNEA are the same as for all private French corporations; and SNEA is free to buy equipment from, and sell its oil to, any nation. Although SNEA might play a prescribed role in a bilateral trade deal, such arrangements are negotiated elsewhere in the French government. France is apparently negotiating goods-for-oil, barter deals with Mexico and Nigeria. SNEA is very active around the world. It has exploratory interests in Brazil, Cameroon, Colombia, Congo, Gabon, Guatemala, Tunisia, and other countries.

Other Nations

As noted above almost all developed nations have a state oil corporation. The British government owns a large share of British Petroleum, one of the world's major oil companies, and also owns the British National Oil Company, which focuses on oil development in the North Sea. Italy's state-owned company is Ente Nazionale Idrocarburi (ENI). The Italians apparently expect ENI to become a more important supplier and, according to their national energy plans, hope to find countries willing to exchange crude oil for Italian goods and services. Germany owns a large share of Deminex, a worldwide exploration group. Norway sponsors Statoil and several other nations also finance petroleum corporations.

OPEC DEVELOPMENT FUNDS

Many developing nations have trouble financing trade deficits resulting, in part, from the price increase of 1973 oil. As a vehicle for recycling

petrodollars to these nations, members of OPEC established several development funds. ^{5/} So far, these funds have not financed many petroleum exploration or development projects. The loans have gone toward very basic development projects such as road construction, cement production, water and sewage treatment, and electric power production. Interest rates are often just one or two percent; substantial grace periods are given; and loans are long term.

Why petroleum investments have not been financed is not known. But a shift in focus toward petroleum projects could make a dramatic difference in developing nations, since the amount of money involved is substantial and the terms are concessionary. Some examples follow:

- o The Abu Dhabi Fund for Economic Development lent \$170 million in 1976, and another \$310 million is being negotiated. Interest rates are 3 to 5 percent, grace periods are three to six years, and the time period is ten to 20 years.
- o The Kuwait Fund for Economic Development lent about \$550 million in fiscal year 1976. Interest rates were 0.5 to 4 percent.
- o The Saudi Arabian Fund for Development authorized grants and loans totaling \$2 billion in 1977-1978.

UNILATERAL ACTION--THE UNITED STATES

The United States can aid developing countries directly through several organizations. Three are discussed here: the Export-Import Bank, the Agency for International Development (AID), and the Overseas Private Investment Corporation (OPIC).

Export-Import Bank

The Eximbank facilitates exports between U.S. sellers and foreign buyers. It does this in several ways:

- o It borrows from the U.S. Treasury and/or the private market to provide "direct" loans to foreign purchasers. When the Eximbank extends a direct loan, the money is paid to the U.S. exporter, and the foreign buyer signs a note to repay the bank.

^{5/} The only central review of these funds available at the time was presented in Hossein Askari and John Thomas Cummings, Oil, OECD, and the Third World: A Vicious Triangle (University of Texas, 1978).

- o It extends "discount" loans, which are advance commitments to lend against or acquire export debt obligations held by commercial banks when and if the banks need cash.
- o It guarantees loans to foreign purchasers by commercial banks, and it extends credit insurance. Financial guarantees assure commercial banks repayment of export loans. Credit insurance protects U.S. exporters against political and commercial risks.

The Eximbank has used all three of its financial tools for energy-related commodities. Table 6 displays active projects as of October 1978, involving oil and gas drilling equipment. The authorized amount represents the portion of the export commodity value covered by the bank. A very wide range of countries is involved: Argentina is named in 108 of the 364 authorizations; Israel and Algeria each have about 30; Mexico and Norway each have 22; the United Kingdom has 19; 48 other countries each are involved in between one and ten authorizations.

TABLE 6: OUTSTANDING EXIMBANK AUTHORIZATIONS FOR OIL AND GAS DRILLING EQUIPMENT: AS OF OCTOBER 1978; IN MILLIONS OF CURRENT DOLLARS

	Export Value	Authorized Amount
Direct Loans	838.6	352.5
Cooperative Financing Facility and Relending Loans	20.6	9.5
Discount Loans	224.3	165.2
All Guarantees and Insurance	<u>196.9</u>	<u>135.0</u>
Total	1,280.4	662.2

SOURCE: Eximbank.

Eximbank loans and insurance are not free. Interest and premiums are paid. In cases in which a competing foreign exporter is being subsidized by its home nation, the Eximbank can lower its rates to meet that competition.

The Eximbank has the potential to engage in what is termed trade bilateralism. The organization could first encourage exploration by financing the necessary equipment purchases in the developing nations. That equipment, of course, would be sold by U.S. manufacturers. If oil were found, the bank could then finance sales of U.S. production equipment and accept as repayment of their funds a portion of the crude oil produced.

The Agency for International Development

Direct U.S. aid to developing countries is channeled through AID. The agency, at the Congress' request, is expanding its energy program. AID probably will not get involved with petroleum, however, since the Congress directed that "... emphasis be given to renewable and nonconventional energy resources..."

Overseas Private Investment Corporation

In testimony before the Joint Economic Committee in March 1978, Secretary James Schlesinger of the Department of Energy spoke concerning OPIC involvement:

OPIC has recently initiated a new policy to offer political risk insurance for investment in the exploration, development, and production of oil and gas in non-OPEC developing countries. Two contracts have already been signed covering investment in oil exploration in Jordan and Ghana. OPIC is currently considering applications for investment in several other countries.

The administration supports this new policy and believes that the availability of this insurance may provide a necessary incentive for investment by smaller U.S. companies in high risk areas. We continue to move cautiously into this sphere gathering experience from which to evaluate the policy's impact on oil discoveries in marginal LDC (less-developed country) areas. The comparative energy and economic benefits of this investment compared to alternative domestic investments are not obvious. They will depend greatly on

future developments in world oil prices and in the political climate in non-OPEC developing countries. We would therefore not recommend any move to change the present guidelines that OPIC's maximum exposure in this area should be limited to 20 percent of its portfolio. 6/

6/ Hearings before the Subcommittee on Energy, Joint Economic Committee, March 1978, p. 127.

CHAPTER V. THE STRATEGY FOR OIL PROLIFERATION: PROS AND CONS

For five reasons, the strategy for oil proliferation clearly deserves serious consideration. First, a good chance exists for moderately increased petroleum production in the non-OPEC developing countries. Second, there will be deterrents to adequate investment in at least some countries by private companies, private banks, and national governments. Third, the United States can, through an intelligently administered program, benefit from increased production in developing countries. Fourth, it would make economic sense to exhaust opportunities to produce oil profitably at \$15 to \$20 per barrel in developing countries before investing in what would inevitably be more expensive synthetic fuels within the U.S. And finally, because Japan and Western European governments appear to have the capacity for active worldwide involvement, the United States must determine whether it will be "squeezed out" of a future international oil market in which all oil production is marketed on government-to-government contracts complete with barter deals.

As the oil proliferation strategy is debated, at least two arguments against it must be raised. First, direct government involvement would preempt U.S.-based international oil companies. These firms could provide the most efficient worldwide system for exploration, production, and marketing. If this is so, it would be damaging to subsidize competition. Second, although oil from developing nations might be cheaper than synthetic oil, it cannot be considered as secure a supply and it cannot be imported without worsening the U.S. balance of trade.

These general pros and cons are discussed further in the following pages.

The Prospects

Geologists appear to agree that there is a good chance for a moderate increase in oil production perhaps from the current level of 4 MMBD to 10 MMBD in 1990. (Total non-communist, world supply should be 72 MMBD by 1990.) There is some chance, according to Bernardo Grossling, that potential production is much higher. This range of estimates, with higher probabilities for lower production levels and vice versa, should be expected; uncertainty is always present in the risky business of petroleum exploration.

Restraints

The extent to which private investments in developing countries have been or will be constrained is unclear. Companies and/or national governments in most of the developing nations have explored to some degree, and private international banks in at least some of these countries have financed petroleum-related investments. Other nations--Argentina, Brazil, and Chile for example--have recently opened their doors to foreign companies for the first time. Whether all economic resources have been or will be evaluated is a matter for detailed, country-by-country geologic and economic analysis. However, the potential constraints are so easy to identify that the probability of finding at least some so-far neglected resources seems great. A program through which the United States searches for missed reserves would be worthwhile if it were superior to alternative domestic energy policies.

Benefits

Policies that expedite a production increase would help mitigate the four risks itemized in Chapter L. With new petroleum production, the world's oil and gas supply would be augmented and the fear of abrupt depletion would be diminished. The competition might also slow OPEC price increases and thereby lower future U.S. payments for imported oil. Furthermore, by purchasing oil from new areas, the United States would diversify its sources and might lessen its vulnerability to supply interruptions. Finally, if the United States could tie these oil imports from new producers to exports of U.S. machinery and technology, the balance-of-trade deficits due to oil importation would be minimized.

Knowledge about the prospects for petroleum production in developing countries is also very important to establishing effective domestic energy policy. Recent events in Mexico illustrate that importance: if sufficient knowledge about Mexican oil and gas resources had been available, the Administration might not have presented an National Energy Plan so heavily dependent on coal substitution.

Comparison to Other Energy Policies

Assume that an investment fund is established and the managers of that fund intend to finance a series of projects that will result in a fair rate of profit as long as the petroleum is sold for \$15 to \$20 per barrel (\$15 is the current world price). That is to say, the investments as a group are expected to be repaid with interest over the life of the resulting oil wells. An investment fund run in this fashion could probably be shown to be superior to investments in most synthetic crude oil. The investment fund is

superior simply because liquid fuels resulting from the other investments are expected to cost much more than \$20 per barrel equivalent; other substitutes such as electricity from nuclear plants are also much more expensive.

It would make economic sense to exhaust the opportunities to produce oil profitably at \$15 to \$20 per barrel in developing countries before investing in more expensive synthetic fuels within the United States. While such investments in developing nations are more economical, however, the security of the resulting oil supply relative to the security of the domestic alternatives is a matter for further debate. Furthermore, unless new oil imports can be tied to exports of American goods and services, these investments in developing countries, unlike domestic projects, will aggravate balance of trade deficits and further weaken the dollar.

Squeeze Out

As the U.S. government debates the need for its involvement, Japan and most Western European governments have apparently begun their strategies for oil proliferation already. Add to these unilateral policies the recently approved World Bank program plus potential investments from the United Nations, the Asian Development Bank, and the OPEC Funds, and the chances for adequate petroleum investment in developing countries seem quite good.

Unfortunately, while this flood of investment funds may mark the end of a problem for the non-OPEC nations, it may mark the beginning of a problem for the United States. If the unilateral policies are actively pursued, the United States could find itself in a world in which all oil production is marketed on government-to-government contracts complete with barter deals. Furthermore, discount loans from the World Bank and other sources could only damage further the competitive position of the international oil companies, the oil suppliers on which the United States depends. At present, there is no problem, but the topic warrants investigation, especially given the recent courting of Mexico by Japan, France, Britain, Canada, and the United States. Perhaps the United States should realize, as other nations have, that some amount of oil imports is inevitable and the best terms possible should actively be pursued.

CHAPTER VI. SPECIFIC POLICY OPTIONS

There are three possible responses to the conditions presented in the previous chapter. First, the U.S. government could leave petroleum exploration and production in the developing nations to private companies, private international banks, and the national governments; this can be termed the laissez faire option. Second, the U.S. government could take direct action; this is called a unilateral policy. Finally, the United States could support efforts of multilateral organizations such as the World Bank. These options will be considered here.

LAISSEZ FAIRE

Before proposing government intervention, one must judge whether the efforts of companies, banks, and governments have been adequate. The three groups should explore and develop areas that they believe have the potential to produce petroleum that could be sold for a fair profit at the expected world oil price. Government action would be warranted if this performance standard were not met or if another standard requiring a greater effort were more appropriate.

For government action to be warranted, there must be a consensus that a government agency can do a more competent job than the group it will, to some extent, supplant. Specifically, with any unilateral or multilateral policy, a key concern is the extent to which government will compete with the international oil companies. Some observers argue that, although there are problems, the companies would provide the most efficient worldwide system for petroleum exploration, production, and marketing. If this is so, it would be damaging to subsidize competition among governments or government agencies.

UNILATERAL ACTION—OPTIONS FOR THE UNITED STATES

The U.S. government could become directly and unilaterally involved with petroleum investments in developing nations. The alternative is to become involved in multilateral action by cooperation with other developed nations through an institution such as the World Bank.

Specific unilateral policies should be dictated by the nature of the deterrents they are designed to overcome. For example, if political risk is the inhibitor of private investment, then a program of political insurance, such as that offered by our Overseas Private Investment Corporation, is appropriate. The options and reasons for choosing them are listed in Table 7.

MULTILATERAL VERSUS UNILATERAL AID

In most cases, the specific types of multilateral aid are identical to the proposals for unilateral policy. Instead of the activities' being arranged by the U.S. government, they would be taken care of by a group such as the World Bank.

From the perspective of the United States the difference between unilateral and multilateral aid is the number of import risks confronted. Multilateral aid could increase the world's oil and gas supply and thereby lessen the risk of an abrupt depletion. But in addition to increasing world supply, unilateral aid could assure new production for the United States so that U.S. oil imports would be diversified; the risk of supply interruptions could thereby be diminished. Furthermore, if trade bilateralism were established in conjunction with a unilateral U.S. program, the problem of balance of trade deficits would become less severe. In sum, unilateral aid seems to have a more direct effect on the United States than does any multilateral aid.

Multilateral aid, however, does have one important advantage. This approach shows a willingness on the part of the United States to cooperate with other oil consuming countries. Cooperation among the western nations has been a central point of debate since the embargo of 1973-1974.

TABLE 7.

RATIONALES FOR AND DESCRIPTIONS OF UNILATERAL POLICY OPTIONS

RATIONALE FOR POLICY PROPOSAL	DESCRIPTION OF POLICY PROPOSALS
<p>The first three rationales are based on the belief that there are prospects for petroleum production at the current world price, but those prospects will not be realized because of one or all of the following restraints.</p>	<p>Since these reserves can be economically produced at the world oil price, none of the first three proposals require concessionary finance.</p>
<p>I. POLITICAL RISKS: Oil companies and private international banks will not invest because they fear political instability in the host country. In addition, one assumes the host country is too poor to generate sufficient investment funds.</p>	<p>I. POLITICAL INSURANCE: Expansion of OPIC-type insurance.</p> <p>MEDIATION: Plan to assist in negotiating, but not insure, deals between the governments of developing countries and private companies or banks.</p>
<p>II. OIL COMPANY POLICY: Oil companies will not invest because they are trying to restrain supplies. In addition, one assumes private banks will not lend funds because they want company involvement, and the host country is too poor to generate sufficient funds.</p>	<p>II. FINANCE THE HOST GOVERNMENT'S NATIONAL OIL COMPANY: Equity investment or loans would be made to the national oil companies of the developing nations. All stages of petroleum exploration and production would be financed.</p> <p>ESTABLISH A U.S. NATIONAL OIL COMPANY: Such a company could finance and perform any or all of the following activities: lease land for exploration; perform predrilling exploration; undertake exploratory drilling; produce petroleum; or market the petroleum.</p>

(Continued)

TABLE 7. (Continued)

RATIONALE FOR POLICY PROPOSAL	DESCRIPTION OF POLICY PROPOSALS
<p>III. NATIONALISTIC STANCE: Governments of developing nations refuse to deal with the international companies and banks, but they are too poor to generate sufficient investment funds.</p>	<p>III. (Same as II)</p>
<p>The final two motivations are based on the belief that the private sector and developing nations are doing all that, by their standards, is adequate. But it is in the national interest of the United States to do more. Concessionary financial aid might be called for in both cases.</p>	
<p>IV. OIL TRADE WAR: The United States is put in a defensive position because all other industrialized nations have actively pursued unilateral policies. In this case, the United States could find itself in a world in which all oil production is marketed on long-term intergovernment contracts.</p>	<p>IV. COOPERATION: The U.S. would end the war by establishing a cooperative arrangement within Organization for Economic Cooperation and Development.</p> <p>WORK THROUGH U.S. OIL COMPANIES: Arrangements would be made between the United States government and U.S.-based oil companies to match the unilateral efforts of other nations. If concessionary aid is being given, the United States could give tax breaks to the companies.</p> <p>ESTABLISH A U.S. NATIONAL OIL COMPANY: (Same as above.)</p>

(Continued)

TABLE 7. (Continued)

RATIONALE FOR POLICY PROPOSAL	DESCRIPTION OF POLICY PROPOSALS
<p>V. EXTRA BENEFITS: From the perspective of the private sector, it is proper to consider the expected profit of oil sales as the value of increased oil production. But for the United States as a large oil importer, the value of increased production from non-OPEC nations can mean more; it can lessen any or all of the four risks. In addition, increased supply could slow the rate of OPEC price hikes and the pay-off would be reduced U.S. oil bills. <u>a/</u></p>	<p>V. FINANCE U.S. OIL COMPANIES: Induce accelerated exploration and investment through tax policies.</p> <p>FINANCE THE HOST GOVERNMENT'S NATIONAL OIL COMPANIES: (Same as above.)</p> <p>ESTABLISH U.S. NATIONAL OIL COMPANY: (Same as above.)</p>

a/ For economists, all this discussion comes under the title of externalities: benefits that could accrue to a group (all U.S. citizens) are not realizable by an individual decisionmaker (private companies and banks) and therefore not properly considered in private investment decisions. The final external benefit, lower fuel bills, would be termed a "pecuniary externality" and many economists would not consider it a proper motivation for public involvement; it would be similar to subsidizing Ford to compete with Chrysler so prices would be lower.