DOCUMENT RESUME

ED 194 324 SE 033 145

TITLE	The United States and International Energy Issues. Report to the Congress by the Comptroller General of the United States.
INSTITUTION	Comptroller General of the U.S., Washington, D.C.
REPORT NO	EMD-78-105
PUB DATE	18 Dec 78
NOTE	128p.; Not available in hard copy due to marginal legibility of original document.
AVAILABLE FROM	U.S. General Accounting Office, Distribution Section, Room 1518, 441 G St., N.W., Washington, DC 20548 (single copy free).
EDRS PRICE	MF01 Plus Postage. PC Not Available from EDRS.
DESCRIPTORS	*Energy; Federal Legislation; Federal Programs; *Global Approach; *International Relations; *Public Policy; Resource Materials; Social Studies; *World Problems
IDENTIFIERS	Energy Education

ABSTRACT

Presented are the major international energy policy issues facing all nations, and a basis for analyzing current and proposed United States' energy policies and initiatives. Eleven issues are examined, all of which relate to one central theme: Are U.S. international energy and related policies consistent with domestic energy goals, national security, economic performance, and quality-of-life objectives? Over 400 experts in 15 countries of North America, Europe, and the Far East reacted to these issues as presented by the staff of the U.S. General Accounting Office (GAO). This GAO summary and analysis is intended to demonstrate the importance of examining, understanding and accounting for the international implications of U.S. energy policies. Thus, Congress should be able to better define national energy priorities and formulate policies for dealing with them. (Author/WB)

BY THE COMPTROLLER GENERAL

Report To The Congress

OF THE UNITED STATES

The United States And International Energy Issues

This report identifies within a comprehensive framework 11 international energy issues, all of which relate to one central theme, namely:

> --Are U.S. international energy and related policies consistent with domestic energy goals and national security, economic performance, and quality-of-life objectives?

For each issue, a series of relevant questions have been posed in order to focus thinking in that particular issue. Analysis, in turn, may lead to still other questions. Obviously, some questions could more properly be analyzed by institutions other than GAO.

The important point is that such questions require analysis and understanding if the United States is to develop policies that are responsive to its own needs as well as those of other nations.

EMD-78-105
DECEMBER 18, 1978

COMPTROLLER GENERAL OF THE UNITED STATES
WASHINGTON, D.C. 20548

B-178205

To the President of the Senate and the
Speaker of the House of Representatives

This report is centered on the relationship between U.S. policies and international energy issues and is written from a U.S. perspective. Energy, we realize, is only one aspect in the universe of international affairs, but it is an important one that in recent years has taken on even greater significance. Energy problems affect all aspects of U.S. national security, the economy, and the quality of life. They also affect the well-being of a great many other nations. More and more the nations of the world are learning that energy interdependence is a fact of life and that what one nation does can affect other nations as well.

This report is designed to place basic international energy issues in a framework within which they can be systematically analyzed and better understood by not only those whose primary concern is energy but also those with responsibility for other aspects of international affairs. Thus, we hope that it will contribute to an increased understanding of national and international energy problems. In addition, the report will serve as a guide for our future work.

We believe we have identified the key international energy issues which are in need of congressional attention. These issues require not only the understanding of the Congress and its committees but also of others concerned with national energy policies. Their actions on energy problems must be founded on the best information available and backed by careful and comprehensive analysis. We are convinced that only through a concerted effort to come to grips with these problems will this Nation be able to evolve cohesive energy policies which can stand the tests of time.

We are sending copies of this report to the Secretaries of Energy, State, Defense, and the Treasury and to the Director Office of Management and Budget.

Comptroller General
of the United States

COMPTROLLER GENERAL'S
REPORT TO THE CONGRESS

THE UNITED STATES AND INTERNATIONAL ENERGY ISSUES

D I G E S T

This report identifies 11 major international energy issues facing the United States and other nations that must be resolved if sound and cohesive national energy policies are to be developed.

Its objective is to contribute to a better understanding of the global dimensions of energy problems by demonstrating how important it is that the international implications of energy policies be fully examined, understood, and accounted for.

If the United States fails to consider the national needs and goals of other countries in formulating its own energy policies, it will be difficult, at best, to achieve a peaceful world on the basis of mutual respect and concern for the legitimate aspirations of all peoples.

The 11 issues follow.

--Are the national security implications of fuel import dependence of the United States and its allies adequately assessed and reflected in U.S. policymaking? (See p. 2-1.)

--Are the U.S. Government and its allies prepared to deal with a disruption in foreign fuel supplies? A substantial price increase? (See p. 3-1.)

--Do U.S. energy policies adequately support international efforts to deal with global energy supply-demand problems? (See p. 4-1.)

--How do U.S. policies influence Organization of the Petroleum Exporting Countries and its member nations' supply and pricing decisions? (See p. 5-1.)

--How effectively are international nuclear energy issues being addressed by U.S. policies? (See p. 6-1.)

--Are the international activities of the private sector and the U.S. policies which affect them consistent with the achievement of U.S. energy goals? (See p. 7-1.)

--Are U.S. policies effectively dealing with international financial problems resulting from or exacerbated by increasing oil imports? (See p. 8-1.)

--How well are international environmental concerns accounted for in U.S. energy policies? (See p. 9-1.)

--What conflicts do growing U.S. energy import requirements pose for other major foreign policy objectives? (See p. 10-1.)

--What are the international implications of U.S. regulatory and tax policies for meeting U.S. energy requirements? How do those policies affect U.S. energy objectives? (See p. 11-1.)

--How do U.S. domestic energy decisionmaking processes impinge upon international energy policies? (See p. 12-1.)

GAO undertook the study because of a concern that the international ramifications of U.S. energy problems are not yet adequately understood nor sufficiently integrated into a coherent set of national energy policies. The Nation's continued heavy demand for energy and its reliance on insecure foreign resources to meet this need raise concerns not only about the efficacy of its energy policies but also about the well-being of those nations more dependent than is the United States on imported energy.

It is generally believed that U.S. efforts to deal with its energy problems have been inadequate. The Nation relies far more heavily on imported energy today than it did at the time of the 1973-74 Arab oil embargo. Moreover, indications are that, by the mid-1980s, it could be nearly twice again as dependent on imported energy as it is now.

Although the United States plays a leadership role in world affairs, 5 years after the Arab oil embargo and the Organization of the

Petroleum Exporting Countries' price hikes that followed, it still has not developed energy policies that significantly reduce the impact of U.S. consumption on global supplies. Other governments are deeply troubled by what they perceive as the inability of the United States to act resolutely to solve its energy problems, to recognize their energy needs, and to realize how American energy demand affects them and the world economy.

METHOD OF STUDY

GAO assembled a team consisting of 11 GAO staff members and international energy experts. The team identified the major international energy policy issues affecting the United States which it believed needed further study and analysis as listed above.

These issues served as the basis for a series of intensive interviews and discussions with more than 400 experts in 15 countries of North America, Europe, and the Far East. Although some of those interviewed did not fully agree with the way the issues were presented and the questions posed, most recognized that these were the issues and questions especially in need of attention. Much work has been and is being done to consider many of these questions. This report makes no attempt to list the issues in order of their priority but concentrates on identifying the issues, placing them in perspective, and demonstrating their inextricable interrelationships.

It is important that a systematic analysis be undertaken of the 11 issues identified. While each is sufficiently important to be singled out for separate analysis, all are interrelated in important ways. Consequently, the result of work in one area is likely to have significant implications for the understanding of other key issues.

The Congress will need all the help it can get in its efforts to devise legislation and policies that will be responsive to the legitimate needs of the American people and those of other nations. GAO will continue to analyze and report on these international energy issues.

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ABBREVIATIONS

AEC	Atomic Energy Commission
AID	Agency for International Development
CEQ	Council on Environmental Quality
DOE	Department of Energy
ECPA	Energy Conservation and Production Act
EEC	European Economic Community
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
EPAA	Emergency Petroleum Allocation Act of 1973
EPCA	Energy Policy and Conservation Act of 1975
ERDA	Energy Research and Development Administration
ESSA	Environmental Science Service Administration
EURATOM	European Atomic Energy Community
FEA	Federal Energy Administration
FEO	Federal Energy Office
FERC	Federal Energy Regulatory Commission
FPC	Federal Power Office
GAO	General Accounting Office
IAEA	International Atomic Energy Agency
IEA	International Energy Agency
IMCO	Intergovernmental Maritime Consultative Organization
IMF	International Monetary Fund
INFCE	International Nuclear Fuel Cycle Evaluation
IRS	Internal Revenue Service
LDCs	less developed countries
LNG	liquified natural gas
mmb/d	million barrels per day
MNCs	multinational companies
MNOCs	multinational oil companies
NASAP	Non-Proliferation Alternative Systems Assessment Program
NATO	North Atantic Treaty Organization
NEA	National Energy Act of 1978
NEP	National Energy Plan
NEPA	National Environmental Policy Act of 1969
NOAA	National Oceanic and Atmospheric Administration
NPA	Nuclear Non-Proliferation Act of 1978
NPT	Nuclear Non-Proliferation Treaty
NRC	Nuclear Regulatory Commission
NSF	National Science Foundation
OAPEC	Organization of Arab Petroleum Exporting Countries
OECD	Organization for Economic Cooperation and Development
OPEC	Organization of the Petroluem Exporting Countries
R&D	research and development
SALT	Strategic Arms Limitations Talks
UN	United Nations

CHAPTER 1

INTRODUCTION

Are U.S. international energy and related policies consistent with domestic energy goals and national security, economic performance, and quality-of-life objectives?

This report identifies the major international energy policy issues facing the United States and other nations and provides a basis for analyzing current and proposed U.S. international energy policies and initiatives. The report's objective is to contribute to a better understanding of these issues and to propose an agenda for analysis of international energy issues. Thus we hope to assist the Congress to better define national energy priorities and formulate policies for dealing with them. At the same time, this report will serve as a guide for further assessing these policies and identifying specific issues which need to be studied.

Although the United States has generous reserves of coal, natural gas, petroleum, and uranium, its growing dependence on imported oil is a cause of increasing concern both at home and abroad. Given the magnitude of U.S. oil consumption, this concern is justified for other nations that have less of these reserves and that must compete for supplies in the global marketplace. In any case, the oil embargo of 1973 demonstrated how inextricably domestic and international energy issues are entwined, established global energy interdependence as an indisputable fact of life, and demonstrated how excessive reliance on energy imports can threaten national security.

The ability of all nations to obtain adequate supplies at reasonable prices on the international market directly affects their economy and their national security. Similarly, the price which energy-producing countries, such as the Organization of the Petroleum Exporting Countries (OPEC) nations, receive for their exports affects their ability to finance their own economic development and to improve domestic standards of living. The growing interest of some nations in nuclear power development as one way to reduce reliance on oil raises concerns about the potential for nuclear weapons proliferation and for the possible hazards of this technology for the health and safety of their people. Continued world population growth, economic development, and industrialization are likely to lead to increased use of coal, shale, and other fuels, which will have a significant impact on the

world environment. These factors raise important international energy issues which will confront the United States and other countries in the decades ahead.

The United States has an important leadership role to play in resolving these issues. The ways in which it copes with its domestic energy problems and the international energy policies and actions it promotes will significantly affect other nations and peoples. But, by the same token, the actions and decisions taken by other countries in the energy area are likely to have an increasingly significant impact on the United States. If the United States is to succeed in its leadership role, it must be responsive to other nations' interests. Equally important, more extensive cooperative international efforts to solve energy problems may be necessary.

Eleven international energy issues are identified in this report. In formulating these issues, it was assumed that energy policies are important not only in and of themselves but because they affect the national well-being: security, economic performance, and quality of life.

The issues identified and subquestions posed were developed by raising a series of generic questions: What are the problems arising from energy dependence? Why are they problems? Who are the actors? What are their roles? What options are open to policymakers? What are the effects of domestic actions, policies, and governmental processes on U.S. foreign relations? What are the implications of these actions for meeting energy needs and for maintaining the national security, economic viability, and quality of life for the Nation and its allies?

In discussing how international energy developments can affect the national well-being, we considered a number of generally accepted indicators of each of the principal elements of national well-being. Components of national security that we considered included defense capability, economic vulnerability, and political stability.

Indicators of economic performance we identified included such factors as real gross national product, rate of unemployment, inflation rate, income distribution, balance of payments, and the energy-gross national product index.

For quality of life, the indicators we considered included water and air pollution, land use, public health and safety, and climate changes.

It was assumed that uncertainty of energy supply relative to demand would most directly have an impact on national security, that energy prices and Government energy program expenditures would most directly have an impact on economic performance, and that the mix of energy production and consumption would most immediately have an impact on public health and safety and environmental quality. Distinctions between short-, medium-, and long-term effects were also considered. It was further recognized that specific energy policies and options can have conflicting impacts on the elements of national welfare. For example, higher energy prices may reduce oil import dependence, thereby enhancing national security, but may also have an adverse effect on economic performance.

To refine these issues, we organized a team consisting of staff members and independent international energy experts. This international energy team interviewed more than 400 experts in 15 countries of North America, Europe, and the Far East. It discussed the growing global energy interdependence in general and the oil import dependence of the United States in particular. Our report includes the results of these interviews.

It is important to note that, while we considered issues facing both the United States and its allies, our report is written from a U.S. perspective.

The following 11 issues identified are summarized below.

1. National security. Since nations need each other as markets and as sources of vital materials, their economic performance and national security are essentially interdependent. Most, if not all, U.S. actions affecting energy supply and consumption relate to, affect, and are affected by the supply/demand calculus of many other nations. This relationship makes international cooperation essential in solving long-term energy problems for the security of all. (See p. 2-1.)

2. Supply disruptions and price increases. Of immediate and continuing concern is the corollary issue faced by energy importing nations--their ability to deal with energy supply interruptions and/or sudden and substantial price rises. Following the Arab oil embargo of 1973-74, most major oil-importing nations formed the International Energy Agency to allocate oil supplies in the event of scarcity. Thus issues of domestic preparedness and international cooperation in such an eventuality are posed. (See p. 3-1.)

3. Global supply and demand. Long-term global energy needs require that efforts be intensified to develop technologies and new resources to meet future demand. Such steps must be taken now because long leadtimes are required to produce new energy sources, commercialize new technologies, and replace existing energy systems. During a transitional period, international efforts to conserve resources and prepare for the day "if" and "when" the oil runs out are important. (See p. 4-1.)

4. US-OPEC relations. Since the member nations of OPEC control a large part of the world's oil supply, a major issue raised for analysis concerns U.S. relations with OPEC as an entity and with individual OPEC member countries. (See p. 5-1.)

5. Nuclear policies. The United States, traditionally the world leader in the development of nuclear technology, finds itself confronted with unresolved nuclear issues and with vigorous sales competition from other nations, some of whom may not be so concerned with these issues. Additionally, problems of the proliferation of nuclear fuels capable of diversion to nuclear weaponry remain unresolved and are of continuing concern to the United States and other nations. These factors impinge upon development plans for future reliance on nuclear power as a major energy resource. (See p. 6-1.)

6. Private sector activities. The role of the private sector, particularly of multinational corporations and financial institutions, as they affect energy matters raises issues for analysis. The management of potential conflict between the legitimate interests of the public and private sectors affects the economies of all countries. The interests and allegiance of some multinational companies may not be clear, and they may be more concerned about accommodating foreign than national policy objectives and interests. (See p. 7-1.)

7. World finance. Domestic financial flows in industrialized economies are significantly affected by the level of a nation's oil imports, as are foreign investment decisions and the balance of payments. Consequently, the financial impact of imported energy in the United States is of interest not only domestically but to other industrialized countries linked with the United States within the international financial community. Moreover, policies adopted by the industrialized nations to insulate against energy-related financial disruption and reductions in economic activity are important to developing nations as well. These countries often depend

on strong growth in industrialized countries' demand for primary products to finance their own energy import requirements. (See p. 8-1.)

8. Environment. Environmental problems stemming from exploration, transportation, production, and consumption of energy have grown in magnitude to the point where they now affect the entire world. Vigorous efforts by individual countries are needed to clean up their own mess, but no single nation by itself can solve global pollution problems. Thus collective and comprehensive agreements and actions to deal with the causes and effects of international environmental problems resulting from energy use are essential. (See p. 9-1.)

9. Other foreign policy impacts. Heavy dependence on oil imports poses problems for the independent exercise of U.S. foreign policy and the foreign policies of other oil import-dependent countries. To the extent that the foreign policies of consumer nations are contrary to those of supplier nations, opportunities for pressure and manipulation are rife. The implications for influence on U.S. and other nations' policies in the Middle East are substantial and provide but one case in point. (See p. 10-1.)

10. Tax and regulatory policies. U.S. tax and regulatory policies are designed to accomplish a variety of national goals and objectives; for example, raising revenues to pay for an array of public services and activities and setting rules for doing business and governing competition within the business environment. Since energy problems have become more publicly apparent, national concern for energy supplies and prices have raised questions about the international effects of U.S. tax and regulatory policies on the Nation's ability to meet energy objectives. (See p. 11-1.)

11. The decisionmaking process. The complex web of Federal, State, and local laws; taxes; regulations; actions; and decisions has a profound impact on U.S. international energy posture and policies. So, too, does the perception of the proper relationship between energy use and the Nation's way of life. Conflict is inherent in the democratic decisionmaking process and may well impinge upon the formulation and implementation of international energy policies. (See p. 12-1.)

CHAPTER 2

ARE THE NATIONAL SECURITY IMPLICATIONS OF FUEL IMPORT DEPENDENCE OF THE UNITED STATES AND ITS ALLIES ADEQUATELY ASSESSED AND REFLECTED IN U.S. POLICYMAKING?

The term "national security" refers primarily to military and defense needs and includes economic performance and political stability. National security considerations have profound impacts on the national will and on the confidence of people in their government and in their economy. Since the United States is still a major fuel-producing nation, the matter of supply allocation to meet military needs in time of war is, for the time being, relatively amenable to resolution. However, to the extent that the national economic performance depends on foreign energy supplies subject to interruption or allocation and price manipulation, the national security is lessened. Is there a point at which the level of dependence on foreign fuels poses an unacceptable threat to national security?

Many countries, including most U.S. allies, are even more dependent on imported fuels than is the United States and for a considerably longer time. In nearly all cases, their national security and economic performance are more threatened by a potential interruption or reallocation of supplies or a precipitous price rise than is the United States. When its allies are endangered, the United States, by implication, is also endangered. The reverse is also true.

From the perspective of world peace and stability the national security implications of U.S. fuel import dependence assume special importance, because the United States has occupied a unique position throughout the post-World War II period as the principal guarantor of the security interests of the Western World. It has shouldered global security commitments and responsibilities as a member of defensive alliances, and these have been largely underpinned by its great economic strength and by its unparalleled military power.

U.S. national security considerations also have profound impacts on the confidence of other nations in the ability and will of the United States to support its global security obligations. Less than 10 years ago, U.S. allies in Europe and Asia could draw considerable confidence from the fact that the United States enjoyed a position of global strategic superiority. Although the United States had long been an energy

importer, it was not heavily dependent on foreign sources of energy and was only minimally dependent on imports of energy from outside the Western Hemisphere. These conditions no longer hold true.

What is particularly significant from a national security perspective is the extent to which U.S. fuel import dependence has dramatically increased within the last few years and the degree to which this dependence has come to center on one geographical area of the world--the Middle East. For example, during the 1950s oil imports ranged from 13 to 18 percent of U.S. total petroleum consumption, and from 5 to 8 percent of gross energy consumption. As recently as 1970, U.S. oil imports accounted for only 23 percent of the Nation's total petroleum consumption and 10 percent of its gross energy consumption. By 1977, however, total oil imports had grown to nearly 50 percent of U.S. petroleum consumption and almost 25 percent of gross U.S. energy consumption. Where Middle East oil in 1970 represented only 1 percent of the U.S. total oil imports, by 1977 it had increased to 44 percent, or 21 percent of total U.S. petroleum consumption.

Equally important from a national security perspective is the broader context of evolving global economic and strategic relationships within which changing U.S. fuel import dependence has occurred. During the 1970s, the Organization of the Petroleum Exporting Countries firmly established itself as a cartel capable of exacting monopoly rents for the oil exports of its member nations and consequently is a major economic force with which to be reckoned. Its actions have enormous implications for the economic health and well-being of the United States and other countries of the world.

In the area of global strategic relationships, a position of parity has evolved during the 1970s between the United States and the Soviet Union. Concurrently, Warsaw Pact nations have greatly expanded their military capabilities for fighting a possible conventional war against North Atlantic Treaty Organization (NATO) nations in Europe. The security implications for the United States and its allies of fuel import dependence cannot help but be affected by these changing power relationships. Specifically, the proximity of the Arabian peninsula to the Soviet Union has become increasingly significant as the United States has become dependent, and its allies even more dependent, upon Arab oil imports.

What are the implications of this increased dependence for U.S. security interests? Are U.S. national security alliances significantly weakened by it? To what extent is U.S. security

directly threatened by this dependence? Can the United States and its allies depend on coordinated action in the event of a fuel crisis or will every nation fend for its own interest?

FUTURE EMPHASIS

The national security dimensions of energy imports are extremely complex and broad ranging. The following problem areas especially need attention.

1. Does the U.S. Government have access to adequate and accurate data on which to base an assessment of security implications of the Nation's fuel import dependence?

Forecasts of future global energy supply-demand patterns and of energy production and demand in the United States itself are critical to assessing the security implications of the Nation's future energy import dependence. If the United States is able to significantly reduce its dependence on oil imports, its security position may be improved and opportunity for confrontation diminished. Similarly, if the international oil market remains in surplus into the 1990s and additional resources are brought on line, the national security implications of continued substantial oil imports into the United States would be less important. If adequate data is not available, how will U.S. policies to deal with the national security implications of high levels of oil imports be affected?

2. Are U.S. contingency plans and those of its allies adequate to protect, if necessary, source, handling, and transportation networks of imported oil?

A variety of situations could develop in which the production, refining, and export of oil from key oil-producer states, particularly in the Middle East, could be substantially or fully interrupted. Examples are: an oil embargo organized for political or other reasons by Arab and/or other oil-producer states; destruction of major oilfields by regional warfare or sabotage by political terrorists; replacement of a government in a key-producer country by a regime determined--for economic, political, or other reasons--to slow the exploitation or change the disposition of its energy resources; military takeover of key oilfields in the Persian Gulf by an external power; and coercion of one or more Middle East producer nations by an external power.

Under what circumstances might such situations develop and what is the likelihood of each? Do the United States and its allies have the military capability (i.e., weapons,

force, levels, bases, contingency plans) to prevent such events from occurring or to respond if they occur?

Has growing U.S. oil import dependence influenced the levels of real U.S. defense expenditures, the mix of weapons systems, types of force levels, etc.?

Is there a need for a U.S. military or naval presence in the Middle East, for joint guarantees and military pacts with NATO and Japan that reflect a common need to maintain stability in the region, or for security agreements between the United States and specific producer nations? How would such arrangements be viewed by other producer nations? By other consumer nations? By third world nations? By potential adversaries? What are the implications of such security agreements?

3. How has the increased energy import dependence of the United States and its allies affected their military capabilities? What are the implications for world peace and stability?

If the United States is to devise national energy goals consistent with its national security objectives, the impact of energy import dependence on broader national security considerations, especially its alliances, must be properly assessed. For example, as noted earlier, U.S. dependence on Middle East oil has increased dramatically in recent years. At the same time, U.S. allies in Western Europe, even more heavily dependent on OPEC oil, are also growing more dependent on the Soviet Union, both directly and indirectly, for imports of natural gas, petroleum, and enriched uranium. Do these increasing dependencies significantly affect the military balance between NATO and the Soviet bloc? The cohesion of NATO?

As another example, the high costs of U.S. oil imports and the resulting negative effect on the U.S. balance-of-payments position has led the Government to take steps to reduce the use of petroleum by the military for training purposes and operational exercises. At what point will further reductions affect the U.S. armed forces operational effectiveness?

4. What are the national security implications of an extended global energy supply shortfall? Of a Soviet bloc supply shortfall?

Various authorities have forecast that a global energy supply shortfall may occur during the mid-1980s or early 1990s and last for at least several years. How realistic are such

forecasts? In any event, were it to occur, such a shortfall would almost certainly be accompanied by dramatic price increases. The economic dislocations resulting from scarce supplies and a steep rise in energy prices might lead to considerable social and political instability in and between many nations. Some forecasters have also warned of a possible energy shortfall occurring in the Soviet Union or the Warsaw Pact nations. This could occur whether or not there are adequate global energy supplies.

What are the national security implications of a Soviet bloc or global energy supply shortfall for the United States and its allies? Might it precipitate a confrontation between the Soviet bloc and NATO? Or would Soviet military actions be directed at key Middle East oil-producing nations? Conversely, what are the national security implications of greater Soviet and Eastern European participation in international energy markets? And what would be the related impact on NATO?

5. Can the total dollar costs of various levels of energy import dependence for the United States and its allies be accurately estimated?

Aside from the direct dollar cost of each barrel of imported petroleum, there are substantial external dollar costs that need to be considered in devising a national energy plan that has as a principal objective a reduced level of oil imports. Among some of the factors to be considered are: the potential for natural or contrived future oil supply shortfalls occurring (of varying levels and durations), the total costs to the United States that would result if such shortfalls materialized (including higher priced energy imports, reduced levels of the gross national product, increased unemployment, etc.), and the cost of establishing and maintaining oil stockpiles and other emergency programs to be used in the event of shortfalls.

Can an index of U.S economic vulnerability be developed to assess the national security implications of various levels of oil imports? An index for U.S. allies?

6. How should national security problems arising from oil import dependence influence U.S. oil import policies and foreign and domestic energy development efforts? How should these problems effect levels of expenditures for research and development?

Recent administrations set a national goal of limiting U.S. oil imports to 6 million barrels of oil per day by 1985.

U.S. oil import dependence is now considerably higher than that and is expected by most authorities to grow to even higher levels during the 1980s. Is there some level of imports at which national security concerns are triggered? Should there be a ceiling on the level of U.S. oil imports?

Given the national security vulnerabilities and the related economic costs associated with present and probable future levels of fuel import dependence, should the U.S. Government be developing new energy technologies even if their cost effectiveness cannot now be justified? What should the role of the private sector be in such an undertaking?

At what point do the costs of reducing oil imports exceed the benefits of doing so? How, for example, will such factors as economic growth, employment, and social and political stability of the United States and other countries be affected by programs to curtail energy imports.

CHAPTER 3

ARE THE U.S. GOVERNMENT AND ITS ALLIES PREPARED TO DEAL WITH A DISRUPTION IN FOREIGN FUEL SUPPLIES? A SUBSTANTIAL PRICE INCREASE?

The most immediate energy problem facing the United States and other fuel-import-dependent nations is the adequacy of their preparedness to deal with another possible oil supply interruption. It is evident that both the United States and its allies were not prepared for the 1973-74 Arab oil embargo. Since then the United States has become even more vulnerable as a result of its increased reliance on imported oil.

As the 1973-74 oil embargo demonstrated, economic dislocations result from fuel supply disruptions. More recently, the gas supply shortages in the United States during the winter of 1976-77 and the reduction in the available supply of domestically produced coal during the coal strike of 1977-78 threatened significant economic dislocations. Only substantial inventories of coal lessened the impact of the latter supply interruption.

The establishment of the International Energy Agency (IEA) in 1974, which now includes 19 industrialized oil-importing nations, and the expansion or, for some nations, the creation of strategic petroleum reserves was an effort to offset the vulnerabilities which arose from import dependence. So, too, are actions to reduce energy consumption and to diversify supplies and sources.

While there has been some reduction in the growth rate of U.S. energy consumption relative to earlier growth rates, consumption in absolute terms has increased slightly since 1974. Reducing consumption is a useful step toward relieving dependence on imported oil and diminishing economic pressures resulting from the sizable cost of those imports.

What policies or plans have the United States and its allies set in motion to avert or, if necessary, to cope with a sudden fuel supply interruption in the near term? Over the medium term? For the long term? Given the range of contingencies which need to be addressed, how credible are these policies?

Only the refusal of Iran and Saudi Arabia to agree to an OPEC price increase at the end of 1977 and more recently in June 1978 over the strong objections of other member nations has prevented additional short-term shocks to the world economy. However, it may not be realistic, given the substantial weakening of the value of the dollar in international money markets and high levels of inflation, to expect those nations to hold firm against pressures for a price rise from other OPEC nations. The value of their dollar earnings and return on investments are effectively diminished by the weakening of the U.S. dollar in the world markets.

Have the United States and its allies created institutional mechanisms and policies that would be effective in the event of a sharp price increase?

FUTURE EMPHASIS

Future efforts in this area need to address the following questions.

1. What contingencies are most likely to result in a short- or medium-term disruption in foreign fuel supplies?

There are a variety of possible events which could result in a disruption in imported fuel supplies. To what extent do U.S. policies account for such contingencies? Does planning for energy emergencies receive adequate attention from responsible agencies of the U.S. Federal Government?

2. To what extent are member nations dependent on IEA programs to assist them to cope with a supply shortfall?

It is not certain that IEA member nations will permit the emergency sharing mechanism to come into operation in the event of a future oil supply shortfall. Each member nation government will have to make a political decision as to whether the likely benefits of implementing the system exceed the probable costs. Should the system, in fact, be called into operation, some individuals believe it may not work. Others believe there will be no event that would "trigger" the sharing agreement. And still others see IEA as no more or less reliable than its members allow it to be. If not IEA, what alternatives are available to its members? Does lack of confidence in IEA impair its effectiveness?

3. How effective is the IEA Emergency Sharing Program likely to be if called into operation during a shortfall?

Effectiveness will depend on a number of factors, including the level and duration of the shortfall, whether member nations have adequate programs for implementing demand restraint measures, and whether stockpiles can be fully used as emergency stocks or are necessary for working-level stock purposes. The multinational oil companies (MNOCs), through the IEA industry supply advisory group, may also affect the outcome--depending on the nature of the shortfall. According to some observers, the companies exert too much control over the emergency sharing program and in particular over the information on which it is based. In an oil embargo situation, the international oil companies will still be responsible for getting supplies to markets and may be subject to manipulation by producer nations, which, in turn, could have an impact on the effectiveness of the IEA program.

Moreover, since the MNOCs are privy to internal workings of both OPEC countries and IEA, does this relationship imply future problems? IEA depends on data supplied by MNOCs. How accurate is that data? Is the accuracy of such data essential for the success of IEA's programs? Are there independent means to verify the accuracy of such data?

4. What U.S. or multilateral sanctions are available to respond to supply interruptions and abnormal price increases?

One of the principal purposes of establishing IEA was to prepare consuming nations to deal with possible future oil interruptions. IEA, however, has no means or organizational responsibility to exercise sanctions in response to a supply interruption or drastic price increase initiated by oil producer nations. There are, though, means by which consuming nations could raise the ante of a disruptive act. They could, for example, respond by refusing or curtailing technical assistance and by restricting the sale of military equipment and spare parts, as well as certain other kinds of trade. There are, of course, other more severe means available.

To what extent are these measures being considered? Are they realistic?

5. Should the United States increase its use of bilateral supply arrangements to avoid supply interruptions?

Because the United States has occupied a unique role as guarantor of the security interests of the Western World, it may be the most likely target for any future Arab oil embargo arising from tensions in the Middle East. If more oil could be bought by the United States from diversified non-Arab sources, the threat of a supply interruption would be

lessened. At the same time, if Arab nations could no longer apply great pressure on the United States from use of the oil weapon, they might be less likely to use it.

Do these and other circumstances warrant efforts by the United States to conclude bilateral supply arrangements with non-OPEC producer nations, such as Mexico and Canada, to mitigate the impact of possible future supply interruptions? Could supply agreements be sought from OPEC members which might include guarantees against interruption? What are the implications of such agreements?

6. What measures are available to the United States and its allies to ease adjustments to dramatic and sudden oil price increases?

The economic dislocations and social and political instabilities resulting from sudden or sharp oil price increases would likely be substantial, at least in the short run. Have the United States and its allies developed plans to ease adjustments to sharp price increases? Is there a need for multilateral agreements on long-run allocation of supplies to poorer nations that can ill afford to compete for the higher priced energy? Should IEA or other international institutions be assigned responsibility to deal more effectively with these problems?

7. In the event of a protracted supply interruption, would existing mechanisms be adequate to assure the U.S. military its petroleum needs from domestic sources?

During the second half of 1973, U.S. armed forces were unable to secure sufficient supplies of petroleum to meet their operational needs because of (1) a tight worldwide supply-demand situation and (2) the imposition of the Arab oil embargo in October, which cut off the armed forces from traditional Arab sources of petroleum. The Defense Department found it necessary to dip into its wartime petroleum reserves, even though the Nation was not at war, and to resort to the authority of the Defense Production Act of 1950 to secure supplies from the civilian economy. Nearly 3 months passed before the necessary authority was secured, and additional time elapsed before the armed forces began to receive deliveries in response to that authority.

Are new legislative or policy initiatives needed to ensure that the U.S. armed forces would have first call on available supplies in the event of future threatening, though nonwar, situations?

CHAPTER 4

DO U.S. ENERGY POLICIES ADEQUATELY SUPPORT INTERNATIONAL EFFORTS TO DEAL WITH GLOBAL ENERGY SUPPLY-DEMAND PROBLEMS?

In some measure, each nation's energy supply-demand balance affects the global balance and thus world energy prices and economic performance. This point is relevant for U.S. energy policy because of the high level of its energy consumption and imports. But a secure and peaceful world requires more than just a secure and satisfied United States.

To the extent that the growing U.S. demand strains the market and drives prices up, its impact on the global supply-demand balance will be increased and will adversely affect weaker nations. Will conservation programs succeed in reducing demand in the United States? Will U.S. domestic supply expansion programs be successful in stimulating increased production? Can the United States realistically urge other nations to conserve fuels and increase production while its demand on available supplies continues to increase? What are the long-term implications for other nations, particularly the less developed countries (LDCs), of high levels of U.S. consumption and import reliance?

The National Energy Plan and other proposals have called for the United States to move toward a long-term inexhaustible resource base upon which to sustain future economic growth. Should the United States pursue strategies that will encourage other nations to follow this development path? Will accelerated development of petroleum resources discourage the search for alternative energy sources? Will current programs that encourage increased domestic petroleum production lead to early exhaustion of U.S. resources and ultimately result in even greater future U.S. dependence on imported fuels? What effects will these efforts cause on future world supply-demand balances?

Technological developments are unlikely to have a large effect on world energy supply and demand in the near future. Changes in energy demand are more likely to be determined by the level of world economic activity, modified patterns of consumption, and the employment of energy efficient machinery. For the short to middle term, changes in energy supply are more likely to be affected

by the discovery rate of exploration programs, the economics of developing known resources, and government policies affecting resource development than by major technological breakthroughs. On the other hand, long-term energy supply and demand could be substantially affected by new technologies and success in bringing alternative fuels on line.

Some analysts have projected a probable shortfall in world oil supplies by the mid-1980s, whereas others believe that rising energy prices will lead to an oil surplus as more oil supplies are developed and growth in demand falls off. Such debates indicate a need for better information to identify world resource potential and the best means for its development. The long-term cooperative program of the International Energy Agency is intended to improve information about the world's energy resource potential and encourage conservation and cooperative research and development of new energy technologies. It was designed to mitigate future fuel supply-demand problems. Is it working?

Do energy policies of the United States and other nations effectively support such cooperative international efforts aimed at the development of secure, environmentally acceptable energy supplies at the lowest feasible price?

FUTURE EMPHASIS

Following are key questions that need to be addressed.

1. Are current data collection practices and analysis methods adequate to provide reasonable forecasts of supply-demand balances for policymaking purposes?

Accurate supply-demand forecasts are needed by both private and public institutions in their decisionmaking processes. In the past, such forecasts of both national and global supplies have varied substantially from year to year and from each other. Have the implications of these variations been assessed? It has been alleged that in some cases governments and private companies deliberately distort data and forecasts to gain some perceived advantage. Others say that accurate projections cannot be made because there are too many unknowns. Some have questioned the reliability of IEA forecasts which project a serious supply-demand imbalance by 1985. Are these forecasts valid? Have the energy requirements essential to world economic growth been adequately assessed? How might accurate data change the energy policies of the United States and other countries?

A number of more specific data and analysis questions also needs consideration. Are data regarding the location of proven, probable and possible oil, gas, coal, and uranium reserves reliable? What is the potential for resource development in the Soviet Union? In China? In Iraq? In LDCs? Other areas? Under the oceans? In Antarctica?

The level of changes in energy prices can also have significant impacts on world economic performance. Does existing data provide an adequate basis for projecting price trends? Supplies available at certain price levels?

2. What are the implications of high levels of U.S. oil imports for world market prices and supplies?

Many nations are highly critical of the United States for failing to adopt policies which reduce reliance on imported fuel. Does the United States have a special responsibility to limit oil imports? Will continued U.S. high import levels affect others nations' access to world energy supplies? How will this affect world market oil prices?

3. Are the impacts of global energy supply-demand problems on LDCs adequately understood and accounted for?

Sharply higher world energy prices have an impact on all countries, but the problems of the underdeveloped countries may deserve special consideration. Further industrialization of LDCs implies substantial increases in energy consumption that will have impacts on global supply-demand balances. Are U.S. programs adequate to assist LDCs in determining and meeting their energy needs? Are they adequate to assist them in financing the development of indigenous energy resources? Are multilateral energy development assistance programs likely to be more effective? Do LDCs have access to energy technologies at costs similar to those in the United States and other industrialized countries?

4. Are international institutions involved in energy activities adequate to deal with supply-demand problems?

The IEA, for example, has become the focal point for cooperative efforts to deal with energy problems. Some observers view the IEA as an organization with little effective authority to act except in an emergency. Other international institutions, such as the World Bank and regional development banks, could play an increasingly important role in facilitating the financing of energy development. How effective are their efforts?

5. What obstacles exist to the expansion of world petroleum supplies and other traditional fuels? What are the available options to overcome these barriers?

Expansion of conventional fuel supplies (oil, gas, coal, and uranium) may be necessary to avoid a global energy supply-demand shortfall by the mid-1980s or later. However, a variety of factors could inhibit their expansion. How will such factors as investment and risk perception, taxes and regulatory policies, existing technologies, environmental concerns, unstable governments, and market considerations affect world energy supplies? What obstacles exist to the development of energy resources in the Soviet Union, China, Iraq, and other promising areas?

6. To what extent can world natural gas and coal be expected to replace the diminishing supplies of oil?

Many experts believe that the world's reserves of oil will be sharply diminished by the end of this century, requiring the development of alternative fuels. Increased development and use of coal and natural gas could provide an important addition to global energy supplies. Natural gas is abundant in OPEC countries but has traditionally been flared at the wellhead. Recently, some oil-producing nations have become more interested in exploiting natural gas. Long-range supply contracts for natural gas and liquified natural gas (LNG) have been completed by some OPEC countries with U.S. and European customers. What are the implications for the United States and other nations of increases in world LNG trade?

With respect to coal, about two-thirds of the world's reserves are located in the United States, the Soviet Union, and China. What are the implications of increased use of and international trade in coal? Could the United States become a major coal exporter in the future? What are the implications of China and the Soviet Union becoming major international coal suppliers?

7. Will accelerated development and use of finite U.S. petroleum and gas resources create a potential for an even greater reliance upon imported fuel in the future?

Current U.S. emphasis is on expanding domestic production of oil and gas to levels which likely cannot be sustained over the long term. What are the long-range implications of the United States running out of these domestic fuels?

8. How do U.S. conservation efforts measure up to those of other nations?

Increased efficiency in world energy use is important to achieving favorable global supply-demand balances. The United States is widely criticized by other nations for having failed to adopt meaningful conservation policies and effective programs to reduce consumption. What should the United States be doing to reduce its energy consumption? What cooperative international efforts offer the most promise for conserving energy?

9. What are the potential advantages and disadvantages of international cooperative energy research and development (R&D) programs?

One appeal of international cooperative energy R&D programs is their potential to reduce duplication of effort, lower costs, aggregate talents, share responsibility, and possibly speed the introduction of new technologies into world markets. Should additional funding be made available for more cooperative R&D efforts? How much and by whom? Should international funding mechanisms be developed? What are the commercial implications of government-to-government cooperative R&D programs? What are the barriers to sharing R&D information and technology? Are efforts being made by the United States or international agencies to develop energy technologies especially suitable to the needs of developing countries?

CHAPTER 5

HOW DO U.S. POLICIES INFLUENCE OPEC's AND ITS MEMBER NATIONS' SUPPLY AND PRICING DECISIONS?

Through the International Energy Agency and the 1976-77 Conference on International Economic Cooperation in Paris, multilateral contacts were established between oil consumers and producers on a variety of issues. If oil producers and consumers could better understand each other's needs, it was argued, they would act more responsibly toward one another, which would reduce the likelihood of another Arab oil embargo or radical price rise to achieve economic or political goals. Many nations, however, have no confidence in the effectiveness of multilateral efforts and, so, have been negotiating bilateral consumer-producer agreements. Some of these are petroleum supply contracts, while others involve the sale or barter of military hardware, sophisticated technology, technical assistance, or consumer goods.

Bilateral discussions between U.S. leaders and Saudi Arabian and Iranian leaders have emphasized the impacts another substantial oil price rise would have on OPEC foreign investments, the value of their dollar holdings, inflation, and the potential for exacerbating already serious global economic problems. It is unclear how persuasive such agreements and discussions have been in tempering OPEC supply and pricing decisions. Many analysts believe that OPEC's decisions not to raise the price of oil during the past 18 months are likely due more to their own perceived self-interests than to the diplomatic efforts of oil-consuming nations.

The bilateral approach, though, may not account for long-range implications and costs that could affect the willingness of other supplier nations to invest in the United States to make longer term trade agreements or to hold large dollar reserves. Since OPEC nations have demonstrated that they can act effectively in unison, informal understandings with individual members may not be secure. On the other hand, bilateral agreements may be seen by other OPEC members as undermining the cohesion of the cartel.

Many persons in the international community believe that U.S. bilateral relationships with OPEC members may prove difficult to manage over the long run, especially in a period of declining oil production or political upheaval in the producing states. Consequently, rather than depend on U.S. and international efforts to maintain good relations

with oil-producing governments, other major oil-consuming nations are seeking to develop their own bilateral relationships with oil-producing countries.

The question remains whether the bilateral approach is the best way to moderate OPEC decisions. Should the United States rather attempt to deal, either by itself or together with other oil-consuming nations, with OPEC as an entity?

Collective OPEC decisions may not represent the national interests of all its member states. Other interests, such as national security, may be as great or greater than the need to sell oil and maximize profits from those sales. It is important to determine at what point the interests of individual member states transcend the collective interests of OPEC as a whole. How have U.S. policymakers accounted for such factors in relations with OPEC member states? What can consumer countries do, either individually or collectively, to moderate OPEC decisions? How successful have such past efforts been?

Security agreements, arms sales, and high-technology trade agreements with OPEC members may well influence supply and pricing decisions. Should the United States and other consumer nations act to encourage and attract OPEC nations' investments to increase interdependence as a means of moderating price and supply decisions? Do OPEC member countries' investments in certain U.S. industries pose threats to national security?

The great difference between the cost of oil and other fuels, the cost of producing oil, and the price to which OPEC raised it in 1973-74 led many individuals to believe that their major motivation was political rather than economic. Whatever their motivation at that time, it is clear that many OPEC nations see an economic need to raise oil prices to even higher levels created by inflationary trends, the falling value of the dollar, and the need for large investments in increased production to meet growing demand. At the same time, investments in their own internal industrial, military, economic, and social infrastructure are vital to OPEC states to develop their countries and to provide the basis for long-term economic growth and political stability.

FUTURE EMPHASIS

The major questions to be addressed follow.

1. How do actions by oil-consuming nations to stimulate increased energy production and to reduce demand affect OPEC decisions?

Oil-consuming nations are attempting to diversify sources of energy supply and cut back consumption to reduce their dependence on OPEC oil. If diversification strategies prove successful, OPEC may not be able to maintain its monopoly prices for oil. If actions were targeted to reduce dependence on imports from key OPEC producers, the cohesion of the cartel might be weakened. How will a change in the market demand for OPEC oil affect the willingness of its members to maintain prices or levels of supply or to invest in increased productive capacity?

2. What other joint actions could be taken by consumer nations to influence OPEC supply and price decisions?

Political or economic sanctions are drastic measures with which to influence OPEC supply and price decisions. In the past, the threat of military power or the "food weapon" were powerful means to influence national actions. Are there better or more moderate means which could be used to influence OPEC?

3. Do U.S. policies emphasizing bilateral relations with OPEC nations impinge on multilateral efforts by consumer countries to diversify fuels and energy sources?

Many foreign governments argue that U.S. policies are directed more toward stabilizing relations with Saudi Arabia and Iran to ensure supplies rather than focusing on the development of alternative energy sources. Multilateral efforts to influence the oil market are not being given sufficient attention, they claim. Moreover, many individuals feel that the development of nuclear power and coal to diminish reliance on oil has not proceeded rapidly enough.

4. How would U.S. bilateral relationships with OPEC members be affected by changes in existing governmental leadership?

One of the major problems for the United States in its efforts to maintain stable relations with oil-producing countries is the potential for removal, democratically or otherwise, of current political leaders. If the government of a major oil-producing country were to change, would its production, and therefore U.S. oil imports, be affected?

5. Do the special relationships between the United States and Iran and the United States and Saudi Arabia encourage other energy-dependent nations to seek bilateral arrangements with oil-producing countries? What are the implications for the United States and other nations of bilateral oil supply contracts?

Some foreign governments believe that U.S. bilateral relationships with individual OPEC nations may work to their disadvantage during times of tight oil supplies. Many energy-dependent nations are interested in establishing their own special ties with OPEC states. If world oil trade is increasingly subject to long-term bilateral supply agreements, how will the United States and other oil-import-dependent nations fare in the event of a short-term supply shortage or during periods when demand exceeds productive capacity? In order to understand how bilateral supply agreements will affect oil markets, it is important to determine the terms of specific supply agreements between oil producing and consuming nations.

6. Should the U.S. Government enter into direct oil supply agreements with OPEC governments?

Various proposals have been made for the development of a U.S. Government oil-purchasing authority to be the purchasing agent for oil imports. Such an arrangement would place the U.S. Government in direct country-to-country negotiations with oil-producing nations for the purchase of oil supplies, thus replacing the intermediary role now filled by the private sector. So far, only Mexican oil has been purchased this way. What would be the effect on the private sector?

7. What are the implications for OPEC oil supplies and prices of the present diminishing real price of oil?

The sustained depreciation of the value of the U.S. dollar has effectively reduced the real price of crude oil. Experts worry whether OPEC nations will continue to tolerate declining values for both their oil export earnings and their investments. OPEC has already proposed various alternative oil pricing schemes to deal with the dollar depreciation, such as a shift to a basket of currencies as the basis for pricing oil. Some OPEC members advocate both a cut in production and a hike in the price of oil to compensate for the dollar's fall. Given periods of worldwide inflation or monetary instability, can OPEC be expected to maintain stable oil price levels?

8. In anticipation of future increases in OPEC oil prices, should the United States levy taxes or tariffs to raise the price of imported oil?

It has been argued that the best way for oil-importing nations to anticipate a future OPEC oil price hike is to increase domestic prices of imported oil. Some proponents say that taxes or tariffs would not only yield increased

income to the oil-importing governments but also effectively raise prices, diminish demand, and could lessen the likely shock effect to consumers of another substantial OPEC price increase which could be absorbed by adjusting the amount of the taxes levied. At the same time, they propose that tax or tariff revenues be used to pay for domestic exploration and alternative technology or resource development costs or to lighten the effects of higher energy prices on needy consumers. Such fiscal measures, however, may invite retaliation by OPEC and result in further price hikes perhaps even greater than the level of taxes or tariffs levied.

9. Would a rise in U.S. oil prices to world levels, by the adoption of a crude oil equalization tax or other Government action, serve as an inducement to OPEC to further raise its oil prices?

The United States is strongly criticized by other import-dependent nations for artificially maintaining its domestic oil prices at less than world levels. However, an increase in U.S. energy prices might serve as a signal to OPEC that the world can handle even higher oil prices.

10. Should the United States and other consuming nations agree to arrangements with OPEC countries to index the price of oil?

Indexation of crude oil prices, by linking them to the prices of goods imported by OPEC countries or to the inflation rate of the industrialized world, has been proposed as one way to reduce uncertainty over future oil prices. Some proponents argue that indexation would stabilize price increases and allow investors to anticipate changes and be better able to plan their investments. Critics argue that such a system might further damage weakened economies of some oil-importing states, especially if the indexed price of oil was substantially higher than market conditions would justify. Would indexing work? What would its long-range effect be on oil prices? Would an oil indexation system trigger demands by producers of other commodities for a similar system?

11. To what extent do the United States and other oil-consuming countries benefit from high oil prices? Should they attempt to pressure OPEC to lower oil prices?

It is important to determine to what extent energy or economic policies depend on continued high oil prices. The rise in OPEC oil prices stimulated the development of North Sea oil and the economic recovery of the United

Kingdom and led to increased funding for research and development in new energy technologies. Should the United States and other countries attempt to lower, hold down, or work toward higher domestic prices that might accelerate energy conservation or lead to increased energy production or the development of alternative energy supplies?

12. Can U.S. nonoil trade, technological assistance, and other instruments of foreign policy be used to influence OPEC production and prices?

Increased trade between OPEC countries and the United States has been particularly noticeable. Higher revenues from oil sales have stimulated trade in military equipment, high technology, and consumer goods. Is there a possibility that the terms of such trade could include government-to-government assurances regarding the stability of future oil supplies and prices?

13. Should U.S. policies encourage OPEC nations' investments in the United States as a means to stabilize petroleum supply? What are the implications of such investment? Are some types of investment better for the United States than other types?

Certain types of OPEC nations' investments may pose threats to the health of U.S. financial institutions or industries or give them effective control over some aspect of the economy. At the same time, they may stimulate employment and economic growth. How can the United States determine the potential costs and benefits of increased OPEC investment in the United States? How can the United States ensure that such investment will have positive economic effects and avoid their potential for economic harm?

14. What are the implications of increased OPEC involvement in downstream activities?

Increased OPEC ownership of and involvement in oil industry operations may influence the future security of oil supplies or prices. Competition from OPEC member refineries would likely affect U.S. and European facilities, which are already operating below capacity. OPEC member ownership of tankers could decrease the flexibility of the industrialized world to distribute oil shipments during another oil embargo. But greater involvement in these aspects of the oil business implies a high investment in plant, equipment, labor, and real estate. A supply interruption or production cutback would then idle the work force and facilities and thus would be very costly.

15. How do the development plans of OPEC member nations affect OPEC pricing decisions?

Domestic development plans and debt positions are likely to influence OPEC members' oil-pricing decisions. The revenue needs of the individual OPEC members vary widely. Some OPEC members have a large revenue surplus, whereas others are in debt. How does dependence on certain levels of future revenues for industrialization and infrastructure development influence OPEC members' pricing and production decisions? Have these factors been accounted for in U.S. policies?

16. Are major OPEC nations assuming roles in international organizations commensurate with their increased economic power? How does this affect OPEC oil supply and pricing decisions?

Certain OPEC nations have increased their influence in regional or global affairs. Some have become major providers of economic assistance to other developing countries and have also lent their political support to less developed countries' demands on the industrial countries for economic concessions. What have been the effects of the growing influence of OPEC in international organizations and financial institutions? Is OPEC influence likely to increase or diminish?

CHAPTER 6

HOW EFFECTIVELY ARE INTERNATIONAL NUCLEAR ENERGY ISSUES BEING ADDRESSED BY U.S. POLICIES?

The history of nuclear power as a source of energy has been marked by a series of developmental problems. The origins of nuclear power technology and its implicit dangers, to both the health and safety of populations; that is, to the human and physical environments, and as a source of materials which can be diverted to atomic weapons, make it the object of special consideration and concern which may limit its potential contribution to world energy requirements.

With passage of the Atomic Energy Act of 1954 and subsequent legislation, the United States became committed to, and has since promoted the development of, nuclear power for peaceful purposes in both this country and abroad. The high hopes and promises of a cheap, abundant, clean, and safe source of power on which was based the "swords into plowshares" policy of the 1950s have been dimmed, but not extinguished, with the passage of time. It can hardly be said that the spread of nuclear powerplants has met with universal acceptance by either the scientific community or the general public, despite what appears to be a record of safe performance. Controversy has accompanied its development and is a factor arresting its growth, while public opposition to it has become more vocal, in both the United States and abroad. Until major technological, safety, environmental, and proliferation concerns can be resolved, it will be very difficult to count on nuclear power as a major energy source.

Some of the outstanding and difficult technological problems associated with nuclear power are the strict control of radioactive emissions, assured pressure vessel integrity, siting, operational safety, quality assurance, fuel densification, and the reliability of emergency backup systems.

Additionally, the various aspects of the fuel cycle, from mining to waste disposal, pose political, environmental, and health problems.

Uncertainties also exist about the long-range availability of uranium at an acceptable cost, which may also influence the growth of nuclear power. Recycling of spent fuel would stretch out resources but, by itself, would not significantly affect the problems of long-term supply availability.

A worldwide nuclear development program, if it were publicly acceptable, could make a substantial contribution to electric energy supplies over the long term and reduce reliance on oil and natural gas for electric power generation. But the investment climate for nuclear power is poor in some countries. In the United States, for example, the long duration (8 to 12 years) between the planning and operating stages, complicated licensing procedures, rapidly escalating costs of construction, waste disposal problems, and substantial public opposition has discouraged some investors because these factors influence the return on investment. Ultimately, the economic viability of the U.S. nuclear industry may be threatened. The nuclear industries of other countries may also be affected by similar factors.

Additionally, U.S. international policies reflect a serious concern for nuclear proliferation; namely, that as present generation nuclear powerplants are built and operated by nations all over the world, plutonium, a byproduct of the fission process, will be more plentiful and therefore susceptible to diversion to nuclear weapons. While other nuclear-supplier nations share these concerns with varying degrees of intensity, U.S. policies, and in particular the recently enacted Nuclear Non-Proliferation Act of 1978 (NPA), are not universally or equally welcomed, for they are seen by some governments as unreasonably inhibiting the development of nuclear power, which they feel necessary to reduce dependence on more traditional fuels.

Furthermore, they see some of the actions to implement the policy as contradictory and cite as an example the recent sale of nuclear fuel to India--a nation that exploded its own nuclear device in 1974 and that has consistently refused either to sign the Nuclear Non-Proliferation Treaty of 1968 (NPT) or submit all of its nuclear installations to full scope international safeguards and inspection. Such selective application of U.S. proliferation policies is particularly disturbing to Organization for Economic Cooperation and Development members and to other close allies of the United States who are signatories of the NPT, accept safeguards, and believe that they have lived up to the terms and spirit of the treaty. In their view, the United States has become an unreliable nuclear partner, attempting to unilaterally control world nuclear development despite the fact that nuclear technology is no longer the exclusive domain of the United States.

The United States has been, until recently, the world leader in nuclear power development. Its dominant position is being challenged by other countries which have launched

vigorous nuclear development programs and seek to fill the commercial gap created by policies governing U.S. nuclear sales abroad. In short, rather than discouraging others from entering the nuclear era, the U.S. posture may have given other nations additional incentives to accelerate development of indigenous nuclear industries; construct their own breeder reactors, reprocessing plants, and fuel enrichment services; and launch vigorous research and development programs and export promotions. Potential customers are increasingly prone to look to other countries for nuclear purchases, which, in many cases, follow American designs and use equipment made under licensing arrangements with U.S. vendors. But other vendor nations offer more liberal financing, less complicated licensing processes, guaranteed fuel deliveries, reprocessing services and, in some cases, may be less likely to insist on agreement to strict application of safeguards as a pre-condition of sale.

The U.S. nuclear industry has, therefore, lost its commercial advantage by virtue of more restrictive rules governing nuclear exports. It is likely that these policies have had some negative effect on the U.S. balance of payments, since increased exports of nuclear technology would help to reduce the imbalance in U.S. foreign trade accounts. Nuclear power technology is, after all, a big ticket item, and each sale implies the likelihood of long-range supply contracts for fuel, spare parts, servicing, and associated technologies.

But the United States is still looked upon as an opinion leader, and U.S. nuclear policies, while the subject of acrimonious criticism by some governments, have been influential in raising concerns and causing some nations to reconsider or slow their nuclear development programs. Some foreign officials say that their domestic nuclear opponents get their inspiration from U.S. nuclear intervenors and claim that actions taken by some American States to discourage the construction of nuclear powerplants has given added weight to fears and bolstered opposition. Many of these countries are almost totally dependent on imported energy resources and see nuclear power as essential to diversifying their energy supplies. They perceive their own national energy needs and the dangers implicit in heavy reliance on tenuous fuel supplies as overriding their concerns for nuclear safety and environmental problems which, in any case, they believe will soon be resolved. In short, they take the position they have no choice but to "go nuclear."

In interviews with our Office shortly after the passage of the the U.S. Nuclear Non-Proliferation Act of 1978, several

foreign government officials expressed their view that the act, in essence, constitutes a unilateral abrogation of the NPT, particularly article IV, which obligates the signatories to facilitiate the development of nuclear power for peaceful purposes and, therefore, not to impede its development.

NPA is also seen as a reversal of the President's assurances, given at the opening of the International Nuclear Fuel Cycle Evaluation (INFCE) talks at Washington, D.C., in 1977, promising no unilateral action by the United States to deny enriched fuels or technology for nuclear powerplants. NPA, they charge, places additional strain on world energy supplies and, although sincere, is ill-advised and self-defeating. Selling plants to countries under international safeguards is certainly preferable, they argue, to refusing to sell--an act which not only sends buyers to look elsewhere but may also encourage them to develop their own nuclear industries without accepting international safeguards. Almost any country can make a bomb, or use plutonium in other destructive ways, many contend, because the technology is not very complex and information, fuels, and materials are not that difficult to acquire nor prohibitively expensive. Although there are no certain controls, some governments view the International Atomic Energy Agency (IAEA) safeguards and inspection as the most effective means to discourage the spread of nuclear weapons, particularly when coupled with the threat of isolation from the world community. In other words, they argue that the United States offers no viable alternatives to nuclear power and is attempting to solve what are essentially political problems by technological means.

But technological means may be used to help mitigate proliferation concerns, as is demonstrated by the recent developments of low-enriched nuclear fuels for research reactors and more proliferation resistant nuclear fuel for commercial power reactors. Such fuels may represent advances that could ultimately reduce proliferation concerns.

FUTURE EMPHASIS

Some of the more important questions that need to be addressed follow.

1. What technological issues need to be resolved in order for nuclear power to play a more substantial role in the world's energy future? What are the likely consequences if nuclear power development is constrained?

A great deal of public controversy over nuclear power comes from the fact that there is still no consensus on the best method for permanently dealing with spent fuel and radioactive wastes. Many persons feel that resolving of the waste disposal problem is key to the future development of nuclear power as a major energy source. Is recycling of nuclear wastes an economic and environmental necessity? How would recycling affect the disposal of nuclear wastes? What are the trade-offs between recycling and proliferation concerns?

Assurance and control of quality in the construction and operation of nuclear powerplants is a difficult matter in the United States and in other advanced industrial nations. It is even more difficult to achieve in less developed countries where adequately trained personnel may be a scarcity. The potentially serious effects of a nuclear powerplant accident magnify technological problems that arise in their design, siting, construction, and operation. What has been the safety record of existing nuclear powerplants throughout the world? What steps could be taken to assure high standards in construction and operation of nuclear plants?

2. How can effective international political instrumentalities be developed that would ensure against the diversion of nuclear materials for weapons or other nonpeaceful purposes?

Many nations that could benefit from nuclear development and reduce their reliance on imported oil have long histories of unstable governments. In some countries the military plays a dominant or even an exclusive role in governing and, therefore, may be in a position to lead a nation from nuclear power generation into nuclear arms development. The recent upsurge in political terrorism also raises questions about the potential diversion of nuclear materials for illicit purposes and raises concern for the security of nuclear installations.

Are existing international agencies, such as the IAEA, adequate to ensure the application of nuclear safeguards? How do export review processes of nuclear supplier countries take into account the political stability of recipient countries and the risks involved in such sales? Are there political sanctions that could be used to prevent diversion of nuclear materials to weapons? Would the leasing of nuclear facilities and/or nuclear fuels present a viable basis upon which nuclear development could take place while avoiding proliferation of nuclear weapons?

3. What are the implications of the U.S. Nuclear Non-Proliferation Act of 1978?

There has been much discussion about the likely impact of U.S. nonproliferation policies on world nuclear development. Angry responses by other nuclear vendor nations and those that are planning nuclear power development to U.S. actions to prevent proliferation suggest that multilateral approaches may be preferable and lead to more widely acceptable results than unilateral efforts can achieve. Some governments believe the United States seeks to slow nuclear power development so that the United States can catch up to the technological levels of other nations. Is there evidence to support such allegations?

With these issues in mind, the U.S. Government has strongly expressed its concern about the proliferation of nuclear materials by enacting the NPA. This act assigns to our Office the responsibility to report on its implementation. The major questions posed by this legislation are: What role should the United States have in providing reliable supplies of nuclear fuel to foreign customers? What role should the United States have in strengthening the international safeguards system? How do Federal nuclear export practices and policies affect U.S. nuclear nonproliferation and energy supply goals? What steps has the United States taken to reduce the risk of proliferation through the negotiation of agreements with other nations? Has the United States adequately assisted other nations to develop nonnuclear energy sources? What is the overall impact and how successful is the implementation of the NPA?

4. To what extent is world nuclear generating capacity being affected by the absence of a universally accepted nonproliferation agreement?

Many foreign government officials fear that unilateral action of the U.S. Government in legislating NPA essentially undermines the potential for acceptance by all nations of the NPT. Some countries, for example, refused to sign the NPT because it would obligate them to international safeguards and inspection of nuclear facilities which they feel would, if accepted, impinge on their sovereignty and national integrity. The passage of NPA is, then, seen by many of those nations as an additional effort by the United States, one of the principal instigators of the treaty and one of its greatest advocates, to retard worldwide nuclear development by encouraging reliance on alternative energy fuels and technologies.

What have been the effects of NPT in the 10 years of its existence? Has it, for example, actually affected nuclear energy development in any country? Has U.S. emphasis on adherence to the NPT, particularly inspection and safeguard requirements, diverted nuclear sales to other vendor nations? How has the competitiveness of U.S. nuclear powerplant vendors been affected by the absence of a universal nonproliferation agreement? How can the United States influence foreign nations to accept strong safeguards and to adopt standards to ensure adequate levels of health, safety, and welfare as a condition of sales to third-party purchasers?

5. Can U.S. and world concerns for nuclear proliferation be lessened by technological means?

It has been argued by some critics of U.S. nuclear policies that nuclear proliferation problems are political and cannot be solved, at least for now, by technological fixes. Nations, they say, with the desire, resources, money, and trained personnel can divert spent fuels to a weapons program if they are willing to spend the necessary funds to construct reprocessing facilities particularly at low levels of sophistication and capacity.

However, the United States has encouraged efforts to develop proliferation-proof technologies and new approaches to the nuclear fuel cycle. The INFCE studies and the U.S. Non-Proliferation Alternative Systems Assessment Program are attempting to identify practical and economic technical alternatives to the present uranium and plutonium fuel cycle.

Moreover, there are some preliminary indications that technological means may ultimately be used to lessen proliferation concerns in the light of the promising developments of low-enriched uranium fuel for research reactors, a "spiked" or highly contaminated plutonium fuel, and new types of reprocessing techniques.

What alternative technologies are there, either actual or prospective, that will help to mitigate problems of nuclear proliferation? What technologies are being developed that might increase proliferation concerns, for example, laser enrichment technology?

6. Are the full costs of nuclear power taken into account in determining the competitiveness of nuclear energy with other energy technologies?

The need for a better understanding of the economics of all phases of nuclear power is compelling. For example,

costs of decommissioning nuclear powerplants and disposing of nuclear wastes are not yet known and, consequently, are not reflected in the pricing of nuclear-generated electricity. These and other costs, including Federal payment for liability insurance coverage and the backfitting of plants with the latest technology to meet evolving safety standards and R&D, are not now considered in economic analyses of nuclear power or in economic comparisons of nuclear power with other energy technologies. These costs must be determined and factored into any meaningful analysis of the economics of nuclear power.

Analyzing the total costs of nuclear power is different from analyzing the cost of other energy technologies. Although many of the same cost factors are common to all powerplants, they are likely to be higher for nuclear power because of the need to contain radioactive emissions and to guard against the consequences of an accident. What has been the economic record of nuclear powerplants throughout the world? Are there standard criteria which should be met by nations considering the purchase of a nuclear powerplant? What are the likely economic consequences to a nation if nuclear power development is constrained?

7. Are U.S. and world nuclear fuel supplies adequate to meet long-term nuclear power needs?

Uranium, just like any other natural resource, is a finite commodity. Some estimates indicate that growth in the use of present generation nuclear technology is likely to be limited by the availability of uranium supplies until about the year 2050. But even these estimates are based on a number of assumptions about technological development, construction, financing, exploration, and resource development which may or may not prove to be true under some circumstances.

How reliable are estimates of U.S. and foreign uranium supplies? What factors are likely to influence the availability of foreign uranium resources? What promising new technologies are there to stretch out available supplies and enhance recoveries of known reserves? What rates of growth of world nuclear generating capacity can be supported by projected uranium resource development?

8. What are the implications of the international uranium cartel for world energy supplies, prices, and future nuclear development?

Given the success of the OPEC cartel in fixing world oil prices at high levels and its effects on the world

economy, there is an understandable concern among energy-dependent nations about a uranium cartel. The recent meteoric rise in the price of uranium supports this fear. How might a uranium supplier's cartel influence the development of nuclear energy or other alternative energy sources?

The location of most proven uranium reserves in only a few countries, such as the United States, Canada, Australia, South Africa, and the Soviet Union, is a concern to many foreign governments. What are the implications of this concentration for the nuclear power development of other countries?

9. How have public perceptions affected the development of nuclear power in the United States and abroad?

It is clear that public acceptance is an important factor in determining whether or not nuclear power will become a major contributor to world energy supplies. Large numbers of people in several countries planning or already committed to nuclear power have been opposed to its construction and operation. Concerns for safety, radioactive emissions, thermal effects, disposal of wastes, and siting are the issues most frequently mentioned as the basis for the opposition.

Why have these issues become so much a matter for public concern? How can such concerns be allayed? How have government and international organizations acted to influence public perceptions of nuclear power? Are the nonproliferation concerns of the administration and the Congress understood and being supported by the actions and the expressed views of key Federal personnel, in both the United States and abroad?

CHAPTER 7

ARE THE INTERNATIONAL ACTIVITIES OF THE PRIVATE SECTOR AND THE U.S. GOVERNMENT POLICIES WHICH AFFECT THEM CONSISTENT WITH THE ACHIEVEMENT OF U.S. ENERGY GOALS?

Before the Arab oil embargo, U.S. companies negotiated the terms of international oil development and marketing agreements directly with foreign governments. The Government did little to develop either independent information sources or institutional competence to deal with international oil issues or, except for tax and antitrust purposes, to monitor or control the business activities of the multinational oil companies. By virtue of their technological skill, financial power, and control over supplies and distribution, U.S. companies gained preeminence in the international oil market. Since 1973, though, OPEC nations have effectively gained control of their oil pricing, production, and export policies. Thus, the role and influence of the multinational oil companies (MNOCs) have changed considerably.

MNOCs still control most downstream operations and possess enormous managerial, technical, and marketing skills which the producing countries continue to rely on. Some producing countries have contracted with the companies to carry out many of the same functions performed when the companies were concession holders. Of necessity, then, the activities of the companies are strongly influenced by producer-government decisions and policies. It is, therefore, not certain that the United States can rely on the MNOCs to serve U.S. national interests when these interests conflict with those of other consuming nations, producer governments, or corporate profitability.

Of course, it is not possible to dismiss the influence that national allegiances may have on the decisions of company managers, but the recent trend toward growing multinational representation on executive staffs and boards and among stockholders raises concern about how corporations will act when consumer and supplier country interests are in conflict.

Increased mobility of operations and capital holdings of MNOCs may have substantial implications for the U.S. energy future and the U.S. economy. Have the implications of the changed role of the multinational corporations been accounted for in U.S. policies?

Litigation in U.S. courts over the manipulation of uranium prices by a U.S. multinational oil company and foreign governments illustrates how corporate interests can conflict with national interests. The horizontal spread of petroleum companies into other fuel areas, including uranium and coal, raises further concerns of the potential conflict of corporate interests with national interests. What are the implications of control by MNOCs over significant portions of other fuel supplies? What level of control of alternative fuel supplies poses a danger to the U.S. national interest and the interests of other fuel-dependent nations?

How valid are these concerns? Do they reflect a widespread and longstanding American view that big is bad or a public preoccupation with concentrated control of basic commodities by a few large firms? Does the diversification of MNOCs imply a threat to the development of alternative energy resources that might compete with existing fuels? Are these concerns shared by other fuel-dependent nations? Are the American MNOCs seen by other governments as national companies representing U.S. national interests and, therefore, not to be relied upon?

Some of these issues have been debated in the United States for many decades, and the result has been the application of antitrust laws--a primary purpose of which has been to prohibit monopoly control of an economic sector. Exceptions have been made where it was perceived to be in the national interest or the unavoidable result of economic, social, or technological realities. Laws and policies prohibiting formation of monopolies have an important effect on energy investment, development, prices, and consumption. Are these effects fully understood? Have they had a significant impact on available energy supplies or new technologies? Are there ways to regulate the business practices of the multinational energy companies to mitigate the effects of their size and market control without negatively affecting energy supplies? Is there true competition among the major multinational energy companies? How does the power of the major MNOCs affect smaller international oil companies, domestic oil companies, or the national oil companies of other countries?

Corporate representatives argue that certain Government policies lessen their ability to compete with foreign energy companies and tend to impede investment in the development of additional energy resources vital to economic performance and national security. Is there evidence to support these contentions? Are new policies needed that treat the

multinationals as managers of a system necessary to meet national and international energy requirements? Are there ways to regulate the multinationals that will permit them to better use their expertise and financial resources to develop and commercialize other energy supplies and technologies?

Further, the role of banks and other financial institutions, large construction firms, and other major industrial companies are likely to have considerable influence on Government energy policies. The same may be true for the activities of a long list of interest groups--environmentalists, consumer groups, foreign government representatives, and a host of others. How do these groups affect the development of U.S. international energy policies?

FUTURE EMPHASIS

Some important questions that need to be addressed are:

1. Would some form of a Federal oil and gas company help assure that U.S. national energy objectives are better served?

Many of the major energy importing and exporting nations have created national energy companies to represent them in some or all phases of the energy industry. One objective for doing this is to counterbalance the influence of private multinational energy companies on their national markets and economies. Another would be to provide the Government with an effective yardstick to measure the performance of MNOCs. How effective have national energy companies been? Would a U.S. national oil and gas company--serving as a purchasing agent, wholesale distributor, and investor in energy development for the country--do a better job of assuring adequate levels of available fuel supplies than the private companies? Would increased U.S. emphasis on country-to-country bilateral supply agreements imply the need for a Federal energy company to represent U.S. national interests?

2. What are the international implications of the horizontal expansion of multinational oil companies into other energy and nonenergy areas? Would divestiture enhance or impede achievement of U.S. national interests and energy objectives?

Some observers fear that the horizontal spread of MNOCs into other fuels and energy technologies concentrates effective control over the future development of energy resources in a few powerful companies. Concern is expressed that the development and commercialization of promising energy technologies and alternative fuels which might compete with existing

oil and gas interests could be squelched or retarded. Further, the control of competing fuels, mainly coal and uranium, would place too much power in the hands of a few multinational companies. Are these valid concerns? What would be the effects of enactment of legislation already before the last Congress requiring divestiture or limiting MNOC investment in other areas of energy resource development?

3. Do U.S. policies foster competition among international energy companies in developing resources and maintaining energy supplies?

Certain U.S. Government policies have allowed U.S. energy companies to engage in what many see as anticompetitive behavior. For example, joint ventures and other cooperative arrangements which spread the risk of investments required for energy exploration and development have been encouraged. The Government has also approved multinational oil companies' participation in IEA (representing consuming countries) while also maintaining close business relationships with OPEC members (producing and exporting countries).

Other Government actions, such as the crude oil entitlements program, have been taken to maintain market competition by equalizing the price of oil to all refiners. The entitlements program, however, essentially keeps inefficient, smaller refiners in business by paying subsidies to equalize the price charged all refineries for crude from all sources. To what extent do U.S. policies maintain the number of companies rather than competition in energy market? What are the implications of a trade-off between reduced competition through greater cooperation among energy companies and strong policies to stimulate competition?

The National Energy Plan set a goal for U.S. oil imports of 6 million barrels per day by 1985. The passage of the National Energy Act of 1978 implies that the goal will not be met. In any case, how would a reduced U.S. oil import market affect the competitive relationships between U.S. and foreign oil companies and between U.S. multinational and domestic energy companies? What would be the economic impact of this proposed reduction in imports?

4. Should the United States seek international agreements to regulate, monitor, and oversee the international energy companies?

The sheer size and economic power of MNOCs and their influence over all aspects of international oil trade has been a matter of concern to many oil import dependent countries,

including some elements of the U.S. Government. Many see them as the hobgoblins of the energy dependent, poised to take advantage for profit of any opportunity presented by a shortage or a supply interruption. Others view MNOCs as highly skilled, competent, and honest managers of a complex and vital system, who do nothing more than earn a fair profit on investment for their stockholders. There is evidence to suggest that both contentions have some merit while neither is entirely true. In any case, could nations whose oil supply depends on one or more MNOCs devise mechanisms to oversee MNOCs to assure that their operations are aboveboard and consistent with national objectives? Are U.S. Government provisions to oversee MNOCs adequate? Could this job be done better by an international agency?

5. How do the activities of nonenergy U.S. multinationals, international financiers, banks, and investment companies affect the United States' and other nations' energy supplies, prices, and consumption patterns? Are the U.S. Government mechanisms and legislative authority adequate to monitor and regulate such activities?

Banks, financiers, investors, construction firms, farmers, and purveyors of goods and products whose manufacture is energy-intensive--all affect U.S. domestic energy consumption in some manner and, therefore, U.S. international energy policies. Moreover, patterns of investment, of farming out certain processes to other countries, plant location, equipment and design--all have implications for the ways in which Americans use energy and the amount they consume. Are the activities and processes of such companies understood for their effects on the formulation of U.S. energy policies? On patterns of consumption? On energy supply levels?

6. Does the National Energy Act reduce uncertainty among potential investors in foreign energy resource development?

Uncertainty makes investment less attractive, and it is clear that the effect of new national energy policies is a highly uncertain matter. Some energy executives complained that the lack of clear, consistent U.S. energy policies makes it difficult to plan their energy investments and, in fact, is often cited as a reason for some energy companies to diversify their investments into nonenergy businesses. What effect will the Government commitment to sharp limitations on oil imports have on investments in exploration and development of new foreign fields? How would a crude oil tariff or other import limitations affect investment in energy production and development?

7. Does the U.S. Government need more reliable information about the international operations, finances, and holdings of the energy companies?

Much has been made of the contention that the international energy companies operate under the cover of secrecy and that it is difficult, if not impossible, for governments to regulate them in any meaningful way. Agreements with OPEC members, resource estimates, income from the various levels of operations, allocations, royalties and foreign taxes, research and development, costs and prices, and investments in other energy and nonenergy areas--all constitute a complex web of activities about which many claim governments have the need to know. Are Government agencies effectively using the data they already have? What level of sophistication of data collection and analysis has been reached by the U.S. and other governments concerning the foreign and domestic operations of MNOCs? What, for example, are the effects of international energy companies' activities on the investment decisions of banks and other financial institutions, particularly in new energy resources and technologies? Does OPEC have better access to MNOC operating information than do consuming nations? How important to the regulatory and policymaking process is such information?

CHAPTER 8

ARE U.S. POLICIES EFFECTIVELY DEALING WITH INTERNATIONAL FINANCIAL PROBLEMS RESULTING FROM OR EXACERBATED BY INCREASED OIL IMPORTS?

In 1977 the United States paid approximately $45 billion for net oil imports. Assuming no price increase in 1978, the U.S. import bill may exceed $50 billion this year. Foreign governments doubt the United States and resolve both to reduce domestic energy consumption and to account for the implications of high levels of U.S. oil imports for the stability of world financial markets. Many governments insist that continued high U.S. expenditures for foreign oil result in the depreciation of the dollar on world money markets and threaten the economic health of their countries as well as that of The United States. Moreover, the low value of the dollar puts foreign imports at a competitive disadvantage in the U.S. market. Further, they say, world financial and monetary problems will not be solved unless the United States reduces its external payments imbalance.

The international monetary and financial impact of continued balance-of-payments deficits may appear arcane and abstract to most Americans, but it directly affects the U.S. standard of living. To the extent that imbalances occur in U.S. external accounts, the value of the dollar on world markets fluctuates. Surpluses normally generate appreciating currency trends while deficits generally reduce the value of national currency in international exchange. It is important to note that neither of these conditions--deficit or surplus--is inherently better than the other. Each has costs and benefits for the economies which produce them, as does long-term balance-of-payments equilibrium.

Balance-of-payments changes are caused by a variety of factors, but in an accounting sense the balances vary in response to changes in

--demand for foreign goods and services;

--foreign demand for domestic goods and services;

--domestic demand for foreign short- or long-term, direct or portfolio investment holdings; and

--foreign demand for domestic short- or long-term, direct or portfolio investment holdings.

U.S. demand for oil imports obviously falls under the first category.

Viewing U.S. oil import demand in this manner is useful in that it puts the problem in perspective. It is one of several factors affecting the U.S. balance-of-payments position, and that position may or may not be detrimental to the standing of the United States in the world economy. Too often, it is simply assumed that the U.S. balance-of-payments deficit is caused by oil imports and that this deficit is a problem for the United States of sufficient concern to warrant the domestic economic changes to curtail it. Neither of these assumptions may be completely accurate. In fact, imports of manufactured goods are a bigger component of the U.S. balance-of-payments deficit than are oil imports.

In the wake of the 1973-74 oil embargo and the fourfold increase in international oil prices, there was a general concern over the ability of international financial markets to accommodate the vastly altered pattern of credit demand. Large dollar-denominated outflows from industrialized oil-consuming nations and oil-poor LDCs went to OPEC recipients with little real absorptive capacity. This put a large strain on the intermediation capability of international financial institutions. Dire predictions circulated concerning the imminent collapse of the international financial system. Five years later, there is general agreement that the system worked extremely well in handling the initial credit adjustment. But there is concern that the international financial community may have overextended itself in certain international market areas in response to intense pressure to rapidly intermediate petrodollars by relending on terms and conditions that may not, over time, prove acceptable. In particular, there is concern over the lending patterns of U.S. banks to oil-dependent LDCs, whose balance of payments are heavily in deficit as a result of the oil price increases.

FUTURE EMPHASIS

The major questions to be considered are:

1. Do U.S. policies address potential problems posed by the recycling of petrodollars?

U.S. payments to OPEC members are largely self-financing. Reverse investment on the part of oil producers in the form of bank deposits, security purchases, and equity participation has offset much of the outflow directly and will continue to do so. Indirect investment, generated as the result of OPEC capital inflows to other countries, also tends to reduce the

impact of oil-related outflows on the U.S. balance-of-payments position. Are the long-term implications of such petrodollar recycling adequately understood?

2. Are U.S. international currency intervention policies influenced by world energy considerations?

Many U.S. and international financial mechanisms, such as the Exchange Stabilization Fund and swap arrangements, operate far from the public view. The extent to which U.S. energy policies influence intervention activities should be examined.

3. What factors account for some oil-importing industrialized countries being in a more favorable balance-of-payments position than the United States? To what extent does the high level of U.S. oil imports contribute to the depreciating value of the dollar?

Countries such as West Germany and Japan, nations which import nearly all their oil, have enjoyed a relatively better economic position in recent years than the United States. These economies run balance-of-payments surpluses and have currencies whose relative values have continued to appreciate in world exchange markets. Moreover, even in countries such as Belgium, the Netherlands, and Switzerland, where oil imports have contributed to trade deficits, capital inflows have been such that currencies have appreciated against the U.S. dollar.

Is the United States actively pursuing policies to attract capital investment and offset oil-related dollar outflows? What could the United States learn from policies of other industrialized nations?

4. How effective have U.S. policies been in dealing with energy-related economic problems of other industrialized countries?

Some industrialized countries were severely affected by the increase in OPEC oil prices in 1973-74. How effective have U.S. policies been in assisting such countries to improve their balance of payments, economic recovery, and ability to arrange for loans and service debts?

5. To what extent are international lending agencies assisting developing countries to relieve their energy-related financial burdens? Do U.S. policies support such efforts?

The balance-of-payments problems of some LDCs have been substantially worsened by the rise in oil prices since 1973.

Industrialization and the increase in production of primary products are often energy-intensive and are not generally amenable to conservation measures. Consequently, the energy-related foreign exchange requirements of LDCs to finance industrialization are large and expected to grow. How effective have policies of the United States and international lending agencies been since 1973 in providing the financial assistance required by developing nations to offset the negative effects of oil price rises on national growth?

After 1973, oil-poor LDC deficits increased rapidly. Low LDC demand-elasticities for essential energy resources, coupled with high elasticities in developed nations for LDC primary exports, created acute foreign currency shortages and a sharp demand for greater access to international capital markets. U.S. and other banks, flush with petrodollar deposits, often catered to LDC needs without adequate credit evaluation concerning the ability of these nations to service and repay borrowings on a timely basis. Moreover, even in circumstances where credit evaluation was undertaken, banks were often unable to determine the extent of lending activity by competitors. Thus, in some nations, where particular project loans appeared sound in isolation, higher than perceived risks existed based upon the debt-to-service (export earnings) capability of the nation as a whole. This sort of situation has led to default or rescheduling of present loans in several cases and may exist in many others where either banks or the nations involved have avoided facing fundamental overextension difficulties through the pyramiding of further borrowing.

6. What should be the posture of the U.S. Government concerning the changing role of international lending agencies in a postembargo environment?

Since the 1973-74 period, countries have been forced to turn to international lending agencies to ease economic adjustments to higher energy prices and have had to accept stringent conditions for this assistance. There have been several instances in which the International Monetary Fund (IMF) has dictated the adoption of national economic programs before agreeing to finance balance-of-payments deficits of member nations. Given the energy requirements and foreign exchange shortfalls in developing nations in particular, it seems realistic to assume that IMF may decide to provide managerial assistance to an even greater extent in the future. Is IMF designed and managed so as to provide such assistance effectively? Is such a role for IMF desirable, and what are the implications?

A corollary matter is the involvement of U.S. private banks in the national affairs of the countries borrowing from them. Two recent cases are Peru and Zaire, where a consortium of U.S. banks have exacted rather strict agreements concerning national economic policies and management prior to making additional loans. From the standpoint of the banks involved, linking assurances of national fiscal responsibility to credit extension makes good economic sense. From the standpoint of the U.S. Government, however, such agreements may have adverse political consequences.

CHAPTER 9

HOW WELL ARE INTERNATIONAL ENVIRONMENTAL CONCERNS ACCOUNTED FOR IN U.S. ENERGY POLICIES?

Energy production, consumption, transport, and waste disposal all have an impact on the quality of the physical environment. They affect air and water, land use, and public health and safety. The U.S. appetite to produce and consume energy often conflicts with other valued goals, among which is a high-quality living environment. Moreover, the rise in the cost and uncertainty over the security of petroleum supplies have turned attention to dirtier, cheaper fuels, such as coal, which can help to reduce oil imports. A fundamental issue remains whether the social and environmental costs of increasing a nation's production and use of fossil fuels and nuclear power exceed the benefits of reducing its dependence on oil imports.

Environmental concerns, like energy concerns, receive the most attention from the public when it comes to believe the problems have reached a critical stage. But environmental impacts from energy use are likely to be long term and cumulative and not fully experienced by present generations. Mid-ocean oil slicks and the measurable accumulation of pollutants in the atmosphere may only represent the early stages of longer term deterioration. The challenge is to identify and define problems now so that efforts to solve them can be initiated. However, the United States and other nations have taken only preliminary and uncertain steps through the United Nations, OECD, NATO, and the Law of the Sea Conference to solve international environmental problems. Do the United States and other countries have effective methods to assess the energy/environment relationship as it is likely to develop over the longer term?

Current national energy strategies call for greater use of liquified natural gas, coal, and nuclear power to replace oil imports. Trade in such fuels and technologies poses many questions regarding the world's environment and safety. At the same time, stringent conservation programs and efforts to move to renewable resources and new technologies, such as solar energy, may also have adverse implications for the quality of life. Have the United States and other countries identified potential problems and developed programs to cope with them?

Some governments of industrialized nations have come to realize that protecting the environment is an effort deserving

attention. It is not always clear that environmental concerns receive adequate attention in national energy policy processes, however--particularly when policymakers fear that attention to environmental problems might affect a country's economic growth. In many developing countries there is less concern with environmental protection than with economic development. How do environmental planning and pollution abatement costs affect economic growth and development?

The role of the private sector is critical in implementing and developing pollution abating technologies. Legislation and regulations to protect the environment are often viewed by industry as constraints on their freedom of activity. Some energy industry executives call for a more rational balance between environmental protection and energy production policies that would stimulate a timely development of world energy resources. Some U.S. businessmen feel that the cost of complying with environmental regulations affects cost-competitiveness and, therefore, the sale of U.S. exports. There is also concern about a proposal to require environmental impact statements for U.S. exports, licensed by a government agency or financed through such agencies as the Export-Import Bank. Distributing information to potential customers on the environmental impacts of U.S. goods, it is argued, will hurt export sales. What would be the effects of such a requirement?

FUTURE EMPHASIS

In order to determine whether the United States and other nations have adequately addressed environmental concerns in their energy policies, the following questions need to be analyzed:

1. Is there adequate recognition of potential climate problems posed by increased global use of coal and other fossil fuels?

Studies have shown that carbon dioxide released in the use of energy from fossil fuels may modify the world's climate. Climatic change would, in turn, significantly affect global atmospheric, water, and agricultural conditions--the so-called greenhouse effect. Heat islands have actually built up over urban areas and heavily industrialized regions. Plans for the massive development of fossil fuels need to be evaluated in the light of such concerns, including a determination about the thermal limit of the Earth's atmosphere.

2. What are the environmental and safety issues associated with a major expansion of international gas trade?

The loading, ocean transport, off loading, local transport, and storage of natural gas, especially in densely populated areas, pose threats to the environment and public safety because of the potential for incidents resulting in fires or explosions. Such concerns are likely to intensify as nations increase their trade in and use of imported natural gas, particularly LNG.

3. What long-term effects do oilspills have on ocean and coastal environments?

Measuring the total impact of oilspills depends on a number of factors, such as how long the oil remains at sea, the amount of oil spilled or discharged, weather conditions, tidal currents, and wave activities. Much is still unknown about the longer term ecological damage from petroleum spills, especially to tidal marshes, estuarine resources, sheltered coastal areas, and aquatic life. More information and new technologies are needed in order to deal effectively with oilspills when they occur and to prevent them from occuring. What outstanding issues need to be resolved at Law of the Sea Conferences in order to reach agreement on ways to deal with these problems? Are there other international mechanisms available to address these problems?

4. Does world nuclear development pose problems for the world's environment and safety?

The environmental and safety issues most frequently associated with nuclear energy are exposure to radioactive releases and the discharge of thermal effluents either from normal nuclear operations or nuclear accidents. Siting of nuclear powerplants and diversion of water resources to their use are also environmental issues frequently in contention. Public concern over the risks associated with the safe use of nuclear materials and the storage and transportation of radioactive fuel and wastes has increased to the point where some nations are reexamining the full range of costs of nuclear development. Questions about how to safely manage nuclear power will not be resolved until a better understanding is reached about these social and environmental costs.

5. Are the environmental effects of solar and other new energy systems adequately understood?

The United States and other nations are emphasizing plans to shift to new energy sources and technologies. Are the environmental effects of these being assessed? For example, scientists have identified some localized problems associated with the use of certain types of solar technologies. Are there any international problems associated with the extensive and widespread use of such technologies?

6. How does world economic performance affect the willingness or ability of nations to make the investments necessary to reduce energy-related environmental degradation?

Complying with environmental regulations can be expensive for those industries which must install new equipment, change processes, or switch their fuel usage. Has the recent world recession caused governments to lessen their emphasis on environmental protection? Does unwillingness of some governments to deal effectively with environmental problems portend longer term environmental degradation?

7. How can developing countries be encouraged to deal with the environmental impacts of current or expanded levels of their energy production and consumption?

As the economies of developing countries expand, so too will their use and production of energy. Efforts must be made to assist developing countries to recognize and deal with the trade-offs inherent in the environmental effects of greater energy use. For example, deforestation from long-term wood consumption in developing countries has led to the destruction of watersheds which can have serious impacts on the environment of neighboring countries. What efforts are underway to understand and deal with these problems?

8. Are there international standards, agreements, and organizations to deal effectively with the environmental impacts of world energy trade, consumption, production, conservation, and transportation?

International organizations generally lack the standard-setting and enforcement powers necessary to address longer term environmental problems of energy use, primarily because nations are reluctant to relinquish sovereignty over domestic energy use and the management of their resources. International energy organizations focus more on supply availability than on how such supplies will affect the environment. Is greater attention by international organizations needed to deal with environmental problems resulting from energy use?

9. How do environmental standards and regulations of the United States and other countries affect the production, consumption, and trade of global energy resources?

Regulations governing air, land, and water quality have an impact on the types of fuel it is economical to produce or use in a given country. Many nations have required some of their consumers to use low-polluting fuels, such as natural gas or low-sulfur crude oil. As world energy demand increases, however, countries are faced with the need to use whatever fuel is available. How is increased energy trade, especially in dirtier fuels, likely to be affected by the enforcement of environmental regulations of producer or consumer nations?

10. How is the competitiveness of U.S. exports affected by domestic environmental regulations governing energy use?

Efforts are needed to determine whether U.S. products are at a disadvantage in world markets because they include costs of meeting certain U.S. environmental standards. What are the energy costs of meeting environmental standards? Are costs of environmental standards offset by the current pricing of U.S. energy below world market levels?

11. Should U.S. companies be responsible for informing their foreign customers about the potential energy-related environmental and safety impacts of their products?

Recent proposals by the administration to have the National Environmental Policy Act of 1969 apply to U.S. exports have met with strong opposition from business and some parts of the Government. Given the environmental consequences of the use of their products, should U.S. companies be required to advise foreign customers about what those impacts are likely to be? Should the U.S. Government prohibit energy exports, fuels, or technologies that may negatively affect another nation's environment or the global environment?

CHAPTER 10

WHAT CONFLICTS DO GROWING U.S. ENERGY IMPORT REQUIREMENTS POSE FOR OTHER MAJOR FOREIGN POLICY OBJECTIVES?

The greater the reliance of the United States on imported energy, the more likely it will be that energy considerations will influence policies that have no evident relationship to energy; in other words, energy could become the tail that wags the national dog. Thus, the interrelationship between oil import dependence and freedom to pursue other national objectives becomes a matter of concern.

There is evidence that U.S. foreign policy has been influenced by pressure brought to bear by Middle East oil exporting nations. For example, the administration had promised the Nation that it would reduce arms sales abroad. But the recent sale of advanced fighter jets to Saudi Arabia and Egypt is doubtlessly linked to U.S. oil import-reliance. The sale of high technology equipment to Iran, despite the administration's strong representations concerning human rights, is likely to have been influenced by energy requirements. There are, of course, other instances where energy considerations influence the shape of U.S. foreign policy as well as ideological commitments and relationships with U.S. allies.

International trade seems to be one area particularly affected by energy. Energy influences the costs of production and transportation and therefore prices to consumers and competitiveness of goods. Many countries argue that the dislocations in the world economy caused by the 1973-74 increase in energy prices make it desirable to establish orderly marketing arrangements, which is a euphemism for less competition in international trade to assure profits. Others believe that such arrangements are highly counterproductive in that they raise consumer prices and reduce national income. How will the trend toward restrictive international trade practices affect international energy markets?

FUTURE EMPHASIS

The more important questions to be addressed are:

1. How are U.S. human rights policies affected by international energy concerns?

The administration's policy on human rights is disturbing to nations with oppressive governments. Those governments undoubtedly view human rights as subordinate to the accomplishment of national objectives. However, when infringements on personal liberties occur in countries that supply the United States with much-needed energy, then a policy conflict is likely to occur. If the United States presses its disapproval of such actions and predicates trade or military assistance on adherence to U.S. human rights policies, then there is a danger that the countries may retaliate by curtailing the flow of energy exports to the United States. Can U.S. human rights policies be reconciled with the need to import large quantities of foreign fuels?

2. How are U.S. arms sales policies and objectives affected by international energy concerns?

A stated objective of U.S. policy is to limit trade in armaments. Sales are often justified by the necessity of purchaser nations to defend themselves against civil uprisings and external aggression and thus protect their legitimate national interests. When arms-purchasing nations also provide energy to the United States, the sale can be rationalized as serving the U.S. national interest by giving those nations the means to protect their energy resources. Conflicts in foreign policy occur when various arms purchaser nations are at odds with each other, thus jeopardizing U.S. foreign relations with each of the countries involved. The United States is then faced with a dilemma of deciding to whom to sell or give arms, under what conditions, what kinds, and how many. To the extent that the United States uses arms sales as a means to influence energy prices and supply decisions, it runs the risk of violating its policies for control and limitation of international arms trade. Do other countries perceive that the United States is abandoning its arms limitation policies because of its need to meet import requirements?

3. How is U.S. participation in international organizations affected by energy concerns?

International organizations have increasingly focused their attention on the economic ills confronting member nations since the OPEC oil price rise in the hope that cooperative action may offer solutions. The United States, because of its powerful multinational banks and corporations, its leadership position in international organizations, and its position as a major energy consumer, is often criticized for its inability to resolve its domestic energy and economic problems and thus to alleviate some of the energy and energy-related problems being faced by the rest of the

world. Does the preoccupation of other governments with United States energy consumption divert international attention from other important areas of world concern? How has the failure of the United States to deal effectively with its energy problem affected its leadership role in international organizations?

4. What role does energy play in the growing trend toward restrictive international trade practices?

Efforts by industrial nations to organize markets for steel, textiles, and other manufactured goods are rationalized as necessary to deal with the rising cost of industrial processes.

Energy costs included in the price of manufactured goods in Europe, Japan, and other industrial countries are believed to be higher than those reflected in similar U.S. products. Consequently, many nations view this perceived disparity as creating a competitive advantage for U.S. products in world markets. Thus, they say they must seek ways to counteract this disadvantage. Moreover, the success of the OPEC cartel further encourages them to seek comparable advantageous arrangements, although cartels have rarely worked well or for long in the past. Is the cost of energy a major component of the decisions to move toward protectionism among industrialized nations? If so, what are the implications for LDCs?

Recent proposals in the European Economic Community (EEC) which call for the organization of a European refinery allocation system to mitigate the effects of excess refinery capacity are signs of increasing movement toward restrictive trade practices. The current surplus oil tanker capacity may cause some countries to adopt cargo preference policies. What are the implications of such policies for international trade? For the United States? For the MNOCs?

5. What impact does the U.S. antiboycott legislation have on OAPEC energy production and pricing policies? To what extent have U.S. energy needs affected enforcement of antiboycott legislation?

U.S. antiboycott provisions are directed at corporations which will not trade with Israel because of pressures brought to bear by some Arab countries. Some believe that the legislation has the effect of levying tax penalties on the treatment of the foreign income of corporations complying with the boycott of Israel. Some corporations may pass the additional costs on to foreign consumers, including those in the countries which originally

instituted the discriminatory trade practice. In order to recover what they see as unjustified costs, or to retaliate, affected energy-producing countries may pressure OPEC to raise the price of oil. Have U.S. corporations and the price of energy been affected by this legislation and, if so, how?

6. To what extent has increased U.S. dependence on foreign oil imports resulted in other policies that have potentially adverse implications for U.S. treaties, alliances, and agreements with other nations?

Many people are concerned that the sale of oil exploration equipment and technology to the Soviets and the provision of assistance necessary to develop their petroleum reserves may imply long-range dangers to U.S. relationships in Europe. Additionally, providing the Chinese with high-technology equipment, capital, and expertise to assist them in their petroleum exploration may also hold long-range implications for other U.S. interests.

In both cases, the United States and its allies are confronted with the dilemma that is posed by the possibility that, if such assistance is not provided and their domestic petroleum production potential is not fully developed, they will become competitors for diminishing world oil supplies. On the other hand, should their oil production capacity be expanded because such assistance is provided, it is likely that, as the United States and its allies become even more dependent on oil imports, they and their allies would realize substantial economic and strategic benefits.

Additionally, the export of oil exploration and other high-technology equipment which is already in short supply and which may be convertible to military use raises serious concerns. Moreover, even if the United States were to maintain restrictive trade policies on high technology exports to those nations, it is not certain that other industrialized countries would support such an effort by refusing to sell. To what extent do these actions introduce instability in international relations and increase the prospects of conflicts between the United States and its allies? What are the potentially positive implications of such actions?

CHAPTER 11

WHAT ARE THE INTERNATIONAL IMPLICATIONS OF U.S. REGULATORY AND TAX POLICIES FOR MEETING U.S. ENERGY REQUIREMENTS? HOW DO THESE POLICIES AFFECT U.S. ENERGY OBJECTIVES?

To the extent that U.S. regulatory policies influence energy costs and prices, they are likely to affect energy production and consumption and therefore have significant implications for global supplies. To the extent that U.S. tax policies influence the cost and price of energy, they affect the cost of doing business and ultimately a broad range of associated activities--including foreign trade, investments, savings, monetary holdings, and transfers.

The world community of nations--developed and developing, producer and consumer alike--considers U.S. leadership essential in dealing with global energy issues. Yet many informed domestic and foreign observers view U.S. regulatory and tax policies and proposals as creating great uncertainty in and destabilizing world energy markets; impeding effective energy conservation and the accelerated development of alternative energy sources; adversely affecting the competitiveness of U.S. companies; and seriously impairing the ability of U.S. energy industries to maintain their dominant roles in providing innovation, expertise, personnel, equipment, and services for world energy development and use.

Current U.S. regulations effectively suppress domestic energy prices and keep them below world market price levels. How do such regulations affect energy supply and demand? Would a free domestic market lead to the stabilization of energy prices? In view of the existence of the OPEC cartel, is a free energy market possible?

Recent legislation and IRS rulings on the U.S. tax treatment of U.S. energy firms operating abroad have reduced foreign tax credits on production income and eliminated certain tax advantages for foreign exploration and development. Many U.S. firms contend that these changes have placed them at a competitive disadvantage with other major foreign companies, private and national, and have lessened their incentives to invest in foreign energy resource development. How does U.S. tax policy inhibit or encourage U.S. investment in foreign energy development?

Administration proposals submitted to the Congress would have governed some activities of energy companies and increased energy taxes on both producers and consumers and, therefore, raise the cost of energy to consumers. The price rise was expected to depress consumption, thereby reducing levels of imports. How would legislation raise energy prices to diminish consumption, affect the profitability of commerce in the United States and therefore the ability of U.S. companies to compete in international markets? How would such provisions affect the use of and demand for energy supplies?

Tax and regulatory policies designed to diminish domestic energy consumption may test the willingness of multinational companies to maintain headquarters or plants or to expand their commercial ventures in the United States. Such policies may affect investments in exploration and resource development and make the business environment generally less attractive. Would such policies encourage U.S. corporations to decentralize their operations abroad and to seek places where the tax and regulatory burdens are less restrictive?

Regulatory and tax policies influence investment decisions, particularly marginal ones. How well are U.S. energy and tax policies planned and coordinated? Are their implications for the U.S. economy fully understood?

FUTURE EMPHASIS

Some significant questions are:

1. How does the U.S. foreign tax credit affect the price or competitiveness of imported crude?

Recent changes in the Federal tax code effectively altered the relationship between producing governments and U.S. oil companies operating abroad. Increased tax burdens on U.S. companies may affect their competitive position and their access to oil supplies and thus create upward price adjustment pressure. The effect of such taxes on U.S. energy policies and objectives should be fully assessed as it influences the development of secure energy supplies from diverse sources.

2. How do U.S. tax preferences differentiate between foreign and domestic energy production?

Certain tax preferences favor the foreign activities of U.S. corporations, especially MNOCs. These include such provisions as foreign tax credits, depletion allowances, and other tax benefits. Some believe that MNOCs benefit unduly

from those tax preferences in contrast to domestic companies. Which of the preferences do influence the income levels of MNOCs and what is their effect?

3. What U.S. tax incentives exist to stimulate U.S. companies to invest in energy development and production in other countries?

A major objective of U.S. international energy policy is to stimulate the development of new, secure sources of energy. Yet the political and financial risks in many countries, particularly LDCs having such potential, are considered great. Are new tax incentives needed to stimulate foreign exploration and development by U.S. companies?

4. Are U.S. energy-related regulatory and tax policies causing a flight of capital out of the United States? Are they making U.S. products less competitive in world markets?

Some contend that excessive regulation and taxes are causing many U.S. firms to invest in or relocate manufacturing plants overseas. Is there evidence to support this contention? Are MNOCs affected differently than nonenergy companies by U.S. tax and regulatory policies?

5. How do the tax systems of other major oil-consuming countries affect their domestic energy markets? What can the United States learn from the energy tax experiences of other countries?

Taxes on energy is the subject of continuing debate and controversy in efforts to develop a national energy policy. Are there any characteristics of other nations' tax systems that can be adapted to U.S. needs?

6. Should the United States support harmonization of energy taxation and regulatory policies with OECD-IEA nations?

Many countries argue that harmonized tax and regulatory policies would enable them to achieve significant energy savings, enhance their supplies, and capture some of OPEC's monopoly rents. Many nations believe that the tax differential between energy consumed in the United States and other nations discourages conservation efforts and the development of alternative energy resources while strengthening OPEC. Crude oil excise tax and gas deregulation are proposed as a means to cope with this concern. Are there other alternatives that should be considered? How would they affect international efforts to stabilize energy prices?

7. How do U.S. and international tax treaties affect pricing and supplies of energy resources?

Many promising areas for energy resource exploration and development are in LDCs. Yet most of these countries lack the necessary financial and technical capability and must rely on trade in other raw materials and products or on loans from international financial institutions to obtain foreign currency to develop their resources. How might tax treaties be used to encourage them? Should special concessions or arrangements be accorded to these nations to help them develop their own energy resources?

8. How does the U.S. entitlements program affect domestic production of petroleum and levels of imports? What is its effect on world oil prices? On Caribbean and European refining capacities?

Many energy authorities contend that the U.S. entitlements program discourages the expansion of U.S. oil production and subsidizes inefficient U.S. refiners. This encourages them to purchase high priced foreign oil--especially light, sweet crudes--and favors crude oil rather than product imports, with the result that much foreign refining capacity is underutilized. Are such contentions valid?

9. What effect would crude oil price deregulation have on imports of petroleum and domestic production? On world oil prices?

Many support oil price deregulation as the surest way to bring about energy supply/demand equilibrium at market clearing prices. Conversely, many others believe deregulation will result in excess profits for producers, higher prices to the consumer, and no real increase in supplies.

10. What effect will the National Energy Act have on LNG imports and on domestic production? On world natural gas prices and trade?

Gas resources are very substantial but are not a very significant factor in world energy trade. The NEA provides, among other things, certain pass-through pricing formulas for liquid natural gases which affect the competitiveness of imports. How will this act influence the future course and terms of world gas trade? Have the international effects of NEA been quantified and assessed?

11. Does the transfer-pricing mechanism distort the price of imported oil? Are these transfer prices representative of the actual prices paid for oil?

The corporate structures of MNOCs are designed in such a fashion as to permit taking advantage of various financial opportunities--especially taxes. Some of these structures are outside the jurisdiction of U.S. regulations even though they use U.S. capital. Allegations have been raised that transfer-pricing regulations have obscured the real cost of imported oil and have led to additional profits for certain oil companies as a consequence of these separate corporate entities. Is there evidence supporting this view?

12. Should U.S. regulations inhibit or encourage foreign investment in U.S. energy industries or in energy intensive industries?

Some contend that the United States should prohibit unregulated foreign investments in the United States that would lead to the export of energy and other natural resources (such as in the coal industry). Such policies are already being implemented by some foreign governments. Others believe that foreign investment in U.S. energy industries should be encouraged in order to stimulate capital investment in domestic energy development and to offset capital outflows. What are the implications of these diverse policy positions?

13. What effect would the adoption of oil import fees, taxes, or quotas have on the U.S. economy?

Such measures have been proposed as a means of limiting or reducing U.S. oil imports. Depending on the levels, timing, and nature of such controls or taxes, they would have definite effects on the world's economy and energy markets.

CHAPTER 12

HOW DO U.S. DOMESTIC ENERGY DECISIONMAKING PROCESSES IMPINGE UPON INTERNATIONAL ENERGY POLICIES?

The inextricable relationship between U.S. domestic energy policies and international energy issues has been stressed throughout this report. While the emphasis of this report has been on foreign affairs, it is clear that a complex web of Federal, State, and local actions has a profound effect on U.S. international energy posture and policies. Just as complex is the relationship between energy consumption and the national way of life.

The great uncertainties being manifested by the Congress about the effects of sharply reducing national energy consumption mirrors the doubts of their constituents. Neither insensitivity nor lack of concern holds the Congress back. It is, rather, a fear about what will happen to the various sectors of the economy and to lifestyles as a result of legislation leading to higher energy prices and taxes. Some, for example, have raised the issue as to whether or not the world is better served by a healthy and growing U.S. economy than one that is fuel conserving and slowed down, if not stagnating.

For decades, U.S. energy policy has emphasized the availability of low-cost, abundant energy supplies. Economic and regulatory incentives were provided to energy industries to assure, as in the electric and gas utility sector, a protected growth market and stable prices. U.S. executive agencies, such as the Atomic Energy Commission; Federal Power Commission; Army Corps of Engineers; and the Departments of Agriculture, Commerce, Interior, and Transportation, were empowered by the Congress to undertake programs which stimulated energy use and resource exploitation. Farmers were encouraged to mechanize and intensify the use of fertilizers and pesticides. Conscious policies fostered mobility and growth and development of commercial and personal long-distance transportation; homeowners were given incentives to increase their energy use; development of the countryside was nurtured by rural electrification programs; nuclear power was developed because the Government invested huge sums; and industry grew and flourished, encouraged by cheap fuels. All of these policies encouraged increasingly heavy use of energy. Policies of long duration are not easily changed, nor are deeply embedded habits of consumption.

It is difficult to argue that such policies were not successful. But since the Arab oil embargo and price rise of 1973-74, the United States has become increasingly concerned

about the relationship between high levels of energy use, heavy reliance on imports, high costs, and the national economy.

All of these issues are further complicated by the U.S. Federal system, which is based on the concept of limited and shared powers among the central Government and State and local jurisdictions. At each level, business taxes; fuel taxes; environmental laws; siting, safety, and utilities regulation; zoning; real estate taxes; and other government actions have a substantial effect on how energy is used, produced, priced, and sold. Some of these powers are shared with the Federal Government. Others are the primary domain of State, local, or regional government entities or special service districts and may ultimately affect both the stream of commerce and international affairs. All are jealously guarded and not easily ceded, even where it can be demonstrated that structural alternatives might better serve the energy needs of the Nation.

California laws affecting the construction of nuclear powerplants or the use of certain crude oil products; Colorado water quality and use regulations affecting shale oil development; intrastate gas pricing practices in Texas and Louisiana, making it more attractive to sell locally than to ship to other States; coastal States demanding shares in revenues derived from the sale of offshore gas and oil well leases; and State laws and regulations affecting prices, siting, power grids, management, and profits of electric and gas utilities--these are but a few examples of how State actions influence national and international energy issues.

One of the most troublesome domestic issues encountered in the development of a national energy policy is that it inevitably leads to even greater Government involvement in private sector commerce. It has been argued that petroleum nationalization by OPEC countries and increased reliance on oil imports make it necessary for greater Federal energy planning efforts. On the other hand, it has also been argued that Government energy planning interferes with private market decisions and moves the Nation an important step closer to centralized economic planning, an action most Americans have traditionally opposed. Will such increased involvement in the name of energy planning bring the Government even further into the realm of private-sector investment decisions and lead to selective technological development and forced commercialization of technologies?

The actions of a great variety of interest groups, from business to nuclear opponents and proponents, environmentalists, labor, finance, manufacturing, and transport industries to ethnic, racial, and religious organizations, geographic regions, States, and an almost infinite array of groups with divergent points of view--all influence public policy decisions affecting energy, often to different ends, for different purposes, and in different directions. In a democratic society this is not unusual. It must be recognized that each of these forces plays a real role in how U.S. energy policies are formulated. But such heterogeneity is often misunderstood by foreign government officials, many of whom tend to confuse protracted debate and a ponderous decisionmaking process with a lack of national will and an inability to act resolutely.

International concerns are one of the elements in the U.S. energy equation, but only recently has their full importance been recognized. A history of plentiful domestic energy supplies and cheap prices did not require that the United States concern itself with the energy use of other countries. Nor did Americans worry about the effect of imported energy on the U.S. economy while it was a small factor in total U.S. supplies. But circumstances have changed, and this Nation can no longer ignore the impact of its energy policies on other countries or the world economy. Since the United States consumes such a large share of the world's resources and is likely to grow even more dependent on external supplies, the interrelationship between domestic actions and foreign policies assumes great importance for the national interest of the United States and other countries. Perhaps two of the most important energy questions facing the United States is whether the decisionmaking structure can or should adjust to accommodate to these new realities and whether or not such an adjustment would lead to a distortion of the democratic process.

FUTURE EMPHASIS

The significant questions to be addressed are:

1. Are improvements needed in the Federal process to assure consideration of constituent interests in the formulation and implementation of domestic and international energy policies?

The extended debate in the Congress over the administration's proposed National Energy Plan illustrates the difficulties in reconciling the competing interests of a wide range of constituents.

There is evidence that international energy considerations have received inadequate attention in the formulation of national energy policy. What institutional procedures exist for assuring that international energy considerations are adequately represented in national energy policy formation? How are various domestic constituent interests represented? Are the taxes and regulatory activities of all Federal agencies as they affect energy consistent with each other and with national policies?

2. How do relations among the States, between the Federal Government and the States, and between States and local government affect the development of international energy policies?

State and local governments share responsibility with the Federal Government for regulating energy development. They are primarily responsible for setting utility rates, approving siting of facilities, implementing speed laws and other conservation programs and are involved in a host of other programs that affect energy supply and demand. Thus, the opportunity for conflict between Federal and State and local government interests is likely to increase as international energy issues are factored into national policies. Do international energy needs and the drive for coordinated Federal policies in energy development and use imply the need to resolve basic constitutional issues in Federal-State relations? How will State and local governments be affected by greater Federal attention to international energy concerns?

3. What are the implications of Federal energy planning for other sectors of the economy?

National energy planning represents additional intervention by the Federal Government in the energy sector which affects all aspects of the economy. Many have expressed concern that energy planning constitutes a substantial movement by the Government toward central economic planning. Does national energy planning imply a much greater Federal control over such areas as domestic and international trade, transport, and other aspects of the U.S. economy? What are the implications of plans to limit U.S. energy consumption growth rates?

4. Is there a need for the United States to communicate its energy policies more effectively abroad?

Foreign perceptions of U.S. energy policies are a critical element in the success of efforts to deal with global energy supply-demand problems. A lack of understanding of the

U.S. governmental process, of the role of States in a Federal system, and of the operation of private capital markets leads many foreigners to a distorted view of energy developments in the United States. At the same time, stories in the foreign media often present a distorted view of U.S. energy priorities. Are energy-related executive policies and judicial and regulatory decisions adequately communicated to and understood by official U.S. representatives abroad? How well do these officials communicate U.S. energy legislation and decisions to foreign governments and the press?

APPENDIX I

MAJOR INTERNATIONAL ENERGY LEGISLATION, TREATIES, AND ADMINISTRATION PROPOSALS

Since World War II many laws have been enacted that deal directly or indirectly with international energy issues. These laws fall rather conveniently into three broad categories: nuclear development, the post-1973 oil era, and the environment.

For each of these categories, relevant legislation is presented in chronological order with brief comments to show historically how particular laws relate to other legislation. Also listed are a number of related international agreements and treaties concerning, for example, nuclear disarmament and nonproliferation as well as power development. Similarly, several important administration proposals to the Congress are included where they either stimulated or implemented legislation. Not included are many laws, treaties, and proposals which may have implications for international energy issues but are so numerous that to deal with them even in a summary fashion would require a separate report.

NUCLEAR DEVELOPMENT

From the end of World War II until the present, a major U.S. foreign policy concern over the development of nuclear energy has been to prevent the spread of nuclear weapons. Initially, the United States decided to pursue a policy of strict nuclear secrecy concerning nuclear energy development until effective international controls could be established. When progress toward this objective proved difficult, the United States turned in the early 1950s more to a policy of promoting the development of the peaceful uses of nuclear power, while continuing to seek international controls.

Atomic Energy Act of 1946 (Public Law 79-585)

This act created the Atomic Energy Commission (AEC) and the Joint Atomic Energy Committee, which together enjoyed nearly three decades of rarely paralleled power accompanied by considerable controversy. The Joint Committee was the only such permanent joint committee to receive continuing authority to report legislation, was granted special oversight powers, and had a dominant influence on policy formation of the AEC.

Controversy began in the mid-1950s in connection with radioactive fallout from U.S. testing of atomic weapons in the atmosphere. In 1957, in hearings before the Joint

Committee, AEC strongly represented the tests as safe. Despite considerable evidence to the contrary, the AEC assessment was accepted by the Joint Committee; in fact, AEC and the Joint Committee assumed a common defensive posture instead of acting as healthy adversaries. In addition, AEC was accused at home and abroad of promoting nuclear weapons research and development and of losing sight of its mission to promote the peaceful uses of atomic energy.

It is generally conceded that the U.S. policy of nuclear secrecy did not accomplish its purpose. Both the Soviet Union in 1949 and the United Kingdom in 1952 developed explosive devices, still other countries established peaceful nuclear programs, and many more were looking for help in setting up such programs. In December 1953 President Eisenhower in his "Atoms for Peace" address before the U.N. General Assembly proposed greater international cooperation and called for the establishment of an international agency to regulate the use of atomic energy. In the next year came the revision of the Atomic Energy Act itself.

The Atomic Energy Act of 1954 (42 U.S.C. 2011)

This act enabled the United States to make cooperative agreements with both individual nations and groups of nations, such as the U.N.'s International Atomic Energy Agency (IAEA) and the European Atomic Energy Community (EURATOM). Initially, implementation of the act centered around the use of research reactors for such activities as basic research, education, and training; radioisotope production and medical therapy; and reactor physics and engineering. Soon, however, international agreements were made which provided for comprehensive exchanges of technology for research and power reactors and for specific power projects. Financing was also provided for U.S. nuclear exports through grants, loans, and special contractual arrangements, and for support of conferences, training courses, and schools.

The United States has reached agreements under this act with about 30 nations as well as with IAEA and EURATOM. Agreements differ as to detail, but most cover research and/or power applications of nuclear energy. All include controls designed to assure that the equipment and nuclear material provided will be used for authorized purposes only and not transferred to third-party nations. Specifically forbidden is the use of nuclear material--enriched uranium and plutonium--for atomic weapons or any other military purpose, including R&D. These controls were applied unilaterally by the United States until the development by IAEA of safeguards after 1957.

Foreign Assistance Act of 1961 (Public Law 87-195)

This act supplements the Atomic Energy Act of 1954 in authorizing funds for programs in developing countries to promote the peaceful uses of atomic energy (sec. 213). Conventional energy programs to assist LDCs are also included for the purpose of

> increasing the production and conservation of energy through such means as research and development of suitable energy sources and conservation methods, collection and analysis of information concerning countries' potential supplies of and needs for energy, and pilot projects to test new methods of production or conservation of energy." (Public Law 94-161)

However, as amended by the International Security Assistance and Arms Export Control Act of 1976 (Public Law 94-329), the use of such funds to provide nuclear technology, equipment, or material is prohibited unless the recipient country meets stringent conditions, including acceptance of IAEA safeguards (Sec. 305).

Other nuclear disarmament and nonproliferation agreements

A number of disarmament treaties were concluded between the United States and the Soviet Union--along with Great Britain as a third negotiating partner until 1969. (Neither France nor China, which became de facto members of the atomic club in 1960 and 1964, respectively, were invited to participate in the negotiations.) Among the more important agreements were: the Limited Nuclear Test Ban of 1963, which prohibits all nuclear testing in the atmosphere and elsewhere except underground; a 1959 treaty which prohibits nuclear explosions in the Antarctic; and the Treaty for the Prohibition of Nuclear Weapons in Latin America (1971). Still other treaties banned nuclear warheads in space and prohibited the emplacement of nuclear weapons on the ocean floor.

These treaties laid the groundwork for a nonproliferation policy which enabled the two superpowers to engage in a nuclear arms race while refusing to share nuclear weapon technology with their allies--except to a limited extent between the United States and Britain and, for a time, between the Soviet Union and China.

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Treaty on the Non-Proliferation of Nuclear Weapons of 1968

NPT also negotiated by the United States, the Soviet Union, and Britain, was not welcomed by a number of other nuclear or potential nuclear nations--including France, China, and India, which have refused to sign or, having signed, failed to ratify it. However, a large number of other nations have accepted NPT. The treaty is unprecedented in international relations in that it posits a general commitment to international inspection of all peaceful nuclear programs within a nation's borders. In addition to the acceptance of safeguards, the treaty commits signatories to the exchange of nuclear technology for peaceful purposes. This provision has proven to be highly controversial. Many nations interested in the potential benefits of nuclear power view the nuclear supplier nations as violating the spirit of the treaty by restricting the exchange of nuclear fuels, equipment, and related technologies.

Disarmament negotiations, such as the Strategic Arms Limitation Talks of 1969 (SALT I), the Antiballistic Missile Treaty of 1972, and the current round of SALT II talks, are likely to help determine what kind of a balance can be struck between the military and peaceful uses of nuclear energy. Meanwhile, the Congress continues to show its concern by trying to get the U.S. nuclear energy house in order.

Energy Reorganization Act of 1974 (Public Law 93-438)

By 1974 the controversy over AEC focused on the inherent conflict between its regulatory and promotional authorities. In order to separate AEC's nuclear regulatory and safety programs from its nuclear development and promotional programs, the Congress resolved the conflict by abolishing AEC and dividing its powers between two new agencies--the Energy Research and Development Administration (ERDA) and the Nuclear Regulatory Commission (NRC). In 1977, the Congress also abolished its own joint committee and parcelled out its responsibilities among several other committees (Public Law 95-110).

The Energy Reorganization Act moved to centralize all Federal nuclear energy research and development activities by transferring to ERDA several R&D programs from the Department of the Interior, the Environmental Protection Agency (EPA), and

the National Science Foundation (NSF). The act also gave NRC the responsibility for assuring the protection of public health, safety, and environment and, more specifically, for licensing and regulating the commercial nuclear industry, including approval with congressional consent for sales of nuclear materials abroad.

Nuclear Non-Proliferation Act of 1978 (Public Law 95-242)

This act (NPA) reflects renewed congressional concern over the ineffectiveness of the IAEA in imposing international nuclear controls. It has four major purposes: (1) to provide for full and comprehensive assessment of proliferation risks in negotiation and administration of agreements with other nations for nuclear cooperation; (2) to authorize the United States to provide nuclear reactors and fuel to nations adhering to effective nonproliferation policies; (3) to provide incentives to other nations to ratify the NPT and participate in international cooperative efforts; and (4) to ensure effective export control by the United States over its nuclear materials, equipment, and technology.

International Nuclear Fuel Cycle Evaluation

A conference was held in Washington, D.C., in October 1977 to establish an IAEA affiliate forum, the purpose of which is to further encourage the development of nuclear energy for peaceful purposes but to discourage nuclear weapons proliferation. This forum consists of 40 nations divided into eight working groups to meet under a 2-year program whose specific purpose is not to negotiate but rather to prepare a technical and analytical study. The technical and economic scope of the study divides into eight areas: (1) fuel and heavy water availability, (2) enrichment availability, (3) assurance of long-term supply of technology, (4) reprocessing, plutonium handling and recycling, (5) fast breeders, (6) spent fuel management, (7) waste management and disposal, and (8) advanced fuel cycle and reactor concepts. A domestic U.S. counterpart of INFCE organized about the same time under DOE is the Nonproliferation Alternative Systems Assessment Program.

THE POST-1973 OIL ERA

The October 1973 Arab oil embargo and oil price rise gave the industrialized world a shock that was as unprecedented as it was unexpected and continues to affect the world economy in many ways. The United States responded quickly with:

Project Independence

Announced by the President in November 1973, this project set up the Federal Energy Office (FEO) with the goal of making the Nation self-sufficient in energy by 1980. How this could be achieved was never worked out. Preliminary approaches to the problem, however, suggested a number of useful ways to conserve oil and gas, develop new sources, and switch to alternative forms of energy--notably coal, nuclear, and solar.

Emergency Petroleum Allocation Act of 1973 (Public Law 93-159)

This act (EPAA) was passed during the oil embargo to cope with shortages of crude oil and refined products. The purpose of this act is to grant the President temporary authority to deal with oil shortages in order to minimize any adverse impacts such shortages might have on the American people and the domestic economy. The "Entitlements" and the "Buy/Sell" programs were developed to carry out these objectives.

Federal Energy Administration Act of 1974 (Public Law 93-275)

The Federal Energy Administration (FEA), previously FEO, was created by this act as a temporary agency whose primary responsibility was to manage short-term fuel shortages using allocation and price control authorities. Transferred to FEA were several energy responsibilities previously belonging to the Department of the Interior and the Cost of Living Council. FEA was charged with developing and recommending policies on the import and export of energy resources. It was authorized to monitor foreign ownership of, influence on, and control of domestic energy sources and supplies. FEA was also made responsible for work in such areas as energy conservation, petroleum allocation and pricing regulations, strategic petroleum reserves, domestic energy resource development, and foreign as well as domestic energy data and analysis.

Energy Supply and Environmental Coordination Act (Public Law 93-319; June 22, 1974)

One of this act's main purposes was to temporarily delay application of clean air standards established under the 1970 Clean Air Act. However, it also had several major energy provisions. FEA was, for example, directed to prohibit electric utilities from burning oil or natural gas if their facilities were capable of burning coal. It was authorized to allocate

low-sulfur fuel during emergencies to those areas designated by EPA as requiring low-sulfur fuel to minimize adverse health effects. FEA was requested to study the energy conservation potential of restricting exports of fuels or energy-intensive products. It was also given broader power to gather and publish information needed to make energy policy decisions.

International Energy Agency

In the international arena, the United States responded to the OPEC challenge by urging the members of OECD to establish the "Agreement on an International Energy Program." This effort resulted in the establishment of IEA in November 1974 in Paris under the aegis of OECD to develop and administer the agreement's formula for emergency allocation of oil among member countries, to institute an information-gathering system on international oil operations, to set a framework for consultations with individual oil companies, to provide the vehicle for long-term cooperation among member countries on conservation and new energy sources, and to promote cooperative relations with oil-producing and third world countries.

Federal Non-Nuclear Energy and Development Act (Public Law 93-577; Dec. 31, 1974)

This act established a 10-year, $20 billion program of R&D in nonnuclear energy sources. It also established broad policy guidelines for carrying out nonnuclear R&D to accompany the nuclear energy policy established by the Atomic Energy Act of 1954. Most energy R&D programs were assigned to ERDA.

Trade Act of 1974
(Public Law 93-618; Jan. 3, 1975)

This act contains many provisions aimed at negotiating an international reduction of trade barrier and easing adjustments by domestic businesses to increased foreign competition. To encourage the importation of manufactured goods from developing countries, duty-free status is given to many products from LDCs under a generalized system of trade preferences. The members of OPEC, however, are specifically excluded from receiving such trade benefits, as are any other countries participating in actions.

> "to withhold supplies of vital commodity resources from international trade or to raise the price of such commodities to an unreasonable level which causes serious disruption of the world economy." (sec. 502 b(2).)

Energy Policy and Conservation Act of 1975 (Public Law 94-163)

Under EPCA, a number of new energy programs were established, mainly in the conservation area. This legislation established a U.S. strategic petroleum reserve and the development of conservation and rationing contingency plans to be implemented in the event of a severe energy supply interruption. EPCA provided for participation by the U.S. oil industry in the international oil allocation program of IEA. Data and information exchanges required under the international energy program were also authorized. Other emergency authorities granted the President were: authority to prohibit exports of fuel or energy equipment; power to allocate supplies of materials and equipment to maintain exploration, production, and construction of energy facilities; and authority to require the production of oil or gas from Federal lands. Under Title V of EPCA, the Comptroller General was empowered to conduct verification examinations of records of persons or companies submitting energy information to the Federal Government.

The act also provided for (1) establishment of mandatory automobile efficiency standards, (2) continuation of crude oil price controls through May 1979, and (3) establishment of a $750-million loan guarantee program to develop new underground coal mines.

Energy Conservation and Production Act (Public Law 94-385; Aug. 14, 1976)

This act was originally introduced to extend the life of FEA past its June 30, 1976, expiration date. The act, however, not only extended FEA's existence through 1977, but also contained a number of provisions which are designed to lower oil imports. ECPA required that FEA's annual report include an analysis of the relative environmental, national security, and balance of trade risks of alternate methods of meeting U.S. energy needs. The act also established an Office of Energy Information and Analysis in FEA to coordinate all Federal energy data collections and analysis activities, both domestic and international.

Department of Energy Organization Act (Public Law 95-91, Aug. 4, 1977)

The DOE act consolidates FEA, ERDA, and the Federal Power Commission (FPC) and draws diverse energy functions from other departments: energy standards in buildings

from the Department of Housing and Urban Development; industrial conservation compliance from the Commerce Department; naval petroleum and oil shale reserves from the Department of the Navy; along with data collection, coal mine research, and the economic and policy aspects of energy resource leasing from the Department of the Interior. DOE is organized by functions; e.g., conservation, energy information, price regulation, R&D, policy formulation, hearings/appeals, and procedures. The act gives pricing authority to the Federal Energy Regulatory Commission (FERC) rather than to the Secretary of the Department.

National Energy Act of 1978

With the passage of the DOE act, congressional attention was focused on consideration of the administration's National Energy Plan (NEP). Introduced in the House in May 1977 as H.R. 6831, it consisted of 113 separate proposals and was subsequently passed on August 5 as one omnibus bill (H.R. 8444). The Senate, however, took a different approach and broke the package into five different bills, all of which passed by October 31 but in a form drastically different from the bill passed by the House. The legislation was heatedly debated for almost a year in conference committee and finally passed both Houses on October 15, 1978. In November 1978, the National Energy Act of 1978, consisting of five bills, was signed by the President.

The major sections of the act are (1) a broad variety of energy conservation provisions, (2) stricter requirements obliging utilities and major fuel burning installations to switch from oil and natural gas to coal, (3) reform of utility rate proposals, (4) gradual deregulation of certain natural gas prices, and (5) taxes on gas-guzzling cars. The Congress refused to approve the administration's proposed crude oil equalization tax and the standby tax on gasoline. Consensus now seems to be that without such energy price actions, the act cannot produce the oil savings originally projected by the administration for 1985 because of shortfalls that will occur in virtually all areas projected, such as conservation, fuel switching, and production.

Pending energy legislation

Preoccupation with NEP diverted congressional attention from an earlier debate over a number of bills introduced to restructure the petroleum industry (H.R. 93, 683, 929, 1564, 1664, and 3370). The debate has centered on the relationship between the structure of the industry and its market performance and whether or not the large integrated petroleum

firms should be required to divest some or all of their four basic operations--i.e., petroleum production, refining and processing, product transportation, and marketing (called vertical divestiture); or whether they should be required to sell or not increase their ownership of alternative energy sources--e.g., coal and uranium (called horizontal divestiture). Some of the above-proposed legislation would require vertical and/or horizontal divestiture and also prohibit or regulate joint ventures between two or more of any of the major oil companies which operate in the United States.

THE ENVIRONMENT

Given the terrifying potential of nuclear energy for catastrophes of various kinds and degrees, it is not surprising that most international legislation and diplomacy deals as much with its potential for evil as for good. Most legislation and negotiations about the environmental effects of fossil fuels, on the other hand, seem relatively weak in light of the growing concern over marine pollution from oilspills and, more recently, over explosions or firestorms from accidents in shipping liquified gases and the climatic effects of carbon dioxide. Earlier indications of such concern are to be found in:

Merchant Marine Acts of
1920 and 1936 as amended

These acts were designed to protect the employment of American seamen, encourage the use of U.S. cargo vessels, and assure that American flag carriers meet stringent safety standards. Also, the Intergovernmental Maritime Consultative Organization (IMCO) has been working since it was established in 1959 to develop safety requirements for oil and LNG tankers. Related legislation includes:

International Convention for the
Prevention of Pollution of the
Sea by Oil of 1954 (12 U.S.T 2989)

Subsequent legislation includes the U.S. Oil Pollution Act of 1961, (Public Law 87-167), as amended; the Intervention on the High Seas Act of 1974 (Public Law 93-248); the Deepwater Port Act of 1974 (Public Law 93-627); and the Coastal Zone Management Amendments Act of 1976 (Public Law 94-370.)

In the 95th Congress, oil spills from tanker accidents were the subject of numerous hearings by committees in both Houses. Two approaches have received attention: Each House has passed differing bills on compensation for oil spill liabilities (H.R. 6803 and S. 2083), and a law requiring regulation and inspection of tankers and the additional use of U.S. flag vessels has been enacted (Public Law 95-474). Still another law to improve the Federal Government's research program on ocean pollution has now been enacted (Public Law 95-273).

Third Law of the Sea Conference

This conference has been meeting intermittently since 1974 and is considering proposals to protect the marine environment; it is also concerned with mineral extraction and many other issues that are more complicated and difficult to resolve than pollution.

National Environmental Policy Act of 1969
(Public Law 91-190; Jan. 1, 1970)

NEPA established the Council on Environmental Quality (CEQ) to coordinate all environmental quality programs and review all other Federal programs which affect the environment, including population questions, conservation of natural resources, and pollution. It also created the requirement for all Federal agencies to prepare and submit environmental impact statements (EISs) on all major Federal actions which significantly affect the quality of the environment. NEPA recognizes

> "the worldwide and long-range character of environmental problems and, where consistent with the foreign policy of the United States, lend appropriate support to initiatives, resolutions, and programs designed to maximize international cooperation in anticipating and preventing a decline in the quality of mankind's world environment." (Sec. 102 (E)).

Presidential Reorganization Plan No. 3
(July 9, 1970)

This action created EPA, which consolidates a number of functions from other departments. EPA is intended not to compete with but to complement CEQ by setting and enforcing pollution control standards for air, water, and soil and to coordinate U.S. environmental activities with other nations.

Presidential Reorganization Plan No. 4 (July 9, 1970)

This action created within the Department of Commerce the National Oceanic and Atmospheric Administration (NOAA) and also consolidated a number of functions from other agencies, notably the Commerce Department's Environmental Science Service Adminstration (ESSA). ESSA was composed of the Weather Bureau, the Coast and Geodetic Survey, the National Environmental Satellite Center, the Environmental Data Service, and the ESSA Research Laboratories.

In 1973, the Secretary General of the United Nations called for efforts to develop an international quality-of-life index for developing as well as developed nations. In the same year, the U.S. Congress enacted legislation requiring the Agency for International Development (AID) to develop a similar index for aid to developing countries:

International Development and Food Assistance Act of 1975 (Public Law 94-161)

The so-called New Directions provisions of this act amend the Foreign Assistance Act of 1961 (sec. 102 c and d) to increase bilateral assistance to LDCs by helping to devise development strategies which include appropriate criteria to assess progress in meeting development objectives. Such criteria could include life expectancy, infant mortality, and literacy, as well as more conventional gross national product indicators such as agricultural productivity, income distribution, and unemployment. The act also directs the administration to encourage the adoption of similar criteria by international development organizations in which the U.S. participates and, beginning in fiscal year 1977, to submit an annual progress report.

Section 107, added by this act to the Foreign Assistance Act, further directs AID to support program activities in the field of intermediate or appropriate technology through grants

> "* * * in support of an expanded and coordinated private effort to promote the development and dissemination of technologies appropriate for developing countries."

Section 119 of the Foreign Assistance Act of 1961 was amended (Public Law 95-88) to authorize the President to furnish assistance in cooperation with AID and ERDA to support

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> "cooperative programs with developing countries in energy production and conservation, with particular emphasis on programs in research and development, and use of small-scale decentralized, renewable energy sources for rural areas carried out as integral parts of rural development efforts in accordance with section 103 of this Act." (Food and Nutrition.)

To help implement the provisions of this section, the Congress directed the examination of proposals, one of which was to be the establishment outside of AID of a nonprofit Government corporation to be designated the International Energy Institute.

President's Environmental Message

In his comprehensive environmental message to the Congress in May 1977, the President proposed a major 2-year interagency study to assess potential global environmental changes and their effect on the United States. His proposal included: an offer to assist interested nations in dealing with problems of population, energy, and natural resources; inclusion of environmental consideration in AID assistance programs; and support for a number of international environmental agreements. This so-called Global 2000 study is to be prepared jointly by CEQ and the State Department in collaboration with EPA, NSF, and NOAA.

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12.	Should U.S. regulations inhibit or encourage foreign investment in U.S. energy industries or in energy intensive industries?	II-5
13.	What effect would the adoption of oil import fees, taxes, or quotas have on the U.S. economy?	II-5

APPENDIX II

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Question

1. Are improvements needed in the Federal process to assure consideration of constituent interests in the formulation and implementation of domestic and international energy policies? 12-3

2. How do relations among the States, between the Federal Government and the States, and between States and local government affect the development of international energy policies? 12-4

3. What are the implications of Federal energy planning for other sectors of the economy? 12-4

4. Is there a need for the United States to communicate its energy policies more effectively abroad? 12-4

APPENDIX III

LIST OF PERSONS INTERVIEWED

More than 400 experts in the United States and in 14 other countries of North America, Europe, and the Far East were interviewed by a team of staff members and consultants from our Energy and Minerals Division (EMD). For reasons of space those listed below include only the lead person in each organization, although in many cases there were others present who participated actively in the discussion. We are deeply grateful for each of their contributions to this report.

Our energy expert consultants were:

Theodore Barnhill, Ph. D.	Finance
Steven Ebbin, Ph. D.	Foreign affairs
Robert Gilkey, Ph. D.	Foreign affairs
Andrew J. Safir, Ph. D.	Economics
James A. West	Petroleum geologist with extensive international experience

APPENDIX III

AUSTRALIA

Representative	Position/ office	Organization	City
Keith Alder	General Manager	Australian Atomic Energy Commission	Sydney (Coogee)
Susan Bambrick		Australia National University	Canberra
M. D. Bridgland	Executive Director	ICI Australia Limited	Melbourne
Gordon R. Bruns	Assistant Chief Economist	Australia and New Zealand Bank, Ltd.	Melbourne
Rod Carnegie	Chairman	Conzinc Riotinto of Australia, Ltd.	Melbourne
Jim Carter	First Assistant Secretary	Department of National Development	Canberra
B. W. Court	Secretary for Minerals and Energy	Victoria Department of Minerals and Energy	Melbourne
Lance A. Endersbee	Dean, Faculty of Engineering	Monash University	Melbourne
B. Fiske	Manager	Ranger Company	Sydney
A. J. Grey	Chairman and Managing Director	Pan Continental Mining, Ltd.	Sydney
Chris Hurford	Shadow Minister for Commerce and Industry	Australian Labor Party	Melbourne
Terry Larkin	First Assistant Secretary	Department of Trade and Resources	Canberra
W. M. Lonie	General Manager, Coal	The Broken Hill Proprietary Co., Ltd.	Melbourne
G. J. Lynch	Chairman	National Energy Advisory Committee	Canberra

APPENDIX III

AUSTRALIA (continued)

Representative	Position/ office	Organization	City
G. A. Mackay	Managing Director	Electrolytic Zinc Co. of Australasia, Ltd.	Melbourne
John D. S. Macleod	Economist	Conzinc Riotinto of Australia, Ltd.	Melbourne
J. D. Norgard	Chairman	Australian Pipeline Authority	Canberra
P. L. Spurrier	Chief Engineer, Brown Coal Research	Victoria Department of Minerals and Energy	Melbourne

APPENDIX III

AUSTRIA

Representative	Position/ office	Organization	City
Ali Jaidah	Secretary General	Organization of Petroleum Exporting Countries (OPEC)	Vienna
George Konz	Energy Project	U.N. Industrial Development Organization (UNIDO)	Vienna
Alan Labowitz	Counselor for Atomic Energy Affairs	U.S. Mission to IAEA	Vienna
Cesare Marchetti	Energy Division	International Institute for Applied Systems Analysis (IIASA)	Laxenburg
R. Skjoelbebrand	Head, Reactor Engineering Section Division of Nuclear Power and Reactors	International Atomic Energy Agency (IAEA)	Vienna

APPENDIX III

BELGIUM

Representative	Position/ office	Organization	City
Michel Amory	Chief of Division, Bilateral and Multilateral External Relations, Directorate C	Commission of the European Communities, Research, Science, and Education D-G	Brussels
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Mario De Bacci	Chief, of Division, Reactor Development and Advanced Technologies, Directorate D	Commission of the European Communities, Research, Science and Education D-G	Brussels
Klaus Ewig	Chief of Division, Middle East, Directorate D	Commission of the European Communities, External Relations D-G	Brussels
Andre Louw	Counsellor, Monetary Matters, Directorate C	Commission of the European Communities, Economics and Financial Affairs D-G	Brussels
Jean-Claude Renaud	Chief Adviser to the Director-General	Commission of the European Communities, Energy D-G	Brussels
Robert Shotton		Commission of the European Communities, Energy D-G	Brussels
H. P. Stief-Tauch	Environment and Protection Service	Commission of the European Communities	Brussels

APPENDIX III

CANADA

Representative	Position/ office	Organization	City
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APPENDIX III

FRANCE

Representative	Position/ office	Organization	City
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Robert Kline	Office of Energy Research and Development	International Energy Agency	Paris
Ulf Lantzke	Executive Director	International Energy Agency	Paris
Phillippe Lecourtier	Chief, International Relations Service, Petroleum Directorate	Ministry of Industry	Paris
Hans Maull	European Secretary	Trilateral Commission	Paris
Andre Petit	Counselor to Director of International Relations	Commissariat a l'Energie Atomique	Paris
Marie Psimenos	First Director	International Chamber of Commerce	Paris
Pierre Salinger		l'Express	Paris
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FEDERAL REPUBLIC OF GERMANY

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Herr Flath	Regierungs-direktor	Bundesministerium fuer Wirtschaft Langfristige Aspekte der Engergiepolitik	Bonn
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Herr Hager		Deutsche Gessellschaft fuer Auswaertige Politi	Bonn
Reinard Loosch	Ministerial-dirigent	Ministerium fuer Forschung und Tech-nologie	Bad Godesberg
Heinrich Mandel	Member of the Board of Directors	Rheinisch-Westfalisches Elektrizitatswerk AG	Essen
Hans K. Schneider	Direktor	Energiewirtschaftlichen Instituts an der Universitat zu Koln	Koln

APPENDIX III

HONG KONG

Representative	Position/ office	Organization	City
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Melvin W. Searls, Jr.	Marketing Director	Esso Standard Oil (Hong Kong) Ltd.	Hong Kong
John L. Soong	Managing Director	Mobil Oil (Hong Kong) Ltd.	Hong Kong
William F. Stones	Director and Deputy General Manager	China Light & Power Company, Ltd.	Hong Kong

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ITALY

Representative	Position/ office	Organization	City
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Publio Fedi	Director, Special Project Directorate for Energy	Consiglio Nazionale delle Ricerche (CNR)	Rome
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Corrado Millesi-Ferretti	Office VII International Energy Problems	Ministry of Foreign Affairs	Rome
Gianraffaele Romagnoli	Planning Office	Ente Nazionale Idrocarburi (ENI)	Rome

APPENDIX III

JAPAN

Representative	Position/ office	Organization	City
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Socichi Tsuge	General Manager, Coordination Office	Arabian Oil Co., Ltd.	Tokyo
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THE NETHERLANDS

Representative	Position/ office	Organization	City
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Han Hoog	Chairman	Netherlands Energy Research Foundation	The Hague
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R. F. M. Lubbers	Member of Parliament	Parliament	Rotterdam

APPENDIX III

NORWAY

Representative	Position/ office	Organization	City
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SWEDEN

Representative	Position/ office	Organization	City
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Ove Rainer	Chairman	Energy Commission	Stockholm
Mats Ringborg	Head of Section, Secretariat for International Affairs	Ministry of Industry	Stockholm
Mans Lonroth		Secretariat for Future Studies	Stockholm

SWITZERLAND

Representative	Position/ office	Organization	City
Gerasimmo Arsenis	Director, Money Finance and Development Division	United Nations Conference on Trade and Development	Geneva
Gerald Dixon	President	Petroconsultants, SA	Geneva
J. E. Hartshorn	Vice President	Jensen Associates	Geneva
Edward Kiener	Director	Federal Energy Office	Bern
Robert Madory	International Energy Affairs	Division of Commerce	Bern
Otto Niederhauser	Policy Advisor	Office of National Economic Defense	Bern
Kurt Schiltknecht	Deputy Director	Swiss National Bank	Zurich
Hans Schmid	Staff Director	Federal Energy Committee	Bern
Jan Tumlir	Director, Trade Intelligence Division	General Agreement on Tariffs and Trade	Geneva
Herbert Von Arx	Deputy Legal Advisor	Swiss Federal Political Department	Bern

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Representative	Position/ office	Organization	City
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UNITED STATES

Representative	Position/ Office	Organization	City
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APPENDIX III

UNITED STATES (continued)

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UNITED STATES (continued)

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UNITED STATES (continued)

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Ira Nordlicht	Counsel	Senate Committee on Foreign Relations	Washington, D.C.
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Rick Rudman	Director of Planning Staff	Electric Power Research Institute	San Francisco, Calif.
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APPENDIX III

UNITED STATES (continued)

Representative	Position/ office	Organization	City
David Saler	Assistant Director, Bureau of Competition	Federal Trade Commission	Washington, D.C.
William J. Sallans	Executive Vice President	Petroleum Equipment Suppliers Association	Houston, Texas
Bart Shackelford	Executive Vice President	Pacific Gas and Electric Company	San Francisco, Calif.
James Shea	Director, Office of International Programs	Nuclear Regulatory Commission	Bethesda, Md.
John J. Simpson	Senior Petroleum Economist	Citibank	New York, N.Y.
Robert A. Solomon	Senior Fellow	Brookings Institution	Washington, D.C.
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David Sternlight	Chief Economist	Atlantic Richfield Co.	Los Angeles, Calif.
Robert Stobaugh	Professor, Harvard Business School	Harvard University	Cambridge, Mass.
J. A. Strand	Senior Vice President, Gulf Oil Exploration and Producing Company	Gulf Oil Corporation	Houston, Texas
Stanley S. Surrey	Harvard School of Law	Harvard University	Cambridge, Mass.

APPENDIX III

UNITED STATES (continued)

Representative	Position/ office	Organization	City
Britt Swofford	Regional Director, Business and Economic Research	1st National Bank of Chicago	Chicago, Ill.
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William Van Ness		Van Ness, Feldman and Sutcliffe	Washington, D.C
Charles Walker		Charles Walker and Associates	Washington, D.C
James Walker	Executive Director	California Energy Resources, Conservation and Development Commission	Sacramento, Calif.
James T. Wallace	Director, Energy Economics Division	Chase Manhattan Bank	New York, N.Y.
Carl Walske	President	Atomic Industrial Forum	Washington, D.C
Caspar Weinberger	Vice President and Director of Legal	Bechtel Power Corp.	San Francisco, Calif.
Leonard Weiss	Staff Director, Senate Subcommittee on Energy, Nuclear Proliferation and Federal Services	Senate Government Operations Committee	Washington, D.C.

APPENDIX III

UNITED STATES (continued)

Representative	Position/ office	Organization	City
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*U.S. GOVERNMENT PRINTING OFFICE: 1978 620-167/10

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