FINAL REPORT

AMERICAN SECURITY AND THE INTERNATIONAL ENERGY SITUATION

Volume I: *Introduction and Summary*

HI-2239-RR

15 April 1975

Prepared for
Advanced Research Projects Agency

Hudson Institute

Quaker Ridge Road, Croton-on-Hudson, New York 10520
1 Rue du Bac, Paris 75007, France
1-11-46 Akasaka, Minato-ku, Tokyo, Japan

POLICY RESEARCH IN THE PUBLIC INTEREST

(9) FINAL REPORT.

(6) AMERICAN SECURITY AND THE INTERNATIONAL ENERGY SITUATION.

VOLUME I: INTRODUCTION AND SUMMARY.

(10) Uzi B. Arad, Principal Investigator (914) 762-0700
Barry J. Smernoff, Associate Investigator

(12) 41 p.

(14) HI-2239-RR-Vol-1

(11) 15 April 1975

ARPA Order No. 2773

(15) MDA903-74-C-0286; ARPA Order--2773

This research was supported by the Advanced Research Projects Agency of the Department of Defense under Contract No. MDA903 74 C 0286. The views and conclusions contained in this document are those of the authors and should not be interpreted as necessarily representing the official policies, either expressed or implied, of the Advanced Research Projects Agency or the U.S. Government.

HUDSON INSTITUTE, INC.
Quaker Ridge Road
Croton-on-Hudson
New York 10520

172000

4/3

PREFACE TO THE STUDY

This report sets down the results of research on some of the significant problems relating to energy and national security. By going beyond the more obvious first-order issues, it differs considerably from other recent studies of the international aspects of energy policy and their implications for national security, such as Energy and U.S. Foreign Policy written by the staff of the Brookings Institution for the Ford Foundation's Energy Policy Project and the SIPRI monograph, Oil and Security. Many of the first-order issues analyzed in these studies were discussed in an earlier Hudson Institute energy study, Energy and Security: Implications for American Policy, which was completed in mid-1974.

It is assumed that readers of this report are generally familiar with the first-order problems and issues being analyzed. The emphasis taken by this study ~~is on~~ goes beyond the more obvious first-order issues, previously analyzed. It deals with less obvious but increasingly important problems, ~~and~~ including: includes the following:

(1) the relationship of the security of oil supplies to prevailing market conditions in the past and in the future;

(2) the more general question of access to non-oil global resources and U.S. policy;

(3) the scope of oil revenues for domestic and foreign investment and patterns of economic development and investment in Middle East oil producing countries; and

(4) the relationship of energy and American economic security and concomitant implications for security and foreign policy issues.

In these and the other areas covered by this study, the primary objective has been to uncover second-order issues which have been given

little serious attention by those interested in the interactions between energy and security problems. Consequently, the choice of research topics has been highly selective. It is hoped that the depth of the analyses carried out in this study can usefully complement the breadth of other studies. Since many recent energy studies have been flawed by the gap between rapidly unfolding events and analysis, a serious attempt has been made to rely solely on updated information in this study.

This study is organized into four volumes. The first volume, by Barry Smernoff and Uzi B. Arad, sets the context for analyzing problems of energy and national security and summarizes the results of the research. Appended to this volume are summary reports of two energy/security workshops carried out by Hudson Institute in 1974.

The second and third volumes are devoted to specific areas of research: security of oil supplies and its relationship to the market, by Uzi Arad., and the petromoney question, by Haim Ben-Shahar. Finally, the fourth volume is a set of collected papers:

1) Beyond the Open Door: U.S. Policy and Access to Global Resources by Lewis Dunn;

2) Can We Avert Economic Warfare in Raw Materials? by William Schneider, Jr.

3) Changing American Foreign Policy in the Middle East by Edward S. Boylan

4) Iraq as a Soviet Proxy on the Persian Gulf by Raphael Danziger; and

5) Energy in the Third World by Jean M. Ingersoll

Table of Contents

VOLUME II:
WORLD ENERGY INTERDEPENDENCE AND THE SECURITY OF SUPPLY

VOLUME III: THE PETROMONEY QUESTION

Chapter I

INTRODUCING ENERGY AND SECURITY

The first half of the 1970's was filled with events that have shattered the conventional wisdom regarding energy affairs and national security. Two years after the Vietnam ceasefire was "secured" by the Paris peace accords, one of America's most stinging foreign policy debacles continues to attract headlines and public attention after South Vietnam abandoned the Central Highlands--the cradle of American involvement in the war--and quickly proceeded to lose the war. The American public's propensity for caring about what happens in Southeast Asia has been severely eroded by domestic political and economic disasters: Watergate and the first Presidential resignation in American history, the current economic malaise of inflationary recession with nearly double-digit unemployment, and continuing energy dependence and confusion.

As an introduction to Hudson Institute's study of energy and security problems, this chapter analyzes the changing meaning of national security and the role which energy is likely to play in determining the shape of American security policy. The purpose of this introduction is to establish an updated backdrop for discussing some of the increasingly important second-order issues centering on the relationship between energy and security. Since many of the details are given in other parts of this report, the discussion here is kept at a rather general level.

The Changing Meaning of National Security

After World War II ended, President Harry S. Truman formulated a doctrine of collective security in which American power and leadership were to be employed to create and maintain a stable world order, thereby

insuring American security. On March 12, 1947, he proclaimed that

> "...it must be the policy of the United States to support free peoples who are resisting attempted subjugation by armed minorities or outside pressures."

Both the critics and defenders of the Truman Doctrine agree that these remarks signaled a turning point of fundamental importance in the history of American foreign policy and led inexorably to direct U.S. involvement in Vietnam.*

More recently, disillusionment over Vietnam has severely eroded the unlimited and rather indiscriminate nature of the Truman Doctrine. The Watergate affair has revealed the legal and moral bankruptcy of using national security as a vehicle for protecting non-vital and often specious interests. Yet, it is difficult to imagine how Americans will be able to celebrate their Bicentennial Year of 1976 with any degree of complacency if the United States continues to experience acute energy insecurity, under an economic and political "siege" by Third World oil producing nations.**

The year 1973 began on a positive note with the Paris peace accords formally ending direct American military participation in the Vietnam conflict. Indeed, Henry Kissinger and Le Duc Tho shared the Nobel Prize for Peace that year for negotiating these accords. The credibility of American commitments throughout the world had been upheld by nearly a decade of fighting in Southeast Asia which cost tens of thousands of American lives and undermined the political viability of two American

---

*John Lewis Gaddis, "Was the Truman Doctrine a Real Turning Point?" Foreign Affairs, January 1974.

**Volume II analyzes the problem of security of oil supplies in great detail.

presidents. In late 1973 OPEC* embargoed oil deliveries to the U.S. and quadrupled the price of its crude oil. After the Vietnam decade proved the credibility of American international commitments, the fundamental essence of U.S. commitments in the world was being called into question, not by a nuclear superpower, but by a diverse collection of Third World countries unified generally by national aspirations of trading black gold for the good life and specifically, in part, by Arab visions of breaking up the close relationship between Israel and the U.S.

Thus, after an uneasy form of peace in Vietnam ushered in 1973, a disorienting and confusing type of international economic aggression and political extortion with important implications for American security and world order escorted 1973 into the history books. During 1974, there was plenty of talk and an abundance of bewilderment about what courses of action were needed to cope with the linked problems of energy supply and economic stagflation. As 1975 began, the unemployment rate in the U.S. had skyrocketed to 8.2%, leading some observers of the economic scene to wonder when unemployment would join inflation in the ominous exploration of what might be called the "double-digit region." The financing of oil imports and the recycling of petrodollars occupied high priority on agendas of many international forums during 1974.** Discussions among intellectuals revolved around the response to the threat from the Third World and the humanitarian imperative of sustaining the Fourth World of non-industrial resource-poor countries in the ailing Indian subcontinent and Africa.***

---

*This is of course the acronym commonly used for the Organization of the Petroleum Exporting Countries. Volume II discusses the cartelization of the world petroleum market at length.

**See Volume III for an extensive analysis of the petromoney question.

***See Volume IV for papers on the implications of the oil crisis for the developing world and on the resource threat from the Third World.

Meanwhile, as oil exporting nations collected their newly inflated revenues and OPEC surpluses grew to $60 billion, talk of military action to redress the embarrassing and potentially destructive (to Western values) imbalance and to reassert traditional norms and power relationships was limited, for the most part, to cocktail parties and defense contingency planning sessions.

Until early 1975, that is. The January 1975 issue of Commentary featured Robert W. Tucker's article, "Oil: The Issue of American Intervention." Tucker argued that, if the oil crisis is really a conflict over vital interests and if the superprice for oil promises to have the same adverse effects as an embargo, then it is not easy to see the legal or moral basis for making a distinction between embargo qua casus belli and destructively inflated oil prices as cause for the threat and use of force.

Coincidentally, Secretary of State Kissinger referred publicly for the first time to the possibility of military action as a last resort to save the Western world from "some actual strangulation."* While Kissinger's remarks created wide speculation and aroused intense anxiety and criticism in some world capitals,** they evoked a responsive chord in many circles. Indeed, a poll published in the 5 January issue of the French weekly, Le Nouvel Observateur, showed 28% of the French public

*"Kissinger on Oil, Food, and Trade" Business Week, 13 January 1974, p. 68.

**Kissinger's Talk of Force Over Oil Stirs the Germans," The New York Times, January 6, 1975; "Kissinger Remark on Force Sparks Wide Speculation," The New York Times, January 7, 1975.

believe that oil consuming nations might resort to military intervention this year to force a reduction in oil prices.

By the conventional measures of national power, the United States is the strongest nation in the world. How long can successful economic warfare be waged against America and its allies before the risk of actual strangulation is perceived to be unacceptable? How grave must the energy/economic emergency become before it triggers an irreversible collapse of the international house of cards? The economic and political strain of maintaining American security and global commitments seems to intensify with every passing day. Many British corporations have reached the ragged edge of solvency, causing informed observers to wonder if Britain herself is next. Portugal has experienced a sharp political shift toward the left. The Cyprus crisis of 1974 was a relatively mild episode compared to the centrifugal forces NATO is likely to experience as the level of social and political chaos rises under the pressures of economic contraction, financial hemorrhage, and pervasive uncertainty in the industrialized West. How will the U.S. act during the next round of Middle East fighting? Is the American commitment to Israel still credible? Has the Atlantic Alliance become soluble in oil?

Meanwhile, the Soviet Union watches silently and recalculates the international "correlation of forces" upon which its SALT and detente negotiating postures are based. Might the Soviets be emboldened by a perception that the United States is rapidly growing weaker and possibly losing its nerve? During SALT I negotiations, Soviet estimation of the correlation of forces encompassed

"the political unity, strength, and will of the United States. This estimate was undoubtedly affected by the U.S. impeachment process. Another factor was, and continues to be, their view of the economic upheaval caused by inflation and the increase in oil, food, and other basic raw material prices. Still another factor is their evaluation of political, psychological, and social conditions in Europe, Japan, and the developing world....On balance, however, they have reason for their stated belief that the net correlation of forces has been, and is, changing in their favor. Until this trend changes, the prospects for obtaining arms control agreements which would significantly relieve the strain upon the U.S. defense posture are less than good.... It is unlikely, were the correlation of forces to move further in a direction which they judge to be favorable, that the Soviets would not exploit that change. Certainly we cannot have high confidence that they would not."*

Future oil debts, financed partially by massive arms sales to Middle East oil producing countries, might turn out to be the least of the Western world's worries if future American security is compromised by Soviet perceptions of American weakness which lead to important Soviet gains or to destructive miscalculations of U.S. responses. In either contingency, the strategic consequences of perceived or real American weakness are likely to be serious. American national security is endangered by old and new threats--many of them are nonmilitary, to be sure--from a multitude of directions, and the U.S. national leadership appears quite unwilling and/or unable to meet these threats with coherent and resourceful thinking, let alone decisive action.

*Paul H. Nitze, "The Strategic Balance Between Hope and Skepticism," Foreign Policy, Number 17, Winter 1974-75, pp. 146-52.

International Redistribution of Economic and Political Power

The words of Charles Dickens, "It was the best of times, it was the worst of times," fit the present situation rather well. One distinguished observer has commented that the search for a stable world structure that

> "secures peace, advances human rights and provides the conditions for economic progress--for what is loosely called world order--has never seemed more frustrating but at the same time strangely hopeful."*

Unfortunately, recent events suggest that the process of world restructuring, being driven by economic and political exploitation of the vast underground treasure in oil-rich countries, might be characterized as forced redistribution. The transfer of oil wealth is accompanied by a redistribution of economic power in the world. Given time, newly acquired economic power translates into political and military power; Iran and Saudi Arabia, among others, are not hesitating to make direct deals exchanging oil for Western arms. Moreover, Iran's dreams of great power status include a nuclear element; large bilateral deals with France for nuclear reactors and major shares in uranium enrichment facilities and with the U.S. for reactors are adequate cause for speculating whether Iran intends to acquire nuclear weapons. The redistribution of economic power through rather extortionate oil superprices is leading to a new configuration of diplomatic power. The excommunication of Israel from UNESCO, diplomatic acceptance of the Palestine Liberation Organization by a majority of U.N. members, the increasingly tight web of Euro-Arab linkages, and the moderately successful Arab boycott of Jewish firms are certainly not the least

*Richard N. Gardner, "The Hard Road to World Order," Foreign Affairs, April 1974, p. 556.

important short-term consequences of oil power. Assuming that the new status quo persists, many books can and will be written about the long-run impacts of Third World oil power.

None of the elements of this forced redistribution of world power through the use of the oil price lever can be quantified to the extent that one might construct an oil security calculus by which "gravest emergency" and "actual strangulation" might be measured.* There are too many credible arguments on each side of the various subissues relating to the threat of oil power (to the current world structure) to permit unambiguous judgments regarding the validity of these arguments, let alone to create an oil security calculus which accurately corresponds to "reality." Furthermore, how can the American public become persuaded that the international balance of power might be tilting dangerously away from the U.S. and its allies when there is an incredible degree of bewilderment and confusion over domestic energy and economic policies? The next section discusses some of the aspects of this confusion.

---

*As Russell Baker put it recently, "At what point on charts of rising unemployment and ailing business does strangulation become 'actual' enough to place war in the ruled-in category? We can only guess. What is worse, so can the Arabs. Being a scholar of diplomacy, Mr. Kissinger must know that nothing is more dangerous in a hostile confrontation than leaving an adversary in doubt about your intentions..." ("Hot Winds Ruffle No Oil," The New York Times, January 1, 1975.)

Helmut Schmidt, writing in the April 1974 issue of Foreign Affairs, (pp. 444-5) stated that,

> In the short run there is at least a point beyond which economic stability would be in jeopardy. And that point is reached whenever the industrialized countries are confronted with intolerable adaptation and reorganization problems incapable of being solved at short notice and are thus driven into employment crises or toward an even higher rate of inflation. In this context, I do not wish even to contemplate a point--at least theoretically conceivable--beyond which the irrational use of force might ensue.

Where is the breaking point? Kissinger's strangulation point?

The Bogey of Energy Policy Confusion

The primary sources of energy policy confusion are intellectual, political, and economic. Intellectual lacunae and wide gaps of knowledge doom all straightforward attempts to formulate acceptable energy policy. There is no easy way to substitute untested theory for knowledge in today's world. There are simply too many unknown or misunderstood issues in the intricate web of energy affairs, and a great deal of empirical research and experience will be needed to develop knowledge and techniques by which effective energy policy may be shaped. The dominant method at the present time seems to be comprehensive listing of alternative policy options, with detailed costs and benefits of each, from which decision-makers are expected to choose some "appropriate" subset of options which best fits their policy objectives. As the saying goes, there must be a better way.

The political sources of policy confusion in energy affairs include widespread lack of confidence in leadership, communication difficulties, and basic conflicts of interest. There is a growing feeling that American leadership is less than capable of meeting current energy challenges, let alone coping with problems of securing future energy supplies. Understandably, Americans tend to become confused when their leaders seem unable (or unwilling) to lead.* Moreover, the problems of communicating energy goals, concepts and programs to the American people continue to impede government officials. This is partly due to their limited ability to communicate well (officials are not immune to being confused), and partly because of poor or

*Review of President Ford's proposed energy program suggests that he is <u>too</u> willing to act decisively on the policy front in the absence of evidence that his program is likely to be successful.

uneven media coverage. Finally, the pervasive nature of energy in America leads to many different types of potential conflicts. In today's era of interest advocacy that emphasizes the much-used possibility of citizen lawsuits, fundamental conflicts of interest impede energy resource development (cf. the Trans-Alaskan Pipeline and Consolidated Edison's pumped storage facility planned for Storm King). Often, energy projects are delayed from the very beginning by vocal opposition groups.

The economic sources of energy policy confusion reside primarily in the worsening situation of persistent inflation and deepening recession. Together with American dependence on foreign energy suppliers which makes one-third of U.S. oil consumption vulnerable to production cuts (cf. the 1973-4 Arab oil embargo), export controls (cf. the new Canadian goal of substantially reducing oil exports to the U.S.), as well as non-market price boosts (cf. OPEC's price quadrupling), economic recession and inflation form a "triple bind" confronting American policymakers with extremely difficult choices. Establishment of energy taxes to induce conservation is inflationary; gasoline rationing is politically unacceptable and rife with inequities. More generally, mandatory energy conservation would appear to be recessionary since economic growth has always previously been tightly coupled to energy growth. On the supply side, proposed development of shale oil has run headlong into slow-growth advocates in Colorado; coal liquefaction and commercial exploitation of Canadian tar sands seem to have met their economic poison in the form of intense cost escalation; and construction of nuclear power plants by electric utilities has encountered the mounting scarcity of capital as well as the political reality of increasing public opposition.

In essence, the specific sources of economic confusion in U.S. energy affairs are proliferating faster than OPEC can raise the price of oil. Not the least important implication of this disturbing state of energy economics is the possibility that the OPEC-administered oil price might continue to rise, unimpeded by cost ceilings corresponding to alternative energy sources. Jamshid Amouzegar, the Interior Minister of Iran, was reported to state in December 1974 that,

> OPEC has been using as its pricing peg the lower-cost alternative to a barrel of oil. This is a barrel of oil made from coal, and its price ranges from $7 to $11 a barrel.*

This reaffirms the opportunity cost pricing policy of OPEC. The unfortunate problem for the Western world, however, is that the current estimated price of commercially viable coal-derived liquid fuel is $12-15 per barrel instead of $7-11. Perhaps it would be better to leave Mr. Amouzegar and his fellow OPECians confused about current price estimates for oil alternatives. Otherwise, the oil cartel might attempt to double the price of oil again!

Ironically, the inverted law of energy supply and demand in which demand reduction creates upward price movement was making itself felt to American energy consumers at the same time it became the kernel of new oil economics guiding OPEC policy. During 1974, stocks of all types of refined petroleum products increased in OECD nations** until OPEC countries cut back production by 4-6 million barrels per day to blunt downward price pressures which might

---

*"OPEC: The Economics of the Oil Cartel," Business Week, January 13, 1975. This article follows the widely read interview with Secretary of State Kissinger.

**Much of the embarrassing high profits in the oil industry, engendering bad feelings toward the industry and skepticism that the energy situation is as bad as it once seemed, results from inventory profits. In many cases, these stocks are being sold for prices substantially greater than they were purchased for.

have proved destructive to cartel pricing. In essence, to stabilize oil prices and secure cartel coherence, OPEC produced less oil. At the same time, the price of oil continued to creep upward (and the profit margins of multinational oil corporations were put under pressure) until the average government take reached $10 per barrel in late 1974 (up from $7 in January).

OPEC had experienced the unique economic thrill of administering an inverted law of energy supply and demand: as prices rise, production drops to stabillze monopiy profits and preserve the cartel. But there is a limit to the growth of idle productive capacity consistent with cartelization, and OPEC is not immune to the destructive impact of approaching that limit--the key question concerns its location.

Since the current economic malaise has been the primary cause of much of the energy confusion recently it is useful to get more specific about the complex interactions between energy policy and the American economy. Until mid-1973, the expanding U.S. economy appeared healthy, resilient, and capable of supporting intensive development of domestic energy resources. By the second quarter of 1973, however, some economists began forecasting a mild recession for 1974. In the midst of food and commodity price runups, this was not good news. On the other hand, it was not all that bad, since the political news of the moment was far worse--Watergate was beginning to heat up public and Congressional pressures leading to the likely impeachment of President Nixon.

The fourth quarter of 1973 (denoted 1973:4 by macroeconomists) was the turning point. After the October War broke out in the Middle East, the Organization of Arab Petroleum Exporting Countries (OAPEC), a subcartel of OPEC, instituted an oil embargo on October 17, targeted on the

U.S. as the chief political and military supporter of Israel. Not much later, three seemingly unrelated events happened in quick succession: 1) President Nixon undertook his "Saturday Night Massacre," affecting the special Watergate prosecutor and Attorney General; 2) the U.S. announced a worldwide military alert in response to a "brutal" Soviet note threatening unilateral intervention to back up the new ceasefire; and 3) OPEC redoubled the posted price of light Arabian crude oil to $11.35 per barrel. But were these events really unrelated, or did the worsening crisis of American leadership lie behind each?

In the aftermath of Watergate, America continues to experience an intense political crisis of leadership. This is one of the central reasons behind the high level of energy confusion. The erosion of American leadership, morale, and nerve which began during the Vietnam years accelerated after the Watergate episode began to unravel the legitimacy of the Nixon Administration. The adverse effects of this erosion on international energy cooperation, mobilization of domestic support for meaningful energy conservation and supply expansion programs, and on general consumer and business confidence reduce the possibility of shaping viable long-term energy policy in the United States.

One of the most disturbing features of this story of high-level policy confusion is the growing awareness that the American Bicentennial will be celebrated by a military and economic superpower which, to some degree, is under economic and political seige by Third World nations. Many people are confused by repeated declarations of the high stakes--America's vital interests, including its political and economic security,

are involved here--contrasted with the relative inaction and lack of nerve demonstrated by the strategy of accommodation and cooperation pursued by the Federal Government. If the energy-intensive American way of life is under attack by economic aggression waged by oil-exporting countries, why don't we fight for what we want to keep?* Such a simplification of the rather complex and subtle foreign policy issues involved in any attempt to sustain vital American interests does cut through the mystery and confusion, as perceived by the average American, which accompany that inscrutable process of making energy policy. Its legal and moral legitimacy and political acceptability, however, are quite dubious.

If the Ford Foundation study is correct in saying that it is "a time to choose"--that "Drift is surely the worst of the alternatives before us" with respect to energy policy**--would it not be attractive to cut through the complex web of interrelated policy issues and come up with a once-and-for-all choice for America's energy future? With so many policy options floating around, unless a firm decision is made soon we might spend precious years developing criteria for choosing, learning how to satisfy competing interest groups, encouraging full participation in the decision-making processes, and slowing (as well as cooling and dimming) America without improving the quality of life one iota. With a superabundance of possibilities and choices available, the feasibility of coming up with politically acceptable decisions which improve the energy situation without serious

*As noted above, an articulate exposition of the possibility of military intervention to free the world petroleum market from the grip of OPEC is given by Robert W. Tucket, "Oil: The Issue of American Intervention," Commentary, January 1975.

**A Time to Choose America's Energy Future, final report by the Energy Policy Project of the Ford Foundation (Cambridge, Mass.: Ballinger Publishing Co., 1974). A critique of this book has been published which addresses some of the 'confused' arguments made there: No Time to Confuse, M.A. Adelman, et al. (San Francisco: Institute for Contemporary Studies, 1975).

harm to its triple-bind partners of inflation and recession depends heavily on effective leadership to reconcile the diversity of interests and attitudes bearing on energy policy.

The high level of energy policy confusion these days is largely due to the unsettling and rather traumatic nature of the oil supply and price discontinuities of 1973:4 which have thrown world energy markets and international financial institutions into unfamiliar and difficult territory. It is not surprising that disequilibrating shocks to the economic/energy status quo should produce unclear vision of what might lie ahead. And it is difficult to sustain much confidence in the future when uncertainty permeates that future with various shades of grey. The "mordant feeling of disintegration and decay" articulated so well by Max Lerner; the burgeoning literature of pessimism casting an apocolyptic shadow over unfolding events; the socially corrosive effect of persistent inflation; the worrisome sense that America might be coming apart as she moves closer to her Bicentennial; and, most important, the emerging battles for personal survival in a turbulent economic sea where friends are losing jobs or are on the ragged edge of making ends meet, or are just too emotionally drained to continue--this is what makes clear energy policy such idealistic fare. Until the setting and context for energy policymaking gets better, clear and consistent* energy policy will reside on the flip-side of reality, located for the most part in the minds of the dreamers.

Many participants in the energy debate use the phrase "business-as-usual" to denote future activities which conform to the past. When dealing

---

*See Barry J. Smernoff, "Energy Policy Interactions in the United States," Energy Policy, September 1973, for a description of energy policy consistency. It should be obvious that formulation of unconfused and consistent national energy policy is important for the development of effective national security policy during the next few years.

with energy policy, however, it might be appropriate to use the term "confusion-as-usual." The last few years have been filled with a bewildering array of energy date, projections, policy options, and proposals. If confusion-as-usual energy policy continues much longer, the American people may be given high marks for placing most of the responsibility for the so-called energy crisis on American government and oil companies (instead of on Arabs or other external "bad actors") as early as January 1974.* Unless the opacity of America's energy future begins to disperse, revealing fairly clear directions and policy objectives, the contemporary energy fog might begin to smother American morale and resiliency and ultimately threaten national security in quite serious ways.

Usually, when domestic politics are highly confused and filled with ambiguities, only an outstanding leader can cut through the morass and make headway in a chosen direction. The U.S. seems faced with several more years of unauthoritative leadership, a likelihood which in itself threatens to endanger national security; the oil crisis will not be resolved until more capable leaders emerge. The larger danger is that internal weakness and confusion may encourage and even precipitate external threats to American economic and possibly military security.

Just as Watergate has sapped American leadership and self-confidence, the shadow of Vietnam hangs over the current oil power impasse. For better or worse, it took self-confident leadership to launch American involvement in the Vietnam conflict after the rather ambiguous Tonkin Gulf incident in August 1964. After the brutal Soviet note on 25 October

*The Gallup Poll, January 10, 1974. News of the results of this poll induced some people to recall the statement made famous by Walt Kelly's Pogo: "We have met the enemy, and he is us." The perception that the American energy crisis does not constitute an external threat to national security seems to be at the heart of the prevailing energy confusion.

1973, which threatened unilateral intervention to guarantee the days-old Middle East ceasefire, Drs. Kissinger and Schlesinger decided to institute Defcon 3 (U.S. worldwide military alert) without the personal participation of then President Nixon. How could the President be expected to give much thought to meaningful options for handling the oil crisis if he was too preoccupied to take part actively in a serious decision affecting the emergent U.S.-Soviet relationship of detente? Since that time, the leaders of OPEC and OAPEC have presumably believed that U.S. leadership was too weak to put up much of a political or military fight. Had OPEC not taken the opportunity, in a period of obvious American weakness, to redouble the price of oil after the Yom Kippur war, it might have been judged guilty of economic folly.

Locked, as it is, in a Catch-22 economic double bind of superprice inflation and nearly double-digit unemployment, how can the United States lead the Western world back to a modicum of economic stability and safety? Given the confusing and incoherent big-talk little-action energy policy which has emerged in the U.S. during the post-embargo period, how can Secretary of State Kissinger believe that an American-led grouping of oil consuming nations might generate the political will and solidarity to implement a systematic approach and define clear directions for coping with the oil problem?

Dr. Kissinger's View

In his Business Week interview, Kissinger was confronted with the growing belief in the financial community that petrodollar recycling is something of a conjuring act, since bad debts will be piled on top of good

ones. Asked how loans drawn on the $25 billion financial safety net might be repaid, Kissinger replied:

> "We have two problems. We have an economic problem, and we have a political problem. The political problem is that the whole Western world, with the exception perhaps of the U.S., is suffering from political malaise, from inner uncertainty, and from a lack of direction. This also affects economic conditions, because it means that you have no settled expectations for the future and therefore a lowered willingness to take risks. One of the principal objectives of our energy policy is to restore among the industrialized countries some sense that they can master their own fate. And even if this would involve some questionable debts, these are debts that have to be met somehow. It would be enormously important for the general cohesion of the industrialized world and for its capacity to deal with the future, that they are dealt with systematically and not as the outgrowth of some crisis..."* (Emphasis added.)

Kissinger uses the word "systematic" no less than nine times in the course of this interview; it is not implausible that such frequent use may reflect a maturing perception on Kissinger's part that the international system is experiencing an incipient breakdown. So much has been written recently about the breakdown of the international economic system that to recapitulate the arguments again would only belabor the obvious. But, after stating that we have two problems--economic and political--Kissinger chooses to stress the political dimension. The reason for this is rather clear: international economic and energy problems have been politicized to the Nth degree, and the basic international problem is political in nature. Indeed, Secretary Kissinger is probably most worried about the surprising but highly important mid-term scenario in which the international political system is severely eroded by a proliferation of beggar-thy-neighbor policies which lead toward chaos. This eventuality might include the collapse of NATO and the diplomatic isolation of Israel and its sole ally, the U.S. This nightmare scenario might help to explain

*Business Week interview, op. cit.

why Kissinger talks so much about institutionalizing cooperative responses to cope with the widening stream of economic and energy problems.

But why does Kissinger say that the whole Western world suffers from political malaise and lack of direction, with the possible exception of the United States? Whom does he think he is kidding, particularly after President Nixon was forced to resign in disgrace? Max Lerner, one of the most imaginative students of American civilization since de Toqueville, published an article in Foreign Affairs last year entitled "America Agonistes," in which he wrote that American self-awareness has recently reflected a sense of

> "being at the end of the tether, a mordant feeling of disintegration and decay....This mood must be taken seriously as part of the image that America offers the world....It has included the convulsions and confrontations of the 1960's, the hippie culture, the squalor and bombings of the Vietnam War, the corruption of Watergate. The judgment around the world--that America was coming apart as she moved, ironically, very close to her bicentenary of 1976--has been reinforced by a self-image filled with self-pity and self-hatred....On her way to the forum of her bicentenary, something happened to America."*

More generally, for several years a new conventional wisdom of gloom and alarmism has been taking hold in the industrialized world. An entire literature of pessimism is being produced with such titles as, The Passing of the Modern Age (1970), Where the Wasteland Ends (1973), The Limits to Growth (1972), The End of the American Future (1973), The Coming Dark Age (1973), and The Phaeton Ride--The Crisis of American Success (1974). Exemplary of this burgeoning literature is Robert Heilbroner's An Inquiry Into the Human Prospect, in which the outlook for man is termed "painful," "difficult," and "perhaps desperate":

---

*Max Lerner, "America Agonistes," Foreign Affairs, January 1974, pp. 287-9.

> "the answer to whether we can conceive of the future other than as a continuation of the darkness, cruelty, and disorder of the past seems to me to be no; and the the question whether worse impends, yes."*

Even so, Lerner's feeling of being at the "end of the tether" does not stop him from believing that while the Arab oil weapon will achieve some short-term victories, there is still some room for (cautious) optimism:

> "in the end, the food production, technology, and the scientific inventiveness of free societies should make them resourceful enough to resolve the impasse without any energy Munichs."**

This type of long run optimism should be understood for what it is, since the only path to the long run passes through the short-term future. Which brings us back to Mr. Kissinger: When asked about objective conditions required for a reduction of the price of oil, Kissinger listed four factors upon which the objective conditions depend:

> One, a degree of consumer solidarity that makes the consumers less vulnerable to the threat of embargo and to the dangers of financial collapse. Second, a systematic effort at energy conservation of sufficient magnitude to impose difficult choices on the producing countries. Third, institutions of financial solidarity so that individual countries are not so obsessed by their sense of impotence that they are prepared to negotiate on the producers' terms. Fourth, and most important, to bring in alternative sources of energy as rapidly as possible so that the combination of new discoveries of oil, new oil-producing countries, and new sources of energy create a supply situation in which it will be increasingly difficult for the cartel to operate. We think the beginning of this will occur within two to three years.*** (Emphasis added.)

---

*Robert Heilbroner, An Inquiry into the Human Prospect (New York: W.W. Norton, 1974), p. 22. Arnold Toynbee has praised An Inquiry as "a most notable and valuable book."

**Max Lerner, loc. cit., p. 291

***Business Week interview, op. cit.

Against the current backdrop of general pessimism and malaise rippling through the Western psyche, are there legitimate grounds for Kissinger's limited, short-term energy optimism? In other words, what are the prospects for 1) adequate consumer solidarity; 2) effective energy conservation; 3) credible financial security; and 4) timely energy supply enhancement? Over and above the question of security of energy supplies, which is treated in Volume II of this report, the essential implications of the global energy problem for American security, broadly conceived, relate to the superprice of imported oil. Hence the widely recognized imperative that the world oil price must be brought down significantly.*

To achieve a large reduction of the price of oil, it appears that all of Kissinger's factors must be operating successfully. The outlook for (nonmilitary) resolution of the international oil crisis--and the deepening world recession and pervasive global inflation may be incurable without timely resolution of the oil crisis--can be gauged by assessing the individual outlook for each of the factors, even though they are to some extent mutually dependent. This assessment is made in the next section.

Prospects for Reducing the Price of Oil

A. Adequate consumer solidarity

Walter Levy, a respected international oil consultant, has articulated the necessity for cooperation among oil consuming countries better than

*It should be noted that the problem of recycling huge oil transfer payments is not much less difficult if the price of oil is $6-8 per barrel, hence it must be reduced from $10-11 to $3-4 to ameliorate the international transfer-of-wealth dilemma (see K. Farmanfarmalan, et al., "How Can the World Afford OPEC Oil?" Foreign Affairs, January 1975.) Secretary Kissinger's recent proposal for an oil price floor of $7-8 per barrel seems to contradict his earlier comments regarding the urgent need to achieve substantial reduction of the price of oil.

most commentators. Like Kissinger, Levy believes that four elements are essential to move toward a reasonable adjustment of the oil crisis:

> "...far-reaching cooperation among the oil-importing nations, an understanding by the importing nations of the interests and aspirations of the producing countries, a clear-cut (and painful) program of energy austerity by the oil-importing countries, and a recognition by the producing countries that even in an austerity situation any attempt to hold prices high must result in worldwide dangers to which they could not be immune. Only with far-reaching consumer cooperation can it be expected that the producing countries will come to this necessary conclusion; at the same time cooperation without austerity will not do the job. Both are needed, and a large new dose of political will, not yet in sight, will be required to achieve them....
>
> Today, governments are watching an erosion of the world's oil supply and financial systems, comparable in its potential for economic and political disaster to the Great Depression of the 1930's, as if they were hypnotized into inaction. The time is late, the need for action overwhelming."*

Will the oil-consuming nations be capable of putting their act together to use cooperation as a lever on oil prices? Or will cooperative oil politics elude these nations as they become increasingly sensitive to brute economic pressures and yield to bilateral oil deals and competitive bidding for shrinking oil production?

Various writers have recently set down more general reasons for improved cooperation among Western nations (and Japan). After the Vietnam ceasefire agreement was signed in Paris, Zbigniew Brzezinski wrote that unless the United States, Western Europe and Japan move toward greater and more active collaboration,

> "...there is a high probability that the fragile global economy and the barely emerging sense of global community will be shattered, pitching the world back into international animosities, fragmenting the world economy and intensifying the social strains within both the advanced and the developing countries."**

---

*Walter J. Levy, "World Oil Cooperation or International Chaos," Foreign Affairs, July 1974, pp. 711-13.

**Zbigniew Brzezinski, "U.S. Foreign Policy: The Search for Focus," Foreign Affairs, July 1973, p. 723.

Writing in Foreign Affairs one year later, Karl Kaiser stated that,

> "Given the crisis of European integration and of European-American relations, Europe and the United States may be at a crossroads in their relationship. It will be, above all, necessary to cool down emotions, to realize common interests and to undertake a sober analysis of the ultimately disastrous consequences of a continuation of the present trends....If the notion of partnership between and integrating Europe and North America is abandoned, the price will be heavy and will be paid by all our societies....The price of failure could well be a breakdown of political stability or, indeed, of democracy in some countries, a breakdown which would inevitably affect the whole of the Western world.*

Coming from scholars of this stature, these opinions can hardly be set aside as unrepresentative of some lines of thinking at high levels in and out of government.

European actions during the 1973 Middle East war, as the U.S. resupplied Israel, demonstrate the type and depth of difficulties facing a serious attempt to generate Western oil cooperation. So strong was American ill feeling at the lack of support from European allies during that war that Secretary Kissinger was rumored to have said, "I do not care what happens to NATO, I am so disgusted." Fifteen months later, in the aforementioned interview, Kissinger elaborated his perception of European-American interactions:

> Q. In Europe, the charge is made that you have sold out Western civilization for 18 months of peace in the Middle East. Why do Europeans feel this hostility toward the U.S. and you?
>
> A. Well, of course, I'd like to know who these Europeans are--for my own education. What could they have had us do?
>
> Q. They're talking about military action.

---

*Karl Kaiser, "Europe and America: A Critical Phase," Foreign Affairs, July 1974, pp. 739-41.

A. The fact of the matter is that the governments they represent systematically opposed every move we made in the Middle East; every strong action that was taken in the Middle East was taken by the U.S.....Our difficulty in the Middle East is caused in part by our inability to organize cooperation even for nonmilitary action. The efforts the Administration made diplomatically to lift the oil embargo reduced, at least for a time, the dangers in the Middle East. It gave everyone breathing space. We gave up nothing. Except the possibility of military action, which was a chimerical idea.

Why are the Europeans so hostile to the U.S.?

I think they suffer from an enormous feeling of insecurity. They recognize that their safety depends on the U.S., their economic well-being depends on the U.S., and they know that we're essentially right in what we're doing. So the sense of impotence, the inability to do domestically what they know to be right, produces a certain peevishness that always stops just short of policy actions. No foreign minister ever says this.* (Emphasis added.)

One of the major questions, of course, is why the American foreign minister ever made this blunt statement available for the public record, since its impact on European propensities to cooperate on oil politics is likely to be adverse, if not devastating. After the Washington energy conference in February 1974, the International Energy Agency was created to organized and implement oil sharing among OECD nations during any crisis. But it is increasingly difficult, in this atmosphere of transatlantic bad temper, to harbor much optimism regarding the mid-term outlook for meaningful and effective consumer solidarity, let alone the "far-reaching cooperation" believed by Levy to be required to produce favorable price changes and supply guarantees.

When asked about the forthcoming meeting between oil consumers and producers, Kissinger replied,

---

*Business Week interview, op. cit.

> "What can happen at a consumer-producer meeting depends entirely upon whether the consumers manage to bring about concrete co-operation and whether they can concert common positions before the conference. In the absence of these two conditions, the consumer-producer conference will not take place with our participation. If it did take place, it would only repeat in a multilateral forum the bilateral dialogues that are already going on."*

What may be on Kissinger's mind is the possibility that, unless consuming nations go into a meeting without producers holding common (read: pro-American) positions, the meeting might produce results contrary to American interests; it may resemble a U.N.-like "tyranny of the majority" in which the U.S. is forced to bend to a Euro-Arab coalition.** Presentation of a public ultimatum to Europe that U.S. participation in the meeting is contingent on achievement of "concrete cooperation" and "common positions" is highly undiplomatic behavior which would be counterproductive, if the American objective is consumer cooperation.

However, if the real American objective is, unfortunately, to construct an American-led consumer cartel by bullying Europe and Japan into toeing the American line on the politics of oil, chances are that the effort will fail miserably: American "inability to organize cooperation" will rule again. Under these circumstances, the Europeans might sense their impotence but the Americans will actually become impotent to deal peacefully with the international oil crisis because they will have become their own worst enemies. Whether or not the fears of Brzezinski or Kaiser prove to be well-founded, the implications of this scenario

---

*Ibid., p. 69.

**Might a similar anti-American coalition carry weight at the forthcoming conference to review the Treaty on the Non-Proliferation of Nuclear Weapons, particularly in a period of weakening American diplomacy? (See pp. 47-9 below.)

for NATO cohesion and the U.S.-Japanese Mutual Security Treaty seem certain to be negative.

B. Effective Energy Conservation

Kissinger's second factor involves the need for effective energy conservation. By now, the widespread concensus concerning this point has become a phenomenon in its own right. Until recently, Western economic growth, fueled by a growing supply of energy, was an ideological strongman. Of late, this ideology has been called into question as a viable long-term concept by those who believe that natural and/or social limits to growth will slow and ultimately stop economic (and population) growth, one way or another. The name of the game, then, would be to slow growth with minimal dislocation to society. In this context, prudent use of energy becomes desirable on a number of grounds other than conservation of expensive imported petroleum; thus, energy conservation may be used as a mechanism to slow economic growth while reducing environmental pollution. This strategy suggests that international scrambling for shrinking quantities of foreign oil may be avoided, or at least minimized, thereby removing an important new threat to world order.

Unfortunately, significant energy conservation seems difficult to achieve without rather Draconian measures. Energy voluntarism does not work readily in a society dominated by energy-intensive lifestyles. After the Arab oil embargo was established, long lines at gasoline stations and even-odd day rules sufficed to ration the scarcity. During 1974, stocks of all types of refined petroleum products increased in OECD nations, until OPEC countries cut back production by 4-6 million barrels

per day to blunt downward price pressures which might have proved destructive to cartel pricing.

At the same time, consumers of electricity in the U.S. were learning a quite different lesson. As electricity conservation set in, electric power rates were driven up by the imperative of financing fixed utility plant costs. Even though the capital crunch was on, squeezing ordered nuclear power plants out of their marginal existence left and right, utility accounting methods had internalized the trend extrapolation that U.S. electric generating capacity would increase 7 percent per year for the next few decades. Reduced use of electricity under prevailing circumstances and revised expectations about future growth led to utility requests for compensatory rate relief to finance unanticipated amortization costs, fuel price increases, and higher interest rates for deferred construction projects. Ironically, the inverted law of supply and demand in which demand reduction creates upward price movement was making itself felt to energy consumers in the West at the same time it became the keystone of new oil economics guiding OPEC policy.

The economic cost of pervasive energy austerity can be quite high, particularly if the return to traditional laws of supply and demand is not at hand. So many price-inelastic energy users are in the marketplace that oil tariffs, gasoline taxes, and the like may increase consumer costs without reducing energy utilization.* More generally, mandatory energy conservation in contracting economies which are experiencing

*In general, Western energy consumers are accustomed to unlimited amounts of inexpensive fuels (i.e., they are spoiled).

unprecedented rates of inflation and unemployment is a dangerous economic experiment to carry out. The disturbing possibility that serious measures to conserve energy might irreversibly swing the American economy near or into double-digit subspace implies that effective energy conservation might move an already disordered economy closer to social and political chaos. Finally, this second possibility would severely undermind American efforts to achieve the other three Kissingerian goals of solidifying consumers, securing financial arrangements, and enhancing energy supplies. Balanced against the benefits that might accompany programs of energy conservation--and to be effective, conservation must cut deeply into energy demands--the risks seem excessive.

Of course, Western policy-makers might decide that energy austerity should not be harsh, implement relatively benign conservation measures, and take credit for "coping" with the energy/economic problem. But this alternative would do no more than dent the large quantities of oil imported by the U.S., Europe and Japan. On balance, the outlook for significant OECD energy conservation which would put meaningful pressure on OPEC pricing policy is relatively poor.

C. Credible Financial Security

The third Kissinger factor relates to the need for

> "institutions of financial solidarity so that individual countries are not so obsessed by their sense of impotence that they are prepared to negotiate on the producers' terms."* [Emphasis added.]

*Business Week interview, p. 67. Note the repeated use of "sense of impotence" in reference to oil-consuming nations.

Since the average mind boggles at the immense problem of financing OECD oil imports during the next few years, let alone for 10-15 years until alternative indigenous energy supplies become available, importing nations are likely to continue to have a frustrating sense of impotence. The enlarged International Monetary Fund oil facility might serve to cushion large oil deficits and soften the general world financial disequilibrium caused by the massive recycling required to insert the $50-60 billion surplus OPEC revenues into productive investments.* There might be a $25 billion financial safety net to bolster countries like Britain and Italy which are not the most creditworthy countries in the world. Many observers of the international monetary scene, however, remain dubious regarding the potential long-term effectiveness of existing financial institutions and payments mechanisms.

"How Can the World Afford OPEC Oil?" asks a seminal article published by five distinguished men in the January 1975 issue of Foreign Affairs, even if the price of oil was significantly reduced:

> ...the oil-consuming countries must recognize that a reduction of the representative Persian Gulf FOB price from $10 down to $8, or even $6, per barrel, would still not reduce their transfer burden to the OPEC countries to readily manageable proportions. In annual gross payments, before any offset for sales of goods to the OPEC countries, or for any aid they may extend, the ranges would drop either to about $90 to $105 billion at the $8 price or to about $75 to $95 billion at $6.**

At $10 per barrel, $400-450 billion worth of oil payments would have to be settled through transfer of claims rather than through movement of goods and services over the remainder of this decade; at $6 per barrel, this

---

*See Volume III.

**Khodadad Farmanfarmaian, et al., "How Can the World Afford OPEC Oil?" Foreign Affairs, January 1975, p. 208. Farmanfarmaian's co-authors are Armin Gutowski, Saburo Okita, Robert V. Roosa, and Carroll L. Wilson.

figure would drop to $200-250--still a gigantic and novel problem, it would seem, for existing financial institutions. The article argues that cooperation among oil consuming countries is vitally important:

> "...if they act individually, it is simply not conceivable that most of the importing countries can find matching inflows of funds, from OPEC countries at least, that would enable them to meet their oil deficit needs for very long.
>
> This conclusion has been concealed, at least from the public, through most of the past year. Indeed, 1974 will surely prove to have been the easy years, not only because the payments themselves had not reached full magnitude until late in the year, but also because many old and new facilities could be called into initial use for channeling these growing payments flows, and because most oil-importing countries still had relatively large reserves or funds or borrowing power to draw upon--capabilities which are being rapidly exhausted in many countries.
>
> Now a denouement, or a succession of denouements, is rapidly approaching. A looming problem is the ability of the major banks to continue to accept such a large volume of funds in the form of short-term deposits. In all likelihood, unless further approaches to cooperative action are made within the next few months, some oil-importing countries will have run out of goods to sell, or markets to reach, or capacity to borrow to cover their deficits, and a number may become unable to meet the servicing on the enlarged debts. Whether that would result in currency devaluations, in defaults by banking and business firms in those countries, in national debt moratoria, or in political revolution and debt repudiation, the entire structure of world payments, and of trade and financial relationships, would certainly be fractured.*

Notwithstanding the general barriers to oil cooperation mentioned above, there seem to be major difficulties ahead for attempts to establish institutions and mechanisms of financial solidarity for coping with the

---

*ibid., pp. 203-4. The international financial strains relating to the problem of lending long-term money using short-term demand deposits are quite similar to the phenomenon of disintermediation being experienced by American savings and loan associations. If the supply of short-term money dries up, so does mortgage money for the housing market; stagflating economic conditions result in more foreclosures, worsening the situation. If the international banking community utilized rather hot petrodollars to supply the demand for deficit financing from oil-importing countries, global disintermediation might ensue from fluctuations in short-term deposits of oil revenues; the situation worsens if the creditworthiness of borrowing nations is marginal.

unique transfer of oil wealth. The worsening economic malaise is not limited to the United States--it is worldwide. Countries not yet in serious financial difficulty might decide that a modified concept of triage is appropriate to present circumstances, assist those nations which are not in such bad shape that moderate doses of financial aid would do little good, and practice benign neglect for those nations deemed to be beyond the pale.

Rational allocation of scarce financial resources, modified by a pragmatic form of the golden rule (Do good for those who would do good for you), particularly when it concerns lending money to other countries which might not be capable of repayment, seems eminently sensible and likely to occur in the current gloomy economic situation. National lending policies based on this line of thinking would be quite different from traditional "beggar thy neighbor" attitudes, even though the ultimate results might not be too different. The general point is that economic rationality and political pragmatism may conspire to preclude the degree of international cooperation and risk sharing required to generate the financial solidarity by which the "enormous cam_i of oil transfe payments" can pass through the eye of the Western financial needle.

D. Timely energy supply enhancement

Moving on to Kissinger's fourth and "most important" factor, alternative sources of energy must be brought in

> "as rapidly as possible so that the combination of new discoveries of oil, new oil-producing countries, and new sources of energy create a supply situation in which it will be increasingly difficult for the cartel to operate."*

*Business Week interview, op. cit.

The conventional wisdom regarding alternative energy sources is relatively optimistic. Whereas the precise elasticities of supply are not known, it is generally true that energy supplies have been responsive to increases in price. Hence $10 per barrel oil should bring on additional supply fairly rapidly. The rapidity with which new supplies can be brought on the energy market, however, depends on current prices, price expectations, technological feasibility, capital conditions (availability and interest rates), government regulation, tax policy, and a number of other factors. Consequently, the transformation of energy resources into marketable BTU's is a complex and increasingly tedious process. On balance, the United States has been skillful in putting together the requisite factors for supplying energy to fuel its growing economy.

The fourth quarter of 1973 brought energy shocks which went well beyond mere contributions to price inflation and general financial disequilibrium as their impacts rippled through the U.S. energy structure to create intense dislocations. These dislocations include a large increase in energy price uncertainty and unusually large uncertainties regarding public policies which are being shaped to cope with interacting energy and economic problems to which the energy shocks were major contributing factors. Consequently, development of domestic energy resources has been slowed down considerably by a combination of widespread anxiety that the OPEC-administered price of oil will break downward sharply, threatening the economic viability of energy ventures undertaken with business-as-usual assumptions, mixed with general financial difficulties relating to tight money markets and a relative scarcity of capital to finance energy projects ranging from nuclear power plants to prototype coal liquefaction facilities.

Planning uncertainty has been greatly exacerbated by the pervasive grip of double-digit inflation on energy ventures. In terms of economic viability, prototype development of oil shale has become a dead issue for the time being, and medium-scale development of Athabascan tar sands has been critically wounded by massive cost escalations. Many capital cost estimates have doubled in the past 12-15 months.* Accelerated development of offshore oil and gas fields planned by the Federal Government has encountered opposition in many coastal states where the environmental and social costs of oil spills and secondary onshore development are believed to outweigh the attendant economic benefits, particularly if the Federal Government remains unwilling to share royalties.

The nuclear power industry has been experiencing the uncomfortable squeeze of scarce capital and dilution of utility equity values, forcing numerous electric utilities to cut back construction plans severely. Consequently, official projections of nuclear electric generating capacity for the U.S. in 1980 have been significantly reduced (see Figure 1). Since smooth growth in the construction of nuclear power plants is of central importance to the potential success of the policy of energy self-sufficiency by 1985, Figure 1 says a great deal about the likelihood that Project Independence will be successful:

---

*During the fourth quarter of 1974, Atlantic Richfield Co. and Shell Oil Co. withdrew from joint ventures to build plants for extracting synthetic crude oil from Alberta's tar sands. "The deteriorating economics of the project caused by rapid inflationary increases in capital and operating costs" figured heavily in ARCO's decision.

Doubts about the economic feasibility of oil shale development had motivated ARCO to shelve indefinitely plans to build a $1 billion plant in Colorado only two months before the tar sands decision. (The Wall Street Journal, Dec. 9, 1974.) Earlier in 1974, the Department of the Interior was unsuccessful in leasing oil shale tracts for developing underground extraction processes when there were no bidders.

> "the disproportionately heavy cancellation or delays of nuclear plants are likely to make impossible the objectives of Project Independence."*

As of March 1975, 55 nuclear power plants having a total capacity of 37.5 gigawatts are licensed to operate in the U.S. and 63 plants (64 Gwe) have construction permits (see Figure 2). If one-third of the plants on order obtain construction permits and are built by 1985, then about 135 Gwe of nuclear capacity may exist by then, amounting to approximately 10 quadrillion BTU's per year in terms of thermal energy equivalents. This projection of 1985 nuclear capacity is much lower than the 325 Gwe projected by the National Academy of Engineering in mid-1974.** The conventional wisdom has greatly inflated expectations of future installed nuclear capacity compared to levels which would seem more realistic if existing economic and political trends are taken seriously.

The economics of nuclear energy had begun to sour as cost estimates for commercial (non-turnkey) plants became available in the late 1960's. Discussing the competitive position of nuclear power relative to fossil-fueled generating capacity, Philip Sporn wrote that,

> "During the past 2 years there has taken place a remarkable and ominous retrogression in the economics of our nuclear power technology."***

---

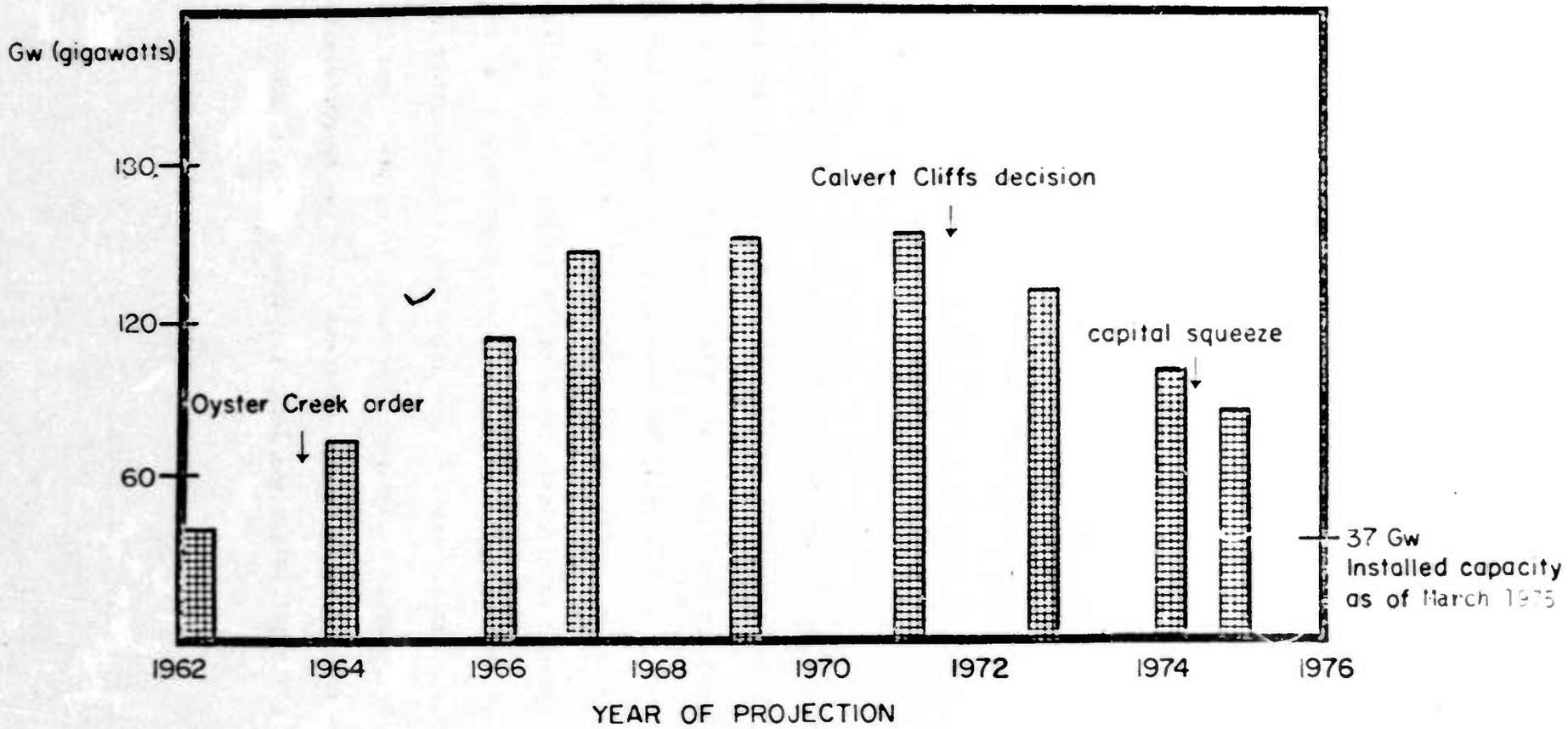
*Lewis J. Perl, "The Future of Nuclear Power in the Electric Utility industry," Nuclear News, December 1974, p. 63. (See Chapter 8, Volume II for details regarding the structure of Project independence.)

**See U.S. Energy Prospects, National Academy of Engineering, May 1974.

***Philip Sporn, "Developments in Nuclear Power Economics, January 1968-December 1969," Nuclear Power and Related Energy Problems--1968 Through 1970, a report of the Joint Committee on Atomic Energy, December 1971.

Figure 1

HISTORY OF A.E.C. PROJECTIONS FOR 1980 NUCLEAR ELECTRIC GENERATING CAPACITY IN THE US



Data for 1962-1975 is derived from various issues of The Nuclear Industry, an annual publication by the U.S. Atomic Energy Commission, with the exception of the data point for early 1974. That point was provided by J. Conner, Director of the USAEC Office of Planning and Analysis, in a talk prepared for the Atomic Industrial Forum's International Conference on Uranium Enrichment, Washington, D.C., April 24, 1974.

Figure 2

STATUS OF U.S. NUCLEAR ELECTRICITY, 1975

THE FOLLOWING FIGURES ARE CURRENT AS OF MARCH 20, 1975:	
55 PLANTS WITH OPERATING LICENSES	37,496 Mwe*
63 PLANTS WITH CONSTRUCTION PERMITS	64,369 Mwe
100 PLANTS ON ORDER	112,186 Mwe
17 LETTERS OF INTENT/OPTIONS	19,082 Mwe
235 TOTAL	233,133 Mwe

*REPRESENTS APPROXIMATELY 7.9% OF TOTAL U.S. GENERATING CAPACITY.

SOURCE: ATOMIC INDUSTRIAL FORUM

Sporn indicated that the expectation of Oyster Creek performance in the generation of electrical energy at about 3.5 mills/KwH had evaporated when 1969-estimated costs of nuclear power for 1976 had doubled to 7 mills/KwH. What he could not have known then was the subsequent tripling of estimated electrical generation costs to 22.6 mills/KwH (see Figure 3). This sharp cost escalation occurred primarily because of the skyrocketing cost of constructing nuclear power plants which went far beyond cost escalation attributable to inflation in the construction industry.

The problem is not purely economic in nature, since the precipitous escalation of nuclear power cost estimates can be correlated with regulatory and legal delays and decisions adverse to the smooth, planned process

of building more nuclear power plants. It appears that public hostility to nuclear power and its related unique problems lies at the core of the souring economics:

> "The extreme critics of nuclear power have been at least partially successful in their efforts to force a downward re-evaluation of the [net] social value of reactor technology...the regulatory process has been used as a device to give effect to the view that reactor technology is not as valuable to society as the anticipated cost of electricity from the first-generation plants implied. The process by which opponents of nuclear power are trying to establish their views about the ultimate value of nuclear power to society is causing delays and costs which obviously can only be reduced by a reduction in the level of the controversy itself."*

The politics of nuclear power are tilting away from the nuclear industry and its Congressional supporters as moratorium movements in various states gain momentum. Four of the new members of the Joint Committee on Atomic Energy have demonstrated noteworthy skepticism on issues of big technology such as the SST and ABM systems. Moreover, the once monolithic power of the AEC-JCAE axis has been splintered by the dissolution of the AEC; various Congressional committees plan to hold hearings on different aspects of nuclear power, opening the door for emerging coalitions of neutral and anti-nuclear Congressmen and diluting the political clout of the traditional pro-nuclear alliance.

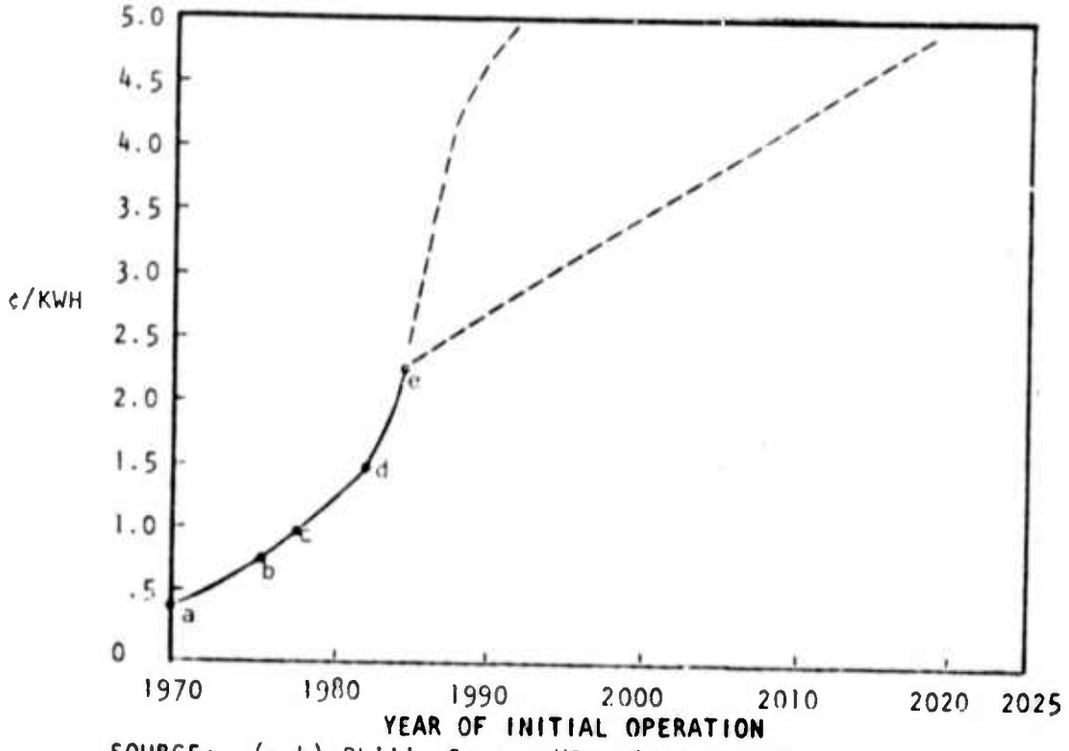
---

*Irvin C. Bupp, et al., "The Economics of Nuclear Power," Technology Review, February 1975, p. 25.

**Robert Gillete, "Nuclear Power: Hard Times and a Questioning Congress," Science, 21 March 1975.

Figure 3

NUCLEAR ELECTRIC GENERATION COST ESTIMATES



SOURCE: (a,b) Philip Sporn, "Developments in Nuclear Power Economics, January 1968-December 1969," published in a report for the Joint Committee on Atomic Energy, Nuclear Power and Related Energy Problems--1968 Through 1970, December 1971.

(c) U.S. Atomic Energy Commission, The Nuclear Industry--1971.

(d) U.S. Atomic Energy Commission, The Nuclear Industry--1973.

(e) U.S. Atomic Energy Commission, The Nuclear Industry--1974.

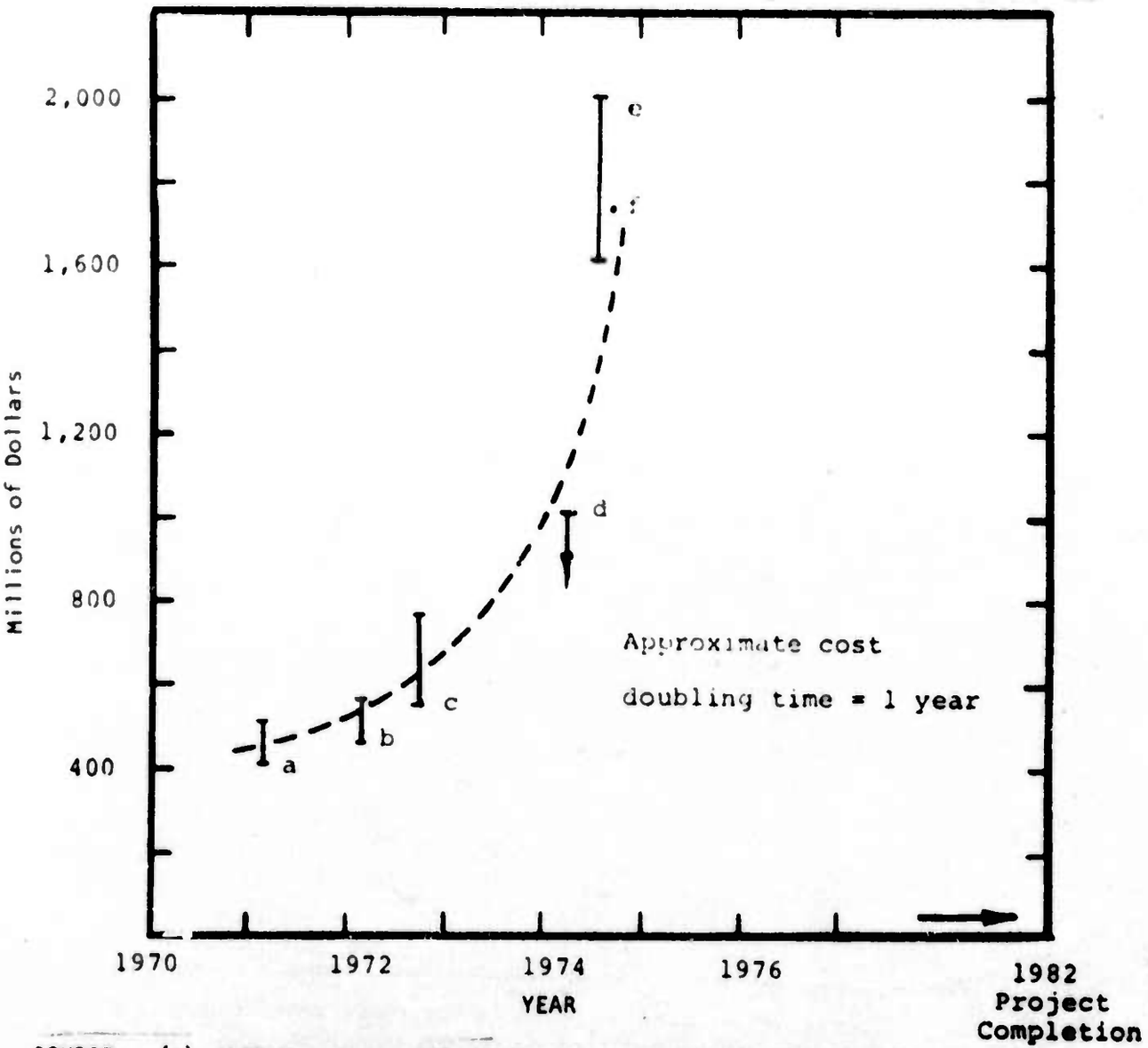
Possibly the most vulnerable link in the nuclear chain is the breeder reactor, which has been seriously damaged by a precedent-setting judicial decision requiring an environmental impact statement for the entire breeder program through the year 2020. Mounting political pressures to slow or halt breeder development in the U.S. are based on 1) lack of solid evidence that cheap uranium is becoming scarce, particularly as the light water reactor industry grows more slowly than expected; 2) arguments

concerning the high and rising opportunity cost of developing breeders (see Figure 4); 3) increasing anxiety relating to the risks of nuclear theft and nuclear weapons proliferation; and 4) general hostility to the nuclear power program. Since these pressures are gaining ground both within and outside government, it is not inconceivable that the breeder may become the energy SST of the mid-1970's.* If this happens, the long-term viability of the civilian nuclear power program might be placed in jeopardy.

*The recent decision to postpone for three years reaching a final position on the use of recycled plutonium as nuclear fuel for conventional reactors, made by the Nuclear Regulatory Commission, indicates that the plutonium breeder reactor program is approaching a do-or-die point in its history (see David Burnham, "U.S. Panel Delays for 3 Years Decision on Using Plutonium as Fuel for Reactors," The New York Times, May 9, 1975.

Figure 4

AEC COST ESTIMATES FOR THE CLINCH RIVER BREEDER REACTOR



SOURCE:
(a) JCAE Hearings, AEC Authorizing Legislation - FY 1972, p. 702.
(b) JCAE Hearings, AEC Authorizing Legislation - FY 1973, pp. 1156-1159.
(c) JCAE Hearings, LMFBR Demonstration Piant, Hearings, p. 44.
(d) Nucleonics Week, 15, March 21, 1974, p. 1.
(e) Weekly Energy Report, 30, July 29, 1974, p. 1.
(f) Weekly Energy Report, 38, September 23, 1974, p. 6.

REFERENCE: Thomas B. Cochran, et al., Bypassing the Breeder, A Report on Mispiaced Federal Energy Policies, Natural Resources Defense Councii, Inc., March 1975.

While the bad state of affairs in the nuclear power industry may be extreme, it exemplifies some of the sizeable problems being encountered by companies and Government officials as they plan for American energy self-sufficiency. The timely development of indigenous energy resources has become extremely problematical, largely because the politics and economics of such energy resource development have become quite confusing. Notwithstanding the large sums of capital and the great economic uncertainties involved in the implementation of Project Independence programs, there is a lack of fundamental political commitment to the stated policy objective of making the U.S. self-sufficient in energy during the next decade. Until the political feasibility of American energy independence can be demonstrated, OPEC nations are quite unlikely to take the paper programs of Project Independence too seriously, and will not feel inclined to reduce the price of oil under pressure from emerging competing sources of oil substitutes.

E. Prospects for a price break

Under the circumstances described above, the likelihood appears slim that new sources of energy such as uranium-based nuclear power, liquefaction and gasification of coal, oil shale, tar sands, and geothermal and solar energy resources can be realized rapidly enough to exert effective supply pressure on the oil cartel to break its monopolistic hold on the energy price structure. The once popular view that energy from tar sands, oil shale, coal synthetics, and uranium is easily accessible has been summarily invalidated by a combination of environmental obstacles and economic reality. Even new petroleum from offshore

producible zones is unlikely to be marketed in substantial quantities during the next few years.

Secretary Kissinger's proposal of creating an energy floor price (near $7-8 per barrel) to avert the risk that OPEC might attempt to undercut emerging infant energy industries by reducing the price of oil seems ineffectual relative to other factors--economic, political, and technological--which preclude orderly and timely development of American energy resources. Furthermore, protection against downward price movements is only one of the problems. On the up side, renewed inflation might imply higher interest rates in the future, making capital formation more expensive, and may create incentives for leaving discovered oil and gas in the ground until rising prices make production more profitable.

An $8 floor price does little good in terms of protecting and encouraging the rapid development of alternative energy sources blocked by public hostility and capital scarcity, particularly if most of these sources require substantially more than $8 per barrel to break even. Instead, it would tend to institutionalize high oil prices, encourage an inflationary bias in other energy prices, and thereby contradict the stated advantages of working to bring about substantial price reductions by breaking the cartel. It is no wonder that some (many?) Europeans and Japanese still believe that Secretary Kissinger helped to engineer (or at least applauded) OPEC's price boost as a way to improve American competitiveness relative to the rest of OECD.

American experience with energy price regulation indicates that once regulation is in effect it is relatively difficult to rescind; the tortuous history of Federal Power Commission regulation of interstate natural gas

prices at the wellhead is exemplary in this regard. Since it appears that the eighteen primary oil consuming nations constituting the International Energy Agency have agreed in principle on Secretary Kissinger's plan for a common floor price for oil imports, what might happen to this price floor in the event that the cartel breaks up? Clearly, vested interest in maintaining the high price level would be widespread in the United States since numerous energy industries would be adversely affected by low prices. On the other hand, countries with much higher import dependencies might remove their support for the floor price which would unnecessarily inflate their energy payments if inexpensive imported oil became available again. In other words, breakup of the cartel within the framework of a common floor price might introduce points of friction between the U.S. and its allies as the U.S. continues to strive for a degree of energy self-sufficiency and its allies try to minimize energy costs.

In spite, rather than because, of Secretary Kissinger's efforts to force the price of oil down and break the cartel, there are some good reasons to believe that a centrifugal breakup of OPEC is impending:

> Crude petroleum prices are being lowered, both directly and indirectly, by individual producing countries seeking to increase their exports....Since the embargo was lifted, demand declined in the face of recessions in the United States, Western Europe and Japan....Current OPEC output is estimated at 26 million barrels a day, 11 million below its capacity....there are now 100 days of consumption in storage....The more rapidly the price is expected to fall, the more rapidly inventories will be reduced, and the lower the demand for newly produced oil....While individual OPEC countries can increase their exports, OPEC countries as a group cannot--at least not until a business upswing occurs.*

*Robert Z. Aliber, "Impending Breakdown of OPEC Cartel," The Wall Street Journal, March 20, 1975.

if this line of argument is valid, OPEC's ability to maintain the price of oil is eroding rapidly, quite independent of policy proposals made by Western governments, and the prospects for a price break to the $5 level or lower are excellent.

If a price break does occur during 1975, then the prospects for 1) adequate consumer solidarity; 2) effective energy conservation; and 3) timely energy supply enhancement become even more bleak. Consumer solidarity would be hastily discarded as nations raced toward economic recovery from what recently appeared to be near worldwide depression, buoyed by the return to cheaper energy. Energy austerity might survive in a reduced form as a mechanism to reduce national import dependencies, but conservation of energy qua economic common sense would be dealt a grave blow. Most important, from the perspective of U.S. energy policy, the likelihood that timely enhancement of alternative energy supplies will occur in the U.S. would shrink greatly. No longer could the argument of national energy security be applied to support agency requests for large expenditures to finance domestic energy resource development and R&D projects designed to achieve U.S. energy self-sufficiency.

The economic and environmental costs of carrying out a program to obtain mid-term energy self-sufficiency would seem prohibitive after a price break, relative to the costs of a smaller program to guarantee energy security by stockpiling petroleum, making careful contractual arrangements with diversified foreign suppliers, and preserving a structured energy R&D program emphasizing development of clean coal burning and safe light-water reactors. Energy developments such as the breeder reactor

which appear excessively costly and/or socially unacceptable would tend to be discarded in favor of more desirable approaches. And a cartel price break would remove the novel threats to national security of the recent past since oil embargoes, price hikes, and concomitant bouts of inflationary recession would be obviated.

Concluding Remarks

Up to now, the oil-producing members of OPEC have been riding high on the crest of a seller's market with high prices and rapidly growing surplus revenues. The potential importance of oil as a political weapon has been demonstrated, to some extent, and future use of the oil weapon is relatively probable. The permanence of this situation may be deceptive, however.

The world price of oil appears to be weakening under pressure from overcapacity due to reduced demand in consuming countries experiencing deep economic recession, itself partially caused by oil price inflation. As downward pressure on the price of oil worsens, the stability of the oil cartel becomes increasingly vulnerable. Quite independent of economic considerations relating to the petroleum market, the intensive arms build-up presently underway in the Arabian/Persian Gulf, which is being financed largely by recycled oil money, introduces a significant mid-term potential for destabilizing OPEC as well as the political-military status quo in the Middle East. And the large intrinsic conflict potential in the Middle East suggests that all bets concerning cartel stability might be off if (more precisely, when) the next round of Arab-Israeli fighting breaks out.

Mr. Kubba, writing in an official OPEC document, has said that future use of the oil weapon will precede the "coming war" in the Middle East instead of lagging it. In the context of Secretary Kissinger's threat of force to cope with economic strangulation of the West by the OAPEC oil weapon, any temptation to unsheath the oil weapon to bolster OPEC cohesiveness and morale and to weaken Western support of Israel prior to the next Mideast conflict may prove quite dangerous for all parties involved. After the breakdown of the international order characterized by Anglo-American hegemony has been given great visibility by the American debacle in Vietnam and successful emergence of the OPEC challenge, the latter due largely to an American policy of appeasement and preemptive surrender, there is an increasing danger that the oil states might soon test U.S. resolve and find themselves locked into an oil escalation dynamic leading to direct confrontation. On the other hand, if OAPEC is patient, how might the case for American military intervention to secure oil supplies be affected if Iran or Saudi Arabia acquire nuclear weapons by the early 1980's?

After the Indian nuclear detonation in 1974, the fragility of the Treaty on the Non-Proliferation of Nuclear Weapons as an international instrument to reduce the probability of nuclear conflict has been demonstrated. It is interesting to note that, prior to the mid-1975 conference of oil producing and consuming nations, there will be an NPT Review Conference in Geneva. The significance of this meeting can be indicated through the words of a distinguished observer of the international scene:

> "...the threat from the Third World has expanded dangerously into the security sphere. The Third World has become the focal point of potential nuclear proliferation. India has attained nuclear capability, and is helping Argentina to do so. Brazil

> is almost certain to go nuclear. Israel already has a major capability; both it and Egypt are to get expanded U.S. help. Iran is buying reactors from France, and the Shah has reportedly stated his intention to become a nuclear power. And there seems a high probability that some of the oil producers in the Middle East will also seek to do so."*

Although this statement might seem to express a strongly subjective belief, it should be read with seriousness since many arms control experts would tend to agree with the thrust of it.

Coming after the threat from the Third World has proved itself potent, at least in the instance of the petroleum market, and after the largest Fourth World nation has joined the other five nuclear-weapon states in demonstrating its potential for making nuclear weapons, the NPT Review Conference should begin to reveal the extent to which future American security may be threatened by recent failures of American policy. If it becomes clear that numerous non-nuclear-weapon states will neither ratify the Treaty nor abide by its intended objectives, the prospects for nuclear proliferation will appear grim. In that case, the outlook for international peace in the long run would not be good.

More generally, it appears that the measurable decline of American credibility in the world has severely eroded the utility of American diplomacy for the negotiation and implementation of international treaties and the mediation of conflicts. With the forthcoming Geneva conference to discuss possible Middle East settlements on the horizon, the limited utility of American diplomatic power may adversely affect the chances for resolving the Arab-Israeli situation.

---

*C. Fred Bergsten, "The Response to the Third World," Foreign Policy, Winter 1974-75, p. 4.

Reduction of the likelihood of nuclear war is clearly in the interest of American security. Consequently, U.S. support for a policy of non-proliferation of nuclear weapons has been a central part of American foreign policy. The history of the negotiation of the NPT indicates that all non-nuclear countries need adequate (i.e., credible and dependable) guarantees by existing nuclear powers against nuclear attack.* Recent reports suggest that Japan and Australia, among other nations, are beginning to question the reliability of American defense commitments after the collapse of South Vietnam.

Erosion of American support for Israel after the surprising collapse of South Vietnam might trigger a process of intense diplomatic isolation of Israel, possibly leading to wide conflict in the Middle East. Moreover, erosion of American support for Israel might prove to borderline non-nuclear-weapon nations that American nuclear guarantees are unreliable. If that belief became widespread, either another nuclear power (e.g., the Soviet Union or China) would provide nuclear guarantees or the prospects for averting further nuclear weapons proliferation would worsen. In either of these circumstances, American security would be reduced. Soviet or Chinese nuclear guarantees to non-Communist countries would weaken the political and military fabric of the Western world, while a chain of nuclear weapon acquisitions by various nations would increase the chance of nuclear war.

*For example, see William Epstein, "The Proliferation of Nuclear Weapons," Scientific American, April 1975.

For all of these reasons, then, the months following the collapse of Vietnamese military (and political) leadership may prove to be extremely important for American security in the future. U.S. security and the future stability of the international order are inextricably linked to external perceptions of American strength, resolve, and internal cohesiveness. American accommodation to economic demands of the oil cartel, coming at a time of turbulent economic and political interdependence in the world, has bolstered perceptions of the U.S. as an increasingly inept and untrustworthy ally vulnerable to further threats, nonmilitary as well as military.

Recently, one of West Europe's "handful of leading statesmen" related to C.L. Sulzberger his impressions of the world scene:

> "...I am very disturbed to see right now the simultaneous development of a strong Communist offensive everywhere. This is becoming more and more generalized. Today we see its actions in Indochina, Portugal and the Middle East. Tomorrow it will be in Yugoslavia, Italy and maybe France.
>
> Against this, all we find is a U.S. policy that fails to adapt itself to reality--even on the scale of Western Europe. We need an independent Europe which can stand on its own feet and cooperate with the United States. But things are going from bad to worse. And your country seems to be suffering from intellectual disintegration.
>
> ....The degeneration of the United States in a psychological and moral sense is awful.
>
> There is a vast reversal in U.S. influence just when Russian influence is rising everywhere...we are witnessing the collapse of Western civilization. First Europe west. Now the time of the United States begins."*

Relatively self-serving American energy policy, together with the Kissingerian attitude that oil consuming nations must accept the American position on international energy policy, further undermines the coherence and viability of American alliances and sets the stage for future threats to Western economic (and possibly military) security.

---

*C.L. Sulzberger, "Mirror, Mirror on the Wall," The New York Times, April 9, 1975.

Instead of being perceived as an external security threat by the American public, the Arab oil embargo and OPEC price quadrupling of late 1973 were viewed as economic misfortunes compounding an existing energy crisis brought on by corporate and Government bungling. As long as the present climate of economic malaise, political confusion and energy complacency persists, the ambitious goals of Project Independence, based as they are on the presumption that American energy security has been seriously threatened, will not be accomplished.

The policy objective of American energy self-sufficiency has become rather tenuous, especially now that many argue that its implementation would be extremely costly, both in monetary and temporal terms. This policy is likely to be discarded gradually in favor of more realistic and less expensive energy goals based on the changing relationships of global interdependence--economic, politcal, and military--which appear too important or too durable to be dismissed. Energy growth will slow as the impact of conservation, through market price mechanisms and non-market regulation, spreads through American society. Political knots and envir-onmental obstacles may prevent U.S. energy resources from being developed rapidly enought to permit meaningful reduction of oil imports in the short run.

A policy of selective importation, based on diversification of sources, combined with a security-motivated policy of oil shortage, should serve to minimize the energy insecurities associated with oil importation whether or not there is a rupture in the cartel. Indeed, even in the absence of cartelization of the petroleum market, there are excellent reasons for

avoiding insecure sources of energy supplies (e.g., many of the members of OAPEC).

To keep its energy options open, the U.S. has pursued four energy strategies during the last year or so: 1) multilateral consumer cooperation with an emphasis on oil sharing agreements, stockpiling, reduction of dependence on OPEC, and financial coordination carried out through the auspices of the International Energy Agency; 2) unilateral interdependence with producers through intensification of bilateral quasi-barter arrangements; 3) unilateral energy independence through a declaratory policy of energy self-sufficiency; and 4) unilateral policy of moderate energy self-sufficiency coupled with some cooperation among consumers. Simultaneous pursuit of these policies may have been sensible for the short run, particularly after the OPEC/OAPEC shocks to the international energy system, but it is simply too expensive--economically and politically--to sustain over the long haul.

The optimal mix of energy strategies appears to be some form of multilateral consumers' approach, with an emphasis on relative American energy independence. Even if the cartel breaks down, security insurance through oil stockpiling and IEA emergency sharing agreements seems eminently advisable. Due to their destabilizing impacts, large arms transfers to Middle Eastern oil states for facilitating petrodollar recycling and minimizing balance-of-payments problems should be avoided at all costs.

The problem confronting American foreign policy extends well beyond assuring access to supplies of oil at manageable prices, not only for the U.S., but for its allies and for the Third and Fourth Worlds. Rather,

this objective should be pursued within the broader framework of U.S. support for a viable system of international economic collective security. Such a system might both depoliticize access to raw materials, to the greatest extent possible, and establish norms, procedure, and related agreements to rationalized the elusive spirit of interdependence. Moreover, central to such a system of global economic security would be an inclusive conception of global equity within which rich nations and poor nations, consumers alike, acknowledged their mutual needs and obligations.

It remains to be seen whether they will be willing to do so, and whether the appeal for a new international economic order voiced by the oil and raw materials producing countries will elicit a positive American response compatible with traditional American values.

Chapter II

WORLD ENERGY INTERDEPENDENCE AND THE SECURITY OF SUPPLY

Introduction

This chapter discusses the relationship of the peacetime security of oil supplies to prevailing patterns of economic and political interdependence. The primary objective has been to uncover the functional relationship between import and export dependencies as they affect the reliability of supply in the past and the future.

A more detailed discussion of this analysis is given in Volume II of this study.

The Erosion of Equilibrium

The multilateral energy system as it existed for more than twenty years after World War II under the aegis of American hegemony was a fragile construct. Its basic stability hinged on the continuation of a series of delicate internal balances. Most important among these was that between the patterns of export and import dependence. From the standpoint of the international political economy, there are two ends to the oil axis; it is the interaction between these two which determines the actual state of the system at any point in time. At one end is the degree of dependence of the principal consuming countries upon imports of oil supplies. At the other end, as as a countervailing force to import-dependence, is the degree of export-dependence; that is to say, the extent to which principal oil-producing countries are dependent upon the income accruing to them from oil production and exportation. The consumers' need, then is for a product; the producers', for a market. The balance or imbalance between

these two partners of dependence influences the political or economic character of the entire system. Therefore, it affects its economic structure, whether it is skewed towards a sellers' or a buyers' market, as well as its political spill-over effects. As a result of the multinational oil industry's ability to keep down the price of oil and due to competition in the market, the system evolved symmetrically in the two crucial dependence areas and multilaterally with respect to its mode of operation. Attempts to capitalize on the vulnerabilities inherent in complex interdependencies failed, as shown by the examples of the Suez and 1967 Mid-East crises, because the reciprocal conditions of relatively high dependency among exporters and importers alike balanced the system, and as such it proved to be quite flexible and efficient.

The system came under pressure in the 1960's, when an American decline was paralleled by the emergence of resource nationalism in the oil exporting countries. The principal process in that respect has been the rise of the OPEC cartel. The coalition failed in its declared purpose as long as the oil industry was backed by home governments committed to the competitive multilateral system--in effect, a product of American-British domination. However, a backing away from such commitment in 1970 marked the beginning of a revolutionary period in which the system was to lose its stability and consequently its functional security.

It is not the size and scope alone that accounts for the importance of the oil industry; the key factor is the salience of oil as a singularly strategic commodity. This reality enhanced the political awareness and activity of these companies, producing the symbiotic relationships between companies and their home governments which were typical of the energy

system as it existed in the postwar decades. The major oil companies controlled the market, determined prices, and decided the amounts of oil to be produced and the size of the revenues to be paid to governments. Their very existence and modes of operation constitute the core of the system. The existence of stable interdependence patterns, then, boils down to the existence of powerful firms which kept the interests of their home governments clearly in mind. Indeed, the entire evolution of the world energy system can be traced back to the emergence of the international oil companies.

With the U.S. leading the group, the oil consuming nations changed their position from resisting OPEC to one of accommodation. Consequently, prices skyrocketed, the industry lost almost all influence over production and pricing, and supply ceased being responsive to demand as curtailment of output occurred, be it for explicit economic reasons or the expedient establishment of economic-diplomatic linkages.

By 1973, the asymmetry between the degrees of dependence experienced by importers and exporters reached the threshold of an acute crisis. The structural conditions of imbalance and the policies of appeasement precipitated a major supply and price disruption in which exporters sought to exploit the state of the system for economic benefits and, for some, political purposes as well. The primary economic objectives were achieved, but the secondary political ones failed. The two, however, were symptoms of the same causes: the cartelization and politicization by oil producers of the oil market, and the consumers' weakness in the face of such a challenge.

In the early 1970's, the attitude of the oil importing countries, as reflected in the position held by the companies (but in fact developed in coordination with their home governments), changed from attempting to preserve the multilateral system, possibly through a line of resistance to OPEC's demands, to appeasement of OPEC members. The two attitudes differ fundamentally. The former risks confrontation for the sake of long-term stability. The latter appears incrementally cheaper by deferring a confrontation, but can be even more destabilizing in the long run, as demands escalate.

This is precisely what happened following the Teheran and Tripoli agreements. The agreements, which were to run until 1976, were greeted in many quarters with a sigh of relief as heralding a long period of stability. It is now known that the opposite occurred, the usual fruit of appeasement. The adoption of the line of appeasement was in fact a signal that the Western commitment to the stable multilateral system had ended. Thus, regardless of whether or not the buyers' market was replaced by a sellers' market, a highly significant change had occurred in the behavior of the companies and home governments alike. Firm resistance to the OPEC challenge by a conservative defense of the status quo was superseded by a position designed to accommodate the revolutionary force that OPEC represented.

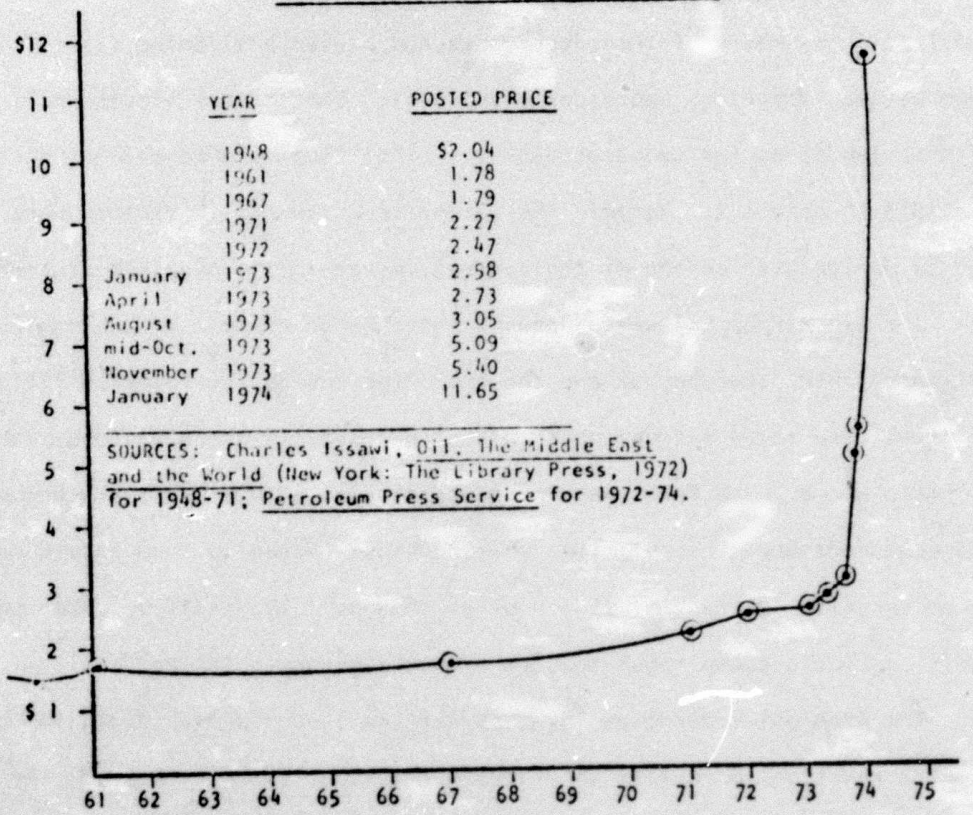
Within weeks after the agreements, the OPEC countries began reneging on their commitments and imposing on the consuming countries a series of endless "supplementary agreements." Each was presented as a "last demand"; the companies acquiesced and passed the costs along. Prices have been spiraling ever since, as is amply evident by the curve depicted in Figure 1.

Figure 1

PRICE HISTORY FOR IRANIAN LIGHT CRUDE

	YEAR	POSTED PRICE
	1948	$2.04
	1961	1.78
	1967	1.79
	1971	2.27
	1972	2.47
January	1973	2.58
April	1973	2.73
August	1973	3.05
mid-Oct.	1973	5.09
November	1973	5.40
January	1974	11.65

SOURCES: Charles Issawi, Oil, The Middle East and the World (New York: The Library Press, 1972) for 1948-71; Petroleum Press Service for 1972-74.



That the effects of the challenge have not been disastrous to the oil consuming nations is not due to restraint on the part of the exporting countries but to certain external constraints on their political and economic leverage. However, forces now at work augur an exacerbation of the imbalance between exporters and importers as the enhancement of capabilities and adverse intentions on the part of the former more than offset the potential reduction in vulnerability among the latter.

Unstable Interdependence and the Oil Weapon

The rise of OPEC against the backdrop of American decline disrupted the fragile symmetry of interdependence and caused a widening disequilibrium between importers and exporters of oil. The serious consequences of that imbalance for the dependability of oil supply were evident during the 1973-74 Arab oil embargo. The extent to which oil interdependence can be manipulated is one of the central issues in the near-term future.

The use of the oil weapon should serve as an example of the manipulation of interdependencies and the exploitations by the vulnerabilities it gives rise to by nations which do not necessarily share Western liberal economic norms. The fact that interdependencies should be so precarious and dependent upon the political whims of those managing them should come as no surprise to the realist school of thought. But realism, unfortunately, is not a conspicuous feature of contemporary thinking.

The Arab oil embargo of 1973 was neither a spontaneous explosion nor a quick reaction to rapidly unfolding crisis conditions. Instead, the embargo was the culmination of an escalation process which began almost a year earlier. The oil weapon was activated in several distinct phases, each more meaningful than its predecessor. It is important to trace the deployment of the oil weapon to its earliest manifestations.

During 1972 Arab leaders made about fifteen separate public threats to use oil as a political weapon against the United States. These threats, however, came from such radical sources as Ba'athist Iraq or Kaddafi of Libya. In later 1972 a conservative Saudi Arabia was still adhering to the self-proclaimed doctrine that "oil and politics do not mix," and King Faisal reiterated the assertion that he would never use oil for political

purposes. In January 1973 the first indications appeared that this doctrine was cracking. At the time, the National Assembiy of Kuwait, another conservative Arab regime, approved a proposal to halt oil suppiies to the Western concession holders in the event of an outbreak of hostilities between Israei and the Arab states. In April, the Arab League Council, meeting in Cairo, urged all Arab countries to use their trade poiicies as weapons against the U.S. and other countries supporting Israel. The oil weapon was thus placed on the poiitical agenda.

The month of Aprii signaied the most important transformation to date in the complex consteliation of oil economics and the politics of the Arab-Israeli dispute. In a major reversai of policy, Saudi Arabi decided to enlist its oil power in the Arab cause in that dispute. A coincidence of economic expediency and national zeal ciearly caused this reversal.

By late August the irreversibiilty of the imminent showdown became ciear. At a series of intensive consultations top level Arab leaders discussed using a restrictive oil policy as an integral accompaniment to another military offensive against Israel. Juan de Onis of The New York Times concluded that "the Arab leaders believe that the present oil situation gives them tactical advantages that they did not enjoy in 1967." In this frame of mind, the oil ministers of ten Arab nations met in Kuwait to coordinate OPEC's pricing imperatives with OAPEC's political objectives.

Specifically, the central issue of the September 4 conference was the question of combining the restrictive oil programs with a boycott of the United States. It is noteworthy that the debate crystallized into two opposing factions, both of which showed a marked tendency toward greater aggressiveness. Saudi Arabia, Kuwait, and some other states

favored a continuation of the putative phase, pending clarification of the American response to Faisal's warnings that production would be frozen if Washington failed to relax its support for Israel. Other Arab states supported even more radical moves, such as immediate production cutbacks or the imposition of selective export controls. Iraq, for instance, proposed a massive cutoff for a period of ten years. The meeting delegated final decisions to a forthcoming meeting of heads of state in the non-aligned summit in Algiers.

If the Arabs needed a last-minute encouragement to go ahead and actualize their oil threats, they received it early in September. At a news conference in the White House, President Nixon said that the U.S. was giving the highest priority "to achieving a Middle East settlement that would put an end to Arab threats to curtail future oil deliveries to Western countries." The admission of a linkage by the direct victim of the oil pressure marked the success of the putative phase. From an American point of view, the last-minute attempt to appease the Arabs by preaching "evenhandedness" proved pitiful and self-defeating. Within four weeks, the American pledge for peace encouraged the Arabs to embark on another war, and American hope that such a policy would contribute to the security of supply made it more insecure than ever.

At the Algiers summit, some two weeks later, the Arabs agreed to embark on a fourth Arab-Israeli war, supporting it by the oil weapon and oil money. The Soviet Union was notified of the decision, and a third Arab oil offensive against the West began.

The actualization of the oil weapon showed that it can indeed provide a political pretext for an economically motivated action.

That the 1956 and 1967 politically-inspired oil crises failed to attain their primary political goals is beyond dispute. Opinion about the 1973 oil embargo, however, varies. Near as one can tell, the Brookings institution's evaluation is probably correct in summing the question up by noting that:

> "...it is too early for final judgments on the success of the Arab use of the oil weapon in 1973-74. They did achieve some change in the publicly proclaimed policies of Japan and several European countries toward the Arab-Israeli dispute. The Arabs also may believe that their embargo and production restrictions spurred the United States to work harder for a Middle Eastern settlement, although it can equally well be argued that U.S. diplomacy was driven more by a desire to defuse a dangerous threat to world peace than by fear of an oil shortage."*

Indeed, it is no coincidence that the oil weapon as a political phenomenon has been found to be only a mildly effective tool of diplomacy at best. The origin of the weapon's relative ineffectiveness lies within the fact--stressed throughout this study--that there is no such thing as a purely political Arab oil weapon. Rather, it is an added rhetorical dimension to an activity which is intrinsically economic and is subjected to policies which are primarily profit-oriented. If OAPEC were genuinely intent on maximizing the short-run political benefits derivable from its latent oil power, as defined under the explicit objectives of the embargo, its strategy should have focused on production restrictions coupled with severe price controls--all indexed to the political issue at stake. Keeping prices low would have simultaneously kept consumers' demand for OAPEC oil, secured their long-term dependence, and demonstrated that political

---

*Joseph A. Yager and Eleanor B. Steinberg, Energy and U.S. Foreign Policy (Cambridge, Mass.: Ballinger Publishing Co, 1974), p. 315.

objectives transcend the temptation to exploit the shortage for economic benefits.

Obviously this did not happen. Lifting of the 1973 embargo coincided with the drastic December price rise and soon almost all Arab production and exportation returned to normal. Concern for the Arab cause on the part of OAPEC's leaders lasted only as long as the contrived shortages had their economic rationale as well. The moment political gains had to be traded off against economic ones, some Arabs unhesitatingly opted for the latter. That is, the major constraint on the oil weapon had been the Arabs' own unwillingness to have to pay for it. But to say that amounts to confirming what has already been asserted: that the oil weapon is nothing more than a deceptive political formulation of a basically economic condition. As long as it will be economically profitable, production will be restricted whether under the banner of the Arab cause, as it was in 1973-74, or as a straightforward cartel oil policy, as done before and after the 1973-74 events. But if production restrictions, being the essence of the oil weapon, were to somehow lose their economic sense, then the experiences of 1957, 1967 and 1973-74 all suggest that the weapon would rapidly be withdrawn or remain unused in the first place. A repetition of supply manipulations of the kind that make up this instrument of diplomacy ultimately depends on the re-occurrence of the economic conditions which call for supply restrictions.

Many observers failed to notice that OAPEC turned the handicap of untargetability into an advantage. In this respect OAPEC exploited two systems of interdependencies: that between OAPEC and the consuming nations where the trade in oil is the binding element; and that among the

advanced industrialized democracies where relations are much more complex. Westerners found it difficult to grasp this transgression of traditional norms of conduct. The Petroleum Press Service noted,

> "It is ironical that those whom the weapon is designed to hurt are least vulnerable to it. The U.S.A., which is completely boycotted by the Arabs, depends upon them for no more than 10 percent of its total oil supplies. Holland, which is also on the embargo list because of its allegedly sympathetic attitude towards the Israelis, normally imports from non-Arab sources more than enough oil to cover its internal requirements....By contrast, the European nations which are on the Arab 'friendly' list import from 70 to 80 percent of their oil from Arab sources, while for the Japanese the proportion is over 40 percent. These and some under-developed countries such as India will be the main sufferers from the curtailment of supplies."*

There is, in fact, no irony at all at this inverse relationship between dependence on Arab oil and independence in foreign affairs. Indeed, countries not vulnerable to Arab oil pressure did not feel compelled to accommodate the Arabs' political whims; this is precisely the reason for their being designated by the Arabs as their target. Irony can be found, however, in the sentiment shared by nations really dependent on Arab oil that they will be spared harm only if they adapt their foreign policies to their economic plight. But pro-Arab sympathies matter little once such nations are selected to be hostages against the United States. The entire affair was uneasily reminiscent of another Arab tactical innovation--international terrorism.

The ultimate irony of the 1973 episode was that by embracing their captors' views, the Europeans and Japanese actually shielded the U.S. from the consequences of the embargo. If Europe and Japan had responded to American appeals earlier that year for greater consumer cooperation and had behaved during the crisis in a manner more compatible with their allies' status, then the Arabs, in turn, would have been more justified in putting

pressure on Europe and Japan, and the U.S. more obligated to come to their rescue, possibly by sharing both available supplies and their pro-Arab attitudes. But Europe and Japan behaved differently; they disassociated themselves from the United States and thus enabled the U.S. to ignore the oil weapon altogether. To the extent that the criteria introduced by Saudi Arabia had this effect, this largely symbolic action backfired on the Arabs who had had to satisfy themselves with the limited diplomatic assistance Europe and Japan could offer at the expense of releasing their hostages, and thus alleviating the pressure on the U.S. wihtout obtaining any significant concession.

The indirect approach is thus no less problematic than its alternatives. Assuming that OAPEC members would not risk destruction of their best oil markets for the sake of a political objective, then the maximum level of economic pressure they can bring to bear is actually set at the maximal tolerance point of the weakest of the intermediary economies. The weakness of the intermediary economy corresponds to a high degree of import-dependence; foreign policy would be similarly affected. This discrepancy between the needed and the feasible amount of pressure can result in total failure of the policy. In other words, a really effective Arab oil strategy is not possible under these conditions.

Certain limitations displayed by the Arab oil weapon were less inherent than due to the contemporary political and economic environment. This opens the possibility of better or worse performance of the weapon in the future, depending on the behaviour of relevant exogenous factors. The foremost example is the role of the major oil companies in distributing the impact of the Arab embargo internationally by switching supplies

between Arab and other producers. The supply of oil available to all consumers resulted in the greatest damage being borne by those nations most dependent upon imports, e.g., Japan, rather than those most antagonistic to the Arab cause, e.g., the United States.

This randomizing of the impact of the oil weapon by the companies may have inadvertently aided Arab political efforts as much as it frustrated the precise targeting of the oil weapon. While the majors deflected much of the impact of the embargo from the United States, it may have been in the best interest of the Arabs to avoid confronting the United States more directly or exclusively. It has been noted that the U.S. was far less vulnerable than other consumers and that, to whatever degree the U.S. could have been hurt by being deprived of Arab oil, backing the U.S. into a corner would have encouraged American propensities to retaliate more harshly. Thus the Arabs were fortunate in being able to pressure the United States by disrupting the Western bloc in general. The United States became increasingly isolated in its strong support for Israel, the Atlantic Alliance was left even more tattered than previously, and the prospects for a politically or economically united Europe were set back substantially as each nation sought its separate interest in pursuing bilateral guarantees of continued supply from individual producers. The Western bloc was most vulnerable in Europe, and whether by active design (e.g., the embargo of Holland, including Rotterdam), or serendipity, this is where (along with Japan) the oil weapon's impact was greatest.

Alternative Energy Policy Responses

In reaction to the crisis and in an effort to resolve its systemic tensions, four alternative courses of action have emerged. The rationale dominating the first, a proposal for joint corsumers' cooperation in energy, is that since disunity among consumers and solidarity by exporters have been major causes of the crisis, only the forging of a concerted program of action by consumers could restore a semblance of balance to the system. Dealing with the security aspect of the crisis first, that approach has produced an International Energy Agency and an emergency oil-sharing agreement. The horizontal approach, however, has failed so far to move from a defensive position to an offensive one vis-á-vis its producers' counterpart--OPEC. One of the reasons for such failure has to do with the competing approach among consumers, that of vertical bilateralism. That approach involves the establishment of closer and more extensive ties between consumers and producers on a government-to-government basis and has alleviated some of the financial problems caused by the crisis without resolving any of its security aspects.

As the limits to cooperative efforts are rapidly reached, it becomes more and more apparent that two alternative approaches might be selected instead. The option of a unilateral drive towards self-sufficiency, as reflected in Project Independence, is a case in point. The potential distance from energy independence varies from about a decade for the U.S. and for certain European countries to twice that long for the rest of the advanced industrialized nations. Escape from interdependence, however, need not be completely autarkical. Thus, a prudent energy policy for the U.S. could be that of gradual disengagement from globalism in energy by

the adoption of preferential import policies compatible with its security concerns.

To keep its energy options open, the U.S. has typically pursued all four strategies simultaneously: it led the creation of the IEA; it engaged in comprehensive bilateral deals; it promulgated energy self-sufficiency as a national objective; and it introduced precautionary ingredients into its import policies. Pursuit of these policies together may have been sensible for the short run, but it is too expensive, economically and politically, to sustain over the long run. In effect, the American energy dilemma is but a component of its general international predicament. If the U.S. were to reverse the process of its decline, then the energy problem could be exogenously resolved as a new system of international economic collective security is erected and policies of appeasement give way to resistance postures. If, on the other hand, present political trends continue, then the optimal mix of energy strategies for the U.S. would be that which stresses relative energy independence attained through a precautionary import policy.

The crisis of energy interdependence, in conclusion, could result in its future avoidance rather than its restructuring or intensification. Gradually, all major oil importing countries would choose to escape energy interdependence by returning to semi-autarkic postures. It is this trend more than anything else which could restore balance and order to the world's energy system. Whether or not the degree of political leadership and will exists to implement effective policies of relative energy independence, in the context of public opposition to nuclear energy and environmentally disruptive energy systems, is yet to be seen.

Chapter III

THE PETROMONEY QUESTION

Introduction

This chapter deals with three interrelated aspects of the world energy situation:

a) The market for energy by 1980, particularly for oil;

b) The patterns of economic development and domestic investments of oil revenues for key groupings of Middle East oil producing countries;

c) The scope of accumulated capital surpluses for foreign investment by Middle East oil producing countries in the years 1975, 1980, and 1985 and the structure of their investment.

These aspects are analyzed under a variety of assumptions as to elasticities of supply and demand, prices, market structure and characteristics of the economic forces at work. One premise, however, underlies this study: projected situations have their own economic logic, which in turn lies at the core of what all too often is obscured by politcal rationalizations. The analysis of this core is the ultimate purpose of this chapter.

A more detailed discussion of this analysis is given in Volume III of this study.

The Oil Market

Western and world net demand for Middle East oil in 1980 is estimated as follows:

Price per barrel	Annual net demand in billion barrels
$ 4.00	14 - 17
7.00	7 - 10
9.00	5.5 - 8.5
12.00	5 - 8

Of crucial importance are the price and income elasticities of demand, and price elasticity of supply of non-oil energies and oil. The above figures were derived from rather conservative assumptions with regard to demand (income elasticity = 1.0, price elasticity = -0.1) and somewhat less so with regard to supply. Most of the medium term supply increase will be provided at price $9. Higher prices will increase incentive for the development of synthetic fuel and other substitues, but this will not be significant before the late 1980s.

U.S. net demand for energy import in 1980 is estimated as follows:

Price per barrel	Annual net demand in billion barrels
$ 4.00	5 - 6
6.00	2 - 3
7.00	1.3 - 2.8
9.00	0.5 - 2.0
12.00	0.2 - 1.7

Thus, the U.S. is not expected to become independent in 1980, even if oil prices remain as high as $9 per barrel. However, most of the decline in the net import levels is achieved at a price of $6-$7.

Higher degrees of self-sufficiency for the U.S. are attained if less conservative assumptions are made, such as price elasticity of demand = -.20 and supply of non-oil energy increases of 7-8 percent per year (instead of 4 percent). In this case, independence levels are seen at a price between $6, in the most optimistic case, and $9.

If the OPEC cartel remains cohesive, it will maximize the present value of its oil revenues (or the value of its reserves) by fixing a price as high as it can maintain, which would be politically feasible and would also impede rapid long-term developments of substitutes. Such a price is probably $8-$9 per barrel. Only for elasticities greater than those discussed would it possibly be worthwhile for the cartel to reduce the prices somewhat.

Lower prices (such as $4 per barrel) reduce the revenues and reserve value of Iran, Iraq and Libya substantially (the last two countries being grouped under the designation "LQ"). On the other hand, Saudi Arabia, Kuwait and the U.A.E. (henceforth designated as "S" group) are quite indifferent to lower prices. Due to their huge oil reserves, they will supply most of the world's increased demand at lower prices and still obtain similar magnitudes of revenues. Therefore, their annual revenues will not decline (except under extreme assumptions); rather, they may increase. The length of period before the reserves are depleted is reduced, of course, but it is still very large (30-60 years) and thus the present value of their reserves is almost not effected. Moreover, due to the realistic possibility of a breakthrough in energy production sometime during the next 30 years, the value of the conserved reserves

for the post-2010 period is questionable even in future terms. The possibility of finding additional reserves that further extend the period of depletion strengthens this point even more.

If the U.S. introduces a minimum price policy at $6 or $7, it would face only a small degree of dependence on imports in 1980. Its total energy balance would be as follows:

Demand for energy	15.8 billion barrels
Supply of non-oil energy	9.2
Supply of oil	4.7
Total supply	13.9
Net import	1.9

This net import is 12 percent of total energy demand and 29 percent of total oil demand.

By reducing U.S. demand for import <u>in case</u> world prices fall below $6, this minimum price policy will have no effect on the OPEC cartel which at any rate tends to retain prices at a level higher than $6 per barrel. It may, however, have the effect of decreasing the "S" countries' incentive to reduce prices since precisely under conditions of low prices the policy of minimum prices becomes operational, consequently leading to a smaller increase in the "S" countries' annual revenues.

An agreement between U.S. (and the West) and the "S" countries may be possible whereby the "S" countries will cut prices to about $4-$5 per barrel, saving the West tens of billions of dollars per annum. In order to create the incentive for this, the "S" countries might expect the West to:

a) secure their foreign investments against inflation risks;

b) support the stability of their present regimes.

The fact that such an arrangement will reduce Iran's rate of resource growth and will make the "S" countries the only substantial investors in world finance constitutes further attraction for this policy.

The total revenues in 1980 for all Mid-East oil exporting countries (the "E" group) are expected to be at the following possible levels:

a) $100 billion (if elasticities are very conservative and under any market scenario);

b) $60-$70 billion (if elasticities are quite conservative and under any market scenario);

c) $40-$50 billion (under reasonable elasticities and an effective OPEC cartel);

d) $20-$30 billion (under very optimistic elasticities, or reasonable elasticities with "S" countries price leadership for a disintegrated cartel.

The Economic Growth of Middle East Countries

Given the high oil reserve, the Gross Domestic Product (excluding oil royalties and returns on foreign investments) of the Mid-East countries is expected to grow at 12-14 percent a year (in real terms) and reach $40 billion in 1975, $80 billion in 1980 and $150 billion in 1985. Adding oil royalties and returns in foreign investments, the total Gross National Income in 1985 will reach a level between $200 and $300 billion. [See Figure 1.]

Domestic investments will reach $18 billion in 1975, between $34 and $38 billion in 1980 and between $50 and $65 billion in 1985. [See Figure 2.] The total net imports of the Mid-East oil exporting countries will largely depend on the configuration of oil reserves in 1980. It is expected to measure then between $22 and $45 billion, and between $28 and $60 billion by 1985. [See Figure 3.]

The accumulation of foreign capital under the various alternative oil revenue levels, combined with an 8 percent p.a. real return on foreign investments are shown in Table 1 and summarized in Figure 4. A zero real rate of return will result in accumulation of about 2/3 of the above level. In the case of high oil revenues, all the countries accumulate substantial foreign investments. In the case of low revenues, the accumulation is small, but for the total it still grows every year. In the case of low revenues, Iran would have deficits in its balance of payments as of 1977; Iraq and Libya retain a small surplus. Only the "S" countries would have a surplus gradually rising to $200 billion in 1985.

Figure 1

NATIONAL INCOME OF MIDDLE EAST COUNTRIES

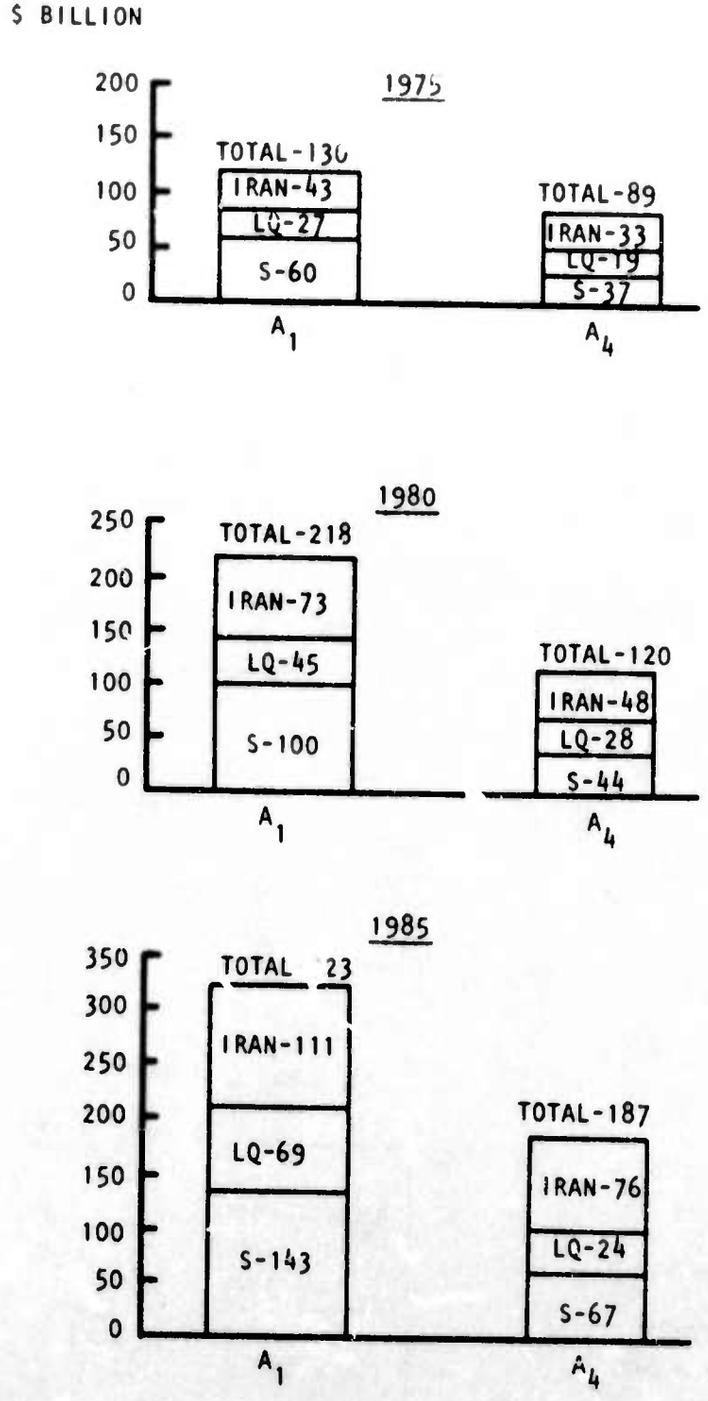
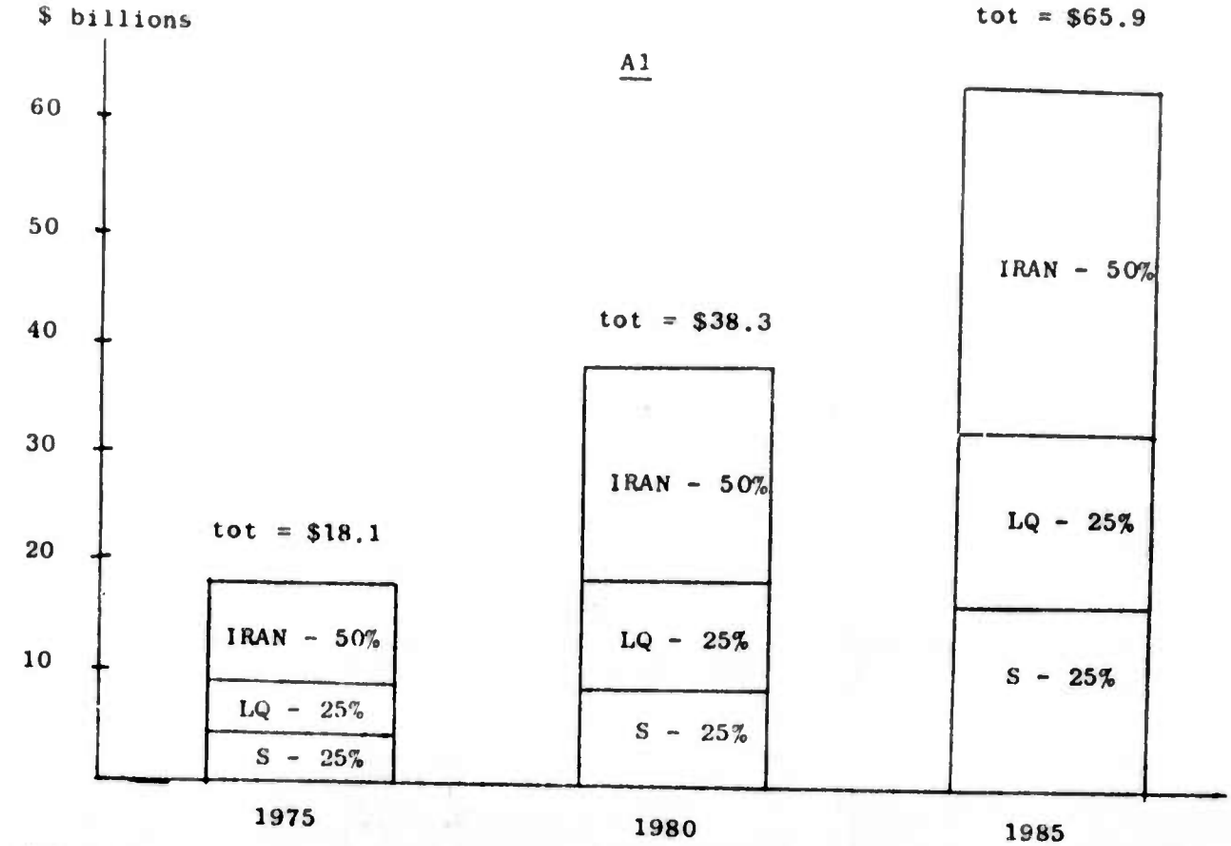


Figure 2

DOMESTIC INVESTMENT - A1, A4

BASE ASSUMPTIONS



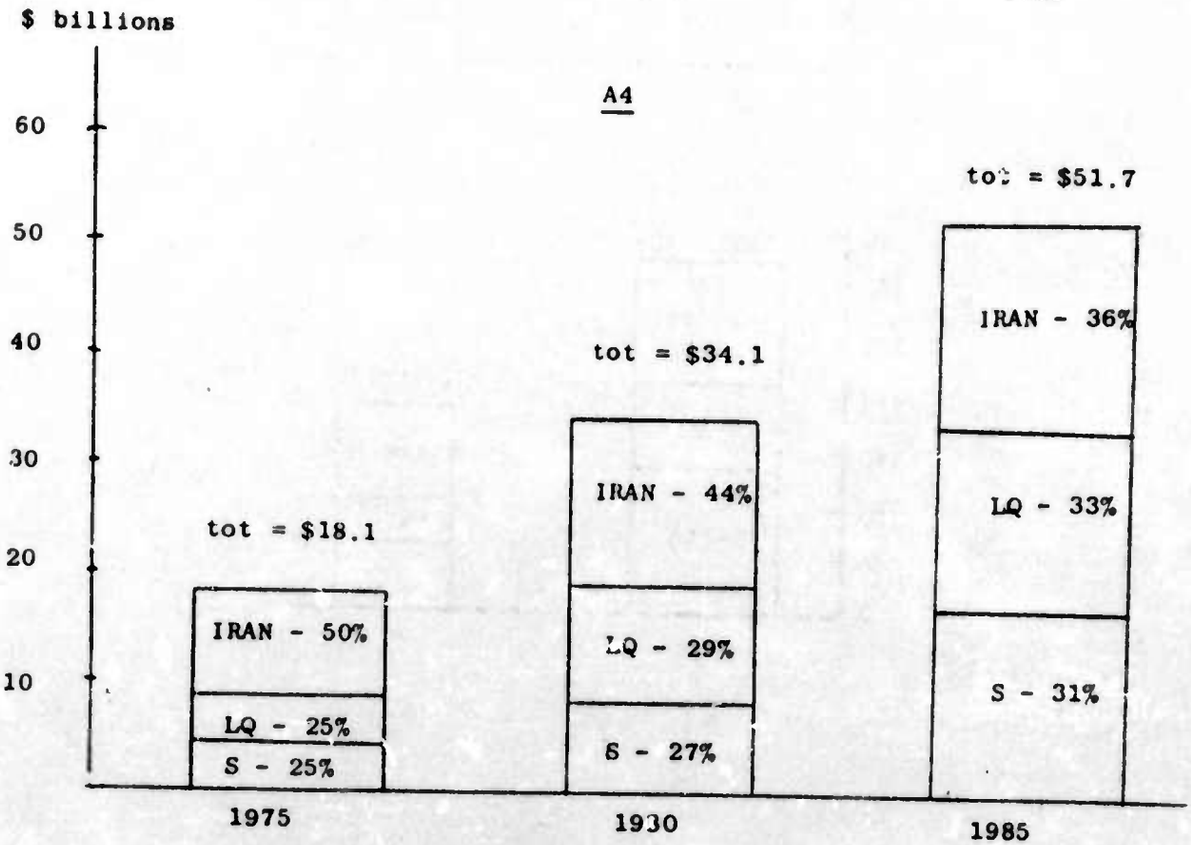
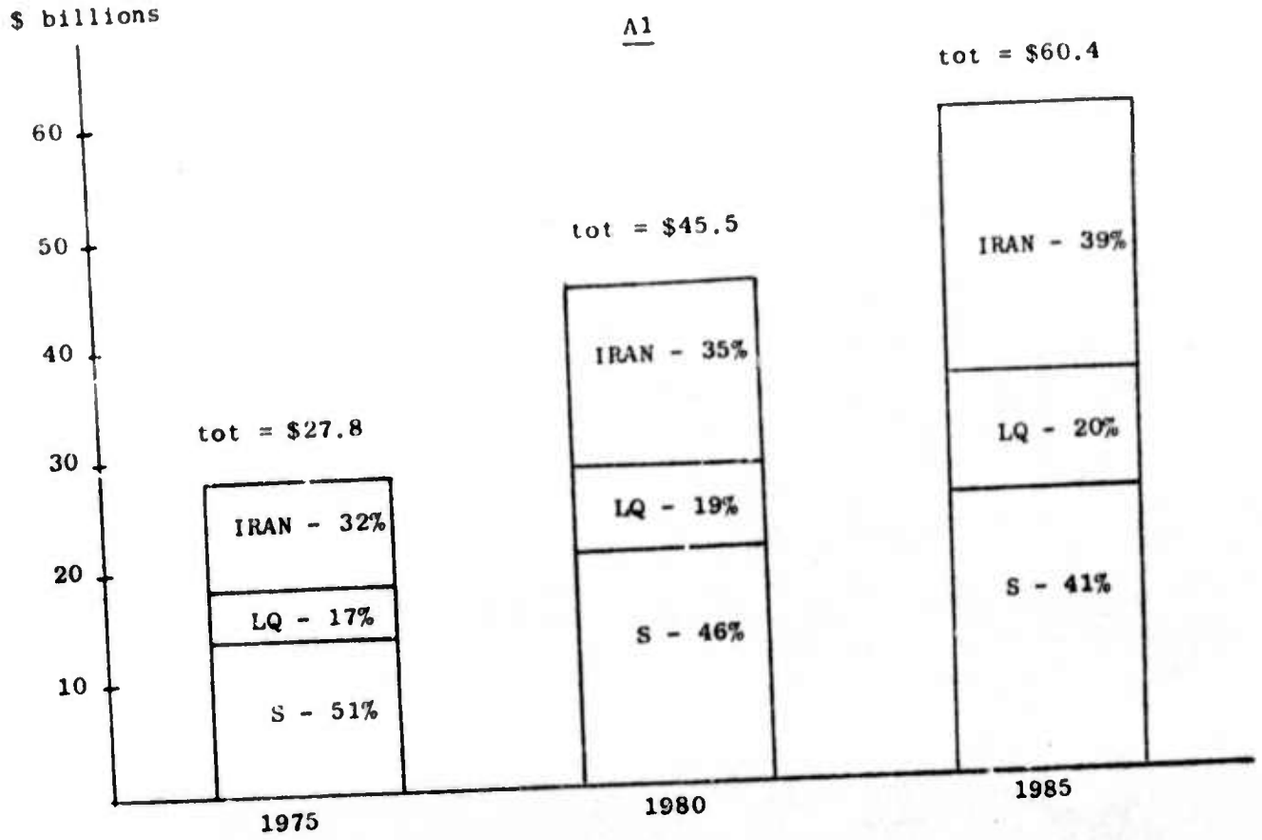


Figure 3

NET IMPORTS - 1975, 1980, 1985

BASE ASSUMPTIONS



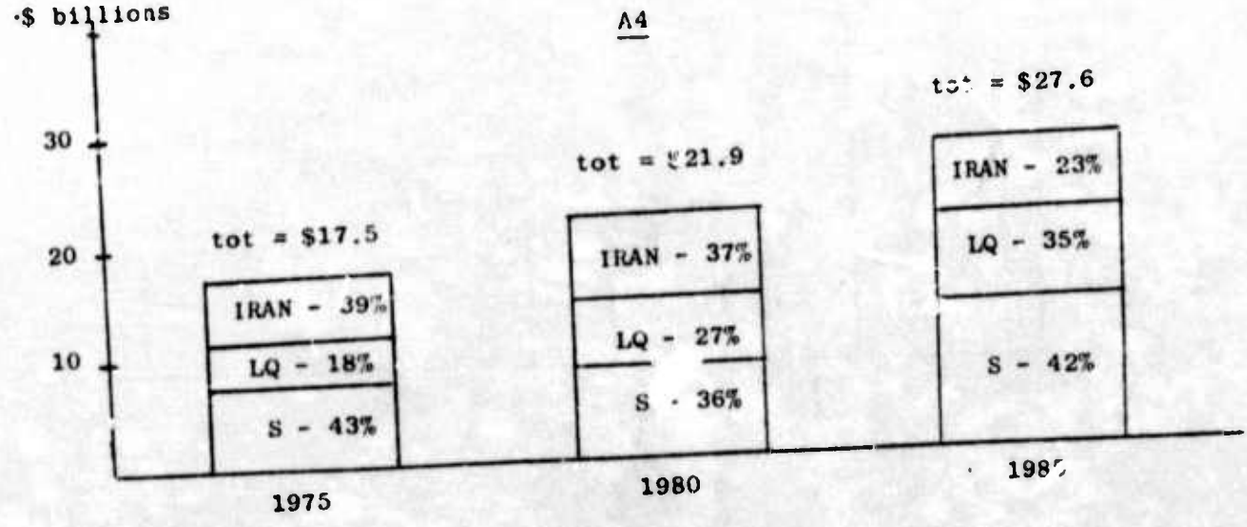
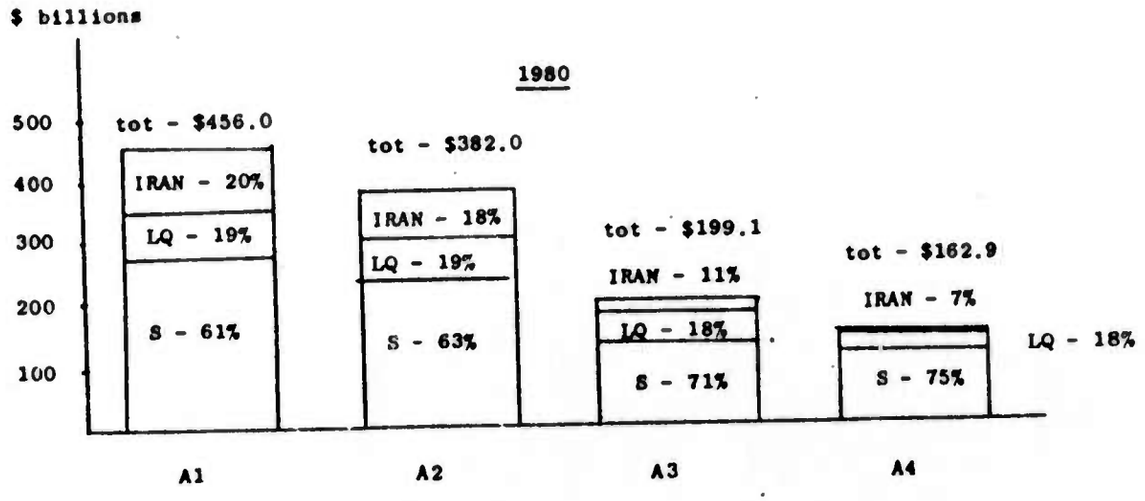
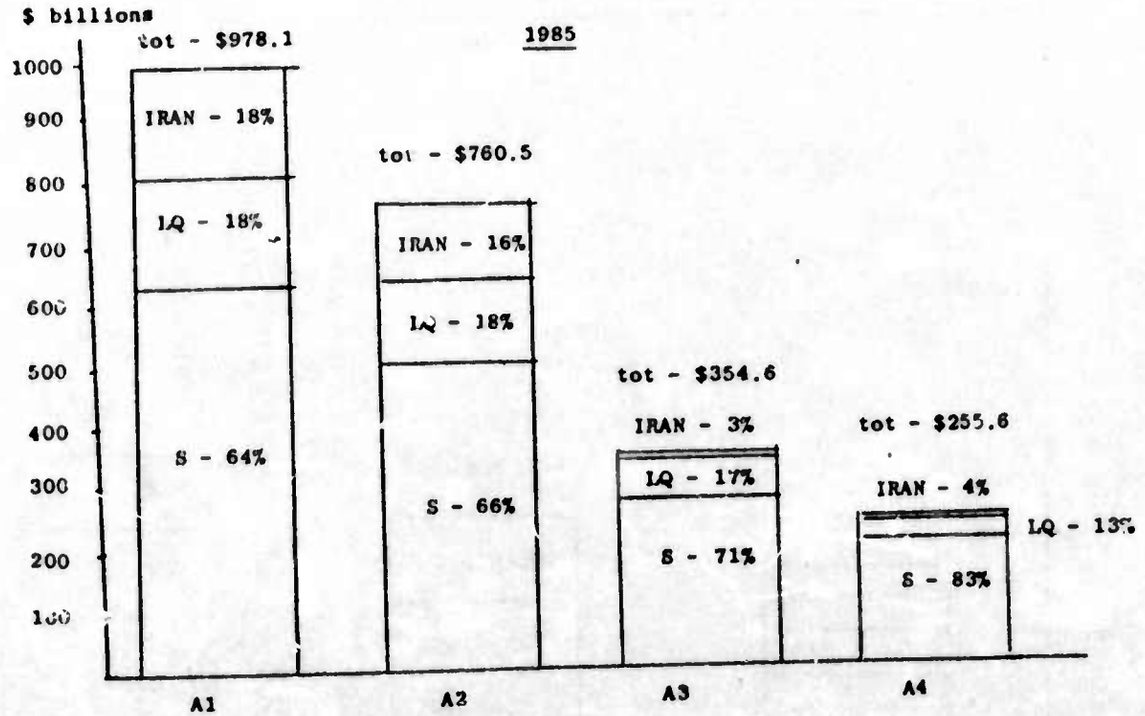


Figure 4

FOREIGN CAPITAL ACCUMULATION - 1980, 1980

BASE ASSUMPTIONS





Investment Strategies of the Oil Revenues Surpluses

Oil revenue surpluses are expected to be invested in foreign countries in accordance with the following goals:

a) to increase the expected rate of return on the investments;

b) to reduce the business risk;

c) to reduce the political risk;

d) to increase the contribution of the investments to the national security;

e) to increase the contribution of the investments to the country's political power in the world;

f) to increase the contribution of the investment to the stability of the current regime

g) to make investments that are more manageable within the limits of skilled manpower;

h) to adjust the investments to the psychological preferences and constraints of the investors.

Given the different performance of various investment tools in achieving desired goals, it is expected that the most efficient investment policy will be to diversify in the various investment tools available in order to optimize.

Short-term assets will be held in order to provide liquidity and ability to shift investment strategies. In a relatively short time (1 to 3 years) much will be transformed into long-term holdings. Investments in institutional bonds (issued by governments and international financial institutions) and other forms of bonds, will increase and their share in the total capital investment will rise accordingly. Later on they will level off. Neutral investments (i.e. investments without managerial control, or investments in neutral industries such as services, real

estate, etc.) will have a small scale in the early period, will rise slowly toward 1980.

Investment in energy will be made as opportunities appear. Thus, there will be a steady increase in the proportion of energy investment over the period. Direct investments (i.e., investment to achieve at least some managerial control) will have a pattern similar to energy investments. The total sum may reach somewhat higher proportions.

"Political" investments in neighboring Mid-East countries and Fourth World countries will be tied to the level of revenues and be kept low, but effective. They may amount to about 10 percent of the total portfolio.

Table 1 summarizes these investment patterns. This pattern of investment strategy is only indicative. Some deviations from it may be demonstrated. Yet certain underlying principles seem to be common and valid to any possible outcome.

a) Business opportunities and the return/risk trade-off will constitute a significant factor in any investment strategy. Money gravitates to opportunity.

b) These opportunities will be utilized subject to political, psychological and managerial considerations.

c) The resulting mixed strategy as defined should not be far from an efficient one and will fairly represent the relative subjective priorities of the ruling sector and policymaker of each country.

d) There may be a difference in subjective priorities in different countries. Therefore, any difference in distribution of ownership of capital may change the mix of the investment strategy.

Translating this investment strategy to the actual amounts of capital accumulation provides the following foreign investment ownership by Middle Eastern countries (see Table 2).

Economic Implications

Comparative static analysis of the impilcations of the increased oil price for the monetary system and the reai economic sector of the Western industriaiized countries leads to the foiiowing conciusions:

Perfect recycling among countries may not be achieved because of the inefficient and incomplete monetary system. Even if successfui, perfect recyciing achieved by the transfer of asset ownership and creation of financial iiabilitles wiii not soive the entire economic probiem. The decline in real income in the oil importing countries wiii reduce aggregate consumption and spending and create a deflationary gap. Rather than heiping to cut the cost-push inflation, it wiii increase unemployment.

Even if the perfect recycling among countries does work well, internai financiai frictions are expected due to:

a) movement of funds from smaii to iarge financiai institutions;

b) erratic changes in the borrowing rate structure;

c) rapid changes in the demand structure for various types of financial assets.

Given imperfect recycling among nations and financial frictions within countries, it is not improbabie that the financial system wiii face dramatic probiems, such as bank failures and deterioration of the system's credibility. A prudent monetary and financiai poiicy under international cooperation can technically prevent this crisis. It is questionable, however, whether such cooperation wiii be achieved.

Governments face "flation traps" where cost-push inflation and unemployment exist simuitaneousiy. Fiation traps are compounded by increased oii prices. It is doubtfui whether governments will be able to deal successfully with this dilemma.

Table 1

INVESTMENT STRUCTURE - 1975, 1980, 1985
(percentages)

	1975	1980	1985
Short-Term Credit	60	20	10
Bonds	25	30	35
Neutral	5	15	15
Energy	0	10	15
Direct	0	15	25
Political	10	10	10
Total	100	100	100

Table 2

SUMMARY OF INVESTMENT PORTFOLIOS
UNDER ALTERNATIVE OIL REVENUES - 1975, 1980, 1985
(millions of dollars)

Year	Short-Term	Bonds	Neutral	Energy	Direct	Foreign	Total
A1:							
1975	48	20	4	0	0	8	80
1980	91	127	68	46	68	46	456
1985	98	245	147	147	245	98	980
A2:							
1975	50	21	4	0	0	8	83
1980	76	115	57	38	57	38	381
1985	76	190	114	114	190	76	760
A3:							
1975	43	18	4	0	0	7	72
1980	40	60	30	20	30	20	200
1985	35	89	53	53	89	35	354
A4:							
1975	43	18	4	0	0	7	72
1980	33	49	24	16	24	16	162
1985	26	64	38	38	64	26	256

oil prices. It is doubtful whether governments will be able to deal successfully with this dilemma.

Due to the increased imports to the oil producing countries, there will be an increase in the volume of international trade constituting, in the next 2-3 years, some 35 percent of their oil revenues. While this development facilitates the recycling process, it creates problems of adjustment in the real sectors. Some countries may face excess demand for exports, and the recycling among the oil importing countries will be required in increasing magnitude.

The process of international adjustment will require changes in exchange rates (devaluation and revaluation). The system of floating exchange rates is more efficient than a system of fixed rates in dealing with this process. There will be a trend toward a decline in the real interest rates, but due to inflation the nominal rates may remain high.

It should be emphasized that these problems are implications of the increased oil prices. They are expected to develop even if the oil producing countries cooperate with the Western world by smoothing the recycling process and avoiding the use of financial power to threaten the world economy.

Political Implications

The political environment is more likely to be exacerbated by the inherent economic difficulties described above than vice versa. Primarily, the following processes can be expected:

Tension may grow between Saudi Arabia, on one hand, and its OPEC partners on the other hand, on the issue of prices. Saudi Arabia's preference for lower prices would conflict with Iran's need for higher

prices. That tension, to be translated in the arena of OPEC production programming, is expected to grow acute as early as 1977.

The "S" countries' relative indifference to price levels in the short run is likely to shift the issue of prices from the economic to the political realm. Thus, linkage tactics such as the coupling of production levels to Western diplomatic positions, say on the Arab-Israeli front, can be expected to continue for the next two or three years.

The existence of relatively easy recycling mechanisms, such as military sales and technology transfers, against the background of a felt need for massive and efficient recycling of the oil money, might result in a Western scramble to sell arms and technology to Persian Gulf states. Such deals, however, often convey serious implications both on the selling and on the receiving ends. Thus, delicate local military balances as well as strategic sectors of the Western economies could be affected.

The volume and source of direct investments in the Western economies could present these countries with the usual dilemmas faced by host governments. The magnitudes involved, however, suggest that existing regulations might not suffice to protect these countries from undesirable control which impinges on their security. A reconciliation of the conflicting considerations could take too long, thus allowing for a period of potentially critical exposure.

The potential for manipulation of reserves by Mid-East oil exporting countries so as to further their political objectives is significantly high. In that sense, a narrowly defined Project Independence might miss its original purpose.

The explosion of the world oil crisis can be traced back to the Teheran and Tripoli Agreements of 1971. That crisis, considering its monetary, financial and political ramifications, has already precipitated one local flare-up. So long as the components of that crisis (i.e., arbitrary use of monopolistic control, exorbitant prices and less than complete commercial responsibility upon which world trade is based) are not blunted, further political aggravation in all directions should surprise no one.

APPENDIX 1:

Security Implications of Energy
OASD (ISA)-ARPA Workshop
Washington, D.C.

18 March 1974

BRIEF

This one-day workshop was intended

A. *TO IDENTIFY SIGNIFICANT SECURITY IMPLICATIONS WHICH HAVE EVOLVED OR MAY EVOLVE FROM THE WORLD ENERGY SITUATION;*

B. *TO CONDUCT A PURPOSEFUL DISCUSSION AMONG DIVERSE GROUPS CONCERNED WITH THE SUBJECT;*

C. *TO PROVIDE AN INPUT TO HUDSON INSTITUTE AT THE START OF NEW CONTRACTUAL WORK ON THE ENERGY PROBLEM AND ITS RAMIFICATIONS FOR DEFENSE PLANNING.*

The workshop did evoke the intensive dialogue desired. *It was actively participated in by the Director (J-4) of OJCA, deputies from OASD (ISA) and by outside groups, notably those of the FEO, Chase Manhattan Bank and Universal Oil.* Senior staff of the Hudson Institute acted as provocateurs discussing energy/security issues for specific geographical regions followed by comments by ISA regional officers and open discussion.

The workshop served to introduce the problem, but the menu was far too extensive for coverage in any depth during one day. Neither time nor focus permitted rigorous discussion. In effect, *it was both a symptom and a function of the lamentable state of the debate that the tenor of the meeting was not policy-oriented* nor was the range of the security aspects of energy adequately explicated. The workshop reflected the current national mood of a general lack of any sense of urgency. Ironically, this very condition is often referred to as one of the major obstacles to successful completion of policies and projects dealing with the energy crisis.

This *general business-as-usual attitude* came through particularly in arguing certain tentative Hudson ideas. Rather than focusing on the main thrust of such programs, most were invalidated with an air of complacency.

The subjects discussed will, however, provide a *start toward more substantive analysis of each with a view to developing scenarios as a framework for planning and to present the range of security issues which result from world concern over energy.* It is clear such development of scenarios will be required to discipline the thinking and activities of the community as a whole. Moreover, quite a few useful observations were made during the session. These tended to center around three interrelated fundamental problems:

I. *THE SUBJECT OF THE PRICES OF ENERGY AND THEIR FINANCIAL EFFECTS;*

II. *THE PROBLEMS OF ENERGY AVAILABILITY;*

III. *THE POLITICAL, ECONOMIC AND SECURITY IMPLICATIONS OF RESPONSES TO I. AND II.*

I. Energy Prices and their Financial Effects

A. *The price of oil has been identified as the most important paremeter for discussion.* Yet, the uncertainty over the future price of oil and its substitutes form a most formidable analytical and practical obstacle to overcome. Widely *differing views on the eventual price of oil* were offered. Chase Manhattan Bank advanced a figure in the *$8-10/bbl range*, with the JCS representative also indicating an expectation of this high price range. Hudson Institute participants, on the other hand, pointed out that a *boom-bust phenomenon could develop, bringing about a drop to the $5-6/bbl range.* Industry representatives supported the latter estimate, and it was clear that this very disagreement was illustrative of the general *uncertainty over the price issue*--a condition which causes great hedging in investment, in evaluation of when other energy sources may become available, in declaration of energy policies, and in appraising dependence patterns among nations.

B. *The three-fold increase in the price of Persian Gulf oil over the past year was seen as creating problems for OECD, severe problems for the less developed countries, and very great problems for the Arabs themselves and for the capital markets of the world in terms of the absorptive capacity for these revenues.* While the increase in the price of oil was seen as likely to increase the cost of oil to OECD countries at roughly $16 billion, in the less developed countries the oil bill would only increase by $10 billion; but this $10 billion would effectively negate the aid programs provided by OECD countries. Indeed, the shortage of foreign exchange in hard currencies available to these countries might create real supply problems simply on the basis of price and encourage those countries, who themselves are raw material suppliers, to use their position as suppliers to apply similar pressure on the U.S. and other developed countries to garner for themselves the necessary foreign exchange. *Deterrence of other raw material suppliers from this temptation makes OECD cooperation on the oil problem particularly important.*

C. The representative from the Chase Manhattan Bank pointed out that since the *Middle Eastern countries are reluctant to engage in direct investment,* the $40 to $50 billion surplus capital accruing to these countries is likely to present severe difficulties to the private firms which are expected to handle it. As he pointed out, *there are limits to the absorptive capacity of the short-term investment market.*

D. It was explained, however, that in the long run one should not be concerned about the problem of price since the *prediction of high prices tended to be a self-defeating prophecy.* That is, *if a price of $10/bbl* is expected worldwide, this will stimulate such a

response from energy producers and those who explore for energy that *within the next five years one might reasonably expect an energy glut.*

E. Chase Manhattan disagrees with this projection; but their projection is based on pre-October energy flows at post-March (1974) prices. This is plainly an unworkable and therefore extremely unlikely situation. *One cannot expect totally inelastic demand and supply functions,* especially when one considers the price-sensitivity of the demand for energy in the less-developed world and also in the case of some of the weaker economies in Western Europe. More importantly, supply should be more responsive to price increases, and even Chase Manhattan agreed that there would be a significant increase in world supply as a result of the current high prices for oil.

F. *The flow of large payments to Arab countries in the short term and how their investment might, in turn, affect the world, post major financial and trade problems:* these funds must be acquired, payment balances must be sought, and investments must be handled. Solutions to these problems at this time, within existing practices, seem remote. One fear is that since the Arab countries place their money in short-term loans, the *financial markets will be saturated within less than two years,* with chaos thereafter. A second fear is that the *funds may be intentionally moved* about by Arab countries to cause disruption in the Western financial markets. Third fear is that *extensive investments in the U.S. might be detrimental to U.S. interests.* Fourth fear is that the third-world countries will be unable to pay for the oil to continue their development, with resulting instability in these regions. (Iran appears to be the only major producer actively pursuing long-term solutions--*and* having the ability to absorb investments.) The *inability of the producer countries to absorb this* magnitude of investments argues for their likely reduction *of production or expanding production slower than desired by consumers.* Moreover, to the extent that the recent Arab embargo was caused by the appearance of revenue surpluses which facilitated the diversion of oil production from the strictly economic to the diplomatic plane, the *expected growth of such excess capital is seen as even more destabilizing and potentially politically disruptive.*

G. As far as Arab exporters are concerned, they are likely to have great difficulties in figuring out what to do with their newfound riches. The Arabian economies do not have, in most cases, the absorptive capacity to make full use of the revenues. As has been pointed out, the short term investment market does not have the absorptive capacity; and the alternative of *leaving the revenues in currency is extremely distasteful, given world monetary instability.* It was generally conceded that the only other logical alternative--*direct*

investment abroad--was one with which the Arabs felt extremely uncomfortable and were therefore highly unlikely to use. This attitude, it should be noted, could change as economic realities sink in, thus positively affecting reluctant exporters' propensity to invest.

H. It was pointed out that *for a smooth and efficient system of global energy interdependence to work would require an Arabian miracle comparable to the German and Japanese miracles of the fifties and sixties.* This is extremely unlikely, due to self-centeredness of the Arab states and the absence of most of the preconditions for rapid industrial growth. Therefore one can only expect the emergence of a few super-sheikhdoms with a relatively high level of consumption, along with some frustrated "great leaps forward" to more ambitious states. This unstable system cannot work; nor can it be expected to persist. *These countries could well undergo a period of being no more than rentier states, as was Spain during the 16th century, with the inflow of gold doing more harm to its stability than anything else.*

I. Finally, Hudson argued that the basic elasticities of demand and supply will tend to cause a drop in prices and thus *these problems are basically a two-year issue with the price down in the third year.* The pros and cons of this argument and implicit strategies were discussed. For example, the possibility considered for the third world was that these buyers would simply borrow funds for this short period and either pay back over the longer term after prices have dropped or, alternatively, they would simply default with little harm done.

II. Energy Availability

A. The supply and availability of energy are not inelastically predetermined by natural constraints. Rather, it was the general consensus of the workshop that *one of the major causes of the current crisis was an erroneous pricing policy, particularly the regulation of gas* so as to keep the price of natural gas artificially low thereby causing the depletion of gas reserves, driving coal from the market and inhibiting and misdirecting research and development efforts for alternative sources of energy. Nonetheless, *it was in discussing the shortage problems that the least sense of urgency was evident.* This was especially surprising since it emerged that *DoD gets at least half of its supplies from overseas and that the embargo hit DoD first in that it gets it POL at the end of the pipeline at the foreign refineries.* Yet, paradoxically, it was the industrial representatives who expressed greater concern over problems of supply and shortages. They referred to the

production problems created in shortfall situations, but these seemed really problems of inconvenience put forth to arouse appropriate appreciation of these difficulties from DoD.

B. More relevant were comments originating from industry pointing out, first, that *defense equipment is rarely designed with efficiency as an important criterion.* Second, it was noted that *energy shortages affected defense production especially with respect to subcontractors, who operate on a much thinner margin.* They made it extremely difficult to get quick fixes on problems as they came up, and general shortages caused by price controls often made it difficult to get replacement parts. It was suggested that more flexible specifications be created for equipment so as to permit substitutes which take into account the energy shortages. Third, and most important, it was suggested that *although DoD uses only 3.3 percent of petroleum consumed in the U.S. and roughly 2.4 percent of domestic energy, it could assume a more active role in national energy planning.* DoD consumption of national energy was given as 2.4 percent, with 75 percent of that being petroleum. The initial shortage was caused because one-half of this was purchased overseas prior to the embargo. Other causes of shortages are the rising cost of petroleum and coal (with petroleum costs up 35 percent in FY74 and estimated to increase 29 percent in FY75). No relief in price nor quantities were foreseen for the next couple of years, with usage expected to be down 26 percent from FY73 levels. This does affect readiness.

C. *Problems to be solved are selection/fabrication of tanker fleets* (big and small) for DoD needs, *fuel standardization to make use of commercial sources,* the use to be made of the oil reserves, and *pursuit of a viable program of R&D.* Industrial representatives suggested that DoD should make power consumption a real factor in equipment design; that the RDT&E budget will feel the adverse impact of higher industrial energy costs; that DoD should expect R&D stretch-outs because of materials shortages (and perhaps more authority to substitute materials should be provided, especially to sub-contract vendors); and that if materials shortages grow, replacement parts may be a future problem for the DoD in addition to the actual fuel available for operations.

D. Hudson participants argued that *DoD is capable of leadership and management functions in the energy area transcending the narrow view of DoD as merely a consumer of energy.* In this connection, Hudson recommended that *immediate test drilling be undertaken to determine the reserves available in Naval Petroleum Reserve Number 4.* These reserves are estimated at 15-30 billion barrels, possibly even more. The test drillings could determine what is really there and if the reserves are actually in the order of 30 billion barrels; *this one action would double the U.S. known reserves and thereby create an*

immediately favorable political and strategic impact on world concerns over energy. In contrast, the current DoD budget requests $72M to be used in development of the Elk Hills reserve, the proceeds of which would in turn be used to test and develop NPR#4 over a 10-12 year period. Clearly, there are political issues in the exploitation of any reserve area, but it is equally clear that an opportunity for significant impact on the energy concerns of the nation (and world) is apparently being overlooked by DoD and others.

E. Finally, FEO representatives urged similar *DoD activity in coordination with Project Independence.* To date the most ambitious response to the energy shortage and its associated strategic-diplomatic complexities, Project Independence was described as being fully underway by fall. Two sets of *uncertainties appear to cloud the prospects for energy independence:* First, *no one knows if the manpower, talents, and capital are available to service the multitude of competing or perhaps complementary worldwide endeavors being discussed for the development of alternative energy sources.* For example, are there enough engineers and construction teams available to design and fabricate the needed refineries; can drag lines be produced (given the steel shortages) to satisfy the fields of Canada and the U.S.; who has the priority on the limited number of off-shore rigs? Without a believable assessment of this "capacity," discussion of the many possible courses of action simply lacks credibility.

F. Second, *price uncertainty could be detrimental.* FEO stated that the projected break-even point for oil shale production is $6.25/bbl and the higher price would provide efficient market incentive for the required capital investment. *Many in industry, it was reported, believe the price will drop and the government's dedication to Project Independence will dissipate.* Therefore, they are unwilling to commit major assets even with government guarantees of a price or market because of doubts about the long-term credibility of such guarantees. There was, however, general agreement that *a combination of energy conservation and development of new energy sources must proceed.* FEO representatives and their Hudson consultants contended that *energy independence, however defined, should remain the ultimate national goal.*

G. A discussion draft of the Project Independence management plan was distributed. The draft plan would establish two basic organizations --an *Early Action Program to* increase energy supply through immediate actions and a *"Project Independence Blueprint"* task force to prepare a *detailed project plan for presentation to the President by October 1. The Early Action Program would include existing or planned energy projects that require Federal decisions or that require additional information to proceed, and generally deal with coal production, coal convervation and use, oil and gas production and distribution, and power plant and refinery siting and*

construction. Of particular interest would be efforts to assist the Colony Group to obtain a pipeline construction permit to meet a 1978 starting goal for the first U.S. commercial oil shale plant, to assist several natural gas firms to obtain strategy to encourage industry to undertake higher risk energy related projects. *The concurrent "Blueprint" planning would proceed under FEO leadership with interagency work groups in six areas, including conservation, R&D, and energy resource development.* Subgroups under energy resource development would address synthetic fuels, oil shale, and geothermal energy. *Proposed participation in the various groups includes DoD* to a limited extent and provides for additional participation where appropriate.

III. Specific Political and Security Implications

A. Most direct energy/security interactions were seen as international in character, with particular emphasis placed on three geographical-political formations: *the Atlantic Alliance, the third world, and the Middle East.* Apparently, international problems could also be approached functionally. The *FEO international program, for instance, was described as concerned with the following priority items: security implications, import expectations, tanker and refinery requirements, stockpile programs, and consumer nation cooperation.*

B. Energy and Europe/NATO security issues was one of the subjects discussed. Several points were made. First, that *many in Europe fear U.S. hegemony over them, and view this crisis as yet another attempt by the U.S. to gain such dominance. Second, that it is important to insure continuity of the alliance for security reasons,* and thus to destroy it because of economic interests would be a serious mistake. Third, that the *image of separate policies by Europe and Japan from those of the U.S. prevents the Arab countries from penalizing these countries*--who are more vulnerable--as a means of getting at the U.S. and thus may be an immediately beneficial tactic. Fourth, it is clear U.S. expectations that the European countries of NATO would increase their defense expenditures or share of burden in the near future are now clearly inoperative. (A discussion took up this point; however, it was never explained why we expected these countries to increase their expenditures prior to the energy crisis.) Fifth, several expressed *concern that we were overly discounting the fragility of the European economy vis-a-vis energy needs, and thus quite serious repercussions would occur within the ability and confidence of the alliance within the next years.*

C. The third world cannot be discussed as a monolithic group. Clearly, higher priority was assigned to Western Hemisphere countries in the developing stage with note that Brazil faces the biggest problem of payments for needed oil imports. Venezuela and Ecuador export oil and are expected to continue to do so--although probably in reduced amounts (now 1.5 and 0.5 million barrels per day, respectively). The possibilities for *increased U.S.-Latin American cooperation* were believed to have been enhanced by Secretary Kissinger's discussions in Mexico.

D. Hudson said the *U.S.S.R. self-sufficiency was said to be problematic,* and this viewpoint was not contested. This implies *concern over their interests in the Middle East and questions vis-a-vis their abilities to supply themselves, East Europe and West Europe.* U.S. (and Japanese) investment potential in the U.S.S.R. appear to have waned, which likely means source developments will be curtailed or delayed if they depend on U.S.S.R. efforts alone. The U.S.S.R. is expected to continue interest in Western technology and investment in this area. It was noted that the *U.S.S.R. was evincing almost as much concern over the oil weapon as we are,* since the effectiveness of the oil weapon may call into question the need for Soviet military support other than as a friendly, interested party. Nevertheless, concern was expressed about Soviet ability to take advantage of the tension within the developed world which seems to be resulting from the current energy problem. The Soviet Union has been more than willing to point out to Japan and Western Europe how the U.S. is benefiting from the current situation and it seems that effective OECD cooperation is the best means for neutralizing the impact of such propaganda.

E. Finally, the *Middle East area was seen to include many unsettled questions beyond the Israeli-Arab issue.* The *Saudi-Arabia-Iran competition* may cause us to choose sides in a few years, the *Kurdish activity causes unrest,* the possibility of growing competition between Turkey and Iran poses problems, in addition to the *ever present unsettled relations among the Arab countries*--and the questions of oil availability and price.

F. A related issue, military sales have increased due to the higher revenue of oil. The sales people had estimated a level of $4B in FY74 and now expect sales of $8B with 80 percent of this in the Middle East (and now 50 percent of total to Iran). They expect a similar level next year, and believe Iran can absorb this level effectively, in contrast to Saudi Arabia which probably cannot effectively use continued purchases of equipment. There was no discussion of the eventual effects of these high levels of armaments being introduced into the region. In sum, *the Middle East is only likely to see further exacerbation of its volatility as it continues as a source of disruptive forces in the political, financial and military arenas.*

CONCLUSION

The OASD(ISA)-ARPA workshop was useful insofar as it reflected the difficulties faced by the Government policymakers on one side, industry management and policy analysts on the other. Although there is agreement that *action is required,* subjective variances in the degree of urgency needed and objective complexities of the current and expected situation provide major impediments to effective action. *Additional analytical work on the security implications of energy is in order if the U.S. is to avoid undesirable political/security outcomes. DoD could continue to take an active role not only throughout the analytical stage but also in advocating national security justifications for various energy postures and by assuming a position of responsibility in their implementation.*

BIBLIOGRAPHY

The following documents were distributed at the workshop:

1. Kahn, Herman, "Current and Future Energy Issues and Policies," Hudson Institute Report No. HI-1939/2-CC;

2. Arad, Uzi, Brennan, Donald G., Fedoruk, Nicholas and Kahn, Herman, "Selected Energy Issues," Hudson Institute Report No. HI-1971-BN

3. Kahn, Herman, "Current and Future Energy Issues and Policies," Hudson Institute Card 2154.

4. "Project Independence Management Plan." Federal Energy Office, Interagency Meeting, March 14, 1974.

APPENDIX 2:

Security Implications of Energy
OASD (ISA)-ARPA Workshop
Washington, D.C.

19 July 1974

I. BRIEF

The second worksho in the Hudson-ARPA/ISA series dealing with the security implications of energy was devoted to a post-mortem analysis of the 1973-1974 oil embargo. The morning session was intended to examine the embargo, its impact and the lessons for the future which we and others have apparently derived from the experience. As background for the discussion the following formal presentations were made:

International Configuration, Embargo Implementation and Effects (U. Arad, Hudson Institute)

Management of Defense Energy Resources (RADM Sonnenshein)

DoD Response to 1967 and 1970 Disruptions (Conners, RAND)

Exporters' Perspective--OPEC AND OAPEC (J. Noyes, OASD(ISA))

Lessons Learned from the Energy Crisis (ADM Weschler, OJCS)

Overlooked Implications of the Embargo (H. Kahn, Hudson Institute)

The afternoon session was intended to explore the scenarios for supply embargo which might occur 3-4 years hence, and thereby to examine the implications from actions taken on the basis of lessons learned. The following presentations addressed themselves to these issues:

Dependence and Independence in the Atlantic Alliance (R. Shatz, Hudson Institute)

Future U.S. Imports and a Precautionary Import Policy (H. Mendershausen, RAND)

Future of the Oil Weapon: Spill-Over and Escalation Potential (R. Ruggles, Hudson Institute)

Soviet View of Oil Weapon (L. Goure, Miami University)

Supply Interruption Scenarios (R. Shatz, Hudson Institute)

The discussion that ensued was demonstrative of the fact that with the advantage of hindsight a much more sober and precise analysis is possible, and this was important for the discussion of an issue so clouded by rhetoric and the unavailability of consistent data as the Arab embargo. As expected, the prognostic part of the day was more difficult and less precise. Yet, there seemed to be a consensus which of the problems and areas need be considered in conjunction with the question of the security of American energy supplies. The following is a synthesis of the comments and arguments presented at the meeting.

II. The Embargo Experience of 1973-1974

A. The 1973 explosion occurred as a result of a sudden exposure of Saudi Arabia to Arab pressures to link its production policies to the Arab cause in the Arab-Israeli conflict. This coincided with rapidly increasing American imports of Arab oil coupled with consequent vulnerabilities. From virtually zero imports from OAPEC in 1970 the United States came to be dependent for 9.2 percent of its oil requirement on OAPEC sources by 1973. The net effect of these parallel processes was that the balance of oil power was gradually shifting in favor of those OAPEC members not dependent on a continuous flow of oil revenues. Specifically, the political and economic configuration in 1973 was conducive to a Saudi-led embargo on the United States. At the same time, an artificially created shortage facilitated the subsequent price hikes as well as enabled continuation of the production cutbacks.

B. The deployment of the oil weapon followed typical escalation dynamics. From a moderately ambiguous putative stage it evolved into a concrete and actual policy acquiring a momentum of its own. In retrospect, it seems that due to intrinsic limitations in the mechanics of the oil weapon, it attains its optimal cost-effectiveness more as a potential threat than as a real action. For instance, to impact on the United States OAPEC was forced to cut back production across the board and by a factor of four relative to the desired level of shortfall in the United States.

C. American vulnerability to oil pressures as of 1973 was still well below critical thresholds, and therefore the shortfall of 1.2 to 1.5 MMB/D affected less than 4 percent of total energy consumption. That shortfall was absorbed mostly by voluntary conservation without serious impact on the United States.

D. DoD experience during the embargo revealed that the Department was unsatisfactorily organized to deal with a long cutback and had not learned the lessons it might have from the preceding cutbacks in 1967 and 1970-1971. There were insufficient prepositioned stored reserves, terminals were inadequate, DoD did not have sufficient tankers and could not count either on the oil companies or fuel commitments from friendly countries. Implementation of the Defense Production Act was delayed and mandatory allocation failed to supply necessary training and readiness activities. Government response was sluggish in allocating funds to cover the rapid increase in DoD fuel prices.

E. In conclusion, despite a tactically premature application of the oil weapon, a less than fully effective implementation thereof, and considerable leakage and swapping in the market, the 1973 Arab oil embargo is generally considered a success.

N ; that it severely damaged Western or Japanese economies, but that it did achieve its political objectives while having only limited economic success. Thus, the Arabs have acquired new stature in world politics; the Israelis find themselves increasingly isolated and uncertain about their future, and there has been a significant movement toward a more pro-Arab line in Europe, Japan and the United States.

F. The lessons that could be derived from observing the success the oil Arabs have had are not unequivocal. For it is obvious that neither the United States nor its allies made use of whichever economic and/or military instruments available to them in trying to counter the embargo. The accommodation postures vis-a-vis the oil challenge which typified the 1973-1974 experience could be replaced in the future by containment policies which might blunt its future potential considerably.

III. IMPLICATIONS OF THE EMBARGO

A. The 1973-1974 embargo clarified the potential danger to the U.S. of high levels of oil imports, especially from the Persian Gulf. The U.S. energy resource base and technological capability are adequate to support a national policy of energy self-sufficiency. however it is clear that for the near-term (next 5-7 years), the U.S. must depend on imports. Considerations of public safety, environmental quality, and commercial feasibility pose difficult barriers to timely implementation of energy self-sufficiency, and the viability of Project Independence will depend on the perception of social costs and how these perceptions are translated into decisions. There is no doubt however that the U.S. can become relatively self-sufficient by the mid 1980s.

B. The major problems of energy supply growth and of energy conservation will be associated with large scale programs. Thus, engineering, planning and managerial problems will dominate the early period. We will have to accept increasingly larger energy R&D budgets if we are to have new technologies for the 1985-1990 period which can reduce the social costs of energy production.

C. Relative energy independence in Europe in the next fifteen to twenty years seems increasingly possible. By the mid-1980s, North Sea energy resource development may yield $40-65 billion annual savings in terms of balance-of-payments outflow relative to an extrapolation of the high-import supply estimated before 1973. Between 1974-1985 the integrated cost of continued high import dependence would be $300-500 billion. If part of these sums were invested in indigenous energy resource development to accelerate North Sea and coal exploitation, they would yield

increased European production capacity and might support domestic economic objectives of full employment and price inflation control.

D. The basic Defense Department organization for energy management had proven effective by the end of the embargo period, although the Defense Energy Information System has just recently become operational. DoD has been the most effective conserver of energy in the Federal Government, saving 90 percent of all energy conservation within the Federal Government.

E. The embargo generated interest in the development of NPR #1 and #4 to meet the nation's energy needs as well as the Navy's. At this point the funding for exploratory drilling is inadequate for any rapid verification of these reserves in FY 1974 and there is no provision for funding in FY 1975. There have been estimates that reserves in NPR #4 may be equal to or greater than proven reserves in the lower forty-eight.

F. At the same time, it is clear that military stocks are not vast and cannot serve as economic insurance for the nation. Military stocks could only supply the nation for five days and are very particular in their applicability.

G. Dod is developing a plan for increasing the energy efficiency of its facilities. The program is estimated to cost $1 billion, but, it can pay for itself in three to five years depending on the price of fuels.

H. In line with its earlier program of supporting solar energy R&D, Dod is looking towards greater use of its laboratory facilities, where feasible, for energy research in other areas. This would be desirable even in areas not specifically related to immediate departmental needs in that it relates to the larger security needs of the nation.

IV. Persisting Problems

A. Unless and until there is energy self-sufficiency in the United States, the U.S. will be exposed to the instabilities of the world energy system. The instability results from the fact that the Persian Gulf, the major source of world crude oil, is politically volatile and some of the major supplier states are antagonistic to each other as well as inclined to use the oil weapon in the Arab-Israeli and other regional disputes. Control of the balance of power in the world oil market is shifting from the United States and the multinationals to the OPEC states. The world economy is in a period of flux which creates tensions both for OPEC and the OECD and between them. U.S.-U.S.S.R. relations are in a period

of redefinition with the Soviet Union inclined to provide the military umbrella for the oil weapon.

B. There are near term tensions in the Gulf states. In order to maintain current price levels in the face of an increasing world petroleum surplus, some of these states will have to cut back production in the next few months. A number of states need all of the revenues now, but it is doubtful whether the Saudis would be inclined to assist the Iranians and Iraqis. Furthermore, the United States has oversold its ability to provide political and economic assistance to the Arab states. This is likely to lead to recriminations and possible retaliation.

C. The U.S. Government seems to be slipping back into a business-as-usual attitude to its energy problems with the projected lifting of mandatory allocations in February, the leisurely funding of NPRs exploration and development, and waining interest in Project Independence.

D. Opinion was divided on the likelihood of another embargo in the near-term. It was seen as likely as a result of continuing Arab-Israeli tensions or OPEC concern about preserving their revenues in the face of a worldwide inflation. The increasing tensions within OAPEC could induce the nations to resort to embargo and other manipulations of production levels in order to increase their solidarity. Also, the Soviet Union has been encouraging the Arabs to make maximum use of the oil weapon due to a perception of the negative impact of the oil weapon on the stability and harmony of the developed capitalist world and an evaluation that the Soviet Union stands to gain politically and financially as it defends OAPEC's right to use the weapon. Proponents of the other point of view argued that the OAPEC countries are becoming conservative as they reap the rewards from the recent use of the oil weapon. They are increasingly interdependent with the rest of the world and can gain more by subtle putative use of the weapon than by actual use. They have been making political progress and they fear the possibility of Western military action were they to invoke the oil weapon again, particularly in light of the current tenuous status of the OECD economies. OPEC cannot push the price of petroleum higher due to the increasing world surplus and any prolonged embargo is only likely to further stimulate further substitution of other energy materials and petroleum sources.

E. Although concern was expressed that the success of the oil weapon would stimulate imitation by non-fuel natural resource and raw materials suppliers, this was deemed unlikely. The sources of supply for U.S. needs are far more diversified, are not as critical or unsubstitutable as petroleum, and there is no burning political issue to motivate these states to run the substantial risks of loss of market to substitutes, other suppliers and increased use of low-grade sources. World reserves

in these materials are enormous and growing in size, prices are favorable at the present time and, because of the oil prices, raw materials suppliers do not have the financial reserves that could cushion denial practices such as cutbacks and embargos.

F. Similarly, certain crucial political uncertainties seem to persist. In the Arab world, Sadat seems reasonable at the present time but his policy of moderation has no solid ideological underpinning with which to reward young Egyptians for deferred gratification of their economic needs. A revolutionary potential exists therefore in Egypt and could be disruptive to the conservative Middle East oil states.

G. Iran could be destabilized by action against the Shah. There is no royal family behind him as in Saudi Arabia. From another perspective Iran could be regionally destabilizing because of its increasingly grandiose conception of its world role. Attempts to fulfill these dreams could lead to military conflict in the Gulf and supply disruptions for the world, Western Europe and Japan.

H. While Western Europe has some potential for mid-term energy self-sufficiency, Japan does not and its economy is very vulnerable to any future major cutoffs from the Gulf. The implications of such Japanese vulnerability to its own "low posture" and for the United States are uncertain but disquieting

I. The defense of U.S. offshore facilities poses increasing problems for the United States which needs to be seriously addressed. It is estimated that by 1980 the United States could be getting 30 percent of its domestic oil from offshore. The military problems of defending these facilities are aggravated by their uncertain legal status as an increasing number of them are outside the 12-mile limit.

J. Increasing world political instability poses serious problems for DoD in terms of prepositioning of its reserves. It is no longer certain which, if any, potential host countries are dependable. DoD was burned a number of times in the recent embargo.

K. Dod has had difficulty in obtaining the necessary fuel supplies on the open market and has benefited from mandatory allocation of petroleum products. The upcoming cancellation of mandatory allocation poses worrisome problems of supply for the Department. Coal problems are already upon the Department and a coal strike might make these problems even more severe.

V. A. Selection of Recommendations

A. In assessing future supply interruptions it would be necessary to estimate both the capability and intentions inherent in such threats. Even Western Hemisphere suppliers possess leverage over the U.S. which is a function of their large share of exports to the U.S. In this vein, an assessment of supply disruption contingencies must include reference to action taken by producers outside the OAPEC group.

B. While pursuing the longer-term goal of relative self-sufficiency, an immediate precautionary element should be injected into current import policies. Specifically, it is argued that a policy of diversification and preference for non-OAPEC oil could render the U.S. relatively immune to direct Arab pressure. A prudent policy would also include the enlargement of the storage capacity for oil, possibly in salt domes and the re establishment of adequate stockpiles in other strategic materials.

C. If one is going to create a consumers organization it is essential for it to be cohesive. If not, it will add to U.S. vulnerability to the oil weapon and it might be better to allow the rest of OECD and the Middle East states to work out their difficulties among themselves.

D. To the extent that the next decade might see further manipulations of the trade in oil and other raw materials for political purposes, it is essential that the U.S. and its allies enhance their bargaining capabilities. This calls for further development of potential diplomatic, economic and military countermeasures. While raw material producers enjoy certain economic advantage, clearly the U.S. and its allies have overwhelming political and military advantage. It is from these assets that the instruments of improved bargaining should be drawn.

E. Develop accelerated funding for the exploration and development of NPR #4 through loop funding, a special act of Congress, or, if necessary, private participation in the project. Plan and construct a cross-Rockies pipeline to enable the United States to take full advantage of rapidly increasing oil supplies to the West Coast.

F. Finally, the following are recommended within DoD: maintain the energy management organization currently established; establish and fund a five-year facility conservation program; make energy effectiveness a consideration in weapons-system development; provide a full-time focal point within DDR&E for energy matters; increase the flexibility of fuel procurement programs; increase DoD and civilian cooperation in dealing with energy problems, and pursue further evaluation of threat to future foreign supplies as well as to domestic and offshore production facilities.

VI. BIBLIOGRAPHY

The following documents were distributed as reference material:

"International Configuration, Embargo Implementation, and Effects" [Arad, Hudson Institute].

"Briefing Notes on the 1967 and 1970 Disruptions," [Conners, RAND].

"Supply Interruption Scenarios," [Fedoruk, Hudson Institute].

"Implications of the 1973-1974 Embargo for World Energy," [Kahn, Hudson Institute].

"Soviet Views on the Oil Weapon," [Center for Advanced International Studies, University of Miami].

"Future of the Oil Weapon: Spill-Over and Escalation," [Ruggles, Hudson Institute].

"Dependence and Independence in the Atlantic Alliance," [Shatz, Hudson Institute].

"Management of Defense Resources," [RADM Sonnenshein, DoD].

SELECTED BIBLIOGRAPHY

Abir, Mordechai. Oil, Power and Politics: Conflict in Arabia, the Red Sea and the Gulf. Frank Cass, London. 1974.

Abeggien, James C. "Materials and Energy: Japan's Problems and Policies." (Mimeo.) The Boston Consulting Group, Inc., Boston, 1974.

Abrahamsson, B. J. "Ocean Transportation in the International Economy." (Mimeo.) Graduate School of International Studies, University of Denver, 1973.

Abrahamsson, B. J. and Steckler, J. L. Strategic Aspects of Seaborne Oil. Sage Publications, Beverly Hills, 1973.

Ackerman, F. and MacEwain, A. "Energy and Power." Monthly Review, January 1974.

Adelman, Morris A. The Supply and Price of Natural Gas. Basil Blackwell, Oxford, 1962.

Adelman, Morris A. "Efficiency of Resource Use in Crude Petroleum." Southern Economics Journal, 1964.

Adelman, M.A. The World Petroleum Market. Resources for the Future, Inc., The Johns Hopkins University Press, Baltimore, 1972.

Adelman, M.A. "Is the Oil Shortage Real? Oil Companies as Opec Tax Collectors." Foreign Policy, Winter 1972-3.

Adelman, M.A. "Foreign Oil: A Political-Economic Problem." Technology Review, March/April 1974.

Adelman, Morris A. "How to Have an Oil Crisis--A One-Year-Later Critique." The Conference Board Record, Vol. 12, January 1975.

Adie, W. A. C. Oil, Politics, and Seapower: The Indian Ocean Vortex. National Strategy Information Center, Inc., Crane, Russak & Company, Inc., New York, 1975.

Adler-Karlsson, Gunnar. Western Economic Warfare 1947-1967: A Case Study in Foreign Economic Policy. Foreword by Gunnar Myrdal. Acta Universitatis Stockholmiensis, Stockholm Economic Studies, New Series IX, Alomquist & Wiksll, Stockholm, 1968.

Ajami, Fouad and Osterberg, David. "The Multinational Corporation. An Analytical Bibliography." International Studies Quarterly.

Akins, J. "The Oil Crisis: This Time the Wolf Is Here." Foreign Affairs, April 1973.

Alker, Hayward R, Jr., Bloomfield, Lincoln P., and Choucri, Nazli. Analyzing Global Interdependence. 3 volumes. Center for International Studies, MIT, Cambridge, Mass., 1974.

American Petroleum Institute. Annual Report, 1972.

American Petroleum Institute. Annal Statistical Review. Petroleum Industry Statistics 1964-1973. Washington, D. C., September 1974.

Arthur D. Little, Inc. "Energy Company Strategies For the 1970's." (Mimeo.) April 1969.

Austin, A. L., Rubin, B., and Werth, G. C. "Energy: Uses, Sources, Issues." Prepared for U.S. Atomic Energy Commission. Lawrence Livermore Laboratory, University of California, UCRL-51221, Livermore, May 1972.

Austin, A. L. et. al. "U.S. Energy Flow Charts for 1950, 1960, 1970, 1980, 1985, and 1990." University of California, Livermore, distributed by National Technical Information Service, U.S. Department of Commerce, UCRL-51487, November 1973.

Barnea, Joseph. "Keynote Address." MITRE Symposium, Volume, March 1974.

Becker, A. S. "Oil and the Persian Gulf in Soviet Policy In the 1970's." RAND Corporation, P-4743-1, May 1972.

Becker, Abraham S. "The Superpowers in the Arab Israeli Conflict, 1970-1973." RAND Corporation, P-5107, December 1973.

Becker, Abraham S. The Superpowers In the Arab Israeli Conflict, 1970-1973. American Elsevier, New York, 1974.

Becker, Abraham S., Hansen, Bent, and Kerr, Malcolm H. with a Forward by Sidney S. Alexander. The Economics and Politics of the Middle East. American Elsevier Publishing Company, Inc., New York, 1975.

Bergsten, Fred C. "The New Economics and U.S. Foreign Policy." The Brookings Institution. Washington, D. C., 1972. Reprint 231. Reprinted from Foreign Affairs, January 1972.

Bergsten, Fred C. "Future Directions for U.S. Trade." The Brookings Institution, Washington, D. C., 1973. Reprint 275. Reprinted from American Journal of Agricultural Economics, May 1973.

Bergsten, C. F. "The Threat from the Third World." Foreign Policy, Summer 1973.

Bergsten, C. F. "The Threat is Real." Foreign Policy. Spring 1974.

Bergstern, Fred C. "The Response to the Third World." Foreign Policy, Winter 1974-5.

Bloomfield, Lincoln P. "Vital National Objectives and Security Interests of the United States: A New Look." (Speech Delivered at the National War College, August 17, 1971.) (Mimeo.) Center for International Studies, MIT.

Bobrow, David B. and Kudrle, Robert T. "Policy Analysis and Resource Cartels: The Case of OPEC." (Mimeo.) Prepared for delivery at the 1974 Annual Meeting of the American Political Science Association, Chicago, August 29-September 2, 1974.

Bowling, John W. "Keep Your Eye on the Middle East." Cover Story, National Review, June 21, 1974.

B. P. Shield International. "Energy in the Future." December 1973.

Bragaw, Louis K. and Genung, Paul F. "Military implications of the Emergence of Supertankers." (Mimeo.) United States Coast Guard Academy.

Brenner, Michael J. "Strategic Interdependence and The Politics of Inertia: Paradoxes of European Defense Cooperation." World Politics, July 1971.

The British Petroleum Company Limited. BP Statistical Review of the World Oil Industry, 1973.

Brown, Lester R. "The Next Crisis? Food." Foreign Policy.

Brown Seyom. "The Changing Essence of Power." Reprint 270. The Brookings Institution, Washington, D. C., 1973. Reprinted from Foreign Affairs, January 1973.

Buchan, Alastair. Crisis Management: The New Diplomacy. The Atlantic Institute, Boulognes-Seine, France, 1966.

Business Week. "Managing in a Shortage Economy." November 10, 1973.

Cabinet Task Force on Oil Import Control. The Oil Import Question. A Report on the Relationship of Oil Imports to the National Security. U.S. Government Printing Office, Washington, D.C., 1970.

Calleo, David P. and Rowland, Benjamin M. America and the World Political Economy: Atlantic Dreams and National Realities. Indiana University Press, 1973.

Campbell, John C. and Caruso, Helen. The West and the Middle East. Council on Foreign Relations, Inc., New York, 1972.

Cantori, Louis J. and Spiegel, Steven L. "The Analysis of Regional International Politics: The Integration Versus the Empirical Systems Approach." International Organization.

Carter, Luther J. "The Energy Bureaucracy: The Pieces Fall Into Place." Science. July 5, 1974.

Ceteris Paribus (Pseud.) "Recycling." Foreign Policy, Winter 1974-5.

Chandler, Geoffrey. "The Changing Shape of the Oil Industry." Petroleum Review, June 1974.

Cis The Oil Fix. An Investigation into the Control and Costs of Energy. Anti-Report Number 8, London, 1974.

Commerce Today. "Project Independence Won't End Nation's Foreign Oil Connections." October 28, 1974.

Commission of the European Communities. Towards a New Energy Policy Strategy for the European Community, Brussels, May 1974.

Conant, M.A. "Oil: Cooperation or Conflict." Survival. January/February 1973.

Congressional Quarterly. "Energy Crisis in America." Congressional Quarterly, Inc., Washington, D.C., 1973.

Congressional Quarterly. Editorial Research Reports on "America's Changing World Role." Congressional Quarterly, Inc., Washington D. C., August 1974.

Connery, Robert H. and Gilmour, Robert S., editors. The National Energy Problem. The Academy of Political Science. Lexington Books, New York, 1974.

Connors, T. T. "An Examination of the International Flow of Crude Oil, With Special Reference to the Middle East." RAND Corporation. P-4209. October 1969.

Cooper, R. N. The Economics of Interdependence: Economic Policy in the Atlantic Community. McGraw-Hill, New York, 1968.

Cooper, Richard N. "Economic Interdependence and Foreign Policy in the Seventies." World Politics.

Cooper, Richard. "Will Araby Bankrupt the World?" The Saturday Review, January 25, 1975.

Cooper, Richard N. "The Invasion of the Petrodollar." Saturday Review, January 25, 1975.

Coplin, William D., editor. The Analysis of Transnational Policy Issues. The Consortium for International Studies Education. A Summary of the International Relations Panels of the 1974 American Political Science Convention.

Cornell Workshops on the Major Issues of A National Energy Research and Development Program. College of Engineering, Cornell University, December 1973.

Cottrell, William F. Energy and Society: The Relation Between Energy, Social Change and Economic Development. Greenwood Press, Westport, Connecticut, 1955.

Darmstadter, Joel with Teitelbaum, Perry D. and Polach, Jaroslav G. Energy in the World Economy: A Statistical Review of Trends in Output, Trade, and Consumption Since 1925. Published for Resources for the Future, Inc., The Johns Hopkins University Press, Baltimore, 1971.

Defense Energy Task Group. Management of Defense Energy Resources. U.S. Department of Defense, November 1973.

Department of Interior's Report. "The Middle East Petroleum Emergency of 1967." U.S. Government Printing Office, Washington, D. C., 1969.

Department of State. "The U.S. and the Impending Energy Crisis." (Mimeo.) Washington, D. C., 1972.

Dobias, Richard S., Anderson, Norma J., Sparling, Richard C. and Winger, John G. Capital Investments of the World Petroleum Industry. The Chase Manhattan Bank, December 1974.

Dougherty, James E. and Pfaltzgraff, Robert L, Jr. Contending Theories of International Relations. J. B. Lippincott Company, Philadelphia, 1971.

Ducsik, Dennis W., editor. Power, Pollution, and Public Policy. MIT Press, Cambridge, Mass., 1972.

Depree, Walter G. and West, James A. United States Energy Through the Year 2000. U.S. Department of the Interior, Washington, D. C., 1972.

The Economist Intelligence Unit. Soviet Oil to 1980. QER Special No. 14, London, June 1973.

The Economist Intelligence Unit Limited. Oil and Economic Growth. Oil Supply and its Impact on Japan, India, the U.K., the U.S.A. and West Germany in 1974. QER Special No. 15, 1974.

El Mallakh, Ragaei. Economic Development and Regional Cooperation, Kuwait. Publications of the Center for Middle Eastern Studies, Number 3, The University of Chicago, 1968.

Ellsberg, Daniel. "The Art and Practice of Blackmail." (Mimeo.) 1958.

Energy Policy Project of the Ford Foundation. Exploring Energy Choices. A Preliminary Report, 1974.

Energy Policy Project of the Ford Foundation. A Time to Choose: America's Energy Future. Ballinger Publishing Company Co., A Subsidiary of J. B. Lippincott Company, Cambridge, Mass., 1974.

Engler, Robert. Politics of Oil: A Study of Private Power and Democratic Institutions. University of Chicago Press, Chicago, 1967.

Erb, Guy F. "Export Controls." Foreign Policy, Winter 1974-5.

Erel, Shlomo. Petroleum: The Phenomenon of a Modern Panic. Orion Publishing/The Jerusalem Academic Press, Jerusalem, 1975.

Erickson, Edward W. and Waverman, Leonard, editors. The Energy Question. An International Failure of Policy. Two volumes. University of Toronto Press, 1974.

European Communities Commission. "Energy for Europe: Research and Development." Bulletin of the European Communities, May, 1975.

Ewing, David W. "MNCs on Trial." Harvard Business Review, May, June 1972.

Falk, Richard A. "Statist Imperatives in an Era of System Overload." (Mimeo.)

Farnie, D. A. East and West of Suez: The Suez Canal in History--1854-1956. Clarendon Press, Oxford, 1969.

Federal Energy Office, Office of Policy Analysis and Evaluation. Project Independence. A Proposed Program for U.S. Energy Self-Sufficiency by 1980. A Staff Paper. Washington, D. C., February 6, 1974.

Federal Energy Office. Project Independence. Background paper. Washington Energy Conference, February 1974.

Federal Energy Administration. A Discussion of the World Energy Market in 1980 and 1985. April 1974.

Federal Energy Office. National Petroleum Supply and Demand, 1974 Post Embargo. Distributed by National Technical Information Service, U.S. Department of Commerce, PB-232-489, April 1974.

Federal Energy Administration. The Economic Impact of the Oil Embargo on the American Economy. August 8, 1974.

Federal Energy Administration. Office of Policy and Analysis. Office of Quantitative Methods. National Petroleum Product Supply and Demand. October 1974 Through 1975. Technical Report 74-5, November 1974.

Federal Energy Administration. Project Independence, November 1974.

Fischer, Joel and O'Shea, Thomas. "International Oil Prosperity Amidst Anxiety." An industry Report. Drexil Burnham & Co , June 1973.

Field, Michael. "Oil: Opec and Participation." The World Today, January 1972.

Fisher, John C. Energy Crises in Perspective. John Wiley & Sons, New York, 1974.

Ford Foundation's Energy Policy Project. A Time To Choose. Ballinger Publishing Company, Cambridge, Mass., 1974.

Ford Foundation. Exploring Energy Choices: A Preliminary Report. Brookings Institution, Washington, D. C., 1974.

Fritsch, Albert J. and Egan, John W. Big Oil: A Citizen's Factbook on the Major Oil Companies. Center for Science in the Public Interest, Washington, D. C., 1973.

Gall, Norman. "The Challenge of Venezuelan Oil." Foreign Policy, Spring 1975.

Garvey, Gerald. Energy, Ecology, Economy: A Framework for Environmental Policy. W. W. Norton & Co., New York, 1972.

Gay, William F. Energy Statistics. A Supplement to the Summary of National Transportation Statistics. Department of Transportation, DOT-TSC-OST-74-12, August 1974.

Gilpin, Robert. "The Politics of Transnational Economic Relations."

Gilpin, Robert. "Has Modern Technology Changed International Politics." The Analysis of International Politics. Edited by Rosenau, James N., Davis, Vincent and East, Maurice A. The Free Press, New York, 1971.

Gonzalez, Richard., editor. Economics of Energy. Petroleum Economics & Management Conference. Northwestern University Press, Evanston, Illinois, 1969.

Guyol, N. B. Energy in the Perspective of Geography. Prentice-Hall, Englewood Cliffs, New Jersey, 1971.

Hafele, Wolf. Energy Choices That Europe Faces: A European View of Energy. Research Report. International Institute for Applied Systems Analysis, Austria, March 1974.

Hafele, Wolf. Future Energy Resources. Research Report. International Institute for Applied Systems Analysis, Austria, November 1974.

Hammond, Allen L. et. al. Energy and the Future. American Association for the Advancement of Science. Washington, D.C., 1973.

Hammond, P. Y. and Harris, E. D. "Energy Availability and National Security: DoD Issues, Roles, and Research Areas." A working note prepared for the Advanced Research Projects Agency. RAND Corporation, WN-8208-ARPA, March 1973.

Hansen, J. "A New Era in International Oil Economy." Aussenpolitik, English Edition, February 1973.

Hartshorn, J. E. Oil Companies and Governments. Faber and Faber, London, 1962.

Hartshorn, J.E. "Oil Diplomacy: The New Approach." The World Today, July 1973.

Hartshorn, Jack. Europe and World Energy. Chatham House, London, August 1973.

Hermann, Charles. International Crises. New York Free Press, 1973.

Herrera, Phil and Holdren, John. Energy: A Crisis in Power. Sierra Club Books, New Jersey, 1971.

Higgins, G. F., Kuenne, R. E., Michaels, R. J., and Summerfield, M. Intermediate-Term Energy Programs to Protect Against Crude Petroleum Import Interruptions. Feasible Alternatives, Program Costs, and Operational Methods of Funding. Institute for Defense Analyses. Prepared for Federal Energy Administration. Distributed by National Technical Information Service, U.S. Department of Commerce, PB-237209, September 1974.

Hill, Peter and Vieluoye, Roger, with a Forward by Lord Aldington. Energy in Crisis: A Guide to World Oil Supply and Demand and Alternative Resources. Robert Yeatman Limited, 1974.

Hirst, D. Oil and Public Opinion in the Middle East. Praeger, New York, 1966.

Holdren, John P. "Energy and Prosperity. Some Elements of a Global Perspective." Bulletin of the Atomic Scientists, January 1975.

Hopkins, George D., Korens, Nick, Schmidt, Richard A., and Trexel, Carl A., Jr. "Analysis of Energy Resources and Programs of the Soviet Union and Eastern Europe Summary." Rome Air Development Center, Air Force Systems Command, Griffiss Air Force Base, New York. RADC-TR-74-204, Technical Report, December 1974.

Hottell, H. C. and Howard, J. B. New Energy Technology. MIT, Cambridge, Mass., 1971.

Houthakker, Hendrick and Kennedy, Michael. Demand for Energy as a Function of Price. (Processed.)

Howell, Leon and Morrow, Michael. Asia, Oil Politics and the Energy Crisis, IDOC, International Document 60-61, 1974.

Hunter, Robert E. The Energy "Crisis" and U.S. Foreign Policy. Headline Series No. 216, The Foreign Policy Association, Overseas Development Council, Washington D. C., June 1973.

Huntington, Samuel P. "Transnational Organizations in World Politics." World Politics, April 1973.

IISS. The Military Balance 1973-1974. International Institute for Strategic Studies, London, 1973.

IISS. The Military Balance 1974-1975. International Institute for Strategic Studies, 1974.

IISS. Strategic Survey 1973. International Institute for Strategic Studies, 1974.

Institute for Defense Analysis. "Intermediate-Term Energy Programs to Protect Against Crude-Petroleum Import Interruptions." PB-237209, September 1974.

International Economic Report of the President, transmitted to Congress, March 1973.

International Economic Report of the President. U.S. Government Printing Office, Washington, D. C., 1974.

International Petroleum Encyclopedia. 1974.

Iskandar, Marwan. The Arab Oil Question. By the Author. 2nd Edition. January 1974.

Issawi, Charles. Oil, the Middle East and the World. 4: The Washington Papers. The Center for Strategic and International Studies, Georgetown University, Washington, D. C., The Library Press, New York, 1972.

Itayim, Fuad. "Strengths and Weaknesses of the Oil Weapon." (Mimeo.) September 1974.

Jensen, W. G. Energy and the Economy of Nations. Transatlantic Arts, Levittown, New York, 1970.

Kaplan, Morton A., editor. Great Issues of International Politics: The International System and National Policy. Aldine Publishing Company, Chicago, 1970.

Kelly, Thom J. Oil and Other Strategic Imports to U.S. in 1981. SEAMIX III, Working Paper #2. Naval Warfare Analysis Group. Center for Naval Analyses. (CNA) 64-74, January 1974.

Kelly, J. B. "Saudi Arabia and the Gulf States." (Mimeo.) July 1974.

Kennan, George F. "Thank you, No!" Op-ed article in The New York Times, December 1973.

Keohane, Robert O. and Nye, Joseph S. "World Politics and the International Economic System."

Keohane, Robert O. and Nye, Joseph S. "Power and Interdependence." Survival, July/August 1973.

Keohane, Robert O. and Nye, Joseph S. "Transgovernment Relations and International Organizations." World Politics, October 1974.

Keohane, Robert O. and Ooms, Van Doorn. "The Multinational Enterprise and World Political Economy." International Organization, 1972.

Keynes, John Maynard. "National Self Sufficiency." Yale Review, Summer 1973.

Kindleberger, Charles P. Power and Money/The Economics of International Politics and the Politics of International Economics. Basic Books, Inc., 1970.

Kirby, James G., Carleton, David A. and Moore, Betty M. "Crude Petroleum and Petroleum Products." Reprint from the 1972 Bureau of Mines Minerals yearbook, United States Department of the Interior.

Kissinger, H., Secretary of State, Interview in Business Week, January 13, 1975.

Klebanoff, Shoshana. Middle East Oil and U.S. Foreign Policy With Special Reference to the U.S. Energy Crisis. Praeger Publishers, 1974.

Knorr, Klaus. Power and Wealth: The Political Economy of International Power. Basic Books, Inc., 1973.

Krasner, S. D. "Oil is the Exception." Foreign Policy, Spring 1974.

Krause, Lawrence B. "The International Economic System and the Multinational Corporation." The Brookings Institution, Washington D. C., 1972. Reprint 250. Reprinted from the Annals, September 1972.

Krause, Lawrence B. "The U.S. Economy and International Trade." The Brookings Institution, Washington, D.C., 1973. Reprint 281. Reprinted from Structural Adjustments in Asian-Pacific Trade, Papers and Proceedings of the Fifth Pacific Trade and Development Conference, January 1973.

Kristol, Irving. "Where Have all the Gunboats Gone?" Editorial in The Wall Street Journal, December 13, 1973.

Kubbah, Abdul Amir Q. Opec: Past and Present. Petro-Economic Research Center, September 1974.

Landis, Lincoln. Politics and Oil: Moscow in the Middle East. Dunellen Publishing Company, 1973.

Landsberg, Hans and Schurr, Sam H. Energy in the United States: Sources, Uses and Policy Issues. Random House, New York, 1969.

Lapp, Ralph. The Logarithmic Century. Prentice Hall, Englewood Cliffs, New Jersey, 1973.

Laqueur, Walter. The Road to War. Penquin Books, London, 1968.

Laqueur, Walter. Middle East Oil. Vanderbilt University Press, Tennessee, 1970.

Laqueur, Walter. Director, Institute of Contemporary History and Wiener Library, London. "The Middle East Problem." Symposium on National Strategy in a Decade of Change II: An Emerging U.S. Policy Co-Sponsored by Stanford Research Institute and Foreign Policy Research Institute. February, 1973.

Laqueur, Walter and Luttwak, Edward. "Oil." Commentary, October 1973.

Laqueur. Walter. Confrontation: The Middle East War and World Politics. Wildwood House, London, 1974.

Laqueur, Walter. "The Idea of Europe Runs Out of Gas." The New York Times Magazine, January 20, 1974.

Lawrence, Robert M. and Wengert, Norman I., editors. "The Energy Crisis: Reality or Myth." The Annals of the American Academy of Political and Social Science, November 1973.

Leith, C. K, et. al. World Minerals and World Peace. Brookings Institution, Washington, D. C., 1973.

Levy, Walter J. "Oil Power." Foreign Affairs, July 1971.

Levy, Walter J. "An Atlantic Japanese Energy Policy." Foreign Policy, Summer 1973.

Levy, Walter J. "World Oil Cooperation or International Chaos." Foreign Affairs, July 1974.

Lichtblou, John H. "Middle East Oil and the U.S. Energy Crisis." Delivered at the Seminar "The Mounting Energy Crisis and the Middle East" at Johns Hopkins University, School for Advanced International Studies, September 19, 1974.

Lincoln, George A. "Energy Security--New Dimension of U.S. Policy." Air Force Magazine, November 1973.

Longrigg, Stephen H. Oil in the Middle East: its Discovery and Development. 3rd Edition. Oxford University Press, London, 1968.

Lubell, Harold. Middle East Oil Crisis and Western Europe's Energy Supplies. The Johns Hopkins Press, Baltimore, 1963.

Luttwak, Edward. "A New Look at the Energy Crisis." New East Report, April 18, 1973.

Luttwak, Edward. "Farewell to Oil." Commentary, May 1974.

Luttwak, Edward. (Miles Ignatus.) "Seizing Arab Oil." Harper, March 1975.

Mancke, Richard B. The Failure of U.S. Foreign Policy. Columbia University Press, New York, 1971.

Mancke, Richard B. "Petroleum Conspiracy: A Costly Myth." Public Policy, 1974.

Mancke, Richard B. Performance of the Federal Energy Office. National Energy Project. American Enterprise Institute for Public Policy Research, Washington, D.C., February 1975.

Mancke, Richard B. "The Future of OPEC." The Journal of Business, January 1975.

Manners, Gerald. The Geography of Energy. Hutchinson, London, 1971.

McDonald, Stephen L. Petroleum Conservation in the United States. Johns Hopkins University Press, Baltimore, 1971.

McLachlan, Keith and Ghorban, Narsi. Oil Production, Revenues and Economic Development. The Economist Intelligence Unit Limited. QER Special No. 18.

Mendershausen, Horst. "Enlisting Reliable Sources of Supply: Persian Gulf and Elsewhere." RAND Corporation, WN-8582-ARPA, January 1974.

Mendershausen, Horst. "Evaluating Reliable Sources of Supply: Persian Gulf and Elsewhere." Prepared for the Defense Advanced Research Projects Agency. RAND Corporation, WN-8583-ARPA, January 1974.

Mendershausen, Horst. "The U.S. and Western Europe in an Energy Ambush: Problems of Cooperation." RAND Corporation, WN-8598-ARPA, January 1974.

Mendershausen, Horst and Nehrine, Richard. "Protecting the U.S. Petroleum Market Agalnst Future Denials of Imports." RAND Corporation, R-1603-ARPA, October 1974.

The Middle East and North Africa 1973-74, Europa Publications, London, 1973.

Middle East Information Series. "The Energy Problem and the Middle East." May 1973.

Middle East Information Series. "The Energy Problem and the Middle East." Spring/Summer 1974.

Middle East Institute, the 26th Annual Conference Record. World Energy Demands and the Middle East. Washington, D.C., September 1972.

Middle East Information Series. The Energy Problem and the Middle East. American Academic Association for Peace in the Middle East, May 1973.

Middle East Institute. The Arabian Peninsula, Iran and the Gulf States: New Wealth, New Power. A summary record of the 27th Annual Conference, Washington D. C., September 1973.

Middle East Record 1967. Israel Universities Press. Jerusalem, 1972.

Midkashi, Zuhayr. A Financial Analysis of Middle Eastern Oil Concessions: 1961-65. Praeger Special Studies in International Economics and Development. Frederick A. Praeger, 1966.

Mikdashi, Z. The Community of the Oil Exporting Countries. Oxford, Oxford University Press, 1971.

Mikdashi, A. The Community of Oil Exporting Countries: A Study in Governmental Cooperation. Cornell University Press, Ithaca, New York, 1972.

Mikdashi, Z. "Collusion Could Work." Foreign Policy, Spring 1974.

Mikdashi, Z. "Cooperation Among Oil Exporting Countries With Special Reference to Arab Countries: A Political Economy Analysis." International Organization, Winter 1974.

Miller, Linda B. "America in World Politics: Linkage or Leverage?" The World Today, July 1974.

Ministry of International Trade and Industry. Japan's Sunshine Project. BI-3 (74-9) March 1974.

MIT Energy Laboratory Policy Study Group. Energy Self-Sufficiency: An Economic Evaluation. National Energy Project. American Enterprise Institute for Public Policy Research, Washington, D. C., November 1974.

Mitchell, Edward J. U.S. Energy Policy: A Primer. National Energy Project. American Enterprise Institute for Public Policy Research, Washington D. C., June 1974.

Mitre Corporation. Energy Self-Sufficiency. How Much and How Soon? Symposium/Workshop Summary report, September 1974.

Modelski, George. "Multinational Business. A Global Perspective." International Studies Quarterly, 1972.

Momota, Tsuneo. "The Sunshine Project Development Program of New Clean Energy Technology in Japan." Technology Assessment--Will it Help Resolve the Energy-Environment Conflict? U.S.-Japan Joint Symposium held at the Mitre Corporation, McLean, Va., February 5-6, 1974.

Monroe, Elizabeth and Mabro, Robert. Oil Producers and Consumers: Conflict or Cooperation. An International Seminar Report. The Center for Mediterranean Studies, American Universities Field Staff, Inc., 1974.

Moorsteen, Richard M. "Action Proposal: Opec Can Wait--We Can't." Foreign Policy, Spring 1975.

Moran, Theodore H. "The Multinational Corporation Versus the Economic Nationalist: Independence and Domination in Raw Materials." (Mimeo.)

Morgenthau, Hans J. "The Geopolitics of Israel's Survival." The New Leader, February 1974.

Morse, Edward L. "The Confidence Problem and International Monetary Crises." (Mimeo.) Prepared for discussion at the International Political Economy Summer Conference (June 30 - July 9, 1972) at St. Catherine's Cumberland Lodge, Windsor Park.

Morse, Edward L. "Interdependence in World Affairs." (Mimeo.) Forthcoming as Chapter 30 of World Politics, edited by James Rosenau, Kenneth Thompson, Gavin Boyd. The Free Press, 1974. Princeton University, July 1973.

Morse, Edward L. "The Transformation of Foreign Policies. Modernization, Interdependence, and Externalization." World Politics.

Mosley, Leonard. Power Play: Oil in the Middle East. Random House, New York, 1973.

Moynihan, Daniel. "The United States in Opposition." Commentary, March 1975.

National Petroleum Council. U.S. Energy Outlook: A Report to the National Petroleum Council's Committee on U.S. Energy Outlook. National Petroleum Council, Washington D. C., 1972.

National Petroleum Council. "Emergency Preparedness for Interruption of Petroleum Imports into the United States." July 1973.

National Petroleum Council Committee on U.S. Energy Outlook. U.S. Energy Outlook. December 1973.

Newland, Kathleen and Sweet, William. "The Impact of the Energy Crisis in the Third World." (Mimeo.) May 8, 1974.

Newlon, Daniel H. and Breckner, Norman V. "The Oil Security System--An Oil Import Policy for the United States." Center for Naval Analyses. Prepared for the Office of Naval Research. Distributed by National Technical Information Service, U.S. Department of Commerce. AD779283, January 1974.

Nippon Steel Corporation. "The Outlook for Commodity Markets, Worldwide." October 1974.

Noble, Stedman B. "Resources and the Political Options Facing the U.S." (Mimeo.) International Research and Technology Corporation, Virginia, July 1974.

Nye, J.S. "Collective Economic Security." International Affairs, October 1974.

Odell, P. An Economic Geography of Oil. Bell, London, 1963.

Odell, Peter R. Oil and World Power: A Geographical Interpretation. Taplinger Publishing Company, New York, 1971.

Odell, Peter R. Oil and World Power. A Geographical Interpretation. Second edition. Penguin Books, 1972.

Odell, P. "Oil and Western European Security." Brassey's Annual, 1972.

Odell, Peter. The Availability of Indigenous Energy in Western Europe 1973-98 With Special Reference to Oil and National Gas. Prepared for the 1st World Symposium, Energy and Raw Materials, Paris, June 1974.

Odum, Howard T. Environment, Power, and Society. Wiley, New York, 1971.

OECD. Energy Policy. Organization for Economic Co-operation and Development, Paris 1966.

OECD. Statistics of Energy 1953-1967. Paris, 1969.

OECD. Statistics of Energy 1956-1970. Paris 1972.

OECD. Economic Outlook 14. December 1973.

OECD. Oil: The Present Situation and Future Prospects. Organization for Economic Co-operation and Development, Paris, 1973.

OECD. Economic Outlook 15. July 1974.

OECD. Energy Prospects to 1985. 2 Volumes. Organization for Economic Co-operation and Development, 1974.

OECD. Statistics of Energy 1959-1973. Paris, 1974.

The Oil and Gas Journal. "Uncertainties Plague '75 Outlook for Oil." January 27, 1975.

Okita, Saburo. "Natural Resource Dependence and Japanese Foreign Policy." Foreign Affairs, July 1974.

OPEC. Cheap Energy, Diversification of Sources and Security of Supply. PR/66/1, 1965.

OPEC. Unit, Annual Statistical Bulletin, Organization of the Petroleum Exporting Countries, Vienna, 1972.

OPEC. Annual Statistical Bulletin 1972. Organization of the Petroleum Exporting Countries. Statistics Unit, June 1973.

Pachter, Henry M. "Imperialism in Reverse." Harper's Magazine, June 1(&$.

Parker, John B. "U.S. Agricultural Exports to OPEC Doubled in 1974." Foreign Agricultural Trade of the United States, March 1975.

Penrose, Edith T. The Growth of Firms, Middle East Oil and Other Essays. Frank Cass Lts., London 1971.

Penrose, Edith. "The Multinational Oil Corporations in the Middle East" (Mimeo.) School of Oriental and African Studies, University of London, January 1974.

Peppers, Don, Weiner, Bob and Wood, Jack. "A Framework for a New Foreign Policy for the United States." A.P.A. 546 Committee Repo t (Mimeo.) April 1973.

Petroleum Industry Research Foundation, Inc. Oil Imports and the National Interest. March 1971.

Petroleum Industry Research Foundation, Inc. U.S. Oil Imports and Import Dependency June-October 1974. New York, December 1974.

Petroleum Publishing Co. International Petroleum Encyclopedia, 1974.

Pfaltzgraff, Robert L., Jr. "International Relations Theory: Retrospect and Prospect." International Affairs.

Pollack, Gerald A. "The Economic Consequences of the Energy Crisis" Foreign Affairs, April 1974.

Pranger, Robert J. American Policy for Peace in the Middle East 1969-1971. American Enterprise Institute for Public Policy Research, Washington, D.C., 1971.

Preeg, Ernest H. "Economic Blocs and U.S. Foreign Policy." National Planning Association. Report Number 135. January 1974.

Proceedings of 1st World Symposium on Energy and Raw Materials. Paris, June 1974.

Ramazani, Rouhollah K. The Persian Gulf: Iran's Role. University of Virginia Press, Charlottesville, 1972.

Ransom, Harry Howe. "Strategic Intelligence and Foreign Policy." World Politics. October 1974.

Raphael, Coleman. President, Atlantic Research Corporation. "A Rational Energy Policy" (Mimeo.) Alexandria, Virginia. April 1974.

Ravenal, Earl C. "The Oil-Arab Scenario." The New Republic. January 18, 1975.

Ray, Dixy Lee. Chairman, United States Atomic Energy Commission. "The Nation's Energy Future." A Report to Richard M. Nixon, President of the United States. WASH-1281. December 1973.

Remba, Oded, Editor. The Energy Problem and the Middle East. American Academic Association for Peace in the Middle East's Middle East Information Series, 1974.

Ridgeway, James. The Last Play: The Struggle to Monopolize the World's Energy Resources. E. P. Dutton, New York, 1973.

Rocks, Lawrence and Runyon, Richard P. The Energy Crisis. Crown Pub., New York, 1972.

Rolfe, Sidney E. "A Primer on Petrodollars." The New Republic January 18, 1975.

Rolfe, Sidney. "Whatever Happened to Project Independence?" Saturday Review. January 25, 1975.

Rose, David J. "Energy Policy in the U.S." Scientific American, January 1974.

Rosecrance, Richard and Stein, Arthur. "Interdependence: Myth or Reality." World Politics. October 1973.

Rosenbaum, Naomi, ed. Readings on the International Political System, Foundations of Modern Political Science Series, Robert A. Dahl, Editor, Prentice Hall, 1970.

Rostow, Dankwart A. "Dependence and Dependability: Political Prospects for Middle East Oil" in Oil Imports and the National Interest; Petroleum Industry Research Foundation, Inc. New York, 1971.

Rouhani, Fuad. A History of O.P.E.C. Praeger Publishers, Inc., New York, 1971.

Rubin B., Winter S., Ramsey W. and Werth, G. "A Rationale for Setting Priorities for New Energy Technology Research and Development." Prepared for U.S. Atomic Energy Commission. Lawrence Livermore Laboratories. University of California, Livermore. UCRL-51511. January 1974.

Russell, Robert W. "Identifying Leverage Points in the Formulation of International Monetary Policy." (Mimeo.) Prepared for delivery at the 1974 Annual meeting of the APSA, Chicago, Illinois. 1974.

Safer, Arnold E. and Mills, Anne Parker. Outlook for World Oil: Prices and Petrodollars. Economic Research and Planning Division, Irving Trust Company, New York, March 20, 1975.

Safran, Nadav. "American-Israeli Relations: A Look into the Future." (Mimeo.)

Safran, Nadav. "Arab Politics, Peace and War." ORBIS. 1974.

Schelling, Thomas S. Arms and Influence. Yale University Press, 1971.

Schlesinger, James R. The Political Economy of National Security. Praeger, New York, 1960.

Schmalz, Anton B. ed. with a Forward by Vice President Gerald R. Ford and an Epilogue by John W. Gardner. Energy: Today's Choices, Tomorrow's Opportunities. Essential Dimensions in Thinking for Energy Policy. World Future Society, Washington, D.C., 1974.

Schmidt, Richard A. "Support of Energy Program Planning." Prepared for Defense Advanced Research Projects Agency, September 1972, Distributed by National Technical Information Service, U.S. Department of Commerce AD 755222.

Schneider, William "Can We Avert Economic Warfare in Raw Materials? U.S. Agriculture as a Blue Chip." Agenda published by National Strategy Information Center, INc., 1974.

Schulz, Klaus Peter. "Are the Lights Going Out All Over Europe?" The German Tribune, Political Affairs Review, Hamburg, June 27, 1974.

Schurr, Sam H. and Homan, Paul T. with Darmstadter, Joel, Frank, Helmut, Schanz, John J., Jr., Stauffer, Thomas R. and Steele, Henry. Middle Eastern Oil and the Western World: Prospects and Problems. American Elsevier Publishing Company, Inc. New York, 1971.

Seale, Robert L. Energy Needs and the Environment. University of Arizona Press, Tucson.

Searl, Milton F. editor. Energy Modeling: Art, Science and Practice Conference Proceedings, Resources for the Future, Washington, D.C., 1973.

Searl, Milton. Towards Self Sufficiency in Energy Supply, Resources for the Future. Prepared for the Ford Foundation Energy Policy Project, Ballinger Publishing Company, 1974.

Shell Oil Papers. The National Energy Outlook, March 1973.

Shell Oil Papers. The National Energy Problem: The Short Term Supply Prospect. June 1, 1973.

Shimado Jin. "Japan's Sunshine Project: The Quest for New Forms of Clean Energy." Technocrat, February 1974.

Shwadran, Benjamin. The Middle East, Oil and the Great Powers. John Wiley & Sons and Israel Universities Press, 3rd edition, New York 1973.

Shwadran, Benjamin. Middle East Oil Latest Phase. Occasional paper. Tel Aviv University, January 1974.

Sipri Monograph. Oil and Security. Stockholm International Peace Research Institute, Almgvist & Wiksell International, Stockholm and New York, Humanities Press, 1974.

Sipri Yearbook 1974. World Armaments and Disarmament. Stockholm International Peace Research Institute. Stockholm, Almgvist & Wiksell and the MIT Press, 1974.

Skeptic, The Forum for Contemporary History. A Special Issue on the Problem of Energy.

Slocum, M. "Soviet Interests in the Middle East Oil." (Mimeo.) December 1973.

Sparling, Richard C., Zraby, Arthur J. and Anderson, Norma J. with Winger, John G. "Annual Financial Analysis of a Group Petroleum Companies, 1971." The Chase Manhattan Bank. NA. 1972.

Sparling, Richard C., Anderson, Norma J. and Dobias, Richard S. with Winger, John G. "Annual Financial Analysis of a Group of Petroleum Companies 1972." The Case Manhattan Bank. N.A. 1973.

Spiegel, Steven. "The Fate of the Patron: American Trials in the Arab-Israeli Dispute." Public Policy, Summer 1973.

Sprout, Harold and Sprout, Margaret. Towards a Politics of the Planet Earth. D. Van Nostrand Company, 1971.

Stanley H. Ruttenberg and Associates, Inc. The American Oil Industry: A Failure of Anti-Trust Policy. Marine Engineers' Beneficial Association, December 1973.

Stevens, Georgiana G. "Western Europe and the Middle East Dilemma." Vista, December 1973.

Stockholm International Peace Research Institute. Oil and Security. Humanities Press, New York, 1974.

Stocking, George W. Middle East Oil: A Study in Political and Economic Controversy. Vanderbilt University Press, Nashville, 1970.

Storr, Lcol, J.W. The Impact of Energy on Strategy. Staff Note 74/14. Directorate of Strategic Analysis, Department of National Defence--Canada. July 1974.

Sullivan, R.W. et al. A Brief Overview of the Energy Requirements of the Department of Defense. Battelle Colombus Laboratories, Columbus, Ohio, August 1972.

Szulc, Tad. "What's Next in the Oil Crisis." Esquire, May 1974.

Szyliowicz, Joseph S. and O'Neill, Bard E. Editors. The Energy Crisis and U.S. Foreign Policy. Praeger Publishers, 1975.

Tahtinen, Dale R. Arms in the Persian Gulf. American Enterprise institute for Public Policy Research. Washington, D.C., 1974.

Tahtinen, Dale R. The Arab Israeli Military Balance Since Octol 1973. American Enterprise for Public Policy Research, Washington, D.C., 1974.

Tanzer, M. The Political Economy of Oil and Underdeveloped Countries. Beacon Press, Boston, 1969.

Tanzer, Michael. The Energy Crisis: World Struggle for Power and Wealth. Monthly Review Press, New York, 1974.

Theberge, James D. "Action Proposals: Raw Materials." Foreign Policy, Winter 1974-5.

Time Magazine. "The Arms Dealers: Guns for All," March 3, 1975.

Tuppetts, Charles S. Autarchy: National Self Sufficiency. Public Policy Pamphlet No. 5. The University of Chicago Press, 1933.

Tobias, Andrew. "War--The Ultimate Antitrust Action." New York. October 14, 1974.

Tollison, Robert D. and Willett, Thomas D. "international integration and the interdependence of Economic Variables." International Organization.

Trajkovic, Miodraf. "Hi-jacking: No Law to Outlaw." Review of international Affairs, November 1973.

Tripartite Meeting on Energy, "Cooperative Approaches to World Energy Problems," Brussels, March 1974.

Ullman, Richard H. "After Rabat: Middle East Risks and American Roles." Foreign Affairs, January 1975.

United Nations, Department of Economic and Social Affairs, World Energy Supplies, 1969-1972, Statistical Papers Series J, No. 17.

United Nations. World Economic Survey, 1973. Department of Economic and Social Affairs, United Nations, New York, 1974.

U.S. Cabinet Task Force on Oil Import Control. The Oil Import Question, a Report on the Relationship of Oil Imports to National Security. Government Printing Office, Washington, D.C., 1970.

U.S. Congress. Joint Committee on Atomic Energy. Certain Background Information for Consideration When Evaluating the "National Energy Dilemma." 93d Congress, 1st Session, 1973.

U.S. Congress, Senate. Committee on Interior and Insular Affairs. Current Analysis of Petroleum Supplies for First Quarter 1974. 93rd Congress, 2nd Session, 1974.

U.S. Congress, House. Prepared for the Committee on Foreign Affairs by the Foreign Affairs Division, Congressional Research Service, Library of Congress. Data and Analysis Concerning the Possibility of a U.S. Food Embargo as a Response to the Present Arab Oil Boycott. 93d Congress. 1st Session. November 29, 1973.

U.S. Congress. Hearings before the Subcommittee on International Economics of the Joint Economic Committee. Economic Impact of Petroleum Shortages. 93d Congress, 1st Session. December 11, 12 and 13, 1973.

U.S. Congress. Committee on Foreign Relations, United States Senate. Emergency Military Assistance for Israel and Cambodia. 93rd Congress, 1st Session, December 13, 1973.

U.S. Congress, House. Subcommittee on Energy of the Committee on Science and Astronautics. Prepared by the Science Policy Research Division, Congressional Research Service, Library of Congress. Energy Facts. 93rd Congress, 1st Session, November 1973.

U.S. Congress, Senate Subcommittee on Energy of the Committee on Finance. Fiscal Policy and the Energy Crisis. 93rd Congress, 1st Session, November 20, 1973.

U.S. Congress, House. Subcommittee on Foreign Economic Policy of the Committee on Foreign Affairs. Foreign Policy Implications of the Energy Crisis. 92nd Congress, 2nd Session, September 21, 26, 27; October 3, 1972.

U.S. Congress, Senate. Subcommittee on the Near East and South Asia of the Committee on Foreign Affairs. Prepared by the Foreign Affairs Division, Congressional Research Service, Library of Congress. Means of Measuring Naval Power with Special Reference to U.S. and Soviet Activities in the Indian Ocean. 934d Congress, 2nd Session, May 12, 1974.

U.S. Congress, Senate. Committee on Interior and Insular Affairs. Measurement of Corporate Profits. 93d Congress, 2d Session, 1974.

U.S. Congress, House. Report of the Ad Hoc Committee on the Domestic and International Monetary Effect of Energy and Other Natural Resource Pricing of the Committee on Banking and Currency. Meeting America's Resource Needs: Problems and Policies. 93rd Congress, 2d Session, November 1974.

U.S. Congress, Senate. Hearings before the Subcommittee on Multinational Corporations of the Committee on Foreign Relations. Multinational Corporations and United States Foreign Policy. 93rd Congress, 1st and 2d Sessions. 7 Volumes. January 1974-January 1975.

U.S. Congress, House. Hearings of Subcommittee on the Near East and South Asia. New Perspectives on the Persian Gulf. 93d Congress, 1st Session, 1973.

U.S. Congress, Senate. Committee on Finance. Oil Company Profitability. 93d Congress, 2d Session, February 12, 1974.

U.S. Congress, House. Subcommittee on the Near East and South Asia, Committee on Foreign Affairs. Department of State Estimates. The Impact of the October Middle East War. 93d Congress, 1st Session, October-November 1973.

U.S. Congress, Senate. Committee on Interior and INsular Affairs. Oil and Gas Imports Issues. 93rd Congress, 1st Session, Jan. 10, 11, 22, 1973.

U.S. Congress, House. Subcommittee on Foreign Economic Policy and the Subcommittee on the Near East and South Asia of the Committee on Foreign Affairs. Oil Negotiations, OPEC, and the Stability of Supply. 93rd Congress, 1st Session. April 10; May 14, 16; July 11; September 5 and 18, 1973.

U.S. Congress, Senate. Committee on Interior and Insular Affairs. Survey of Energy Consumption Projections. 92d Congress, 2d Session, 1972.

U.S. Congress. Hearings before the Subcommittee on Africa of the Committee on Foreign Affairs. The Crisis of Development and Interdependence. 93rd Congress, 1st and 2nd Sessions, May 23; June 12, 20; July 27, 1973 and February 26, 1974.

U.S. Congress, Senate. Prepared for the Subcommittee on Multinational Corporations of the Committee on Foreign Relations. The International Petroleum Cartel, the Iranian Consortium and U.S. National Security. 93d Congress, 2d Session. February 21, 1974.

U.S. Congress, Senate. Report of Senator Henry M. Jackson to the Committee on Armed Services. The Middle East and American Security Policy. 91st Congress, 2d Session, December 1970.

U.S. Congress, Senate. Subcommittee on Near Eastern Affairs, of the Committee on Foreign Relations. The Middle East Between War and Peace November-December 1973. 93rd Congress, 2nd Session, March 5, 1974.

U.S. Congress, House. Hearings before the Subcommittee on the Near East and South Asia of the Committee on Foreign Affairs. The Middle East, 1974: New Hopes, New Challenges. 93d Congress, 2d Session. April 9; May 7, 14, 23 and June 27, 1974.

U.S. Congress, House. Hearings before the Subcommittee on the Near East and South Asia of the Committee on Foreign Affairs. The Persian Gulf, 1974: Money, Politics, Arms, and Power. 93rd Congress, 2nd Session. July 30; August 5, 7 and 12, 1974.

U.S. Congress, House. Report of a Study Mission to the Middle East from October 22 to November 3, 1973, Committee on Foreign Affairs. The United States Oil Shortage and the Arab-Israeli Conflict. 93rd Congress, 1st Session, December 20, 1973.

U.S. Congress, House. Report on the Fifth Meeting of Members of Congress and of the European Parliament, for the Committee on Foreign Affairs. Turbulent Era: The Year of Europe in Retrospect, Florence, 1974, 93d Congress, 2d Session, June 1974.

U.S. Congress. Hearings before the Subcommittee on Europe and on the Near East and South Asia of the Committee on Foreign Affairs. United States-Europe Relations and the 1973 Middle East War. 93d Congress, 1st and 2d Sessions. November 1, 1973 and February 19, 1974.

U.S. Congress, Senate. U.S. Tariff Commission, the Committee on Finance World Oil Developments and U.S. Oil Import Policies. 93rd Congress, 1st Session, December 12, 1973.

U.S. Department of Agriculture, "Foreign Agricultural Trade of the United States." March 1975.

United States Department of the Interior. The Middle East Petroleum Emergency of 1967. Office of Oil and Gas, Washington, D.C., 2 Volumes. 1969.

The United States Strategic Bombing Survey. The Effects of Strategic Bombing on the German War Economy. Overall Economic Effects Division, Washington, D.C., 31 October, 1945.

Usmani, I.H. "Sharing the Energy Crisis." (Mimeo.)

Van Sant, Carl. Strategic Energy Supply and National Security. Praeger Special Studies in International Politics and Public Affairs. Praeger Publishers, 1971.

Vicker, Ray. The Kingdom of Oil. The Middle East: Its People and Its Power. Charles Scribner's Sons, New York, 1974.

Vicker, Ray. "OPEC Test an Uneasy Unity," The Wall Street Journal, February 27, 1975.

Wagstaff, Reid H. Geography of Energy. William C. Brown. Dubuque, III, 1972.

Warman, H.R. "The Future of Oil." Geographical Journal, 1972, Vol. 138, Part 3.

The Washington Post. "Oil Embargo Futile: Yamani." January 18, 1974.

Wedley, William C. "Libya--Super-Rich, Labor-Poor." Columbia Journal of World Business, Summer 1974.

World Energy Supplies. The Unavoidable Challenge, The Financial Times, London, 1974.

World Oil. International Outlook, August 15, 1974.

Yaari, S. "The Basic Economics of Arab Oil Actions." (Mimeo.) 1973.

Yager, Joseph A. and Steinberg, Eleanor B. Energy and U.S. Foreign Policy. A report to the Energy Policy Project of the Ford Foundation. Ballinger Publishing Company. A Subsidiary of J. B. Lippincott Company. Cambridge, Mass., 1974.

Yamanaka, C. et al. "Plasma Generation and Heating for Thermonuclear Temperature by Lasers." IPPJ-117 Institute of Plasma Physica, Nagoya University, January 1972.

Yergin, Daniel. "The Economic Political Military Solution." The New York Times Magazine, February 10, 1975.

Yost, Charles W. "The Geopolitics of Israel's Survival." The New Leader. February 1974.

Young, Oran R. "Interdependence in World Politics." International Journal.

Zinke, Otto Henry. Energy in the Near Term. Department of Commerce Energy Study. State of Arkansas. June 1973.

Zionist Organization of America. "The Energy Crisis. Its Ramifications for the United States and the State of Israel." Public Affairs Department, New York.

Zraket, Charles A. "Energy Resources for the Year 2000 and Beyond." The Mitre Corporation. November 1974.

Zraket, Charles A. "Energy Resources for the Year 2000 and and the Year 2100." The Mitre Corporation MTP-401, March 1975.

ADDITIONAL PERIODICALS

1. Arab Report & Record
2. BRIEF--Middle East Highlights
3. Energy Digest
4. Energy Policy
5. Energy Review
6. Energy Users Report
7. International Financial Statistics
8. MEMO--Middle East Money
9. Middle East Economic Survey
10. The Middle East
11. Near East Report
12. The Oil Daily
13. Oil and Gas Journal
14. OECD--The Economic Outlook
15. Oil in the Middle East
16. The Petroleum Economist
17. The Petroleum Intelligence Weekly
18. Platt's Oilgram
19. World Oil

UNCLASSIFIED
Security Classification

DOCUMENT CONTROL DATA - R&D
(Security classification of title, body of abstract and indexing annotation must be entered when the overall report is classified)

1. ORIGINATING ACTIVITY (Corporate author)
Hudson Institute, Inc.
Quaker Ridge Road
Croton-on-Hudson, New York 10520

2a. REPORT SECURITY CLASSIFICATION
UNCLASSIFIED

2b. GROUP

3. REPORT TITLE
AMERICAN SECURITY AND THE INTERNATIONAL ENERGY SITUATION

4. DESCRIPTIVE NOTES (Type of report and inclusive dates)

5. AUTHOR(S) (Last name, first name, initial)
Arad, Uzi B. and Smernoff, Barry J.

6. REPORT DATE
15 April 1975

7a. TOTAL NO. OF PAGES
950

7b. NO. OF REFS

8a. CONTRACT OR GRANT NO.
MDA903 74 C 0286

b. PROJECT NO.

c.

d.

9a. ORIGINATOR'S REPORT NUMBER(S)
HI-2239-RR-Vol-1

9b. OTHER REPORT NO(S) (Any other numbers that may be assigned this report)

10. AVAILABILITY/LIMITATION NOTICES
DISTRIBUTION STATEMENT A
Approved for public release;
Distribution Unlimited

11. SUPPLEMENTARY NOTES

12. SPONSORING MILITARY ACTIVITY
Defense Advanced Research Projects Agency
1400 Wilson Blvd.
Arlington, Virginia 22209

13. ABSTRACT

This report sets down the results of research on some of the significant problems relating to energy and national security. The relationship of the security of oil supplies to market conditions in the past and in the future is examined. An analysis is made of the scope of oil revenues for domestic and foreign investment and of the patterns of economic development and investment in Middle East oil producing countries. The general questions of access to non-oil global resources and the relationship of energy and American economic security are addressed.

DD FORM 1 JAN 68 1473

172000

UNCLASSIFIED
Security Classification