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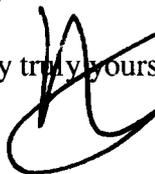
August 11, 2009

Mr. David Horrock
Supervisory Archivist
Gerald R. Ford Presidential Library
1000 Beal Avenue
Ann Arbor, MI 48109

Dear David:

When President Ford lost the election, we prepared a background briefing paper for the incoming administration which is attached. Also attached is a copy of my transmittal letter to President-Elect Carter and his response.

Very truly yours,

A handwritten signature in black ink, appearing to be 'F. Zarb', written over the closing text 'Very truly yours,'. The signature is stylized and includes a long horizontal stroke extending to the right.

JIMMY CARTER

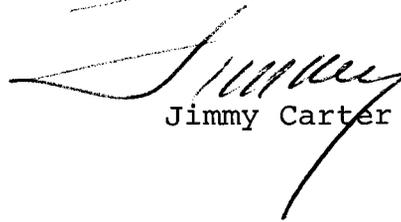
December 29, 1976

To Frank Zarb

I've read your Perspective on Energy, and appreciate your sending it to me.

I will carefully review your information so that we may get ideas for evolving a long range national energy policy.

Sincerely,



Jimmy Carter

JC/jsr

77 JUN 10 PM 4:15



FEDERAL ENERGY ADMINISTRATION

WASHINGTON, D.C. 20461

OFFICE OF THE ADMINISTRATOR

December 3, 1976

Honorable Jimmy Carter
President-Elect of the United States
Carter-Mondale Transition Group
P.O. Box 2600
Washington, D.C. 20013

Dear President-Elect Carter:

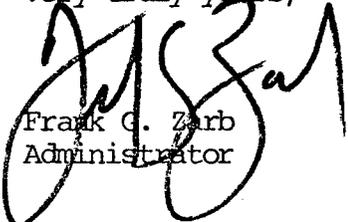
I would like to add to the many good wishes you have already received on your election as the 39th President of the United States.

Having grappled with the United States energy program for the last two years it is good to see that it will continue to be a major issue which will receive your personal attention. As you must know, I firmly believe that there is no more pressing problem facing this Nation over the next ten years than that of achieving a higher level of energy self-sufficiency for the United States economy.

We have been spending considerable time with your energy transition team, who appear to be doing a thorough and competent job of preparation for the new Administration. I hope that between now and the time I leave office in January we might have an opportunity to personally meet to discuss some of the overriding energy issues, obstacles and potential solutions as I have come to know them during the last twenty-four months.

You can count on me to help in any way possible in the months and years ahead to help you move this Nation further toward our national energy goals.

Very truly yours,


Frank G. Zarb
Administrator

Perspective on Energy Policy

**Elliot L. Richardson
Secretary of Commerce**

**Frank G. Zarb
Administrator
Federal Energy Administration**

December 16, 1976

PREFACE

Domestic and international events of the last few years have had a dramatic effect on our energy situation and prospects for the future.

Internationally, the United States helped establish the International Energy Agency which will continue to provide an effective vehicle for international cooperation among energy consuming nations. We have negotiated and brought to operational readiness an integrated emergency program to enhance the ability of all consuming nations to withstand the economic impact of a future embargo, and we have successfully tested a program for managing the international allocation of oil during supply emergencies. We are also fostering a new cooperative dialogue between oil producers and consumers to find a long-term solution to our respective problems.

On the domestic front, we have participated in an intensive debate on national energy policy. At times the debate seemed mired in conflict, but five major pieces of energy legislation have now been enacted into law. These provide for a range of supply, conservation, and standby measures which lay the foundation for improving our energy situation.

However, the Nation has not confronted the choices and issues fully. A wide range of actions is still needed, and the debate will continue.

While the foundation is in place, our energy dependence has worsened. The U.S. imports more oil from the OPEC nations than ever before and foreign oil bills keep rising.

The following Perspective on Energy Policy focuses on the many broad energy issues currently confronting this Nation. It has been prepared in the hope that the Congress and the new Administration will assess the varied initiatives that may be undertaken to resolve these issues, debate their effectiveness, settle their differences, and enact whatever additional energy legislation is necessary. This Perspective on Energy Policy is not intended to be an exhaustive analysis of our energy problem, but rather, an overview of those areas where accomplishments have been made, those areas where changes are needed, and those

initiatives which should be analyzed in greater depth. It does not shy away from considering new initiatives and is not merely a brief for previous policies. We hope that it usefully serves its purpose.



ELLIOT L. RICHARDSON
CHAIRMAN
ENERGY RESOURCES COUNCIL



FRANK G. ZARB
EXECUTIVE DIRECTOR
ENERGY RESOURCES COUNCIL

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SECTION 1

THE ENERGY SITUATION

Background

- The oil embargo in late 1973 was a shock to most of the American people and demonstrated the extent to which our energy situation had deteriorated. Most Americans still assumed that the United States supplied most of its own energy and still dominated the world oil pricing system. However, beginning several decades earlier, the roots of our current energy problem were beginning to take shape.

- Coal
 - Coal is the United States' most abundant energy resource (about 90 percent of our reserves). During the early part of this century, coal supplied most of the nation's power. As the popularity of the automobile increased, as environmental protection became a national concern, and as railroad travel deteriorated, the demand for petroleum and natural gas grew and replaced coal in many uses.

 - As a result of these trends, coal production has only recently exceeded levels reached in the 1920's and its percentage of total energy demand has fallen dramatically (from accounting for almost 80 percent of our energy in 1920, coal had fallen to less than 20 percent by 1973). Coal production should be about 660-670 million tons in 1976 (as compared to about 600 million tons in 1973).

- Oil
 - Domestic petroleum production increased initially in response to rising demand. While energy demand was growing at about 3.6 percent annually, oil consumption was up about 4.6 percent. However, oil exploration peaked in the 1950's and declined until 1974, for several reasons:

- Domestic oil production had become less profitable because of rising costs and depressed prices caused by the availability of inexpensive foreign oil;
 - Exploration and development by the oil industry in frontier areas was restricted because of environmental concerns;
 - The better drilling prospects were exhausted over time;
 - State production rate limitations reduced profitability.
- Additions to proved reserves also declined and domestic U. S. crude oil production reached its all-time peak of 9.6 million barrels per day (MMB/D) in 1970 (as compared to 8.1-8.2 MMB/D in 1976). An encouraging trend in 1976 has been the increase in exploration activity (drilling reached a 14-year high).
- As a result of rising demand and declining supply, U. S. imports grew. Imports were:
- very small in the 1950's
 - 3.4 MMB/D in 1970 (or 23% of U. S. oil consumption)
 - 6.2 MMB/D in 1973 (or 35%)
 - 7.0 MMB/D (est.) in 1976 (or about 40%)
- With rising imports and rising prices came a higher bill for foreign oil. In 1970, the U. S. paid about \$2.7 billion for imported oil; in 1975, the bill had risen to \$27 billion and was about \$34 billion in 1976. Most of the increase in imports has come from Arab sources, since those are the sources with extra production capacity.
- Natural Gas
- While natural gas production rose substantially during the 1960's, its growth rate began to decline in 1969, mainly due to price controls on the interstate market.
- Natural gas production peaked at 22.6 Tcf in 1973 and declined to under 20 Tcf in 1976. Most of the decline has been in interstate sales, causing growing natural

gas curtailments in the Mid-Atlantic, Midwest, and other areas.

- Nuclear

- Although nuclear power has accounted for an increasing share of electricity generation, its growth has been slowed by the lengthy licensing process and siting problems due to safety and environmental concerns.
- The United States now has 63 operating nuclear plants, supplying about 9 percent of electric power.

- Others

- Other sources of energy, such as solar and geothermal, are growing, but do not contribute a significant share of U. S. energy needs.

The Rise of OPEC

- The domination of the Organization of Petroleum Exporting Countries (OPEC) over world oil production and prices has been largely a phenomenon of increased world demand and abundant OPEC resources. The Middle Eastern and North African members of OPEC possess 70 percent of the world's known, easily recoverable oil reserves.
- In 1960, Venezuela, Saudi Arabia and several other Middle Eastern nations formed OPEC to gain control over the price and production levels of crude oil in their respective countries. Ultimately, OPEC gained such absolute control over its oil that oil company concessions began to be effectively nationalized and the price for their oil was increased sharply. In October 1973, the Arab members of OPEC effected an oil embargo.
 - The effect of the embargo on the U. S. was appreciable. GNP dropped by between \$10 and \$20 billion and unemployment increased by approximately 500,000. Consumer prices increased by about 10 percent in 1974, one-third of this due directly to higher world oil prices. The embargo demonstrated clearly the need to re-evaluate our domestic and international energy policies.

U. S. Reactions to the Embargo

- Government Energy Organization. An initial reaction to the embargo was to reorganize government energy functions which, until then, had been widely dispersed.
 - During the embargo, the President established (on December 4, 1973) the Federal Energy Office (FEO).
 - The Administration submitted and Congress enacted, in 1974, legislation to create a Federal Energy Administration (FEA); to abolish the Atomic Energy Commission; and to create the Energy Research and Development Administration (ERDA) and the Nuclear Regulatory Commission (NRC). Congress also established an Energy Resources Council (ERC) in the Executive Office of the President.
- Project Independence. During the embargo, President Nixon announced a program called Project Independence to achieve energy self-sufficiency by 1980.
 - In March 1974, the FEO began work on a report to assess the feasibility of Project Independence. The report was derived from a major analytical effort to forecast energy supply and demand growth through 1985 and to examine the constraints affecting energy. The Project Independence Report indicated that energy self-sufficiency by 1980 was impossible, but that an aggressive program of resource development and conservation could eliminate any adverse impact of future embargoes by 1985.
- Administration Strategy. The fundamental approach taken by the Administration to solve the energy problem was to develop new sources of supply consistent with environmental protection; remove restrictive government controls from the energy marketplace; encourage conservation through pricing and, where appropriate, regulation; and develop standby authorities to deal with a future embargo. The Energy Independence Act of 1975, proposed by President Ford, embodied these principles.
 - The major efforts proposed to increase domestic supply were the elimination of price controls from crude oil and natural gas; authorization of production from the Naval Petroleum Reserves; reduction of regulatory lag in the licensing

and siting of nuclear plants; conversion of power plants from oil and gas to domestic coal; acceleration of Federal coal development and OCS leasing programs; and a program of financial support for synthetic fuel commercialization.

- To encourage conservation, the Administration proposed mandatory thermal efficiency standards for all new buildings; appliance labeling; an insulation tax credit; a system of import fees, taxes, and decontrolled prices; voluntary automobile fuel efficiency goals; and a weatherization assistance program for low-income families.
 - In addition, programs were adopted to try to make the Nation aware of the critical nature of the energy problem and to provide information to private citizens, industry and commercial concerns on how to use energy more efficiently.
 - The attempt to educate the Nation regarding the seriousness of the energy situation was undermined by public suspicion that the energy crisis was a creation of the oil industry to justify higher prices and generate windfall profits.
- To protect the United States from the severe impact of another embargo or other supply disruption, the Administration also submitted legislation to the Congress for the creation of a strategic petroleum reserve, and emergency standby authorities to reduce the economic impact of a supply interruption.
- Congressional Response. There was an immediate negative reaction in the Congress to the Administration's energy program. With the economy in the midst of a recession and the public not yet ready to adjust to even higher prices, the Congress fought the decontrol/import fee program successfully. The Congress did not respond favorably to the notion that windfall profits taxes and rebates could alleviate their concerns.
- The initial approach put forward by the Congress involved increased regulation. There were proposals for further allocation, more stringent price controls, rationing, and import quotas. Each of these programs had major drawbacks (including severe regional inequities)

and ultimately were not enacted or were changed radically.

- The Congress (especially the House Ways and Means Committee) conducted a long debate over energy taxes. Various tax proposals were considered, including taxes on gasoline and all petroleum products. Most of the attention focused on a gasoline tax.
 - The United States' gasoline tax is much smaller than that of almost every other consuming nation. For example, Japan's gasoline tax is about 55 cents per gallon; Italy's is about \$1.70; but ours is only about 12 cents (including State taxes).
 - They considered gasoline taxes varying from 3 cents per gallon to over 30 cents, but all were rejected. This reaction points out the difficulty of imposing higher prices of energy.
- After a long debate over crude oil pricing stalled most of the pending energy legislation, a compromise was reached in December 1975, when the President signed the Energy Policy and Conservation Act (EPCA). It was a controversial bill. The oil companies believed the continuation of price controls in the bill would hamper domestic production and exploration activity, while consumer groups argued that prices remained too high.
- Three major pieces of energy legislation have been passed subsequently in the last year:
 - the Naval Petroleum Reserves Production Act;
 - the Energy Conservation and Production Act (ECPA);
 - the Alaska Natural Gas Transportation Act.
- As a result of these Acts, the Federal Government now has the authority and has begun to:

In Supply:

- Exempt the first sale of domestic stripper well crude oil from price controls;

- Implement the 40 month crude oil decontrol plan, under which domestic prices are allowed to escalate by no more than 10 percent annually to keep pace with inflation and provide production incentives;
- Provide added price increases for tertiary recovery and California heavy gravity crude;
- Develop at the maximum efficient rate the three Naval Petroleum Reserves in the Lower-48 States; and continue exploration of NPR-4 in Alaska, leading to its eventual development;
- Implement an expedited selection process for a transportation route to deliver Alaskan natural gas to the lower-48 States;
- Dismantle as much of the current crude and product regulatory system as feasible.

In Conservation:

- Provide conservation grants to States to assist in the development and implementation of energy conservation programs;
- Implement appliance energy efficiency labeling;
- Set mandatory automobile efficiency standards for 1980 and 1985 of 20 mpg and 27.5 mpg, respectively;
- Establish industrial energy conservation targets for the ten leading energy consuming industries, and mandatory reporting of progress;
- Develop thermal efficiency standards for all new residential and commercial buildings, subject to Congressional approval of sanctions;
- Implement a three year, \$200 million weatherization grant program for the insulation of homes of low-income, elderly, and handicapped persons;
- Provide grants to States for testing innovative utility rate structure designs to achieve a higher degree of conservation.

In Standby Measures:

- Build a strategic petroleum reserve of at least 150 million barrels of petroleum

by 1978 and 500 million barrels by 1982;

- Establish standby measures to deal with severe energy emergencies that may arise in the future;
- Develop cooperative contingency and planning programs with the International Energy Agency (IEA).

Outlook for the Future

- Domestic consumption of petroleum products will continue to increase as the economy recovers and before conservation programs take effect, although at a slower rate than pre-embargo trends. Petroleum consumption in 1975 was about 3 MMB/D below what would have occurred had pre-embargo trends continued. "Lower-48" crude production will decline until Alaskan North Slope oil comes to market in late 1977. Imports may average over 8 MMB/D in this period.
- By 1985, however, through judicious policies, this Nation can greatly expand its domestic energy production and cut the rate of growth in energy demand, and still meet its economic objectives. If there are restrictions on energy development, if fewer reserves are developed than expected, or if price controls are extended, our dependence on foreign oil could rise well above today's level.
- The amount of oil discovered and produced depends upon the extent of reserves, the Federal OCS leasing program, and whether oil prices are high enough to justify more production. Domestic crude oil production could increase to considerably over 10 MMB/D in 1985 (from about 8.1 MMB/D in 1976).
 - More intensive use of secondary and tertiary recovery in current fields and new discoveries can keep onshore production about constant. If aggressive OCS leasing and development schedules are followed, OCS production could increase substantially by 1985.
 - If world oil prices fall or domestic prices are regulated over a long period, production could be at about today's level in 1985. The more expensive enhanced recovery techniques and some frontier area production, such as that from Alaska, would not be economic at lower prices.

- Total domestic energy supply is forecast to increase substantially between now and 1985, with all major fuels besides petroleum playing a larger role:
 - Coal production could increase to over a billion tons, from current levels of about 670 million tons, unless long-term utility demand alters significantly and environmental and transportation issues are not resolved.
 - Natural gas production could reach about 22 Tcf, if deregulation occurs, but would be less if current price regulations continue;
 - Nuclear power could grow from current levels of 9 percent to over 20 percent of electricity generation; however, uncertainty in demand growth, financial difficulties and licensing delays can lower this projection significantly.
- Each of these supply increases, while technically and economically feasible, will not be forthcoming unless pricing and government regulatory policies encourage it. In addition, if one or more domestic energy sources do not achieve these projected levels, oil imports will make up the shortage because other domestic fuel sources could not compensate for the loss.
- Higher energy prices should cut energy demand growth during the next ten years, reducing the growth rate to between 2.5-3.0 percent from the historical rate of 3.6 percent. Even if a very active conservation program reduces energy demand further (by the equivalent of 3-4 million barrels per day), the growth rate would still be a little over 2 percent through 1985. Electricity generation will continue to grow about twice as fast as overall energy demand, but at reduced levels from historical rates. Consumption patterns will gradually shift from oil and gas to coal and nuclear power.
- If the appropriate actions are taken, import needs could be reduced to approximately 4 MMB/D by 1985. If oil and gas price controls remain in effect through 1985, however, imports could be closer to 10 MMB/D and, if energy development cannot proceed as planned, imports could be more than 10 MMB/D.

- Emerging technologies will not play a significant role in stabilizing our energy situation in the next ten years. Solar, geothermal and synthetic fuels will make only a small contribution to domestic energy supplies by 1985--about 1 percent of total use. While the technology for these sources exists, they must be proven economically viable on a commercial scale.

Post-1985 Outlook

- The post-1985 prospects for maintaining independence are less certain. Declining reserves of oil and gas will need to be offset by significantly increased use of nuclear power, synthetic fuels, solar, geothermal, and other technologies. However, the major contribution from solar, geothermal, and synthetic fuels will not be felt until after 1990.
- Electricity is projected to continue to increase its market penetration. It could represent about 37 percent of energy use in 1990, as compared to 28 percent in 1974. The major economic choice in electricity generation by 1990 will still be between nuclear power and coal. However, actual capacity additions will be determined by other factors as well, such as environmental standards, financial health of utilities, peak to average load growth, and infrastructure to transport coal.
- If electrical energy grows at the anticipated rate, there will be a strong need to increase coal production (to over 1.3 billion tons in 1990) and to resolve the nuclear fuel cycle problems.
- Oil and gas production is likely to decline again around 1990; Alaskan production would also decline in this period, unless significant NPR-4 reserves are proved and produced.
- As consumers adjust to higher energy prices, the growth rate of energy consumption could increase in the post-1985 period.
- With demand increasing and supply of oil and gas either stable or declining, oil imports in 1990 could be over 10 MMB/D, unless synthetic fuels or other new technologies expand more rapidly than anticipated.

- However, by 1990, a number of existing OPEC countries can be expected to have dropped out as exporters of large quantities of oil. Many of the countries will have passed their peak of production and/or will have developed domestic markets of such size that they will not have substantial production available for export.
- The reduced number of major exporters could represent a physical difficulty in meeting U. S. import requirements by 1990, unless major new sources of oil are found in countries that are not currently active as exporters.
- If shortages of crude oil occur, prices would increase and certain energy sources now considered uneconomic would look more attractive for investment.
- Natural gas appears to be the fuel most likely to be in short supply in the 1985-1990 period. Unless an economically feasible approach can be found for producing synthetic gas from coal in large quantities, either growing quantities of imported liquid natural gas may have to be used or intensive conversion to other fuels pursued.

SECTION 2

FEDERAL REGULATORY POLICYNATURAL GASBackground

- Natural gas is a vital fuel that is consumed by over 40 million residences, over 3 million commercial establishments, and almost 200,000 industrial users.
- Domestic natural gas production peaked at 22.6 trillion feet (Tcf) in 1973, but has declined to an expected 19.5 Tcf in 1976. Additions to proved reserves reached a low of 6.5 Tcf in 1973.
- Until recently, the Federal Power Commission (FPC) has controlled prices for natural gas sold for resale in the interstate market (all but the producing States located mainly in the South) by placing a ceiling price of 52¢ per thousand cubic feet (Mcf) on this gas--about one-fourth the equivalent Btu price of oil. The low price for gas has been a major factor in causing demand to exceed supply in the interstate market, and curtailments of gas customers in this market have grown.
- Gas curtailments reported by interstate pipelines to the FPC rose from about zero in 1970 to about 25 percent of firm requirements in the current year.
- Natural gas on curtailing pipeline systems is allocated among distributors and direct pipeline customers according to FPC guidelines, with residential and small commercial customers receiving highest priority; followed by large commercial and industrial feedstock and process users; industrial users without alternate fuel capability; and gas used for boiler fuel or by interruptible customers.
- A very cold winter this year could create spot shortages of alternate fuels to replace curtailed gas volumes, despite large inventories. Cold weather could also reduce availability of emergency supplies.

- Intrastate gas prices on new contracts have risen steadily over the past few years averaging almost \$1.30 per Mcf in 1975 and an expected \$1.60 in 1976. Correspondingly, the portion of all annual new gas reserves dedicated to the intrastate market has increased from about 35 percent in the late 1960's to 87 percent in 1975. The increasingly serious supply situation for interstate pipelines can be summarized most simply by noting that in 1965 they had access to known reserves that would last them an average of almost 20 years. At their current rate of sales, this "sales-life index" had dropped to 10 years by 1975 and was less than 5 years for at least one major pipeline.
- The outlook is for continued declines in domestic gas supplies, particularly in the interstate market, unless major changes in the pricing or distribution system occur.

Proposals Offered

- In 1973, President Nixon proposed deregulation of new natural gas; in January 1975, President Ford also proposed that the wellhead price of new natural gas (production first introduced into interstate commerce after January 1, 1975) be deregulated.
- If prices were deregulated, FEA estimates that natural gas production could reach 22 Tcf per annum by 1985, with over 12 Tcf sold interstate; under continued regulation at the previous regulated price of 52¢ per Mcf, total production is projected at less than 18 Tcf, with only 6.6 Tcf sold interstate; under continued regulation at the current regulated price of \$1.42 per Mcf, total production is projected at about 21 Tcf, with 10 Tcf sold interstate.
- Since only new gas would be deregulated, the price impacts on consumers would be gradual. Further, if low regulated prices continued, natural gas would not be as available to residential users, would have to be replaced by more expensive oil and electricity, and

average residential fuel bills would be higher than with deregulation.

- The Senate, in 1975, passed a phased deregulation bill (S. 2310) under which new onshore natural gas prices would be deregulated immediately and offshore gas prices after five years.
- The House came within a few votes of passing S. 2310 (which President Ford had indicated he would sign), but passed H. R. 9464 instead, which rather than removing regulation, extended controls to the intrastate market. The House and Senate bills were never brought to conference. Among the reasons cited for rejecting deregulation are:

- The price of natural gas would rise considerably and natural gas producers do not need the \$1.75-\$2.00 per Mcf prices that could result from deregulation in order to produce new gas. The argument was made that allowing such prices would be letting OPEC dominate our domestic gas market.
- Since lead times for new production are long, consumers would be confronted with higher prices and still see rising curtailments for a few years. Additionally, if distributors roll-in (or average) the price of more expensive gas with less expensive existing supply, excess demand would continue. The counter-argument to this is that averaging the prices reduces the consumer impacts.
- There is no guarantee that increased production would result from deregulation and, in fact, there were many charges that gas producers were withholding natural gas from the market awaiting deregulation.
- The curtailment situation and discussion of economic effects was manufactured by the Administration and the gas industry to bring pressure for deregulation.

- Deregulation in a time of shortage could result in bidding up the price of new gas to an excessively high price and above the long-run equilibrium price.
- The National Governors Conference proposed an approach under which new gas prices would be deregulated for a test period of five years, after which the question would be reassessed. While this plan provides for deregulation until 1981, the lead times for new production and already declining reserves would make it difficult to show dramatic improvement as a result of the temporary deregulation. Further, as a practical matter, it would be difficult to roll back natural gas prices after a five year period of deregulation.
- In July, 1976, the FPC issued Opinion 770 in which the major action was to increase the national base ceiling rate for new gas (wells commenced after December 31, 1974) from 52¢ per Mcf to \$1.42 per Mcf. That decision was reaffirmed by the Commission on rehearing in the issuance of Opinion 770-A on November 5, 1976.
 - This action could increase natural gas production to over 21 Tcf by 1985 (about 1 Tcf less than with deregulation) and would increase the interstate share of market in 1985 from about 6.6 Tcf under the previous controlled price to about 10 Tcf. However, the interstate share would be about 2 Tcf less than with deregulation and there would still be market distortions favoring selling new onshore gas in the intrastate market.
 - The rates established by the FPC in Opinion 770-A are in effect, but being challenged by parties on both sides in the U.S. Court of Appeals. If past experience is a guide, final confirmation or modification of these new rates may take one year or more.
- In September 1975, the Administration proposed temporary emergency legislation to the Congress to alleviate the effects of curtailments. The

legislation would have allowed pipelines and high priority users to obtain intrastate gas at unregulated prices for a limited period. This legislation became embroiled in the deregulation debate and was not passed.

- In the fall of 1976, the Chairman of the FPC indicated that he would welcome temporary emergency authority to allocate natural gas between pipelines. Although such allocation authority would only be used in severe emergencies, the natural gas industry believes it penalizes pipelines and customers who have been prudent and is the first step to a Federal allocation system. This outcome is especially likely if forced transfers between pipelines are made at prices below market levels.

Remaining Problems

- The price regulation issue is tied up in the courts and even if resolved at the \$1.42/Mcf level for new gas, market distortions will remain against interstate users.
- Natural gas curtailments continue to increase. After alerting the public to the problem last year, warm weather, and the economic slowdown reduced the effects of the shortage. The Administration was accused of magnifying the problem and distrust continues.
- Natural gas shortages are distributed unevenly, concentrating in the mid-Atlantic and parts of the Midwest.
- Along an individual pipeline, one distributor may be adding new high priority residential customers, while others may be denying new hook-ups. Also, the current priority system sometimes provides little incentive for utilities to induce residential conservation, since gas volumes that are conserved by one distributor company could, either through petition to the FPC or a subsequently altered

base period, be reallocated by the interstate pipeline for higher priority loads in another distribution area.

- Because most gas is still cheaply priced old gas (29¢ per Mcf rather than \$1.42), and because both pipeline and retail rate structures are generally not reflective of the costs of incremental gas supplies (be they new supplies or from storage), natural gas is clearly mispriced at the retail level. One effect is to create grossly inadequate incentives for conservation. Another is to insure that virtually any price can be paid for supplemental gas supplies, since when averaged in, the resulting prices of natural gas are still below the prices of most competing fuels. This could lead to uneconomic investments.

New Initiatives

- Two broad philosophical approaches exist to deal with the natural gas price and supply issue. The alternatives are to allow the market price to work by effectively permitting natural gas well-head prices to reach the market clearing level, or to continue regulating price and/or supply. There are several options:
 - Deregulate the price of new natural gas. This approach is the current Administration's proposal and the limitation to new gas deregulation is intended to provide maximum incentives for new production to reduce windfall profits for producers, and to allow more gradual increases in consumer gas costs. Deregulation could be either immediate or phased-in over a few years. However, there is no guarantee that additional revenues will be used for increased exploration and consumer impacts could be greater than expected due to abrogation of old contracts.
 - There is also a potential transition problem in that under average cost pricing, new gas prices could be bid up only to the rolled-in market clearing price.
 - Price deregulation could also be initiated with a temporary cap at the estimated long-run

price, but such a cap could become permanent which would be counter-productive.

- Complete deregulation at the wellhead coupled with a windfall profits tax. This approach eliminates the problems of defining new gas equitably, encourages recompletion of wells, and produces government revenues. The consumer impacts would be substantial, even if a rebate system is used with the windfall profits tax; designing such a tax equitably is difficult; and the industry's loss of revenues could affect adversely new development plans, if no "plowback" provision were enacted.
- Five-year experimental deregulation of new natural gas. This approach would enable the Congress to see the effects of price deregulation on natural gas production before making a complete commitment to removal of price controls. Thus, it may be more palatable to the Congress than complete deregulation. This approach may not stimulate offshore and frontier area gas production due to the uncertainties in the future price potential; with lag times inherent in the system, five years may be too early to judge accurately future production response. If regulation is reimposed, it would likely be at higher price levels since large rollbacks would be politically difficult to accomplish.
- Maintain current regulations (given upholding of Opinion 770-A). While this alternative imposes the least consumer impact, it sustains the distribution distortion between the interstate/intrastate market, does little to alleviate the curtailments situation, will stimulate less production by 1985 (1 Tcf) than under deregulation, and will increase the average annual residential fuel bill by 1985 by over \$20 (or almost 10 percent of what the bill is estimated to be with deregulation), because of substitution of higher priced alternate fuels.

- Maintain current regulations and impose Federal excise tax on wellhead price to bridge gap between interstate and intrastate prices. This alternative allows the free marketplace to operate at the end-user level, thereby reducing curtailments. It reduces the potential for producer windfall profits (as compared to deregulation), and the revenue gain could be rebated to consumers and/or used to finance other energy projects.
 - This approach, however, does not ensure attraction of new onshore gas to the interstate market. In addition, the Congress has shown little inclination to pass excise taxes of this nature and the potential for Congressional disapproval is high given its effect on consumer costs.
- Extension of regulations to intrastate market at the recent FPC announced level for new gas (or current intrastate market average price). This alternative would require both State and local distribution priorities to be consistent with Federal priorities and extend Federal pricing and allocation regulations to the intrastate market. It would eliminate the intrastate/interstate market distortion. The production increases would be about the same as with the FPC price increase, but a larger share would move into the interstate market as there would no longer be a price advantage in dedicating new reserves to the intrastate market.
 - However, this alternative requires extensive Federal Government intervention into the intrastate market, and could conceivably raise constitutionality questions. It does not eliminate the inherent inequities of the current curtailment priority system, nor does it eliminate

the need to allocate available supplies. It will not stimulate as much increased production as under deregulation and likely will continue to price gas below its commodity value, thereby promoting inefficient use.

- The Administration and the FPC have sought two emergency measures from the Congress to alleviate curtailments: direct end-user purchases from the intrastate market and 180 day emergency purchases by pipelines at free market prices. The new Administration will have to decide whether this approach is still applicable:
 - Direct end-user purchases from the intrastate market by high priority curtailed customers are already sanctioned by the FPC, although not yet definitively tested in the courts. Emergency purchases at free market prices by gas companies are also currently allowed, but only for 60 days. To date, the Nation has been able to handle the curtailments situation without any emergency legislation, and distribution companies and end-users are becoming better prepared to offset potential curtailments.
 - Nevertheless, severe economic impacts can still be encountered, even with this legislation, as there is no guarantee that individual pipelines will voluntarily assist each other. This legislation could provide only about 200 Bcf of emergency gas into curtailed areas due to the limited spot intrastate market for gas.
- Other potential measures exist to deal with curtailments:
 - Seek standby mandatory allocation authority between pipelines. The small volumes of gas needed to be allocated among pipelines would preclude severe impacts of curtailments and would ensure government protection of high priority end-users during an emergency. However,

this alternative provides a strong disincentive to pipelines to secure added gas supplies and to take high financial risks for supplemental gas supplies (e.g., LNG and SNG). The establishment of equitable criteria for allocation would be difficult, reimbursement problems with pipelines would be encountered, and there would be large administrative complexities.

- Place a ban on new growth of firm customers, particularly high priority customers at the distribution level, where distributors are served by pipelines experiencing curtailments. Many States are already imposing moratoria on residential book-ups. This approach would reduce the vulnerability of existing customers to shortages, would prevent distributors from securing more gas supplies by industrial to residential load switching, and would eliminate the paradoxical situation of adding new customers at a time when old customers cannot be served.
 - But, it would require Federal pre-emption of State and local authorities and would also encourage continued use of available gas for existing low priority uses. Further, it would make a business decision that gas companies could not expand markets in the years ahead and thus stifle the free enterprise system.
- Due to apparent inequities in the existing priorities system and other administrative problems in implementing the Natural Gas Act, several regulatory reform measures are currently under consideration by the FPC:
 - "Conservation Gas" Distribution. Distribution companies have had success in inducing high priority customers to conserve natural gas. However, under the current FPC priority system, the gas volumes that are conserved ("conservation gas") could be reallocated by the pipeline to

another distribution company in order to maintain uniform priority end-use allocations along the pipeline and to prevent use of the "conservation gas" by lower priority users. This, in effect, stifles the incentive for distributors to induce conservation, since the gas could ultimately be shifted to a high priority user served by another distributor.

- The FPC could adopt a policy of prohibiting reallocation of "conservation gas" in order to encourage conservation. Such a policy could, however, increase energy regionalism and would relinquish "conservation gas" for lower priority users.
 - This policy can be implemented by FPC rulemaking and does not appear to require new legislative authority. At least one State (New York), has permitted incentive pricing for "conservation gas," whereby the conserving customer receives not only the incremental cost of the alternate fuel, but also a premium from the customer who would otherwise be curtailed.
- Pricing of supplemental gas. Another issue which must be resolved is how to price higher cost supplemental gas, including synthetic gas from coal, substitute gas from oil products and natural gas liquids, imported liquefied natural gas, and Alaskan natural gas. FPC's current pricing authority extends to the prices charged by interstate pipelines to its distributor customers, but not generally to the burner-tip since the prices charged by distribution companies are under the jurisdiction of state public utility commissions.
- A new amendment to the Natural Gas Act could be considered to require that distribution companies adopt the same pricing procedure as the interstate pipelines. This approach would ensure conformance by all regulatory bodies and ensure that

end-users pay full cost of consuming supplemental fuels, where the FPC deems it practicable. It would eliminate the artificially high demand for supplemental fuels created by rolling-in their price with lower cost supplies.

- The disadvantages of this approach are that it involves a pre-emption of State and local authorities; it is not yet clear that incremental pricing to the burner tip is administratively feasible, in any case, where curtailments exist; and it may reduce supplemental gas supplies at the same time a natural gas shortage exists.
- National LNG siting authority. Importers, pipeline sponsors and State and local governments have asserted that the current Federal regulatory procedures for determining site selection for LNG facilities are inadequate and have led to long delays. A new legislative initiative could require Federal LNG siting standards and/or criteria for site selection. However, since each project is different, national standards may have little meaning, and could pre-empt local jurisdiction. It is not likely that such a proposal would be received favorably by the Congress.
- Alaskan natural gas. Under the recently enacted Alaska Natural Gas Transportation Act, the FPC will have to recommend to the President a transportation system (if any is deemed to be in the public interest) by May 1, 1977. The "system" recommendation is not simply a matter of choosing how the gas is to be transported, but involves a number of things including a price determination of the Alaskan gas at wellhead and a determination of how it is to be priced when sold to and by an interstate pipeline (rolled-in or incremental); the extent to which the proposed alternatives satisfy certain distribution requirements specified by the Act; and the evaluation of the safety, reliability, financial feasibility, cost, environmental impact, and impact upon competition of the alternatives. On the basis of the FPC recommendations and a variety of other

inputs, the President will decide whether a transportation system should be approved and, if so, designate the system. The Congress shall review and, if found acceptable, approve the Presidential decision.

Conclusions

- Natural gas pricing and regulation may be the most crucial energy legislative issues facing the Congress. If the decline in domestic production is not reversed, shortages will grow and there will be adverse economic and social impacts. To improve our natural gas picture, several key actions are needed:
 - Congress, as a high priority, should enact legislation to deregulate the price of new natural gas either immediately or phased-in over a few years.
 - Congress should adopt the emergency legislation proposed by this Administration to mitigate the short-term curtailments problem.
 - The new Administration and the Congress should review the issues and possible initiatives associated with "conservation gas;" pricing of supplemental gas; and siting of LNG import projects.
 - The Administration and the Congress should expedite consideration of Alaskan natural gas transportation systems.

CRUDE OIL

Background

- Crude oil and petroleum product price controls were imposed by the Cost of Living Council in August 1973, and were continued in effect by the Emergency Petroleum Allocation Act of 1973.
- Only controls over petroleum prices remain of all the price controls imposed in the early 1970's; the oil industry claims that controls are inhibiting production incentives, and consumer groups contend that controls provide sufficient production incentives, while still holding domestic prices below cartel prices.
- Despite price controls, the average cost of petroleum products to American consumers has more than doubled since 1973, primarily as a result of higher world oil prices.

Proposals Offered

- In January 1975, President Ford proposed to the Congress a plan to remove price and allocation controls from crude oil and petroleum products by April 1975, in conjunction with a windfall profits tax and a program of import fees and excise taxes.
 - FEA estimated that immediate decontrol could reduce imports by 500,000 to 1 million barrels per day by 1977.
 - There was an overwhelmingly negative reaction to this proposal in the Congress, mainly because Congress feared the economic impact of decontrol during the recession and because of an inherent distrust of the oil industry by much of the public.
- A long, often bitter debate ensued over crude oil prices, and after several alternative proposals (e.g., extending the price control phase-out over a 39-month period) were offered by the President and rejected by Congress, a compromise was reached with the signing of the Energy Policy and Conservation Act (EPCA) in December 1975.

- Under the EPCA, average domestic crude oil prices were to be rolled back to \$7.66 per barrel effective February 1976 (from over \$8 per barrel). This "composite" price was allowed to escalate over a 40-month period at the annual rate of the GNP deflator plus a 3% production incentive (but at no more than 10 percent). Price controls are to expire in May 1979.
- The pricing provisions of the EPCA were its most controversial features. There was considerable opposition in industry to allowing a 40-month extension of Federal controls, and placing previously uncontrolled "new" and stripper oil prices under controls.
- The President signed the Energy Conservation and Production Act (ECPA) in August 1976.
 - The ECPA allows a full 10 percent annual rise in the composite price regardless of the GNP deflator and releases stripper well production from price controls. Stripper well production is that from properties producing less than an average of 10 barrels per well per day and represents about 70 percent of the wells in this country, although only about 13 percent of production.
- Using authorities provided in the EPCA, the FEA has proposed and Congress has allowed price and allocation controls to be removed from residual fuel oil; middle distillates; military jet fuel; and naphtha, gas oils, and other products. Thus, about half of refiners' output has been decontrolled, with gasoline, natural gas liquids (propane, butane, natural gasoline), commercial jet fuel, and aviation gasoline being the most important products still controlled.

Remaining Problems

- There is some uncertainty about the ability to hold to the May 1979 termination date for controls, given the likelihood that domestic prices are likely to be considerably below foreign prices at that time, and the American people may not be willing to accept an immediate

price rise (currently the difference is about \$5.00 per barrel). Further, the composite price system has proven difficult to administer. It is now a three-tier price system: lower tier (averaging \$5.16 per barrel); upper tier (averaging \$11.93); and decontrolled stripper and Naval Petroleum Reserve oil.

- While price controls are in effect, the FEA has administered a crude oil "entitlements program" to assure that all consumers share equitably in the benefits of price-controlled oil. Under this program, refiners with the access to more than the national average of price controlled crude oil are required to purchase entitlements (worth about \$8.00 per barrel) from refiners largely dependent upon upper-tier and foreign oil. The program has resulted in an income transfer of about \$2 billion per year, mainly from the Southwest to the East Coast, and has also benefited customers of Northern Tier and offshore refiners (e.g., Puerto Rico).
- Decontrol of remaining controlled products (except for propane, which is in short supply and is projected to remain short until natural gas production increases substantially) appears to be warranted based on supply/demand analyses. Failure to decontrol products in the near-term could lead to shortages and market distortions.
- There are some fundamental regulatory policy issues that must be resolved. These include:
 - Crude oil price freeze. The Administration and Congress made an early estimate of the expected prices and proportions of "new" and "old" oil which turned out to be incorrect. Thus, initial estimates of the composite price were about 3 percent lower than the actual average price. To compensate for "overshooting" the composite price and to account for other regulatory and legislative changes made in 1976, FEA has frozen the price of upper and lower tier crude oil since July 1976. The extra revenues gained by crude oil producers (approximately one percent, or \$240 million) must either be returned to

the public by means of a continued price freeze or crude oil price rollback, or Congress would have to be willing to make appropriate adjustments in light of the composite price miscalculations.

- Domestic production of heavy, high sulfur crude oil. Price differences due to quality differentials of crude oil remain unaffected by the entitlements program. Environmental regulations have increased these traditional pricing differences between heavy and lighter oils and production may be shut-in if the problem persists. This problem is particularly noticeable in California.
- Production incentives. As required by the EPCA, a report is due to the Congress by February 15, 1977, setting out the effects of the production incentive factor on domestic production and exploratory activity. At that time, Congress has the opportunity to review and change this factor in the average price escalator.
- Canadian crude oil allocation. As Canadian crude oil exports are reduced (they have declined from almost one million barrels per day in 1973 to about 250,000 B/D expected in 1977), many Northern Tier refineries may be unable to obtain adequate feedstock. Changes may be needed in the regulatory program to assure continued supplies to some of these refiners.
- Pricing of Alaskan North Slope crude oil. In April 1977, the FEA must submit to the Congress its recommendations concerning the pricing of North Slope crude oil. Among the factors that will affect the decision are the disposition of oil and whether its first sale price will be included in the composite price.
- Small refinery subsidy. The entitlements program contains substantial preferential treatment for small refiners, but there is a need to review the necessity for such a program and the appropriateness of the current level of subsidy.

- Encouragement of refinery expansion. A report is due to Congress in March 1977, discussing options for encouraging new refinery construction in the United States. There is concern over whether the existing regulatory program is operating to encourage enough expansion of domestic refinery capacity.
- Mandatory Oil Imports Program. A major review of this program has been conducted concerning its need, continuation of fee-free allocations, and regional impacts. Decisions as to possible revisions must now be made.

Possible Initiatives

- New price control phase-out schedule. There are three basic options to modify the current price control formula:
 - Propose a new phased decontrol schedule of about 2-2 1/2 years, with no composite price formula. A simple phase-out schedule may be more palatable now that economic conditions have changed and in light of experience with the complexities of a composite price approach.
 - Maintain a composite price system, but provide greater administrative flexibility and adjustments to move prices closer to world levels in a shorter period of time. Additional quantities of high cost production (such as tertiary recovery) could be allowed to sell at market levels outside the composite price structure.
 - Reverse the trend towards decontrol and announce that price controls would be maintained indefinitely and that escalation would continue solely at the rate of inflation.
- Product decontrol. Each of the remaining products under controls must be considered separately if removal of controls is proposed. Initial findings are indicated below:
 - Motor gasoline can probably be decontrolled without any price increases in addition to those that would occur under controls. The perceived possible impacts of removal of allocation controls could be mitigated by a form of dealer protection legislation such as was finally considered by the House of

Representatives in the 94th Congress; however, there may be no justification for the bill.

- Commercial jet fuel and aviation gasoline seem to satisfy conditions for decontrol (as set forth in the EPCA). While opposition might be expected by certain groups, stand-by regulations could reduce objections.
- Propane, butane, and controls over allocation of naphtha to SNG plants may not meet legal decontrol standards since there appears to be declining supply and rising demand. One of the difficulties with propane is that its price is based principally on that of natural gas and historical gas processing costs, causing it to remain underpriced in relation to propane produced from crude oil. Further, propane supply has declined along with natural gas production, since about 70 percent of total propane supply is extracted from natural gas.

Conclusions

- There will continue to be serious issues associated with the petroleum regulatory system. While resolution of most of these issues should await completion of the appropriate regulatory proceedings, it is clear that there is a need to remove any regulations that are not necessary (such as controls over gasoline). Further, the composite pricing system for crude oil has proven to be complex to administer; it was never envisioned to operate with a long freeze on price escalation. Thus, it is recommended that Congress adopt a simpler system that would expedite the phase-out of crude oil price controls, with or without use of composite prices. If the composite price system is retained, it should operate with greater flexibility to provide for maximum production incentives.

ENERGY TAXES

Background

- The taxing power of the Federal Government provides an adaptable tool for modifying investment behavior, stimulating conservation, discouraging use of particular fuels, and raising revenues for social redistribution or funding energy development. However, many believe the tax system is primarily a revenue raising mechanism and should not be used to provide subsidies or incentives for particular social or economic objectives.

Proposals Offered

- In January 1975, President Ford asked Congress for a variety of energy taxes to reduce consumption immediately. These included:
 - An excise tax of \$2 per barrel on all domestic crude oil production, accompanied by an equivalent import fee.
 - A 37¢/Mcf excise tax on natural gas.
 - A windfall profits tax on petroleum to be coupled with price decontrol.
 - A tax credit of up to \$150 for homeowners to buy and install insulation in existing residences.
 - An increase in investment tax credits and changes in accounting rules for utilities.
 - Rebates of the energy tax revenues.
- Congressional attention focused initially on the import fee and decontrol provisions and, after those were defeated or rescinded, the rest of the President's energy tax proposals were not enacted. The opposition stemmed mainly from concern over raising energy prices to consumers in the face of a recession and recent OPEC price increases, as well as doubt that higher prices really do dampen demand. The homeowner's insulation tax credit was deleted twice in Conference Committees.

- The House Ways and Means Committee considered a wide range of energy taxes including various gasoline and petroleum excise taxes, energy conservation trust funds, and a graduated tax on new cars linked to vehicle fuel efficiency. The Congress defeated the energy tax initiatives proposed by its Ways and Means Committee and only minor energy taxes were passed.
- A gasoline tax was considered as a means for discouraging discretionary use of automobiles. For every additional tax of 10¢ per gallon, consumption would drop by about 150,000 barrels per day (about 2 percent). The United States has the lowest gasoline prices and taxes of any nation in the International Energy Agency. Among the difficulties with a gasoline tax are the following:
 - Any gasoline tax would need a clear rebate formula to reduce regressive effects.
 - A gasoline tax accounts for only 40 percent of oil consumption, thus concentrating on automobile use which may be less elastic than other uses. The other 60 percent of petroleum consumption should also be considered for a reduction in demand through taxes.
 - A gasoline tax would have varying effects by region (rural and western consumers would bear a disproportionate burden), and by industry (the recreation/tourism and automobile industries would be affected adversely).

Possible Initiatives

- Broadly based or Btu taxes. Substantial reductions in energy use could be achieved by a very large tax on all energy use. Energy consumption would drop about 16 percent with a tax of \$1.35 per million Btu, with offsetting income tax rebates.
 - While such a tax could raise large revenues and reduce consumption, energy prices would go up dramatically (such a tax is the equivalent of about \$8.00 per barrel) and the whole tax system might have to be revamped to eliminate regressive effects on consumers and to offset the transfer of funds from the private to public sector.

- Indiscriminate application of Btu taxes would discourage use of those energy resources whose use we may wish to encourage, i.e., synthetic fuels, coal, solar, etc. There is little logic in subsidizing certain energy sources and then taxing away the energy produced from these sources. Further, energy Btu taxes could dampen economic progress in critical areas of employment.
- Excise taxes for specific conservation objectives. A major defect of the Btu tax--its broad focus--could be corrected by targeting a conservation excise tax on specific fuels (e.g., oil and gas); specific fuel using equipment (such as automobiles); or specific uses of a particular fuel (e.g., outdoor gas lights; gasoline used in automobiles; or taxes for boiler fuel use of oil and gas). Although such taxes would be more specific than a Btu tax, they raise some political problems due to their discriminatory nature.
- Import fees. Imposition of substantially increased import fees can reduce consumption and discourage imports, but would lead to higher unearned revenues for some domestic producers of oil and gas (e.g., currently decontrolled stripper well oil). Regional effects are reduced as long as the entitlements program is in effect, but would be substantial after price controls expire. Import fees have administrative advantages, since they can be imposed by the President without new legislation, as long as the factual findings necessary under the Trade Expansion Act can be made.
- Market adjustment taxes. Under continued price regulations, both domestic crude oil and interstate natural gas will continue to be sold to end-users at prices substantially below marginal import prices. While decontrol of prices, possibly accompanied by a windfall profits tax, would be a more desirable approach for dealing with this problem, a basis exists to correct such distortions by taxing controlled fuels which compete with imports, to bring them into price parity with imports. Revenues from these taxes could be rebated through income tax reductions, used as income transfers and social adjustment factors, or earmarked for specific energy-related expenditures (such as R&D or financial assistance).

- The adoption of such taxes could tend to perpetuate and institutionalize existing price regulations. Nevertheless, if distorted prices are frozen into the structure of the economy, as in the case of energy intensive capital goods with long lifetimes, they can have particularly adverse effects.
- Investment incentives. Favorable depreciation schedules, tax exemptions and tax credits can be used for the purpose of providing investment incentives for energy development and conservation. The size and risk of potential targets vary considerably. Beneficiaries of previously considered proposals have ranged from individual homeowners to large utilities, and credits have been considered for items ranging from insulation and solar water heating to state-of-the-art desulfurization equipment and nuclear generating facilities. An administrative problem arises because many investments are for purposes other than conservation.
- Loan guarantees have been suggested as an alternative to tax incentives, particularly for not-for-profit institutions and firms with no profits. Loan guarantees can be effective in correcting credit market imperfections and situations in which private lenders perceive excessive risk, e.g., for large or unusual ventures. The Government can, through insurance principles, spread the risk associated with any one loan over a large number of loans. Apart from removing credit market imperfections, loan guarantees are not likely to encourage private investors to undertake risky projects unless subsidies are also provided, e.g., through non-recourse arrangements or guarantee fees inadequate to cover the Government's administrative costs and probable losses.

Conclusions

- The debate over energy taxes should be reopened. Taxes can be an effective way to cut consumption or modify investment behavior. Ideally, the best way to provide the correct market signals would

- be to remove artificial price controls. However, since controls are now in effect, the Congress should review the need for broad (e.g., Btu) or specific (e.g., gasoline and/or natural gas) energy taxes. In addition, investment incentives for business (e.g., tax credit for purchase of coal-fired equipment) or homeowners (e.g., insulation tax credit) should be adopted.

FUELS POLICY

Background

- While oil and gas account for less than 10 percent of the U.S. energy reserves, they represent over 75 percent of our energy consumption. The domestic production of both of these fuels is declining and reserves are being depleted.
- In contrast, the Nation has sufficient deposits of coal to last for several hundred years. We also have substantial uranium deposits.
- The basic disparity between available energy resources and our current utilization prompts consideration of a fuels management policy. The fundamental question is to what extent should the Federal government have a role in allocating the use of fuels (e.g., substituting coal or electricity for oil or gas) or sectoral distribution of use (e.g., forcing natural gas out of boilers and into residential use), versus encouraging the market to operate?
 - Technically, electricity can be substituted (generally at higher costs) for gas in some industrial processes; for oil and gas in space heating; and for oil in some limited transportation use. Electricity generated from coal or nuclear power uses resources in greater domestic supply than are oil and gas.
 - In general, electric resistance heating using electricity from oil or gas is uneconomic, because of the lower efficiency of electricity and its price. Electricity used in heat pumps or heat storage systems is more efficient than resistance heating.

Proposals Offered

- The first indirect fuels policy in recent years occurred with the Clean Air Act Amendments of 1970, which led to shifts from coal to oil or gas. (Utility oil consumption increased by 125 percent from 1969 to 1973.)

- Beginning in 1970, declining natural gas supplies forced interstate pipeline curtailments of natural gas. More recently, the shortages have resulted in FPC allocation policy guidelines which generally are based upon particular end-uses of the gas. (The FPC policy to date has been to protect residential and small commercial customers, as well as those industrial uses that are most difficult to convert to alternate fuels.)
- The Federal Energy Administration has played a role in fuels management by not allocating supplies of feedstocks for new synthetic gas plants, and has been reviewing the environmental impacts of its policy. Its preliminary analysis also shows that the conversion of petroleum products into gaseous fuels is an inefficient use of relatively scarce oil.
- The FEA's coal conversion program is the first direct fuels management policy to be legislated. The original legislation authorized the FEA to (1) prohibit any electric power plant and any major fuel burning installation (MFBI) from burning oil or natural gas as its primary energy source, provided it had the financial and physical capability to burn coal and met environmental specifications; and (2) require by "construction order" new power plants to be built with the capability to burn coal.
 - In the EPCA, the initial ESECA authorities were renewed and extended to cover issuance of construction orders to new MFBI's, and to require the recipients of such orders to burn coal. Under this extension, many more power plants will be candidates for prohibition orders.
- The Congress has considered fuels management in a number of areas:
 - A modified coal conversion program has been considered by the Senate Public Works Committee (S. 1777). The bill, which is described in Section 5 (Electric Utility Regulatory Reform), has not been reported out of Committee.

- The Congress has also considered allocation priorities for natural gas, but has yet to develop a program in that area. Proposed programs to date have not put forth a clear rationale for deciding upon priorities. Any priority system should be developed in concert with other aspects of natural gas policy (such as price policy). Absolute priority for residential customers (new and old) could result in greater demand for residential use (because it would be cheaper than alternatives). This growth would have to be satisfied by conversion of existing industrial uses, and it is not clear that the cost of conversion would be worth the benefits.

Remaining Opportunities

- To replace use of dwindling oil and gas supplies, the greatest potential for near-term fuels substitution is in the electrical generation sector; the least amenable sector in the next 10 years is transportation.
- Oil and gas represent almost one-third of electricity generated. Oil-fired power plants are concentrated most heavily on the East Coast, because of availability of previously less expensive imported oil. Utilities using gas are located primarily in the South Central region, because of locally abundant natural gas. (About 12 percent of the natural gas consumed in the United States is used in Texas and Louisiana utilities.)
- In some cases, the same power plants that converted from coal to oil in the early 1970's to meet air quality requirements are now being forced back to coal. This creates confusion in the business community and a lack of confidence in the stability of government regulatory policy.
- Industry uses about 9 Tcf of natural gas annually, and 3 MMB/D of oil. Most industrial gas is used as a boiler fuel or for process heat and could be replaced by coal or petroleum (although sometimes

at considerable expense). About 18 percent of petroleum consumption is in industry and, while most use is non-substitutable, there is some potential for conversion to coal.

- An efficient way to use oil and gas, as well as coal, is to extract as much energy as practical in the form of electricity and then utilize the waste heat for other purposes. When applied to buildings this process is referred to as total energy, where a small generating plant supplies electricity and then the remaining heat supplies hot water and space heating. In industrial processes, high pressure steam can be generated and then expanded through an electrical generator to give low pressure steam suitable for heating or process purposes (often referred to as "co-generation").
- In the residential/commercial sector, the primary potential for fuel conversion is in the construction of new buildings using electricity for space heating purposes. Replacement of oil or gas heating with electricity in existing homes will normally be quite uneconomic.
- Virtually no fuels management can occur in the transportation sector until (and if) electric car use is more widespread. (Congress recently overrode a Presidential veto of a bill to increase substantially the R&D effort on electric cars). There is some possibility for replacement of diesel rail by electric rail, but costs are high.

Possible Initiatives

- Oil and gas use for electrical generation can be reduced by cutting the rate of construction of new oil- and gas-fired capacity; reducing use of existing capacity; reducing use of electricity in peak hours (where fuel is often oil or gas); and converting existing units to coal. This policy would reduce dependence on expensive, relatively insecure, and dwindling resources, and is likely to be required as domestic oil and gas reserves are depleted. A program such as S. 1777 could accomplish these objectives, but at significant cost and potential adverse

environmental impact. Key questions are the time period during which this change occurs; the extent to which the Federal government should require it by direct regulation; and the possible need for changes in environmental regulations.

- In the residential/commercial sector, the Federal government could attempt to ban or suggest limitation of new connections of gas for heating purposes and impose a stiff tax on replacing furnaces. Such a program would increase use of natural gas for existing industrial users and, if electricity use increased, would lower system efficiencies, and eventually require winter-peak generating capacity. These problems could be mitigated by greater use of heat pumps and home storage systems.
- New rate structures and regulatory changes may be needed to encourage co-generation.
- The magnitude of the intervention that is implied by a comprehensive fuels management policy cannot be minimized. The regulatory structure that would be required to specify so basic and so universal a set of decisions is probably unprecedented in the American peacetime experience. When the exceptions procedures and the possible litigation are combined, it is likely that comprehensive fuels management policies would stimulate a more complex procedural process than that already in effect. The implementation of a comprehensive fuels management plan would also be a significant and possibly irreversible step in the direction of a fully planned economy. A comprehensive fuels management policy would also have to take into account regional supply, consumption patterns, and environmental differences.

Conclusions

- On the surface, it may seem attractive to manipulate the use of various fuels in order to derive the greatest end-use efficiencies and to minimize environmental impacts. Further, given the current regulatory environment, the appropriate market signals are not being communicated. The Federal government should continue to pursue opportunities to reduce the use of oil and gas in power plants and major industrial

facilities in order to expand the use of coal. A concept like that in S. 1777 (with modifications) should be adopted.

- However, the Federal government must also be careful to avoid massive intervention in the energy marketplace. The regulatory structure that would arise from a comprehensive fuels management policy would be virtually unadministerable, costly, and probably inequitable. Indeed, a much more desirable approach would be to remove price controls and allow the marketplace to allocate fuels.

SECTION 3

ENERGY CONSERVATIONBackground

- Domestic energy consumption is projected to grow at between 2.5-2.8 percent annually through 1985, as compared to 3.6 percent before the embargo.
- The United States' conservation efforts to date have been rated near the bottom of all consuming nations in the International Energy Agency. The principal reasons for our low ranking are the continuation of oil and gas price controls, low tax on gasoline, and failure to enact (prior to the ECPA passage in August) most of the Administration's proposed conservation measures.
 - Nevertheless, if legislation already passed is implemented fully, these measures could save over 2 million barrels per day by 1985, and should result in a more favorable ranking by the IEA.
- The current market price of domestic energy does not fully reflect the true value of energy to the economy and considerable energy is wasted.
- Energy conservation has become a popular political issue; yet, it is often difficult to receive widespread support for specific proposals, since any additional regulation involves restricting personal or business choices.
- Conservation provides an effective mechanism to improve use patterns in efficiency of services, to slow the trend of increasing reliance on imported oil, and "buys" time to develop alternative energy supply technologies to meet increased energy demand in the future.
 - However, conservation alone cannot solve our energy problem. The potential energy savings from additional regulation are limited; in fact, without higher energy prices or considerable restriction of economic activity, most of the potential savings from regulation can be achieved from measures enacted already.

Proposals Offered

- In January 1975, the President proposed to Congress a wide range of conservation proposals encompassing price increases, mandatory and voluntary standards, as well as a comprehensive public education program. The following were requested specifically:
 - Crude oil price decontrol, accompanied by windfall profits tax and rebates;
 - Petroleum and natural gas excise taxes;
 - Voluntary automobile gasoline mileage increases by 1980;
 - Mandatory thermal efficiency standards for all new buildings, with strict sanctions;
 - A tax credit for homeowners providing up to \$150 for purchasing and installing insulation in existing residences;
 - A weatherization grant program to provide grants for low-income and elderly people to install insulation in their residences;
 - Voluntary appliance efficiency standards;
 - Mandatory appliance and automobile efficiency labeling to enable consumers to see the cost of operating equipment over a period of time;
 - Mandated reforms of State Utility Commission processes to include the application of conservation practices in establishing rates;
- In December 1975, the Congress passed the Energy Production and Conservation Act (EPCA) which included provisions for:
 - Phasing out price controls on domestic crude oil;
 - Requiring appliance manufacturers to provide energy efficiency labels to consumers on major appliances and establishing voluntary energy efficiency targets for the appliance industry;

- Establishing mandatory automobile fuel efficiency standards of 20 miles per gallon (mpg) by 1980 and 27.5 mpg by 1985;
 - Establishing voluntary industrial energy conservation targets for the 10 leading energy consuming industries, and mandatory reporting on progress in meeting these targets;
 - Providing conservation grants to States to assist in the development and implementation of energy conservation programs;
 - Requiring mandatory conservation standards for Federal agencies.
- The House Ways and Means Committee, in its consideration of energy tax legislation, debated the merits of a range of gasoline excise taxes which were subsequently deleted from its bill (H.R. 6860). Included in the House-passed H. R. 6860 were such conservation measures as tax credits for business and residential insulation, business use taxes on petroleum and natural gas, and recycling tax credits. This bill was never passed by the Senate.
- An insulation tax credit for homeowners was passed by the Senate as part of the Tax Reduction Act of 1975, but deleted in Conference. It was also included in H. R. 10612, a general tax reform measure, but was deleted in Conference and remained pending in the Senate upon adjournment of the 94th Congress.
- The Energy Conservation and Policy Act (ECPA) passed in August 1976, included the following conservation programs:
- Mandatory energy performance standards for new residential and commercial buildings, but without the sanctions requested by the Administration. The experience with this bill clearly illustrates the difficulty in enacting mandatory conservation legislation;
 - A \$200 million low-income and elderly weatherization grant program;

- A \$2 billion obligation guarantee program, aimed at conservation retrofit of buildings and industrial plants. This program provides loan guarantees for conservation and renewable resource investments;
 - Authorization for a \$200 million demonstration program to determine the feasibility of a national program of subsidies to stimulate retrofit of existing dwellings;
 - A \$13 million grant program to State regulatory commissions to demonstrate alternative utility rate forms and related conservation measures.
- A number of other conservation measures have been proposed by various groups or individuals, including mandatory reduction of industrial energy use and increased funding for mass transit. Most of these measures did not pass because costs exceeded their benefits.

Remaining Problems

- While legislation has been enacted to effect substantial conservation savings (programs enacted are projected to reduce demand by over 2 MMB/D by 1985 as compared to otherwise projected demand levels), few savings will be realized unless existing programs are implemented effectively.
- Further savings could be obtained depending upon the level of Federal intervention in the marketplace, and the prices charged for energy consumption, yet there remains debate over the effectiveness of either more regulation or higher prices.
- A national awareness of the benefits of conserving energy still needs to be instilled.
- The Federal efforts to plan and implement conservation are fragmented organizationally.

Possible Initiatives

- There are differing philosophical approaches as to the Federal role in stimulating conservation.

- There are a number of specific conservation measures which the Federal Government can enact or implement administratively to stimulate further conservation and end-use efficiency in all sectors. Some of the measures in the list below are probably not cost-effective or likely to have much impact, but have been included for completeness.

-- Transportation

- Gasoline excise tax. As indicated in Section 2, a substantial gasoline tax could save considerable petroleum and has a strong near-term impact.
- Voluntary fuel economy standards for trucks and buses. While automobiles now have to meet mandatory standards, efficiency of trucks and buses could be improved and save 125,000 B/D.
- Revision of CAB air transport load factor standard. Airplane load factors are now about 55 percent; an increase to 65 percent, while causing greater inconvenience to passengers, could save almost 70,000 B/D.

-- Residential/Commercial

- Insulation tax credit for homeowners. This tax credit reduces the burden of first costs and can save over 100,000 B/D.
- Mandatory lighting efficiency standards. Efficient lighting standards have been identified, but enforcement of this measure would be extremely difficult.
- Utility insulation financing. Under this proposal, gas utilities would be encouraged to install efficiency improvement devices in homes and investment costs would be capitalized and recovered through a cost of service charge. Such a program could save considerable gas, but raises regulatory and economic issues (See Section 5, "Electric Utility Regulatory Reforms," for more details).

- Mandatory beverage container deposits. A recent FEA study indicates that national legislation in this area could save about 85,000 B/D and have significant environmental improvements. Four States currently have these laws, but the industry believes there would be adverse economic impacts from widespread adoption.

-- Industry/Electrical Generation

- Financial incentives or standards to increase in-plant self-generation of power. Encouraging industrial plants to generate their own power is a desirable way of using waste heat and saving energy.
- Conduct energy audits. Energy audits of major industrial plants could be required and reported. Such a program could be expensive and may not save much energy.
- Efficiency standards for industrial equipment (e.g., boilers, electric motors). Such standards could save about 200,000 B/D by 1985, but such savings would be achieved most easily voluntarily, in response to market forces.
- Disallowance of the expensing of energy costs for tax purposes. This change in the tax laws could provide greater conservation incentives, but possibly at a significant cost to energy intensive industries.
- Utility rate reform. Such measures as peak-load pricing and minimizing use of inefficient peaking generators have considerable potential for reducing peak loads and saving energy. A report on these initiatives is due to Congress in February 1977.

-- Taxes and Tax Credits

- In general, further initiatives in the area of tax credits (business insulation, installation of more efficient equipment, etc.)

and taxes (Btu, business use of petroleum and natural gas, etc.) could be utilized to induce conservation in all sectors.

- Various feasible energy taxes, their potential conservation effects, and relative advantages and disadvantages are discussed in Section 2, "Energy Taxes."

Conclusions

- The United States' energy policy must include both a strong conservation effort and an aggressive program to develop domestic supply. The legislative achievements in energy conservation over the past two years will result in significant reductions in demand and improved efficiencies. Yet, with the exception of conservation induced by higher prices and some limited regulatory measures, there is little that can be done to reduce demand in the next few years. The benefits of all conservation measures should be weighed against the cost of implementation and regulatory burdens they impose. The following actions should occur:
 - Congress should enact the Administration's proposed tax credit for insulation.
 - The Congress and Executive Branch should monitor closely the implementation of existing programs, especially the thermal efficiency standards for new buildings. Tough sanctions may be needed to make the buildings program work.
 - The ERC has established a task force on energy conservation to deal with implementation of existing programs and to prepare a thorough analytical report to Congress as required by the ECPA. The new Administration should continue this effort.

SECTION 4

ENERGY DEVELOPMENT: THE BROAD ISSUESBackground

- It is clear that irrespective of whether conservation programs prove successful and domestic energy prices are decontrolled, the Nation's use of energy will continue to expand. Even if energy demand growth were held to about 2 percent annually (an ambitious goal), domestic energy consumption would be about 87 quadrillion Btu's (quads) in 1985 and 96 quads in 1990, as compared to 71 quads in 1975. (Note that one quad is the equivalent of about one-half million barrels per day, or about 40-45 million tons of coal per year.)
- In addition to conservation, there are only two alternatives to meeting our increased energy needs: develop more domestic sources or increase reliance upon imports. To keep imports relatively constant, it is likely that the Nation would have to:
 - Increase coal production from current levels of about 670 million tons annually to over one billion tons per year by the mid-1980's.
 - Expand oil production in frontier areas of Alaska and the Outer Continental Shelf (OCS), as well as encourage enhanced recovery from existing fields to replace declining supply.
 - Increase the share of nuclear energy in the generation of electric power in the next ten years from about 9 percent to over 20 percent.
 - Develop supplemental sources of oil and gas, such as coal gasification and liquefaction and shale oil to meet shortages of liquid and gaseous fuels.
 - Expand dramatically the use of renewable resources, such as solar energy.

- While considerable progress has been made in enactment of legislation in the conservation and standby areas, little progress has been made to legislate measures to increase domestic supply:
 - Only the Naval Petroleum Reserves production and Alaskan natural gas transportation legislation, and extension of coal conversion authorities have occurred.
 - Some progress has been made toward decontrol of oil prices, but the price deregulation proposal for natural gas and most proposed environmental amendments were not enacted.
- There is a growing recognition of the role that must be played by State and local governments and interest groups in decisions on new energy projects. Cancellation of major energy facilities, such as Kaiparowitz (Utah) and several nuclear plants, as well as defeat of legislative proposals to aid the siting process, point out clearly the need to work with local interests.
- There is also a growing regionalism in energy, which often conflicts with national policy interests, but cannot be ignored. Issues such as oil prices in New England; OCS development off the Atlantic Coast; coal and oil shale production in the Western States; oil and gas production in the South Central Region; oil and gas transportation through California; and Alaskan development are all large regional issues.
- There is a continual need to balance energy goals with environmental objectives and economic factors.

Proposals Offered

- The approaches tried by the Executive and Legislative Branches of the Federal Government can be divided into two basic areas: regulatory override/expediting and environmental/energy balancing.
- In the regulatory override or expediting area, there were several legislative initiatives:

- Energy Facility Planning and Development Act. In January 1975, the President proposed to Congress a bill which would encourage States to develop and apply a comprehensive and coordinated process for expeditious review and approval of energy facility siting applications. This bill did not receive much attention in the Congress mainly because it created a Federal role in an area traditionally under State and local jurisdiction.

- Energy Independence Authority (EIA) Act. In the EIA, which is a \$100 billion financing assistance bill, there is a provision for expediting the regulatory process at the Federal level for projects deemed critical for energy development. It would establish the FEA as the coordinator of a streamlined permit process for all new facilities which require Federal licensing. This portion of the EIA Act did not receive serious consideration as the rest of the EIA bill became stalled.

- Nuclear Licensing Act. The Administration asked Congress to pass legislation to reform the nuclear facilities licensing process by providing for early site review and approval, and encouraging standardization of nuclear facilities design. This bill was not enacted.

- Outer Continental Shelf Leasing Amendments. The Congress devoted considerable time to a bill which would have altered significantly the current OCS leasing procedures. The bill would have modified the current bonus bidding practice and provided an expanded role for States, but was not enacted before the close of the 94th Congress despite strong Congressional support.

- Alaska Natural Gas Transportation Act. In February 1976, the President asked the Congress to enact legislation to expedite delivery of Alaskan natural gas to the lower-48 States. The Congress enacted and the President signed such legislation.

- In the area of energy and environmental interactions, there were a number of proposals:
 - Clean Air Act Amendments. The Administration and the Congress developed numerous proposals for amending the Clean Air Act. The key issues concerned the following:
 - Significant deterioration, where courts have ruled that in areas where air quality is superior to national standards, significant deterioration of that air quality must be prevented. This interpretation could preclude much energy development and legislative clarification was sought. It is one of the most serious environmental issues.
 - Compliance date extensions, where the Administration has sought an extension of the dates in which existing power plants must be in compliance with air quality regulations to allow time to develop permanent pollution control systems.
 - Non-attainment policy, in which the existing Clean Air Act precludes construction of new air polluting facilities in areas where they may interfere with attainment or maintenance of ambient air quality standards. Concern has been raised about the effects on hydrocarbon emitting facilities, such as refineries.
 - Auto emission standards are largely a problem of fuel economy and conservation, rather than resource development, although obviously enmeshed in the Clean Air Act debate.
 - Surface Mining Legislation. Surface mining legislation has been introduced into the Congress every year since 1971; Congress has passed such legislation twice, and has failed to override Presidential vetoes (which were argued mainly on grounds of economic impact and production loss) both times. Lack of uniform nationwide minimum reclamation standards has been decried by environmental groups. Although some States have stringent

standards, proponents of Federal legislation say that these standards are often weak or not being enforced. The Interior Department has issued new regulations for local mining on Federal lands, and has recently decided to apply to Wyoming State regulations to Federal coal land development in that State.

- Impact Assistance. The President, in February 1976, asked the Congress to consider comprehensive Federal energy impact assistance legislation. This one billion dollar loan, loan guarantee, and grant program would provide financial assistance to all areas affected by Federal energy resource development in the next fifteen years. The assistance would utilize a variety of financing mechanisms to help plan and finance energy-related public facilities prior to energy production, and assistance would be repaid from future taxes and revenues. The Congress passed legislation that provides assistance for coastal development, but not for inland projects such as coal, oil shale, tec.
- Nuclear Safety and Waste Disposal. See Section 6.

Remaining Problems

- There remains a strong need to resolve most of the major resource development and environmental issues raised above. It is particularly important that uncertainty be reduced with respect to coal development (Clean Air Act and surface mining legislation), nuclear power, supplemental sources of natural gas, and synthetic fuels commercialization.
- A major issue is likely to confront the new Administration regarding the disposition of Alaskan oil. Between the time the trans-Alaskan oil pipeline legislation was approved and expected delivery next year, conditions changed and it now appears that a surplus of about 500,000 barrels per day may be available for movement from the West Coast.
- The surplus was caused by lower demand as a result of much higher prices and greater conservation awareness; the decision to

commence production from Naval Petroleum Reserve #1 in California; and greater incentive to use enhanced recovery techniques at existing California fields.

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- There are several possible alternatives for movement of oil from the West Coast. These include a Trans-Provincial Pipeline through Canada; a northern-tier pipeline to Minnesota; the SOHIO project to construct a marine terminal in California and use an abandoned gas pipeline to deliver oil to the Midwest; and a Central American Pipeline project.
- In addition, some have suggested that Alaskan oil be sent to Japan in exchange for Middle East crude for the Gulf Coast. While such an approach would reduce transportation costs, there are important reasons why this alternative is not desirable.
- Another key energy development issue will be a decision on an Alaskan natural gas transportation system. Under existing legislation, the President will have to make a recommendation on such a system to the Congress in 1977, for its consideration. His recommendation will also consider financing questions. There are currently three competing proposals for this multi-billion dollar project.
- The dispute over the need for power and the possible impacts of having too much or too little energy is another important issue.

Possible Initiatives

- Amendments to the Clean Air Act. This issue will be considered again by the Congress and a whole new strategy may be desirable. Among the options that should be considered is a separation of the stationary source and automobile emission provisions into two separate bills. There may also be consideration of a sulfur emissions tax.

- Surface Mining Legislation. The need for Federal surface mining laws will be reconsidered by the 95th Congress.
- OCS Leasing Amendments. The Congress is likely to take up again possible reforms to the OCS leasing practices of the DOI. Among the alternatives that will be reviewed are changes in the bidding system; greater participation by States and local governments in the decision-making process; and the adequacy of current environmental safeguards.
- Alaskan Oil Distribution. Proposals may have to be developed if review of the Alaskan oil distribution study indicates a need for legislative or administrative action.
- Coal Slurry Pipeline. Legislation which would allow the right of eminent domain to coal slurry pipelines will probably be reconsidered by the Congress.
- LNG Siting and Safety. To assure that needed liquefied natural gas projects are expedited, there may be a need for administrative or legislative action. Such action could consist of national siting standards; Federal regulatory reform; more participation by States; or greater expenditures for safety and risk analysis.
- Siting Programs. There may be an opportunity to streamline Federal regulatory processes for siting new facilities, and providing incentives to states to develop siting programs. One such incentive might be an energy resource planning activity as part of an inland impact assistance program or modification of the State conservation grant program to include resource development planning.
- Changes in State/Federal Relationships. Since State and local governments and interest groups have such a strong voice in energy development decisions and since attempts at Federal overrides have proven to be difficult to pass, there could be a further involvement of these groups in the Federal decision-making process. The key questions revolve around the extent of involvement; whether such involvement be in an advisory role or with some veto ability; and whether funds should be provided for such participation.

Conclusions

- The United States will have to continue expansion of domestic energy development in order to preserve its economic and national security. But such development will not take place unless the Federal government takes the appropriate steps to ensure that environmental standards are met, and that State and local interest groups are involved in the decision-making process. Further, the following actions are proposed:
 - The Congress should review the entire regulatory process involved in siting new energy facilities and propose methods to improve the process where feasible.
 - The Congress should attempt to reduce uncertainty concerning the ground-rules for environmental standards and development on Federal lands.

SECTION 5

ELECTRIC UTILITY REGULATORY REFORMBackground

- Electricity consumption has grown at a considerably faster rate than overall energy demand in the past few decades (7 percent annually from 1947-1972 vs. about 3 1/2 percent for all energy), primarily because of its versatility of use and variety of sources. While its use is essentially pollution free, its generating stations often concentrate pollutants in a single and highly visible source.
- Prior to the embargo, the electric utility industry was known for its stability, characterized by rising consumption and declining prices. The embargo, and subsequent price increases, led to large fuel cost increases. Consumer reaction to higher prices, energy conservation awareness, and the recession brought about a relatively flat growth rate in 1974-1975.
- The inability of utilities to obtain adequate rate relief to cope with higher fuel prices, escalating capital costs of nuclear and coal plants, uncertainty about demand growth, and environmental problems, resulted in major cutbacks in 1974 in plans for generating capacity. At one point, more than 75 percent of planned nuclear plants were postponed or cancelled.
 - In 1975, market conditions improved somewhat and a record \$3 billion of rate relief was granted and market to book value ratios have improved; however, the basic uncertainties about load growth, financing capability, and siting difficulties remain. Utility reserve margins remain high (about 35 percent).
 - Nuclear and coal-fired power plants are the cheapest base load plants, but are the most capital intensive (a 1000 MWe nuclear

plant costs about \$600 million to build, in 1975 dollars, as compared to \$240 million for an oil-fired plant) and easiest to defer. Given their long lead-times (7-10 years), if they continue to be deferred and considerable load growth resumes, utilities may have to build oil- or gas-fired plants to meet customer needs in the 1980's.

Proposals Offered

- The Administration proposed a number of measures over the last two years to deal with the utility problem. These include:
 - The Utilities Act of 1975 was designed to assist the financial health of public utilities by reducing regulatory lags involved in approving proposed rate changes and assuring that rates adequately reflect the full cost of generating and transmitting electricity. To reduce the cost of capital for needed utility expansions and stimulate equity rather than debt financing, proposals for tax changes were also presented, including increased investment tax credits for public utilities and preferred stock dividend tax deductions.
 - Legislation to provide a stronger role for the Federal Government in the utility rate setting processes has met with strong resistance in the Congress, as utility regulation is the traditional province of the States, and some claim that the necessity for higher utility rates has not been demonstrated adequately.
 - The Energy Facilities Planning and Development Act of 1975 would require that States have a comprehensive and coordinated process for expeditious review and approval of energy facility applications, and that final State energy facility decisions cannot be nullified by actions of local governments. This proposal was not passed mainly because of its attempt to interpose Federal regulations on local decision-making.

- The Electric Power Facility Construction Incentives Act of 1975 (proposed by the President's Labor-Management Committee and endorsed by the Administration) was designed to provide tax incentives to stimulate the construction of new electric power generating facilities other than those fueled by petroleum. This legislation allowed an increased investment tax credit, extension of five-year write-off of pollution control equipment, depreciation of construction work in progress (CWIP) as expended and optional dividend reinvestment with deferred income taxation. The first three benefits are conditioned on inclusion of CWIP in the rate base and normalization of tax deferrals and credits. This bill was not enacted.

- The Energy Independence Authority Act, which was proposed to supplement and encourage private capital investment, would finance energy projects that would contribute directly and significantly to energy independence, and would not otherwise be financed without government assistance. EIA financial assistance would require as a condition of assistance to a regulated utility, sound and expedited regulatory response from rate commissions. It would include agreement by the regulatory commission to a rate covenant with EIA and the regulated utility to assure adequate earnings to protect EIA's investment. This bill was not enacted.

- Amendments were passed by Congress to the Energy Supply and Environmental Coordination Act (ESECA). These extend and broaden the mandate to convert oil and gas boilers to coal, where practicable, and to order plants to be designed for and use coal.

- The Nuclear Fuel Assurance Act of 1975 would encourage the development of a competitive private uranium enrichment industry to fuel expected nuclear power plant needs. This bill, as discussed in Section 6, was barely defeated in the Senate late in the 94th Congress.

- Amendments were proposed to the Clean Air Act to resolve regulatory problems resulting from court decisions regarding "significant deterioration" of air quality, and to extend compliance dates for air quality standards through 1985 (to allow use of intermittent control systems in isolated power plants and require other sources to achieve control as soon as possible). These amendments, as discussed in Section 4, failed to pass.
- The Nuclear Power Plant Siting and Licensing Procedures Act intended to shorten and improve the licensing process for nuclear facilities, would allow licensing procedures for reactor sites and standardized reactor designs to be completed at an early point in time. This bill was not enacted.
- As indicated above, the amendments to the ESECA coal conversion authorities were the only Administration initiatives passed by the 94th Congress in the utility area. Primary attention toward utilities in the 94th Congress centered on consideration of S. 1777 in the Senate Public Works Committee and H.R. 12461 in the House Interstate and Foreign Commerce Committee, although neither bill was reported out of Committee.
- S. 1777, as discussed in Section 2, would extend and broaden FEA's coal utilization authorities. Under ESECA, the FEA can identify existing utility and industrial boilers that should be converted from oil and gas to coal, or new utility or industrial facilities that should be constructed to burn coal. In each instance, FEA must justify its orders. These ordering authorities expire June 30, 1977.
- S. 1777 would extend the ESECA conversion and construction order authorities. New utility oil and gas construction, however, would be prohibited completely (with certain exceptions). The burden of proof would shift to the utility to receive a permit from FEA. S. 1777 was not considered by the Senate due to the priority of

Clean Air Act amendments in the Public Works Committee.

- H.R. 12461, considered by the House Interstate and Foreign Commerce Committee, approaches the utility issue by mandating certain ratemaking practices on a national basis (regardless of uniform applicability), providing for automatic adjustment clauses under certain conditions, limiting the inclusion of construction work in progress in the rate base and excluding it entirely from bulk power rates, and other measures. The bill involves a complex set of regulatory changes.
- In addition to these programs, load management demonstration programs have been funded by the Congress for the past two years, and the recently enacted Energy Conservation and Production Act authorizes a \$13 billion utility demonstration program and mandates the development of proposals on utility rate reform. A report on rate reform is due to Congress in February 1977.
- There are several reasons why the utility proposals have not received a more positive reaction:
 - Almost all the utility rate relief proposals involve higher costs to consumers in an area where costs have already risen dramatically (the average residential electric bill increased by 45 percent from 1973 to 1975).
 - Assistance to utilities is never a popular public issue, since most consumers think utilities are already in good financial health.
 - Siting and regulatory decisions are traditionally made by local authorities and attempts at Federal override meet with strong "states' rights" opposition.
 - Environmental quality concerns often conflict at a local level with national energy policy considerations. Nuclear power, in particular, has undergone considerable public scrutiny in the past year.

Possible Initiatives

- Coal Conversion. Converting existing power plants is a long and arduous process. To date, almost half of the 74 existing units identified as candidates for conversion have actually started burning coal. Legislation such as S. 1777 may be needed to amend and extend current ESECA authorities.
- Rate Guidelines. As mandated by the ECPA, the FEA is currently assessing the utility rate setting process. The study and any proposed guidelines will consider load management, changes in declining block rate structure, cost of work in progress, fuel adjustment clauses, and the normalization of accounting practices.
- Investment Tax Credits. There are a number of alternatives for using tax credits as an incentive to the greater use of coal and nuclear power in the generation of electricity:
 - A greater investment tax credit for the electric utilities building new nuclear and coal power plants; solid waste utilization and coal gasification facilities for electric power generation; capital investments to convert existing natural gas and oil powered plants to coal; and capital investments in load management and environmental control devices;
 - Legislation which would provide that no tax credit be given for any oil- or gas-fired facility, except those fueled by gas produced from coal. However, such legislation may not be necessary if a new coal conversion approach is adopted, and could affect the ability to build any needed peaking equipment.
- Regional Generation. To promote bulk power generation of electricity, the Congress could consider legislation authorizing States and their regulatory bodies to enter into agreements

providing for the formation of regional wholesale generating companies which would construct all future base loaded facilities in their service area and be governed by FPC rules on bulk power generation. This legislation could require adherence by participating utilities to minimum rate guidelines. Opposition to this proposal can be expected on the basis of Federal interference in State rate setting processes.

- Utility Conservation Financing. One approach that has been considered for stimulating conservation is to have gas (and possibly electric) utilities install insulation or make other conservation investments in individual homes and charge the cost of the insulation against the utility's rate base, rather than against the householder directly. The rationale for such a proposal centers on the high cost to a given utility of obtaining supplemental gas supplies (synfuels, LNG, etc.), relative to the cost of installing equivalent insulation. The theory is that if the entire rate base benefits from installation of insulation in individual homes, then the entire rate base should support the cost of such installation, just as the entire rate base supports the cost of additional supply alternatives.
 - Utility insulation financing, charged against the rate base as a whole, could contribute significantly to overcoming many of the major obstacles to widespread insulation investment. These include somewhat high initial costs, long payback periods, uncertainty regarding ultimate cost effectiveness, and difficulties encountered in dealing with the financing and supervision of the household improvement industry.
 - However, the reluctance of utilities to invest directly in the conservation business and possible legal problems would have to be overcome. Potential opposition by insulation businesses which might object to competition from the utilities on antitrust grounds and bondholders who might question the security

of insulation investments, as well as opposition by consumers who have already installed insulation, would also have to be addressed.

- Merger Policy. The traditional position of the Department of Justice has been to oppose utility mergers as reducing competition. Since there are economies of scale associated with larger plants, and since competition between adjacent utilities is small, there may be a need to review merger policy.

Conclusions

- Electricity consumption is expected to continue to grow at about twice the rate of energy demand. If coal and nuclear electric generation capacity is not started now, it is possible that power shortages would result after 1980 and utilities would turn to oil and gas as a source of power. To reduce the possibility of such a result, the following actions are needed:
 - The Congress should broaden, through amendment and extension, the Government's existing coal conversion authorities.
 - The Congress should consider additional investment tax credits for utilities to encourage greater use of coal and nuclear power in the generation of electricity.
 - However, any Congressional action on electric utility rate reform should await completion of the FEA Report to Congress mandated under the ECPA.

SECTION 6

NUCLEAR ENERGYBackground

- By substituting for oil and natural gas in electricity generation, nuclear power permits the use of these scarce domestic fuels for purposes where no other alternatives exist. It can also substitute for coal in many instances where environmental considerations and economics do not allow use of fossil fuels.
- This country is now in its 18th year of commercial nuclear power production, with 63 plants totaling over 46,000 megawatts (MWe) authorized to operate and supplying about 9 percent of our electrical generation. Another 173 plants totaling nearly 190,000 MWe are planned or under construction. Nuclear plants now supply the equivalent of over 1 MMB/D of petroleum.
- Most planned nuclear power plants or additions in capacity were postponed or cancelled in 1974-1975 due to uncertainty over load growth, utility financing difficulties, and siting problems.
- High capital costs, coupled with the difficulty of raising funds, and uncertainties over the price and availability of uranium (particularly after the failure of a major uranium supplier to meet contract requirements), have affected the economics of nuclear power and led to a reassessment of plans by many utilities. Nevertheless, electricity generated in current light water nuclear reactors is economically advantageous to fossil fuel electricity production in many areas.
- Recently, nuclear power has faced considerable criticism, which has added to uncertainty about its future. The criticism has been directed at various aspects of the regulation of nuclear power, including siting decisions, waste disposal, possible sabotage, safety, and reprocessing, as well as the question of the proper Federal role in nuclear development.

- The Federal Government has had a major role in nuclear development, since the days of the Manhattan Project during World War II, when the primary objective was to develop a new and powerful weapon.
- In the post-war period, the Atomic Energy Commission was established to maintain civilian control over weapons development and to regulate the use of fissionable nuclear material.
- In the mid-1950's, the "Atoms for Peace" program was established to utilize, for peaceful purposes, the technological base established by the military programs, and was the beginning of Federal involvement in nuclear electric power generation.
- The government-sponsored research to develop power reactors, regulated safety, and produced the enriched uranium fuel needed to power the reactors in three facilities which had been built originally for weapons production. The pervasive role of the Federal Government has been attacked by some critics.
- There has been increasing concern over the course of the U.S. non-proliferation policy, with many people fearing misuse of nuclear power by other nations. The United States has participated in about 30 bilateral agreements on nuclear cooperation.

Proposals Offered

- Licensing and Regulation. The Atomic Energy Commission was abolished in 1974 mainly because of concern that an agency responsible for both the regulation and promotion of nuclear power could not perform both functions efficiently and without bias. The independent Nuclear Regulatory Commission was created to license nuclear facilities; protect the health, safety and environment; and to review antitrust considerations.

- At the same time the Energy Research and Development Administration was created and charged with the responsibility for nuclear and nonnuclear R&D.
- The Administration asked Congress to enact nuclear licensing legislation to improve the efficiency and timeliness of licensing of nuclear facilities. The licensing and regulatory process have slowed due to challenges from various sectors of the public on safety and environmental grounds, and the reactions of the regulators and the industry to these challenges.
 - Slippages in nuclear facility construction are of concern because they can result in electricity shortages; need to purchase high cost power from other utility systems; the construction of oil- or gas-fired facilities with shorter lead times to replace deferred nuclear capacity; or higher electricity generating costs due to the large capital expenditures and inflation.
 - The licensing legislation would encourage standardized plant designs and decouple site and safety reviews. The bill was not enacted by the Congress.
- An important aspect of the siting and licensing of power plants is the need to define Federal and State roles clearly. Nuclear initiatives on the ballot in July in California and in five States in November were defeated by considerable margins. However, earlier in the year California passed three bills relating to siting, nuclear waste disposal, and spent fuel reprocessing.
 - These bills raise serious legal issues about the roles of the States and the Federal Government in regulating nuclear power. Legal research is now underway with respect to this question.
- Uranium Resource Exploration. There has been a dramatic increase in the budget for uranium resource assessment. The United States has sufficient reserves and probable resources of

uranium ore to fuel some 300,000 MWe of capacity for 30 years of operation. Less than half that capacity is expected to be in operation by 1985. Whether or not additional (non-breeder) nuclear plants can be fueled beyond this 300,000 MWe capacity depends on how successful the industry is in the coming years in finding new uranium resources. Continued exploration and development effort will be required to convert resources into reserves. Higher uranium prices will probably serve as an incentive to continue exploration for resources and the construction of mining and milling facilities to develop these new sources.

- Uranium Enrichment. The Nuclear Fuel Assurance Act proposed by President Ford and narrowly defeated in the Congress would authorize ERDA to enter into contracts with private firms to finance, build, own, and operate enrichment facilities. It would foster creation of a private, competitive enrichment industry. The bill was defeated primarily because of concern over allowing private companies to take over these operations and general anti-nuclear sentiment.
 - Uranium for use as fuel in light water reactors must be enriched in the fissile isotope U-235 to a concentration of approximately 3% by weight. Naturally occurring uranium contains only 0.7 percent U-235 by weight, the rest being U-238. Currently, the United States is the major supplier or foreign enriched fuel. Contracts have been signed for some 300,000 MWe of capacity, of which one-third represents foreign commitments.
 - The Administration proposed legislation in 1975 to establish prices for uranium and enrichment services reflecting their fair value.
- Reactor Safety. There remains some concern about the safety of nuclear power plants, despite the record of over 200 plant years of operation without a single death from a nuclear accident in a commercial facility, and the Rasmussen study, which assessed the

probabilities of catastrophic accident as being extremely low. The major thrust towards reducing public concern and assuring safety has been massive budget increases for reactor safety research and development.

- Spent Fuel Reprocessing and Plutonium Recycle. Uranium fuel used in current nuclear reactors produces power, slightly enriched uranium, some radioactive waste products, and plutonium which can be chemically separated. The uranium and plutonium can be recycled and used to generate nuclear energy, thereby offsetting the need for additional uranium resources. Nuclear development in the United States has been based on the assumption that reprocessing and plutonium recycling would occur.
 - Three facilities have been built by private industry. Two of these facilities have been abandoned because of technological problems. The third plant is partially completed, but awaits a final decision by NRC on commercial use of plutonium recycle.
 - The major concern in reprocessing is the recovery of plutonium, the key material needed to make nuclear explosives. Once separated in a reprocessing plant, plutonium conceivably could be diverted or seized by terrorists. Several major industrial nations plan to operate reprocessing facilities.
 - In October 1976, President Ford asked ERDA to define a reprocessing and recycle evaluation program, complementing NRC's environmental analysis, and he invited other nations to join in the evaluation. He also encouraged ERDA to change policies that assumed reprocessing would proceed, to encourage prompt expansion of spent fuel storage facilities, and investigate alternatives to reprocessing. The President called upon all nations to restrain the transfer of reprocessing technology.
- Nuclear Proliferation. The potential benefits of spent fuel reprocessing and plutonium

recycling must be balanced against the danger of nuclear weapons proliferation. Expanded use of nuclear power internationally occurs for a variety of reasons, including peaceful and potential military use. The United States has participated in the Nonproliferation Treaty (NPT) and used its market influence to impose restraints. As its share of the nuclear material, equipment, and technology market declined, the U.S. leverage on restraints has been reduced. In October 1976, President Ford called for the following measures:

- He directed the State Department to pursue establishment of a new international regime to provide for storage of civil plutonium and spent reactor fuel. He urged the International Atomic Energy Agency (IAEA) to implement this concept.
- He urged an upgrading of the IAEA's safeguard functions and an investigation of the possibility of an international convention on physical security.
- He indicated that the United States would, at a minimum, respond to violations of a safeguards agreement with an immediate cutoff of supply of nuclear fuel and cooperation.
- He announced that U.S. nuclear export policy would favor nations adhering to the NPT; foregoing reprocessing or enrichment facilities; or participating in an international storage regime.
- He directed ERDA to pursue programs to provide design information for international safeguards and other controls, support an international plutonium management regime, establish an international system of assured fuel supplies and demonstrate waste management technology.
- The issue of nuclear proliferation and diversion has been of increasing Congressional concern. A number of bills were introduced, including measures to prohibit domestic plutonium recycling; to control

export of nuclear facilities and materials; and to expand safeguards to reduce possibility for theft, diversion or sabotage.

- Nuclear Waste Management. In addition to dramatic budget increases for waste management, the President asked ERDA to demonstrate all components of waste management technology by 1978 and to have a complete repository for such wastes in operation by 1985. He also urged international discussions on the possibility of establishing centrally located, multi-nationally controlled nuclear waste repositories.
- Nuclear wastes are highly radioactive and must be isolated from the environment for centuries. The principal problem is confining the radioactivity, not finding enough storage space (total volume of commercial waste through 2000 will be about 70 cubic feet). The technology has been demonstrated at a small scale, and most experts believe deep underground storage is the most practical method.

Remaining Problems/Possible Initiatives

- Votes on nuclear referenda this year by about 20 percent of the population and a recent public opinion survey show that most Americans favor nuclear power. Nevertheless, some individuals and groups remain opposed to its expansion.
- Almost all the legislative and administrative proposals cited above have yet to be enacted or implemented.
- Major decisions will be needed or need to be reaffirmed on the following subjects:
 - Extent of nuclear power use in the United States;
 - Federal/State roles in regulating nuclear power;
 - The role of the United States as a supplier of world markets;

NOTE: PAGES WERE INCORRECTLY NUMBERED. THERE IS NO PAGE 71.

- Enrichment capacity and pricing of services;
- Reprocessing;
- Proliferation;
- Waste Repository;
- Breeder Reactor.

Conclusions

- The use of nuclear power must continue to expand. Nuclear energy has a record of safety, and has been shown to be economic and have little environmental impact. Major decisions will have to be made or reaffirmed regarding the role of nuclear power and the extent and nature of reprocessing, enrichment, waste disposal, proliferation, and funding of the breeder reactor. In addition, the Federal agencies and the Congress should adopt the measures recommended by the President in October with respect to nuclear fuel cycle.

SECTION 7

ENERGY FINANCINGBackground

- Over the past few decades, energy investments have accounted for about 25-30 percent of total fixed business investment in plant and equipment. Projections indicate that this trend is likely to continue in the next ten years, with expected energy investments of almost \$600 billion (in 1975 dollars), amounting to about 30 percent of fixed business investment.
- The total expected energy investment, while enormous, is anticipated to be manageable in the aggregate. Nevertheless, specific sectors, such as electric utilities, may find it difficult to raise capital unless regulatory practices act to maintain their financial health.
- The Federal Government now has specific authority to implement a number of energy financing programs, with minimum Federal exposure of at least \$5 billion. These include:
 - Coal loan guarantees;
 - Conservation obligation loan guarantees;
 - Geothermal loan guarantees;
 - Price-Anderson nuclear indemnification program to provide government insurance to vendors and utilities in excess of available private insurance, and thus remove a possible bar to private investments;
 - Weatherization grants;
 - Energy conservation and renewable resource demonstrations;
 - Coastal zone impact aid;
 - Coal impact loan program to States affected by Federal coal development;
 - REA loan financing for electricity related items;
 - Liquefied natural gas tanker subsidies and mortgage guarantees.

- A number of Federal mechanisms could be used to encourage investment in needed energy projects, including:
 - income tax credits, penalties and refunds;
 - excise taxes (see Section 2 for tax options);
 - guaranteed or subsidized loans;
 - Federal grants;
 - Federal ownership;
 - price supports;
 - government market purchase guarantees.
- The issue to be resolved is whether the existing market mechanisms, in the absence of further government intervention, will channel necessary investments to meet our evolving national goals for conservation and energy resource development.

Proposals Offered

- During the past two years, the Administration has submitted several financing proposals to the Congress to facilitate and expedite the construction and operation of a wide variety of energy facilities. These proposals had one or more of the following objectives:
 - to expedite commercial development of emerging energy resources and conservation technologies which are deemed economic and environmentally sound;
 - to provide financing to overcome key bottlenecks to orderly development of energy facilities and resources;
 - to provide economic assistance to localities impacted by Federal energy resource development activities;
 - to provide financing assistance to those segments of the economy which must make significant capital expenditures to satisfy Federal regulations on fuel mix and environmental control of energy uses.

- to improve knowledge with respect to commercialization of new technologies.
- Among the financing proposals were the following:
 - Synthetic Fuels Commercialization. A Federally sponsored Synthetic Fuels Commercialization Demonstration Program was first proposed to the Congress in January of 1975 and subsequently submitted as part of the ERDA budget. As negotiated with the Congress, but failing by one vote on a procedural question in the House, it would have provided \$2 billion of Federal assistance (primarily loan guarantees) to commercial facilities for synthetic gas, coal liquefaction, and oil shale production.
 - Energy Independence Authority (EIA). On October 10, 1975, the President forwarded legislation to the Congress to establish an independent government financing authority with financial resources of \$100 billion to provide loans, loan guarantees, and other financial assistance for the development of private sector energy projects which would not be financed without government help. The projects that could be assisted would be at the commercial stage (not R&D) and could include conservation and transportation facilities, as well as resource development proposals. The EIA would also expedite the regulatory process at the Federal level for projects deemed critical for energy development, by establishing the FEA as the coordinator of a streamlined permit process for all new facilities requiring Federal licensing. The bill did not pass.
 - Nuclear Fuel Assurance Act. In May 1975, the Administration submitted to Congress legislation to, in part, authorize ERDA to negotiate cooperative agreements providing temporary government financing, technological and contractual assurances to private ventures wishing to finance, build, own and operate uranium enrichment plants. The bill was not enacted.
 - Electric Utilities Construction Incentive Act. Proposed in June 1975, this legislation would accelerate the construction of electric power generating facilities by increasing the investment

tax credit to 12 percent for all electric utility facilities except those that are oil- or gas-fired; extend until 1981 rapid amortization of pollution control equipment, and apply rapid amortization to converting or replacing oil-fired generating facilities; allow depreciation of construction expenses for other than oil- or gas-fired facilities prior to the completion of the project if such expenses are included in the rate base; and allow deferral of taxes on dividends, if they are reinvested in the utility. The bill was not enacted.

- Federal Energy Impact Assistance Act. This legislation was proposed in February 1976 and authorizes up to \$1 billion for loans, loan guarantees, and planning grants for States and local communities for energy-related public facilities and infrastructure prior to construction. The Congress addressed part of this question in the Coastal Zone Management Act Amendments (July 1976). This legislation provides \$1.2 billion of loans and grants to coastal States over the next ten years for construction of public facilities to reduce the impacts of offshore fossil fuel development and production, but ignores inland resource development (i.e., coal and synthetic fuels).
- Residential Insulation Tax Credit. This proposal was submitted to Congress by the Administration in January 1975. It allows homeowners a tax credit of 15 percent of the first \$1,000 invested in materials and installation of residential insulation over a three year period (maximum of \$150 tax saving). The bill has passed both Houses at various times, but was deleted twice in Conference Committees.
- Weatherization Program. The Administration proposed and Congress adopted (in the ECPA) a three year, \$200 million weatherization grant program for the insulation of homes of low-income, elderly, and handicapped persons, and Native Americans.
- The Congress adopted several energy financing proposals that were not proposed by the Administration. These include:

- Coal Loan Guarantee Program. The EPCA and ECPA have authority for \$750 million of loan guarantees to small coal producers for opening new coal mines or re-opening existing underground mines; most of this assistance must go for low sulfur coal.
- Amendments to Mineral Leasing Act. The Congress overrode a Presidential veto and enacted amendments to the Mineral Leasing Act which increase the State share of royalties from Federal leases from 37 to 50 percent.
- Conservation Obligation Guarantee Program. The ECPA authorizes up to \$2 billion in obligation loan guarantees for conservation investments by industry, small business and non-profit institutions, provided conservation investments would pay off and applicants satisfy a test that credit is unavailable elsewhere.
- State Conservation Grant Program. The EPCA and ECPA provide a total of \$255 million in grants to States (over three years) to assist in the development and implementation of energy conservation programs.
- Energy Conservation and Renewable Resources Demonstration Program. The EPCA provides \$200 million to the Department of Housing and Urban Development (HUD) to undertake a national demonstration program to test the feasibility and effectiveness of various forms of financial assistance for encouraging conservation measures. FEA is authorized to establish a demonstration program to test various mechanisms (grants, low interest loans, interest subsidies, etc.) for encouraging energy conservation improvements or use of renewable resources, such as solar heating or cooling, in existing residential buildings.
- Congress also considered a number of other financing measures, including additional tax credits for household insulation, solar heating, heat pump replacements for resistance heat, and investment tax credits to businesses for insulation, solar energy, waste conversion, coal mining, and oil shale development.
- As indicated above, a number of proposals did not succeed in the 94th Congress. Among the reasons cited for such failures were:

- Widespread opposition to Federal financing aid for large energy companies (particularly oil companies), despite the risky nature of commercializing technologies.
- Reluctance on the part of market approach advocates to subsidize development of technologies that are or may be uneconomic.
- The belief that more emphasis should be given to bringing about basic policy changes and regulatory reform, rather than relying on Federal financial assistance.
- The public perception about the extent of support (in terms of dollars) seemed large during a time when the government is trying to reduce spending and deficits.
- The assistance programs like synthetic fuels and EIA cover a broad range of projects and may be harder to accept or explain than would be more specific project assistance.
- If Federal financial assistance results in projects being undertaken which would not have been built otherwise, the demand for capital would be increased, causing interest rates to rise and redirecting capital to less economic investments.
- Some environmental groups were concerned about supporting projects which may have adverse environmental impacts.
- Some of these bills, and particularly the synthetic fuels bill, were referred to several Congressional Committees, losing time and interest in the process.

Remaining Problems

- It seems apparent that some needed energy investments may not occur due to market uncertainties, potential risks, or national interests being different from individual company concerns. There are several questions that still must be addressed:
 - Will market forces adequately advance commercialization of the evolving energy technologies and conservation when the prices of conventional energy commodities are controlled?

- Is there sufficient venture capital available at reasonable rates to permit timely commercialization of evolving technologies in the face of market and government regulatory uncertainties?
- How can government regulatory and resource development rules be rationalized so that a clear and favorable climate for private action can be established?
- Can the government bureaucracy manage and plan resource development programs without causing more problems than are solved by its assistance?
- Is the tax system or other Federal financial measures the "appropriate" mechanism to achieve these energy policy goals?

Possible Initiatives

- Establishment of a Federal government financing authority. Under this approach, a government energy financing authority would be established to implement any existing and new financing programs authorized by the Congress (could include synthetic fuels, inland impact assistance, uranium enrichment, etc.) for energy resource development and conservation activities.
 - Such a comprehensive mechanism would be advantageous for controlling Federal financial commitments in a coordinated fashion, assessing impacts and distortions upon the capital markets and other segments of the economy, coordinating with other ongoing Federal and State fiscal and monetary actions, and providing appropriate budgetary treatment for these obligations.
- Propose specific financing Authorities. A set of specific financing proposals (with or without a proposal for a government financing authority) could be offered. The possible areas of Federal financial assistance include:
 - Conservation;
 - Synthetic fuels;
 - Coal;

- Solid waste utilization;
 - Supplemental sources of natural gas;
 - Transportation infrastructure;
 - Inland impact assistance;
 - Nuclear fuel cycle.
- Government Purchase Program. The government can play a major role in fostering the commercialization of evolving energy resources, environmental control devices, and conservation technologies by establishing a market for specific products through initial, high volume government purchases. A government purchase program could be implemented with certain performance and cost criteria, so that subsequent production would be expected to be commercially competitive. The government could consume these products by itself and/or lease or sell them to the private sector. The capital outlays for such a program could be at least several billion dollars and could involve significant administrative costs.
 - Pricing Policy. Decisions over pricing and regulatory conditions (particularly with respect to supplemental sources of natural gas) could have a major impact on the need for Federal financial assistance. For example, many firms indicate that incremental pricing of synthetic gas will result in little or no market for the fuel and that "take or pay" contracts may be needed. Others contend that rolled-in pricing generates artificial demand for the product and that "take or pay" contracts force consumers to take all the risk with new projects.
 - Tax Policy. The government can also affect investments by modification of Federal tax policy to provide more favorable depreciation schedules, investment tax credits, etc. This alternative is discussed in more detail in Section 2.

Conclusions

- The energy industry will have to make substantial capital investments in the next 10-15 years. Some sectors should have sufficient capital as long as unfavorable regulatory actions are not taken. Sectors, such as electric utilities and synthetic fuels, may need some form of Federal financial assistance. As a central element of our policy, maximum reliance

should be placed on private sector financing of energy projects. Many of the barriers to private financing are a result of government regulation. However, Federal financial assistance may be needed for projects which will contribute significantly to energy independence, but would not be undertaken in a timely fashion without such assistance.

- The new Administration and the Congress should review the entire financing issue, but should assure that those first generation plants that are needed, can be built. The technology, efficiency, economics, and environmental implications of these new facilities should be demonstrated at a commercial level.

SECTION 8

R&D PRIORITIESBackground

- The fuel sources to meet our Nation's energy requirements have changed considerably over the last hundred years. Due to advances in technology, the development of new fuel sources, and economics, coal has replaced wood, and oil and natural gas subsequently replaced coal as our predominant energy sources.
- The impacts of environmental concerns, the oil embargo, higher fuel prices and heightened energy awareness have forced an abrupt re-evaluation of American energy policies.
 - Environmental groups have raised serious questions about the ability of the environment to withstand continued growth.
 - The embargo has forced policy-makers to examine the issue of dependence on oil.
 - Higher energy prices have served as an incentive to conserve and have stimulated the search for technological solutions.
 - The realization that there are geological limitations to presently used resource supplies - and that we may be pressing these limits, given the long time frames for new technology development and commercialization - has inspired a greater urgency in search for alternatives.
- In the long-run, the Nation must face the question of how the economy will make a transition from reliance on finite oil and gas resources to other, more abundant, resources. In fact, of course, the whole world must begin now to make such a transition as supplies of oil and gas are depleted. The timing for completion of this transition is uncertain, and depends on domestic supply availability, demand, import goals,

environmental factors, and technology development. However, the end of this century is likely to be a critical time period.

Proposals Offered

- Reorganization. Prior to the 1973 oil embargo, the responsibility for formulating and executing Federal energy R&D policy was fragmented among a wide variety of Federal agencies. However, the Energy Reorganization Act of 1974 led to the formation of the Energy Research and Development Administration (ERDA). The major objective of this legislation was the creation of a comprehensive, independent energy research and development agency which would play the leading Federal role in the balanced and speedy development of various energy production and efficiency technologies.
 - Another purpose of the Act was to separate the nuclear research and development functions of the Atomic Energy Commission from the regulatory functions of that agency. (It also established the Nuclear Regulatory Commission.)
- Research and Development Acts. Other major legislative mandates were simultaneously or subsequently given to ERDA in the following additional acts:
 - The Federal Nonnuclear Research and Development Act of 1974, which provides the major guidance to the ERDA Administrator as to the principles, authorities and duties to be carried out with respect to R&D in energy technologies other than nuclear power.
 - The Solar Heating and Cooling Demonstration Act of 1974 and the Geothermal Energy Research, Development and Demonstration Act of 1974, which authorize expanded solar and geothermal R&D programs.
 - The Electric and Hybrid Vehicle Research, Development, and Demonstration Act of 1976, which authorizes additional funds for R&D in electric cars and requires Federal purchases.

- Expanded Budgets. Federal funding for energy R&D had already begun to increase prior to the embargo (from \$382.4 million in FY-70, to \$642.3 million in FY-73). In FY-73, 74 percent of the Federal energy R&D budget was devoted to nuclear fission and fusion R&D; 15 percent to coal resource development; 6 percent was expended on environmental control technologies; and the remainder was devoted to a variety of other projects including solar, petroleum and other technologies.
 - Following the embargo, an even more dramatic increase in Federal R&D expenditures occurred. Budget outlays for total energy R&D rose to \$2.9 billion in FY-77 and the emphasis has been changed. Nuclear fission and fusion R&D now amount to 48 percent of the total budget; fossil R&D at 15 percent; environmental research and basic energy sciences at 14 percent; conservation and solar energy at 8 percent; others at 15 percent.
- Research Strategies. As required under its enabling legislation, ERDA prepared annual R&D Plans in 1975 and 1976. The plans have set forth proposed national R&D goals, strategies, and technology priorities. In its most recent plan, ERDA assigned highest national priority to energy conservation technologies, along with direct use of coal, enhanced oil and gas recovery, and nuclear convertor reactor supply technologies.
 - Greater emphasis was given to commercialization of near-term technologies and to closely coordinating technology development with socioeconomic and environmental factors.
 - Primary responsibility for developing and commercializing conservation technologies was considered to rest with the private sector, although ERDA funding was also increased in this area.

- The report argued that national priorities for energy R&D are not the same as priorities for the allocation of Federal funds for energy R&D. In many cases Federal R&D funding may not be justified either because the R&D function can better be performed by the private sector; the objective can better be achieved by some means other than R&D; or the funding required is not sufficiently high in priority compared to other demands for Federal funds.

Remaining Problems

- Despite considerable change in emphasis, there is still criticism of the Federal energy R&D effort. Some claim that ERDA budget levels for energy efficiency (or conservation), near-term, renewable, or non-electric technologies should be higher; that its basic research programs regarding fossil, solar, geothermal, end-use conservation, heat transfer, thermodynamics, and combustion processes should be strengthened; and that alternative R&D budget strategies at different levels of funding should be investigated further.
- In a similar vein, questions are raised as to the need, or desirability of large funding levels for such technologies as the nuclear breeder or fusion reactors.
- There are basic questions remaining with respect to the degree of emphasis on electricity and particularly on nuclear power (converter reactors as well as breeder) and the appropriate degree of emphasis on energy efficiency and demand reduction as opposed to supply. These questions are at the heart of the Nation's long-term fuels policy (as discussed in Section 2) and at the root of many environmental concerns. There is also dispute over funding full-scale demonstrations of technologies that are not economic at this time.

- With a rapidly growing R&D budget, many difficult choices did not have to be made. As some of the new programs mature from the research phase to development and demonstration, they will require a further increase in the R&D budget relative to the Federal budget or a greater scrutiny of on-going programs. Trade-offs will have to be made on the allocation of funds and careful analysis will be required of on-going R&D efforts. Strategies and priorities should be re-examined continually.
- There are still organizational and activity overlaps in such areas as conservation, environmental and safety R&D, etc.
- It is not yet clear what will happen if the combination of energy policies and R&D fail to bring our longer-term energy situation into a proper balance, but the ERDA long-term analyses suggest that the impacts on U.S. economic viability could be significant.

Possible Initiatives

- Further Definition of Priorities. The most recent ERDA plan pointed out that, although all national energy technology goals (i.e., generic solutions such as expand domestic supply, improve energy efficiency, etc.) must be pursued together, every conceivable technology approach does not have to be pursued with equal vigor or at all. ERDA and the Congress must address the use of limited resources and where priorities ought to lie. They should consider the following questions:
 - To what degree should the Federal energy R&D program emphasize projects with near-term, mid-term or long-term payoffs?
 - Should research be spread across many areas to provide greater flexibility and hedges against uncertainties, or concentrated only

in a few potentially high payoff areas? Concentration involves evaluating the risks that development strategies may fail, e.g., public rejection of nuclear power; recognition of a catastrophic CO₂ problem; coal production retarded by environmental problems; or technology to guarantee large-scale access to breeders, fusion or solar power ultimately not being achievable. The debate thus becomes whether to expand or limit options.

- What should be the government's involvement in the following major technologies:
 - breeder reactor
 - solar electric
 - uranium enrichment
 - expanded use of coal
 - synthetic fuels
 - conservation
- Improved Cost-benefit Analysis. There needs to be more analysis of the relationship between Federal expenditure and achievements; the value of increased flexibility; the socio-environmental costs of new technologies; and the national costs of failure to achieve R&D objectives.

Conclusions

- Since energy research and development funding cannot continue to expand at its current rate, it will be necessary to make difficult choices about priorities. The Nation should look most favorably at those technologies that have the greatest likelihood of being able to contribute significantly by the end of the century and of being economic.

SECTION 9

INTERNATIONAL CONSIDERATIONSENERGY INDEPENDENCE AND ECONOMIC INTERDEPENDENCEBackground

- U.S. international energy policy pursued in the last three years reflects the fundamental change that has occurred in the international oil system. Key decisions affecting the production and pricing of international oil have shifted from the control and commercial motivations of international oil companies (IOC's) to the less predictable political and economic objectives of the member governments of OPEC.
- The economic and political impacts of the 1973 oil embargo and subsequent four-fold increase in world oil prices increased U.S. concern about the reliability and price of oil imports, focused public attention on energy policy, and gave impetus to first attempts at long-range comprehensive energy planning. Early statements by the Administration announced the goal of energy independence, a concept that was popularly misinterpreted to mean zero imports. Instead, its goal was to reduce imports to levels at which both the likelihood and effects of an embargo would be very small (probably 4-6 MMB/D).
- Initial emphasis was placed on the security of our energy supply. Reliable energy supplies are fundamental to the economic viability of the United States and other consuming countries and to the flexibility in foreign policy necessary to preserve U.S. strategic national security and interests.
- In addition to reliability of supply, energy independence was viewed as a means of diminishing the effects of unanticipated substantial increases in world oil prices. Adjustment to such increases imposes severe economic costs on the United States and other consuming nations.

- It is difficult to calculate the costs and benefits of U.S. energy independence. From a domestic perspective, in order to determine benefits, assumptions must be made regarding the likelihood, magnitude, duration, and frequency of embargoes; the ability to influence pricing decisions; the probability of success in reducing imports; the value of added flexibility in foreign policy; the ability to lower costs of new technologies by accelerating implementation; etc. Similarly, the costs of independence must reflect the costs of reducing our imports below that which would result without further Federal intervention, e.g., the economic costs of energy development, conservation programs, environmental and other major economic and social goals.
- Alternatives to reducing imports, such as a larger stockpile, diversification of sources or improved bilateral relations should be considered as approaches to reducing vulnerability.
- However, analysis done to date indicates that the reduction of imports through cost-effective supply and conservation actions, and the adoption of standby measures, is in the interest of this Nation.
- In an international sense, the goal of energy independence must be pursued within the context of the interdependence among the economies, and related strategic interests of the oil consuming countries, as well as the economic interdependence between consuming and producing nations.
- Energy -- especially oil -- is a critical factor in the economic future of most countries.
- Differences among oil producers stem largely from variations in the size of oil reserves, populations, and the relative importance of their oil revenues to their economic development programs.
- Oil exporters regard the revenues from their oil resources as the principal, if not only, means of transforming their economic base from primary resource suppliers to suppliers of processed and/or finished goods. Such a process requires vast amounts of capital, technology and possibly a longer time frame than the life expectancy of oil reserves in some countries at current production rates. Those nations perceiving a problem may prefer to conserve their oil resources by limiting production and maximizing the revenues derived via high oil prices.

- Reliable supplies of oil at reasonable prices are also necessary for economic growth in importing countries, including those developing countries without significant oil production. The development of alternative energy sources requires large investments, technology development, and long lead times.
- World oil supply and demand projections after the embargo differed in judgments about future consumption, costs and rate of development of alternative energy sources, and the impacts of higher prices. Oil prices have been sustained to date despite the reduction in the rate of growth in energy demand subsequent to 1973. Whether these conditions prevail in the future must await further evidence on a number of factors, including:
 - Availability, costs and rate of development of oil and gas reserves, and alternatives to oil and gas;
 - Resolution of institutional factors affecting energy, e.g., the environmental uncertainty over coal and nuclear energy.
- Oil producers could take advantage of continued dependence on imported oil, but run the risk of undermining the viability of the international economic and political system which is crucial to their development plans.
 - Alternatively, if oil importing nations ignore the dominant role of oil producers and decreasing oil availability, they risk adopting policies resulting in greater oil demand than producers can or elect to produce at reasonable prices.

Approaches Tried

- The Administration proposed a program to reduce substantially U.S. dependence on imported oil by 1985 (thereby reducing its demand for OPEC oil and resulting vulnerability to supply disruptions and abrupt price increases).
 - The nation's energy dependence can be reduced if a strong domestic energy program is adopted, unless geological projections are greatly inaccurate or institutional factors delay development. Analysis shows that the United States would have imported about 12-13 MMB/D in 1985, if no action had been taken after the 1973 embargo. Legislation passed and signed prior to November 1976 could result in an import level of 7-7.5 MMB/D by 1985, if programs are implemented fully and no negative energy actions are taken.

- Such measures as natural gas deregulation, insulation tax credit, and accelerated OCS leasing schedules could reduce the 1985 import level to about 4-5 MMB/D. That level, coupled with the impact of stored petroleum reserves and emergency standby measures to offset any future embargo, represents an acceptable level of energy dependence for the U.S.
- Two factors dictate caution in assessing the effectiveness of the U.S. reduced dependency goal:
 - The ability to sustain acceptable import levels in the post-1985 period may be difficult, unless growth of U.S. consumption is reduced and we increase reliance on coal, nuclear power, and renewable resources.
 - Even if the U.S. reduces import vulnerability, Japan and most of Western Europe probably will remain heavily dependent on OPEC oil, because their oil resource base cannot meet demand. The strong political and economic ties between the United States and the other industrialized nations will require continued U.S. concern and involvement with the international factors affecting the supply, reliability, and prices of their oil imports.
- Consumer Cooperation. The first step in the U.S. international energy strategy was the establishment of the International Energy Agency (IEA). Its immediate objective was to provide a means for minimizing the risks, costs, and destabilizing effects of unexpected supply interruptions. This goal has been accomplished by the International Energy Program, an emergency oil sharing plan.
 - The IEA evaluations of member nation conservation programs resulted in greater cooperation and publication of Energy Conservation in the International Energy Agency.
 - Moreover, the IEA has served as a conduit for the exchange of ideas on energy policy and research, at a time when most IEA nations had only formative energy programs.

- The current focus of efforts within the IEA centers around the Long Term Cooperative Program. This program includes:
 - Extending the basic motivations of the emergency sharing program to the longer term;
 - Effecting an efficient transition to an energy base that is less dependent on oil, recognizing the constraints to achieving greater reliance on alternate energy sources;
 - Assessing the implications of the continued reliance on imported sources of energy with uncertain supply and price conditions imposed by producer countries;
 - Possibly adoption of reduced dependency objectives by IEA nations. This program could reinforce consuming nation commitments to reduce oil imports, and thus strengthen the credibility of national and joint energy goals.
- Emergency Supply Actions. Stockpiling is an effective alternate supply source during interruptions, depending on the level of U.S. imports and the source, likelihood, magnitude and duration of any interruption. The U.S. is committed to a strategic oil storage program. The FEA reserve plan has recommended storage of 500 million barrels for 1982 with the provision that more storage should be considered if U.S. imports were projected to be significantly above 7 MMB/D by 1985.
- Price Actions. The U.S. has argued actively against OPEC Price increases, stating that precipitous price increases generate public fears of inflation and thus can have an adverse effect on Western economies; such effects can be shown to impact negatively the economies of the developing world and OPEC nations; and that there is no economic justification for further price increases.

Future Considerations

- Several key issues concerning our international and related domestic energy strategy and initiatives warrant further consideration:
 - Measures to further enhance the effectiveness of the IEA in reducing the demand for OPEC oil to a level which minimizes the upward pressure on world oil prices;
 - The scope and purpose of some form of continuing international energy dialogue between producers and consumers and the manner in which it should proceed;
 - A thorough review of the relationship between the level of oil prices and the rate at which an energy transition can be made at a pace consistent with other economic goals;
 - The rate at which alternate fuel development and energy conservation can proceed in order to maximize their impacts on the world energy supply and demand balance;
 - Measures to encourage adoption of policies to assure the availability of adequate supplies of oil to meet world energy needs through the energy transition.
- The desirability, achievability, and sustainability of energy independence is a dynamic issue and the subject of some disagreement. The process of evaluation and implementation has begun, but the new administration should re-evaluate these issues and consider particularly our non-energy social and economic objectives and the appropriate role of government.

Possible Initiatives

- Consideration should be given both to short-term initiatives which address the immediate problems of the world energy balance and the longer-term transition to a non-fossil fuel base. Actions in the following areas may be feasible:
 - Congressional Involvement in Reduced Dependency Objectives. The IEA is analyzing the feasibility of establishing import dependence targets at specific levels for the IEA as a whole and individual nations within the IEA. Consideration should be given as to the extent, timing, and forum for involving the Congress in decisions as to the specific targets and degree of commitment towards achieving those levels.

- Tariffs or import fees, which are discussed in Section 2 ("Energy Taxes"), could discourage unwanted imports or protect domestic industry, but affect regions inequitably.
- A quota provision was contained in the House-passed H.R. 6860, but did not survive Senate action. A quota, used in conjunction with allocations to prevent spot shortages and price controls to prevent windfall profits to domestic producers, can provide an upper limit on U.S. import dependency. A quota would signal the intention of the U.S. to move away from dependency on imported oil. However, design and administration of a quota is difficult, it expands U.S. Government intervention and regulation of the marketplace, and it could lead to negative economic impacts, similar to a long-term restriction of supply.
- New oil production outside of OPEC could increase the amount of oil available to the international market. Since U.S. companies own a large share of necessary oil and gas exploration equipment and technology, the U.S. could explore policies to encourage incremental production.
- To encourage energy exploration and development in developing countries, the U.S. has proposed establishment of an International Energy Institute. The U.S. also could consider proposals to encourage the flow of capital to enhance energy resource development and to continue to encourage recognition by the existing official international lending institutions of the urgency of the energy investment required, including infrastructure, by such countries. Such assistance might provide the means for developing countries to expand supplies of energy, and might involve adoption of production and pricing policies which reflect the critical contribution of such additional supplies to global energy and economic requirements.
- Reassessment of Energy Goals. Energy goals are not set independently of economic and environmental goals and should be periodically reassessed. Consideration should be given to a national debate on this issue, through public hearings or energy forums.

Conclusions

- Energy will remain a critical factor in world economic and political affairs. The issues of supply security; oil prices; consumer nation cooperation; producer-consumer relations; long-run transition from oil and gas to coal, nuclear, and renewable resources; and the value of and approach to energy independence should be reassessed continually. The following are suggested courses of action:
 - Continue producer-consumer dialogue;
 - Involve Congress in setting reduced dependency objectives, perhaps through a Joint Resolution;
 - Encourage incremental oil and gas production throughout the world and pursue creation of an International Energy Institute;
 - Initiate a national and regional energy debate.

MULTINATIONAL OIL COMPANIES

Background

- The relationship of the major international oil companies to the U.S. Government and to U.S. energy policy objectives is a matter of obvious public concern. Perceptions about the companies' role in the embargo and price actions of the last three years have generated much discussion, and the structure of these companies has become a domestic political issue in the United States. The public opinion of the major oil companies has affected many energy policy decisions, including the crude oil pricing debate. There are several key issues involving Federal interest that have been raised concerning these companies:
 - Divestiture
 - Relationship of oil companies to producing and consuming governments and oversight of oil company negotiations with foreign governments.
 - Financial reporting requirements
- The international oil market structure is exceedingly complex. The position of the majors vis-a-vis the producer nations has undergone substantial evolution, which is still in process. There are presently four major types of companies within the world market:
 - The majors. Exxon, Mobil, Texaco, Gulf, Standard Oil of California, British Petroleum and Royal Dutch Shell (Compagnie Francaise des Petroles (CFP) is sometimes included) have historically held large concessions in producing areas. They are fully integrated downstream. Their 1975 liftings were 25 MMB/D worldwide.
 - The independents. These companies emerged in the 1950's. They are partially or fully integrated and are characteristically seeking foreign crude for domestic refineries.
 - The consumer national oil companies. These companies developed in France and Italy as governments sought to serve national interest

by controlling crude oil supplies to protected domestic markets. Other European national oil companies have emerged as the North Sea has been developed.

- The producer national oil companies. All OPEC nations, except Gabon, have national oil companies (NOC's) which have entered the production phase through increased participation. They determine production levels, terms of access, and price.
- The control of the world petroleum market has shifted perceptibly in the last three years from the majors to the producer nation governments, through a series of participation agreements, Aramco being the latest. In the Aramco negotiations, the volume of crude which will be allotted to the Aramco members, the amount of their service fee, the compensation paid for assets and other provisions have been subjects for discussion for over a year.
- OPEC governments have also sought to move into downstream markets. They have bought tankers at depressed prices to move into the transportation phase of the industry. However, they currently own only about 3 million deadweight tons (DWT), or enough tonnage to move about 4 percent of government-owned crude oil. OPEC could have a fleet of 20-30 million DWT by 1980 (enough to move 5-8 MMB/D). A tanker capability of this size is thought to be of enough significance to be taken into account in future U.S. contingency planning.
- Plans for expanded refinery capacity and petrochemical ventures in OPEC nations have also been announced, but lack of indigenous technical personnel constrains this downstream movement, so that it should not impact the industry markedly in the near- or mid-term.
- Although the petroleum industry is composed of thousands of firms, the economic power wielded by the major companies has been a source of controversy since the early part of this century. The "majors" conduct operations that are truly global in scope and often include diverse activities that have little to do with petroleum or are only tangentially related. These firms (and most of

their slightly smaller competitors) share a common characteristic: their corporate structures are vertically integrated; that is, each company operates in more than one of the functional activities necessary to produce, transport, refine and market petroleum products.

- The actual form of corporate organization used to operate in the various functional areas varies widely: some companies use different intracorporate divisions; others use wholly- or partially-owned subsidiaries; others use joint ventures for particular projects. While the arrangement of a company's internal organizational components may have significant tax or corporate law implications, it has little bearing on the ability of a company to function as a vertically-integrated entity.
- A second characteristic of many of these firms is that their activities have branched into areas removed from oil and gas. Leaving aside general investments in non-energy sectors of the economy, many of the 18 largest firms control extensive coal and uranium reserves and play a significant role in the development of alternative energy sources. This characteristic, referred to as horizontal integration, is also becoming controversial since it is feared that the inherent possibility for conflicts of interest (favoring or retarding the development of alternate energy resources in relation to oil or gas) may be exercised.

Proposals Offered

- Divestiture legislation. Numerous bills were introduced to require one form or another of vertical or horizontal divestiture. The principal bill on vertical divestiture is S. 2387, which was favorably reported out of the Senate Judiciary Committee in June, but never scheduled for floor action before the 94th Congress ended. S. 2387 requires that petroleum companies meeting certain size criteria (which, in practice, means the largest 18 companies) divest themselves of certain prohibited assets within five years from enactment:

- Companies engaged in production could not also engage in transportation by pipeline or refining/marketing;
- Companies in transportation would restrict activities to that field;
- Marketing or refining operations acquired in the past could continue to function together, but a refiner could not acquire additional marketing assets, nor could a marketing company integrate further into refining;
- S. 2387 permits companies to design their own divestiture plans, setting forth the method and sequence of divestiture in conformity to Federal Trade Commission guidelines. Final plans would be submitted to the FTC for approval and divestiture would be completed within five years.
- Another vertical divestiture bill was offered during Committee consideration of S. 2387, and may be considered next year. It provides that:
 - Integrated companies would have to treat discrete functional activities separately for accounting purposes (e.g., cost and revenue allocation, pricing, and capital spending);
 - While legal divestiture and accompanying problems would be avoided, companies would be required to conduct each operation as though it were conducted independently, and could not subsidize some operations with the profits made in others or grant discriminatory preferences to affiliated activities;
 - Extensive proprietary data would be gathered by the FTC and SEC and made public.
- The debate on vertical divestiture is well publicized. The companies that would be affected made a concerted effort in the media to stop the legislation, calling it "dismemberment" and pointing to economies inherent in the current system and the fact that such legislation would

go far beyond current anti-trust law. Proponents of divestiture presented two major contentions: that divestiture, by increasing competition, would lower prices; and that the oil companies helped support OPEC by prorating production, a condition which would end if domestic refiners had an independent incentive to seek the lowest priced sources of supply.

- The Energy Resources Council (ERC) interagency subcommittee on divestiture produced a report which showed no evidence that vertical divestiture would achieve its proponents' goals. The ERC raised the following points:
 - The real question to be considered was whether mass reorganization of the corporate structure of the petroleum industry was likely to contribute to the attainment of national energy policy objectives.
 - The resulting confusion of the transitional period, whether it might last only five years as proponents claimed or several decades as the industry claimed, would delay the investments necessary to develop domestic resources.
 - The standard indices of market concentration and competitiveness showed no evidence of excessive concentration.
 - The Administration indicated that any individual problems of industry corporate structure were better handled by existing anti-trust laws, rather than made the subject of an experiment during a crucial period in our energy future. Further, divestiture could have adverse international implications, and effects on capital markets.
- The principal horizontal divestiture bill was S. 489. While the Congress concentrated last year on vertical divestiture, it is likely that horizontal divestiture will receive greater consideration in the next session. The principal features of S. 489 are indicated below:
 - Three years after enactment, any petroleum or natural gas firm, irrespective of size,

would have to dispose of assets in nuclear, coal, solar or geothermal energy;

- There is no provision for a direct government role in the divestiture process other than gathering certain types of data.
- With respect to horizontal divestiture, the lack of Congressional attention has been accompanied by a lack of formal position-taking on the question. Proponents of such legislation contend that companies with a direct financial interest in protecting existing investments in oil and gas resources have an incentive to prevent competing energy resources from being developed rapidly. Opponents claim that the U.S. energy situation demands so many new sources of supply that the market for oil would not be largely diminished. Further, opponents also assert that given the magnitude of the financial resources necessary to develop alternate energy supplies, it seems unlikely that they will be developed in the near future if the oil companies are excluded. It is also possible that if all oil companies were forced to dispose of their alternate energy assets simultaneously, the lack of a sufficient number of eligible buyers could further retard the growth of coal, nuclear, and solar energy alternatives.
- Monitoring Oil Company Negotiations. In November 1976, the FEA published a request for comment on increased monitoring of oil company negotiations. The negotiations between producer countries and the IOC's governing lifting and pricing of oil are traditionally a matter of private, commercial concern. The FEA interest in increasing monitoring of these negotiations has come about because of their impact upon supply security; the price level of imported oil; and possible long-term lifting or downstream obligations. Any monitoring should be done cautiously to avoid putting the U.S. Government in the negotiating process and to avoid release of sensitive information.
- Government Oil and Gas Corporation. At various times, the Congress has considered possible legislation establishing a Federal Oil and Gas Corporation. Depending upon the specific proposal, these corporations could develop resources on Federal lands; buy and sell oil and gas; and negotiate directly with

foreign governments for purchase. Arguments raised in favor of these proposals include the desirability of better "protecting the public interest" and providing greater credibility to our energy policy. A contrasting viewpoint is that the Federal Government never manages such programs very well (the Post Office and railroads are usually cited), that it is likely to disrupt a smoothly running system, and that it would not accomplish the proponents' objectives.

- Boycott Legislation. There was an intensive effort in the 94th Congress to enact legislation with stringent penalties for participating in a boycott against Israel. Obviously, the oil companies, which have a heavy trade with Arab nations, would be affected by such legislation. The extent of the impact was hotly debated, as well as the desirability of the proposal; and it is likely to surface again in the 95th Congress.
- A legislative amendment to the 1976 tax reform bill removes tax advantages from countries complying with the Arab boycott of Israel by disallowing credit for foreign taxes paid to countries boycotting Israel. Because of the complexity of the legislation, the dollar impact on the oil companies is difficult to assess, but due to the volume of business between the IOC's and Arab nations, it could have a major impact. Other observers feel that the compliance provisions of the Act are not defined well enough to be enforceable.

Possible Initiatives

- Oversight of the oil companies. New administrative or legislative options might be considered, for expanded oversight of IOC's in order to provide the data and experience necessary for designing an optimal policy toward the multinationals. This oversight could include authority for reviewing major contract negotiations prior to signing. As indicated above, protection of proprietary information is a major problem area for pre-agreement filing, as well as questions of the desirable role of the government in such negotiations.
- Government purchasing authority. The logistical function of the majors could be supplanted by a

government entity empowered to negotiate directly with OPEC governments for all U.S. supplies of petroleum products. Such a structure could be used in conjunction with absolute quotas, country quotas, or differential import fees. However, direct government purchases could involve substantial administrative problems (such as matching crude types with refinery needs) and considerable interference with the oil market system. Such authority was vested in the President in the EPCA.

- Divestiture. Continued analysis of the divestiture issue is necessary. The basic argument for or against divestiture should be based on whether there is any evidence suggesting that positive benefits would result and that the possible adverse impacts are outweighed by such benefits.
- Financial Reporting. Under the EPCA, the FEA is required to consult with the SEC to determine the extent to which major changes in accounting practices are contemplated by the SEC.

Conclusions

- The multinational oil companies will remain an important force in domestic and international energy affairs. Rather than act hastily to break up these firms, the Congress should consider carefully the impacts of both vertical and horizontal divestiture. Neither form of divestiture should be supported unless it would increase domestic production, improve the reliability of supply, and reduce prices. With the Nation facing a crucial energy period, this is not the time to disrupt the existing system so dramatically. However, there may be a need for some change in the government/industry relationship and possible alternatives should be explored.

STANDBY MEASURES

Background

- In response to the effects of the 1973 oil embargo, the U. S. government (as well as many other petroleum consuming nations) realized the overwhelming necessity of protecting itself against the potentially serious impacts of a future embargo. The last embargo caused considerable loss in Gross National Product and added about 500,000 people to the unemployment rolls.
- An embargo management strategy has been prepared which outlines the steps the Federal Government will take to mitigate the effects of an embargo. In the event of another supply interruption, the government would act to increase available energy sources, constrain demand and distribute available supplies as equitably as possible.
- Considerable progress was made in providing the basic legislative authorities for a standby program when the EPCA was enacted.

Approaches Taken

- Strategic Petroleum Reserve (SPR). In January 1975, the President asked Congress for authority to build a strategic petroleum reserve of up to a billion barrels. In the Energy Policy and Conservation Act (EPCA) the SPR was authorized, with a requirement that at least 150 million barrels be in storage by the end of 1978. The strategic petroleum reserve will consist mainly of crude oil storage in Gulf Coast salt domes designed to provide drawdown capability of approximately 500 million barrels by 1982 (Congress authorized up to one billion barrels).
- Planning for a strategic reserve is necessarily insuring against an unknown event. The sensitivity of the SPR plan to variations in type of embargo, level of existing imports upon commencement of an embargo, and degree of oil sharing required by the IEA must be considered.

- There continues to be an issue regarding the ultimate size of the SPR. While present plans are to build a 500 million barrel reserve, the issue will be reviewed in the future. Other issues that have come up include the desirability of regional storage, industrial storage, and method of crude oil acquisition.
- International Energy Program (IEP). By agreement among 19 consumer nations in the International Energy Agency, a program has been established for managing the international allocation of oil during supply interruptions. Under the provisions of the IEP, a member nation experiencing an overall shortfall of 7 to 12 percent of demand can call upon other IEA members to redirect supplies to meet the shortage. Whether a given nation would have a right to additional supply (or an obligation), depends on an allocation formula which factors in magnitude of shortfall, targeted countries, assumed conservation actions, etc.
 - The IEP allocation system was tested in November 1976. Three scenarios were used in interactive embargo simulations with the IEA secretariat, the Industry Supply Advisory Group (ISAG), and over 30 participating oil companies. The test runs showed that the system works in procedural and mechanical terms.
- Allocation. The program for allocating petroleum products was used during the 1973-74 embargo to distribute available product supplies equitably. This program is currently being phased out; however, standby allocation authority exists until September 30, 1981 (to reimpose allocation controls on those products already decontrolled). Both allocation and price controls probably would be reimposed immediately on all products in the event of another supply interruption.
- Rationing. If the United States is unable to constrain demand and utilize the SPR to reduce sufficiently the impacts of an embargo, it may have to resort to rationing of available supplies. Rationing has been a particularly controversial subject since it is an extremely expensive program (over \$2 billion to implement) and administratively burdensome. A rationing plan for both gasoline and diesel fuel, nevertheless, has been designed and will be submitted to Congress.

- Emergency Demand Restraint. After price and allocation controls would be reimposed in an emergency situation, a public awareness and voluntary conservation campaign would be undertaken to stress the severity of the shortage. A wide range of emergency demand restraint measures has been identified, and these could reduce demand by the equivalent of over 1 MMB/D if implemented immediately with full compliance. These measures range in scope from reducing thermostats to shortening the national work week. Should it prove necessary, the President would select for implementation one or more of the mandatory measures (such as commuter parking management and car pooling incentives; heating, cooling and hot water restrictions; weekend gasoline and diesel fuel sales restrictions; restrictions on illuminated advertising; etc.) which would have already been approved by Congress in accordance with the requirements of the EPCA.
- Refinery Output Adjustments. By adjusting the types of products produced from domestic refinery runs, it is possible to increase or decrease the availability of particular products. The ability to do this, however, is constrained by the structure of many refineries. Most are geared to produce given yields with only a narrow range for variation to accommodate fluctuations in seasonal demand.
- Coal Conversion. There is limited potential to further shift oil usage to coal during an embargo situation. It is possible to require emergency drawdown of existing industrial inventories, but such action could result in spot domestic coal shortages. If such a policy were implemented, about 95,000 barrels of oil per day could be re-directed in the system temporarily.

Remaining Problems

- The United States has begun to frame, but not yet completed implementation of its standby strategy, mainly because of the absence of real alternatives until the early Strategic Petroleum Reserve becomes operational by 1978. Even then, our reserves would only accommodate a 50 percent loss of imports for about 50-60 days. Despite being able to distribute the shortage better, several important industries would be severely hurt and the disruptions caused during the last embargo (e.g., lines at gas stations,

increased unemployment, reductions in disposable income) could recur.

- There are also major problems that would arise in implementing the programs. Under the EPCA, Congress must approve the mandatory conservation plans and the rationing plan before implementation. It is difficult to implement a program before an estimate is made of the total duration of the embargo. As presently conceived, rationing would not even be considered until it was clear that the embargo would last long enough to justify the expense and burden of so complex a program. But there is an element of circularity involved. Those who institute the embargo and can control its duration and magnitude are not likely to announce in advance how long it will last. Rather, they will probably keep the embargo in place until the underlying objectives are accomplished or until the threat of retaliation becomes too great.
- Even if U. S. planners knew the intended duration of an embargo, the built-in lead-times required to get Congressional approval and start up a new program mean that there is always a lag between the need for one type of program and the implementation of that program. In effect, programs could become operational only after the situation they were designed to address had deteriorated to the point where a more stringent program was required.

Possible Further Initiatives

- Government-wide Management Strategy. Since it is imperative for the United States to adequately plan for another embargo, it may be worthwhile to require the preparation of such a strategy, fully integrating energy management options with monetary, fiscal and other policies that would be affected by a supply interruption or steep price increase. The government strategy could encompass the problems raised above and consider what to do if an embargo occurs in the near-term.
- Additional Authority. Among the most effective measures to reduce demand during a supply interruption would be the imposition of emergency taxes or fees on petroleum products. Since such authority does not exist now, there could be a request to Congress to amend the EPCA to allow such actions.

Conclusions

- The United States must be prepared to deal with any future interruption of oil supply. We have already made considerable progress in legislating and beginning implementation of a strategic petroleum reserve. In addition to the SPR, we will need standby allocation, demand restraints, and rationing measures. It would be desirable to simplify standby plans and Congress should consider amending the EPCA to allow imposition of fees, tariffs, taxes, etc., during an emergency. Further, the Federal government should prepare a government-wide embargo management strategy, fully integrating energy management options with monetary, fiscal, and other policies.

SECTION 10

FEDERAL ENERGY ORGANIZATIONBackground

- Energy organizational issues have been a matter of attention within the Executive Branch and the Congress for some time:
 - Prior to the 1973 oil embargo, President Nixon had proposed creation of a Department of Energy and Natural Resources (DENR) and division of the Atomic Energy Commission (AEC) into a research agency and a regulatory agency. A small Energy Policy Office had been established in the Executive Office of the President.
 - In December 1973, during the embargo, the President established the Federal Energy Office (FEO) in the Executive Office of the President. He delegated to it the petroleum price and allocation authorities, vested by law in the President, including those previously exercised by the Cost of Living Council and transferred to FEO some energy functions of other agencies, principally the Interior and Treasury Departments.
 - In June 1974, the Federal Energy Administration (FEA) was created by law and in October 1974, the Energy Research and Development Administration (ERDA), Nuclear Regulatory Commission (NRC), and policy-coordinating Energy Resources Council (ERC) were established by the Energy Reorganization Act.
 - The Energy Conservation and Production Act (ECPA), which extended the FEA until December 1977, requires that the President submit to the Congress a reorganization proposal for energy and natural resources by December 31, 1976.
- Among the problems still considered to exist are the following.

- The existing agencies are a mixture of permanent (e.g., Department of Interior and ERDA) and temporary (e.g., FEA and ERC) entities.
- Energy functions remain scattered in a number of diverse agencies often leading to overlapping responsibilities and sometimes to gaps in authority.
- Policy analysis, coordination and evaluation occurs through the ERC, but it is an organization with no staff.
- Certain independent regulatory functions, such as those carried out by the Federal Power Commission (FPC), should be responsive to overall policy direction, while preserving the independence of specific adjudicatory decisions.
- Energy is a vital problem, needing a clearly designated spokesman who should perhaps have Cabinet status.

Possible Initiatives

- The President must submit a reorganization proposal to the Congress. Congress as well as the new Administration, has indicated a desire to review the issue. There are a wide variety of alternative approaches that can be considered, including:
 - Department of Energy and Natural Resources (DENR). This could include such agencies as Interior, FEA, ERDA, possibly FPC, National Oceanic and Atmospheric Administration (NOAA), etc. The DENR would consolidate most energy functions and bring them together with certain natural resource interests. But it would be a very complex organization with such a broad span of control that key areas could be delegated to lower status and there could be a domination of energy over land management decisions. Unless this Department were expanded to include the Forest Service, Soil Conservation Service, Corps of Engineers, etc., it would still fall far short of complete natural resource consolidation. Further, its creation would affect a

large number of Congressional Committees.

- Department of Energy (DOE). This agency could include FEA, ERDA, possibly FPC, the Rural Electrification Administration (REA), and some energy and related functions of Interior, although not its land management and geologic functions. The DOE would be distinctly an energy agency and would guide energy policy; however, it would still require close coordination with DOI and inclusion of some of its possible components would be controversial.
- Energy Agency. An energy agency would simply combine FEA and ERDA. This would be the easiest organizational change to effect, but would retain many of the current problems cited above.
- Retain Present System. Under this alternative, the current organizational alignment would be retained, but some changes would be made to improve the system (e.g. strengthening ERC; creating a permanent FEA; etc.)
- A number of key organizational questions remain to be resolved, even within the broad structure of the proposals listed above. These include whether any of the following agencies or functions should be made a part of the new energy organization:
 - FPC
 - NRC
 - REA
 - ERC
 - Naval Petroleum Reserves
 - NOAA
 - Tennessee Valley Authority (TVA) and other power producing authorities

There are obvious advantages to inclusion of these agencies for the sake of completeness, broad coverage, and policy responsiveness. Disadvantages include domination of the regulatory functions by a policy-making body, dissimilarity of procedures required by current law in various energy agencies, and too great a span of control.

- The energy organizational issue ought to be considered with any other government reorganization questions, including proposals for a Department of Oceans or a cabinet level environment and land management agency.

Conclusions

- There are very good reasons to consider reorganizing the energy functions of the Federal Government. In both the Executive and Legislative Branches, there is a need for consolidation to eliminate fragmented responsibilities. The basic issues that need to be addressed in an Executive Branch reorganization include the degree of separation of natural resources management and economic regulation from broad energy conservation, research, development, and policy functions. However, reorganization only makes the process of government easier; it will not produce more oil and should not be viewed as the answer to our energy problem.