The original documents are located in Box 5, folder: "Energy Independence Authority" of the Frank Zarb Papers at the Gerald R. Ford Presidential Library.

Questions About Energy Independence Act

How does EIA affect:

1. The balance between energy conservation and energy supply in allocation of resources. Will EIA make the same resources available for developing a technology to save 1 bbl oil/day energy equivalent as to supply that amount? If not, why not?

2. The need to minimize total social costs (economic + pollution + ecological + health costs) in choosing among supply alternatives.

3. The desirability of promoting competition in the industry (ease of entry, preventing price manipulation by vertically and horizontally integrated companies to squeeze out independents, etc.)

4. Centralized vs. decentralized supply techologies (coal and nuclear vs. decentralized forms of solar)

5. The need to have users of energy (not the general taxpayer) pay for the full costs of the energy they use, so that they will have the proper incentive to use less.

6. The desirability of not heavily investing in a new technology if lower-total-cost options are available. For example, maybe the time for oil shale and high-Btu gas from coal will never come (nor, perhaps, should it ever come), if a combination of conservation, a temporary increase in conventional supplies, and a long-term shift to solar and nuclear makes it unnecessary and higher in cost. The point is: How do we keep EIA from masking the truth in such a situation?

7. The need to avoid subsidizing activities which, if they are indeed worthwhile. can be financed with private capital (e.g., water-cooled nuclear reactors, Lurgi gasifiers), especially if users paid prices covering full incremental costs. Would not much of the EIA subsidy be going to the same companies to be taxed to take away windfall profits from decontrol? Possible device to guard against subsidy of activities which can otherwise be financed: Offer loans only with interest rates above market rate.

8. ERDA's program to finance desirable RD&D. Should not a worthwhile first-of-a-kind unit be helped by ERDA, with the government keeping patent rights, rather than by EIA, which might give one company a strong competitive advantage? How does EIA handle the question of proprietary rights?

9. Relative priorities (among nuclear, solar, coal, oil, gas, geothermal).
What are the criteria and/or formulae to be used for allocating EIA resources?
How about the following as guidelines:

   1. Potential total amount of energy to be supplied or saved.
   2. Estimated total social cost of the alternative.
   3. RD&D costs.
   4. Estimated probability of success.
   5. Relative maturity of industry (for example, if industry provides 1% or more of U.S. energy, it does not qualify for EIA assistance).

10. The desirability of a simultaneous (annual?) review of all federal energy activities so that changing priorities can affect allocation of resources. How do we avoid throwing good money after bad?

11. Price and market solutions to the desirability of protecting a high-cost demestic fuel industry from possible destructive price warfare by OPEC. For example, a limited number of rights to import oil could be periodically auctioned. A slash in the OPEC price would not then result in destruction of the domestic industry, since the auction price would rise to compensate.

12. The availability and cost of capital for worthwhile non-energy sector investments.

FRANK G. ZARB'S
EIA TALKING POINTS

Introduction

- The EIA is a government corporation to help achieve energy independence by providing financial assistance to private sector energy projects.

- Financial resources of $100 billion ($25 billion-equity, $75 billion-debt).

- Results could be up to 10-15 mm/bbls of oil per day equivalent of new production by 1985.

Background

- Domestic crude oil production at 9 year low and still declining -- and imports are rising.

- Natural gas production peaked in 1973.

- Financial problems and regulatory delays have resulted in cancellation or postponement of huge amounts of new electrical generating capacity.

- FEA has estimated that about $600 billion will be needed over the next 10 years to reach energy independence.

- Synthetic fuels, shale oil, solar, and very large projects such as new energy parks will find financing difficult because of long lead times and technological uncertainties.

EIA Organization

- Ten year life; no new financing commitments made after seventh year.

- Five-person board appointed by President with advice and consent of Senate; President selects Chairman; no more than three members from any one political party.

Financial Structure

- Twenty-five billion dollar capital stock - subject to budget/appropriation process; authority to borrow $75 billion through Treasury.

- Financing to be accomplished through:
  - -- Direct loans
  - -- Loan guarantees
  - -- Guarantees of price
  - -- Purchase and leaseback of facilities
  - -- Purchase of convertible or equity securities
- No financing where private funds are available; maximum participation by private lenders encouraged.
- Terms of financing will be structured so as not to give undue advantage of recipients over competing firms through low interest rates on loans.
- No permanent Federal ownership and operation of an energy facility will be permitted.

Scope of EIA Investments

- Criteria for support:
  - -- Projects that will contribute directly and significantly to energy independence.
  - -- Projects that would not be financed without government assistance.
- Specific types of projects include:
  - -- New technologies not yet in widespread commercial operation to produce, transport, or conserve energy.
  - -- Technologies to support nuclear power.
  - -- Electric power generation and transmission through other than oil or gas sources.
  - -- Conventional technologies whose scope or size would be too large for the private sector to handle or represent institutional or regulatory arrangements not in widespread use, e.g., energy parks.

Other Regulatory Authorities

- The FEA would be authorized to coordinate and expedite Federal regulatory proceedings that affect energy projects.

- Congressional intent that all such processing should be accomplished in 18 months and agencies must promulgate regulations to accomplish within 90 days of enactment.

FRANK G. ZARB'S
EIA TALKING POINTS

Introduction

- The EIA would be a government corporation to help achieve energy independence by providing financial assistance to private sector energy projects.

- Financial resources of $100 billion ($25 billion-equity, $75 billion-debt).

Background

- The President has proposed the EIA ~~against~~ in light of a deteriorating energy situation.

- Domestic oil and gas production are declining.

- Financial problems and regulatory delays have resulted in cancellation or postponement of huge amounts of new electrical generating capacity.

- Synthetic fuels, shale oil, solar, and very large energy projects will find financing difficult because of long lead times and technological uncertainties.

EIA Organization

- The EIA is not a permanent Federal bureaucracy.

- It will have a ten year life and no new financing commitments could be made after the seventh year.

- It will have a five-person board appointed by the President with advice and consent of Senate; no more than three members, from any one political party.

Financial Structure

- The EIA will have a $25 billion capital stock which will be subject to the Congressional appropriation process and will have authority to borrow $75 billion through Treasury.

- The EIA's issuance of securities and other obligations, which directly impact the capital market will be subject to approval by the Secretary of the Treasury as to timing, methods, source, interest rate and other terms.

- Total loans, guarantees, or other financial assistance cannot exceed $100 billion.

- It will not be able to make further investments if its expected losses exceed its equity and earned surplus.

- Financing to be accomplished through:
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  - -- Loan guarantees
  - -- Guarantees of price
  - -- Purchase and leaseback of facilities
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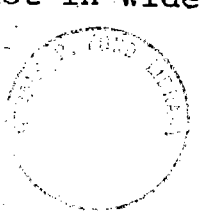

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Tab A - Prepared Statement for Vice President Rockefeller

FOR IMMEDIATE RELEASE April 12, 1976

Office of the Vice President

STATEMENT OF THE VICE PRESIDENT
BEFORE THE SENATE COMMITTEE ON BANKING, HOUSING
AND URBAN AFFAIRS ON S 2532
A BILL TO CREATE THE ENERGY INDEPENDENCE AUTHORITY
WASHINGTON, D. C.

April 12, 1976

Mr. Chairman, Members of the Committee: I appreciate this opportunity to join with you to discuss the most challenging problem of a challenging era -- the energy crisis.

First, I would like to ask, and then answer, the following questions: (1) Is there really an energy crisis? (2) What happens if we just continue as is -- to depend on increasing foreign imports to meet our Nation's growing energy needs? (3) Do we, as a Nation, have the resources and capacity to achieve energy independence? (4) What does it take to do it? (5) Why does government have to get into it?-- Why isn't private enterprise doing it? (6) How can government play an appropriate role in achieving energy independence without subsidizing private interests, or without interfering with the free enterprise system? (7) If the answer to getting us off dead center is an Energy Independence Authority, as provided for in Senate Bill 2532, how would it work? (8) With an all-out national effort, how fast can we expect to achieve the goal of energy independence?

I. Is There Really an Energy Crisis? -- Unfortunately, many Americans do not believe the energy crisis is real because there is no tangible evidence of it. There is gas in the pumps, and the lights go on when they flip the switch. They recognized it two and a half years ago during the Arab oil embargo when the lines formed at the service stations. But there are no lines now because we are importing 40 per cent of the oil consumed in this Nation.

In 1960, we received 18 per cent of our oil from foreign sources. During one week last month, our foreign oil imports reached more than 50 per cent of our total consumption. Even more alarming is the fact that the proportion of our imports which comes from unstable Mideast sources is rising faster than the growth rate of our imports as a whole.

While imports rise, domestic production of both oil and natural gas is declining. The Northeastern part of this country is now dependent upon foreign sources for 75 per cent of its oil. If this supply were suddenly cut off, there would be social and economic chaos. Should we have another embargo, the economy of this country would be shattered. Today's energy situation is, in my judgment, a clear definition of a crisis.

(MORE)

II. What happens if we just continue as is -- to depend on increasing foreign imports to meet our Nation's needs? -- Between now and 1985, our energy needs will grow by 36 per cent. If we continue our current course, and continue to regulate oil and natural gas prices at current levels, if we do not develop our current reserves, if we fail to increase the generating capacity of nuclear plants, if we do not adopt a strong program of conservation, and if we fail to commercialize new sources of energy, such as gas and oil from coal and shale, we will be importing between 50 and 60 per cent of our oil in 1985. And it will cost us in foreign exchange not $30 billion as it will this year, but $50 billion by 1985. It is obvious what a threat of an embargo would do to our national security and defense capabilities under such circumstances as well as to our capacity to meet our responsibilities to the other nations of the free world who, without our protection, would be equally vulnerable. I am hesitant even to speculate on the kinds of economic, political and military pressures that could be imposed on this Nation if we continued to be more than 50 per cent reliant on foreign sources.

With such a large amount of the oil coming from one area of the world, the supply lines provide a tempting opportunity for the Soviet Union, with its growing sea power, to disrupt the transport on the high seas. But there are other serious consequences that could result. The continued dependence upon foreign sources of oil could cause us to lose credibility with our allies. They would be justified in asking whether or not we would support their interests against those of our oil suppliers. Our continuing dependence on imported oil threatens our ability to maintain our leadership in the free world, our economic well-being and our national security.

Now, let's look at what happens to our economy, if we continue along our present path of depending on increasing foreign imports to meet our Nation's growing energy needs. In 1973, we were spending $4.3 billion annually for foreign oil. And in 1976 we will spend $30 billion. We now export $22 billion in agricultural products -- which is up from $8 billion in 1973. Were it not for the sale of these farm products and the sale of $10 billion worth of arms, we would not have maintianed our balance of payments.

On the other hand, if we just continue on the present course, we will be spending up to $50 billion overseas for imported oil to meet the growth in our domestic needs. On the other hand, if we were to spend the $30 billion at home, it would provide jobs for at least 1,200,000 people. And, by 1985, $50 billion spent at home to produce our energy requirements domestically would produce close to 2,000,000 jobs for American workers.

If we don't follow this course, at some point, the economics of business will compel industrial concerns to locate their facilities in close proximity to energy sources abroad, rather than to their markets and customers at home. This would mean an additional loss of jobs in this country and would be detrimental to the vitality of the entire American economy.

As energy costs rise due to the arbitrary action of the OPEC cartel over which we have no control, inflationary pressures are placed on our economy. When this occurs, there is a tendency for government to enact policy which inhibits economic growth. To continue along our present path spells economic, social and political chaos.

(MORE)

III. Do we as a Nation have the resources and capacity to achieve energy independence? -- The answer is yes! We are extremely fortunate as a Nation to have vast reserves of resources that can be converted into energy. The North Slope of Alaska will make available significant amounts of oil and natural gas. And we have known reserves of coal that will last us for at least one hundred years. It is estimated that our shale oil reserves are equivalent to four to five times the total amount of known oil reserves in the Middle East. The potential resources on the outer continental shelf are expected to be substantial. We have the technology and ability to more than triple the generation of nuclear power with appropriate safeguards by 1985. We have, in this country, potential energy from geothermal, solar and other sources. All of these can replace our dwindling present domestic supply of natural gas and oil -- in a way that protects our environment.

To achieve energy independence in this century, we must develop and construct the facilities necessary to exploit these new sources, and we have already lost two years in getting started.

IV. What does it take to do it? -- To achieve energy self-sufficiency we must, in the short-term, face up to the issues that confront this Congress and the American people. We must enact and employ conservation measures. We must deregulate the prices of domestic oil and gas. We must assure that we do not unduly impede the development of nuclear power. And we must assure that our environment is protected, but that the policies we adopt in doing so do not deter the development of our resources, such as coal, oil shale, and off shore oil reserves. There is no problem in achieving both goals if we all work together. Modern science and technology can assure the achievement of both goals together.

According to Federal Energy Administration estimates, if we take all the necessary actions in the next 10 years, we can reduce our energy needs by 5 per cent through conservation, increase domestic oil production by 50 per cent, increase coal production by 100 per cent, increase natural gas production by 10 per cent and increase nuclear power generation by 300 per cent. This will require, among other things, deregulation of oil and gas -- strong conservation measures -- and $600 billion to $800 billion in private sector investment in domestic energy production. We must restore existing and construct new transportation systems where necessary. In the longer-term, we must commercialize known technology for the gasification and liquefaction of coal.

And, as new technologies become known for the development of such energy sources as solar, geothermal and urban wastes, they can be applied commercially. Energy independence can be achieved from the application of all of these approaches before the end of the century if we have an all out national commitment.

V. Why does government have to get into it? -- Why isn't private enterprise doing it? -- Energy independence is a national objective that is essential to the economic and strategic well-being of this Nation. Private enterprise alone cannot and will not do it. There is ample precedent for positive government action to encourage the American enterprise system in achieving national objectives that contribute to economic growth, the well-being of our people, and our national security.

(MORE)

We have a transcontinental railroad system because the government provided the land. We have a uniquely productive free enterprise agricultural system because of assistance by the government through the Homestead Act, Land Grant Colleges, the Extension Service, and the Federal Agricultural Credit System. Our civilian aviation industry evolved from the research and development of military aircraft. Because of the billions of dollars spent on our highway system by all levels of government, we have a prosperous automotive industry which is basic to our economy. All of these are examples of the partnership between government and industry to achieve an essential national goal which was not attainable by either acting alone.

In the case of energy, we have the raw materials to achieve self-sufficiency. However, the normal functioning of our economy will not, because of the uncertainty of the risks involved, produce the capital investment required to fully develop these resources within a reasonable period of time. Private capital sources are -- for good reason -- reluctant to make capital available for domestic energy production projects because of the uncertainty of government regulation, cost and prices. For example, the development of a single coal gasification plant would require a capital investment of up to $1 billion and take approximately 6 to 10 years to construct. Because of the uncertainties of the technology, and price, and the long lead times, such a project has more than just the ordinary risk. Many projects, such asfloating nuclear power plants, railroad reconstruction, or large pipelines, are of such size and scope that financing from the private sector alone may not be adequate. Ninety-two nuclear power plants have been cancelled or postponed, in large part because the electrical utilities have not been able to raise the financing necessary to construct them. They now take 10 or more years to build, cost approximately $1 billion, and the state regulatory bodies will not give a rate increase to finance them until the power from the new plant comes on line. Thus, their inability to get private financing.

This is not to suggest that these projects are destined to lose money. It only points out the uncertainties that deter private sector investment. We are not in a position to wait until these uncertainties become certainties. The longer we wait, the further into the future we push the day when these projects will add to our domestic energy production.

VI. How can government play an appropriate role without subsidizing private interest, or without interfering with the free enterprise system? -- Government has traditionally played a role of providing incentives in one form or another to assure that adequate capital is available to the private sector in achieving national objectives. In this case, the government's role would be to provide up to a total of $100 billion of risk capital for energy projects essential to energy independence which cannot get the necessary amount of private financing. The government loans would be on terms comparable to those offered by the private sector. In financing the development of energy resources, the government program should function like an investment bank or other private sector financing agency -- providing assistance to promising projects, but on a self-liquidating basis. This would provide an appropriate government/private sector partnership which would work rogether to get this country off dead center in achieving energy independence without a giveaway or subsidy.

(MORE)

The legislation stipulates that the private sector would own and operate productive facilities, and not the government. The American enterprise system has shown itself to be the most efficient and capable producer in the world. By providing financial assistance to take those risks which are beyond the capacity of the private sector, the government would act as a catalyst in getting the energy independence program into motion.

But after costs were determined and market prices established, then the competitive nature of our system would provide the incentives necessary for the successful achievement of our energy independence goals.

VII. If the answer to getting us off dead center is an Energy Independence Authority, as provided for in Senate Bill 2532, how would it work? -- The Energy Independence Authority would have authority to provide up to $100 billion of financial assistance for energy projects which could not otherwise secure financing from private sector sources. This sum would be raised through the sale to the Treasury of up to $25 billion in equity securities and the issuance of up to $75 billion in government-guaranteed obligations. The Authority could provide financial assistance in a variety of ways, including loans, loan or price guarantees, purchase of equity securities, or construction of facilities for lease-purchase. The Authority would not be permitted to own and operate facilities, or to provide financing at interest rates which are below those which prevail in the private sector. The Authority would be authorized to support emerging technologies in energy supply, transportation or transmission, and conservation, projects which displace oil or natural gas as fuels for electric power generation, projects which involve technologies essential to the production or use of nuclear power and projects of unusual size or scope, or which involve innovative regulatory or institutional arrangements. It is also authorized to finance capital investments necessary for environmental protection. The Energy Independence Authority would be run by a board of five directors appointed by the President and confirmed by the Senate.

VIII. With an all-out national effort, how fast can we expect to achieve the goal of energy independence?-- With an all-out effort -- based on the establishment of the Energy Independence Authority to assist in financing the short-term actions required to limit our vulnerability by 1985, as well as the new domestic energy sources we will need after 1985 -- we can achieve energy independence before the end of this century. But time is of the essence. We cannot wait another year if we are going to protect our national security and rebuild our economic strength to meet the needs of our people at home and our responsibilities abroad.

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Tab B - Prepared
Statement for
Frank G. Zarb

TALKING POINTS

BACKGROUND

- As the Vice President indicated, the need for bold action on energy is clear. This is a time for imaginative solutions.

- To illustrate the gravity of the situation, just maintaining 1975 levels of imports (6 MMB/D) in 1985, the following must occur:

  - Oil -- Increase production by almost 50%, from 8.4 to 12.3 MMB/D.

  - Natural Gas -- Increase to 22 Tcf/Yr as compared to 1975's 20 Tcf.

  - Coal -- Increase production by 60% from 640 million tons in 1975 to over one billion tons in 1985.

  - Nuclear Power -- Increase its contribution from 1975's 8.6% of electric power generation to 26% in 1985.

  - Synthetic Fuels -- R&D and commercialization efforts must begin now, but will contribute only 1% by 1985 and more beyond that year.

  - Conservation efforts in cars, houses, buildings, and industry must be expanded.

- To achieve these levels of production and reduced demand will require:

  - Phased deregulation of oil and natural gas prices.

  - Resolution of uncertainties (Clean Air Act and surface mining) facing expanded coal development.

  - No major restrictions on nuclear power growth.

  - Adequate financing.

ENERGY INVESTMENTS NEEDED

- Estimated $580 billion (in 1975 dollars) needed over next 10 years.

- ° 30% of fixed business investment, which is energy's historical share.
- ° Certain sectors, such as utilities, will place large demands on capital markets.

- Oil, gas, and electric utility capital spending will almost double.
- Electric utility sector could account for 48% of total.
- Coal investment represents only 3% of the total, but will triple in the next ten years.
- Energy conservation investments could add another $250 billion.
- Some selected energy sectors will find financing difficult.
  - ° Investments in synthetic fuels, such as shale oil and coal gasification are not being made because of uncertainties over the future price of world oil and the technology, and long lead times.
  - ° Projects such as railroad roadbed reconstruction may be too large to be financed by certain companies or by the private sector alone. If we can produce coal in West Virginia, but are unable to transport it to New England, we have serious problems.
  - ° Emerging technologies in the solar and geothermal areas, as well as conservation, may be difficult to finance.
  - ° Some industries, such as electric utilities, are not able to finance needed growth because of insufficient earnings and regulatory problems.

SCOPE OF EIA

- Government entity designed to help achieve energy independence by providing financial assistance to private sector energy projects.
- Financial resources of $100 billion ($25 billion - equity; $75 billion - debt).
- Some arguments have been raised against EIA:
  - ° Capital diversion - Yet, at the estimated $580 billion, energy would absorb its historical share of about 30% of business investment.

- Giveaway to oil companies - We have assured that this will not occur, as conventional energy development will not be allowed to receive EIA support unless certain conditions are met.

- Risk ventures will lose money - EIA will only fund those projects which demonstrate an ability to operate profitably on a commercial scale, but which cannot obtain the necessary capital in the next few critical years. Some investments could lose money, but EIA is expected to make a profit.

- Permanent bureaucracy - EIA has specified life of 10 years, with new financing commitments permitted only in the first seven years.

- Congressional control - Senate approval of Board of Directors; equity capital requested through Appropriations process; Annual Congressional Report; GAO audits.

- Energy independence unattainable - goal of independence is reachable if we act boldly and promptly.

TESTIMONY

OF

FRANK G. ZARB

ADMINISTRATOR

FEDERAL ENERGY ADMINISTRATION

BEFORE THE

COMMITTEE ON BANKING, HOUSING, AND URBAN AFFAIRS

UNITED STATES SENATE

ENERGY INDEPENDENCE AUTHORITY

APRIL 12, 1976

MR. CHAIRMAN, MEMBERS OF THE COMMITTEE: THE VICE PRESIDENT PROVIDED YOU WITH AN EXCELLENT OVERVIEW OF THE NEED TO ACT BOLDLY AND EXPEDITIOUSLY TO REVITALIZE OUR DOMESTIC ENERGY PRODUCTION ACTIVITIES AND, IN THE PROCESS, ATTAIN AN ASSURED DEGREE OF SELF-SUFFICIENCY. I WOULD LIKE TO TURN NOW TO A MORE DETAILED ASSESSMENT OF THIS NATION'S ENERGY NEEDS AND THE ADMINISTRATION'S PROPOSALS TO ACHIEVE THE GOALS WHICH THE VICE PRESIDENT JUST DESCRIBED.

THE NATIONAL ENERGY OUTLOOK (NEO) RECENTLY PUBLISHED BY THE FEDERAL ENERGY ADMINISTRATION CLEARLY INDICATES THAT THE UNITED STATES MUST MAKE A SUBSTANTIAL COMMITMENT OF POLICY AND PROGRAMS TO ACHIEVE ENERGY INDEPENDENCE. AS THE VICE PRESIDENT DESCRIBED IT, JUST TO MAINTAIN CURRENT IMPORT LEVELS OF ABOUT SIX MILLION BARRELS A DAY, THE NATION MUST ACCELERATE ITS ENERGY PRODUCTION IN ALL FUEL SECTORS.

- DOMESTIC CRUDE OIL PRODUCTION MUST INCREASE FROM 8.4 MILLION BARRELS A DAY TO ABOUT 12.3 MILLION BARRELS BY 1985. THIS IS AN INCREASE OF ALMOST 50 PERCENT, EVEN THOUGH CURRENTLY PRODUCING ONSHORE RESERVES WILL DECLINE TO 2.4 MILLION BARRELS A DAY BY 1985, AS THE OLDER FIELDS ARE DEPLETED. NEW SUPPLIES WILL HAVE TO

COME FROM THE OUTER CONTINENTAL SHELF AND ALASKA, WITH SYNTHETICS CONTRIBUTING VERY LITTLE IN THE ABSENCE OF FINANCIAL ASSISTANCE FROM THE FEDERAL GOVERNMENT.

- NATURAL GAS PRODUCTION MUST GO OVER 22 TRILLION CUBIC FEET BY 1985, AS COMPARED TO THE 20 TRILLION CUBIC FEET TOTAL WE WERE ABLE TO PRODUCE IN 1975, AND THE PROJECTED 17.9 TRILLION CUBIC FEET IN 1985 UNDER CONTINUED REGULATION. MOST OF THIS NEW GAS PRODUCTION WILL COME FROM THE GULF OF MEXICO AND INTENSIVE ONSHORE ACTIVITIES. ALASKAN GAS, LIQUIFIED NATURAL GAS, AND SYNTHETIC GAS COULD ALSO SUPPLEMENT THE 1985 SUPPLY.

- COAL PRODUCTION, 640 MILLION TONS IN 1975, MUST GO OVER ONE BILLION TONS BY 1985, WITH MOST OF THE EXPANSION COMING IN THE WESTERN UNITED STATES.

- NUCLEAR POWER'S SHARE OF ELECTRIC POWER GENERATION WILL HAVE TO INCREASE TO ABOUT 26 PERCENT, AS COMPARED TO 1975'S 8.6 PERCENT. THIS EXPANSION WILL HAVE TO OCCUR DESPITE REDUCED DEMAND GROWTH FORECASTS, DELAYS IN SITING, AND FINANCIAL DIFFICULTIES OF MANY ELECTRIC UTILITIES.

- AN EXPANDED COMMERCIAL DEMONSTRATION EFFORT FOR SYNTHETIC FUELS TECHNOLOGIES MUST BE IN PLACE BY 1985. UNLESS CONSTRUCTION OF SYNTHETIC FUELS PLANTS IS STARTED NOW AND PROVEN COMMERCIALLY VIABLE BY 1985, IT WILL NOT BE POSSIBLE

FOR THESE NEW ENERGY SOURCES TO REPLACE DWINDLING SUPPLIES OF OIL AND GAS IN THE POST-1985 PERIOD.

- LASTLY, BUT EQUALLY IMPORTANT, WE MUST CONTINUE AND EXPAND OUR CURRENT EFFORTS TO CONSERVE ENERGY USE IN AUTOMOBILES, HOUSEHOLDS, COMMERCIAL BUILDINGS, AND INDUSTRY.

EACH OF THESE ELEMENTS, AS YOU CAN SEE, IS A MASSIVE PROGRAM IN ITSELF, AND ALL OF THEM MUST WORK IN CONCERT WITH EACH OTHER IF WE ARE TO REACH THAT SIX MILLION BARREL PER DAY IMPORT FIGURE BY 1985. QUITE CANDIDLY, ALL OF THESE THINGS WILL NOT HAPPEN BY THEMSELVES. ALL MUST OCCUR WITHIN THE BOUNDS OF CERTAIN CRUCIAL ASSUMPTIONS:

- THERE MUST BE A PHASED PRICE DEREGULATION OF OIL AND NATURAL GAS.
- THERE MUST BE A RESOLUTION OF THE UNCERTAINTIES TO PERMIT THE ORDERLY DEVELOPMENT OF COAL.
- THERE MUST BE NO MAJOR RESTRICTIONS IN THE GROWTH OF NUCLEAR POWER.
- THERE MUST BE ADEQUATE FINANCING AVAILABLE.
- THERE MUST BE A STREAMLINING OF THE REGULATORY PROCESS TO ELIMINATE UNNECESSARY DELAYS IN BRINGING NEW ENERGY DEVELOPMENT ON LINE.

IT IS ON THIS LAST POINT THAT A DISCUSSION OF THE PROPOSED ENERGY INDEPENDENCE AUTHORITY IS PARTICULARLY RELEVANT. FOR

THE FORECASTS WE HAVE PRODUCED ASSUME THAT FINANCING WOULD BE AVAILABLE FOR THE ENERGY PROJECTS WHICH WE SHALL NEED IN THE NEXT DECADE AND BEYOND.

FULLY $580 BILLION (IN 1975 DOLLARS) IN ENERGY SUPPLY INVESTMENTS ARE EXPECTED TO BE NEEDED IN THE NEXT TEN YEARS. THIS REPRESENTS ABOUT 30 PERCENT OF FIXED BUSINESS INVESTMENT, WHICH IS CLOSE TO ENERGY'S HISTORICAL SHARE. INVESTMENTS TO INCREASE ENERGY EFFICIENCY AND PROMOTE CONSERVATION COULD ALSO ADD THE SIGNIFICANT AMOUNT OF MORE THAN $200 BILLION TO THE TOTAL NEEDED THROUGH 1985.

NOW MOST ENERGY PROJECTS SHOULD AND WILL BE FINANCED FROM CONVENTIONAL PRIVATE SOURCES, BUT THERE WILL BE OTHERS IN SELECTED ENERGY SECTORS THAT WILL ENCOUNTER FINANCIAL DIFFICULTY.

FOR EXAMPLE, ELECTRIC UTILITIES, WHOSE SPENDING WILL HAVE TO ALMOST DOUBLE IN THE NEXT TEN YEARS, CAN BE EXPECTED TO CONTINUE TO HAVE SERIOUS DIFFICULTIES IN RAISING CAPITAL UNLESS FURTHER CHANGES ARE FORTHCOMING ON A TIMELY BASIS TO PROVIDE ADEQUATE RATES AND STRONGER EARNINGS. THIS INDUSTRY IS NOW AND WILL CONTINUE TO BE THE MOST INTENSIVE USER OF THE CAPITAL MARKETS TO FINANCE EXPENDITURES - AND ON A REVENUE BASE WHICH IS LESS THAN HALF OF THAT OF THE OIL COMPANIES. IN ADDITION TO NEW OUTLAYS, THE ELECTRIC UTILITY INDUSTRY WILL

NEED ADDITIONAL CAPITAL TO BRING ABOUT THE REPLACEMENT OF OIL- OR GAS-FIRED PLANTS, OR TO PROMOTE A NEWER TECHNOLOGY AT A FASTER PACE, SUCH AS DUAL-PURPOSE STEAM AND ELECTRIC PLANTS.

IT IS ALSO CLEAR THAT IF THERE IS TO BE DEVELOPMENT OF A COMMERCIALLY VIABLE SYNTHETIC FUELS INDUSTRY, SOME DIRECT FEDERAL FINANCIAL STIMULUS WILL BE REQUIRED. MOST OF THESE TECHNOLOGIES ARE CAPITAL INTENSIVE - GENERALLY EXPECTED TO RUN ONE BILLION DOLLARS PER PLANT TO PRODUCE HIGH COST ENERGY. WITH CONTINUED UNCERTAINTY OVER WORLD OIL PRICES, INVESTORS ARE RELUCTANT TO COMMIT ONE BILLION DOLLARS TO BUILD A PLANT WHOSE OUTPUT PRICE WILL NOT BE IMMEDIATELY COMPETITIVE WITH THE WORLD PRICE OF CRUDE OIL. FURTHERMORE, THE RISK OF COMMERCIALIZING THESE TECHNOLOGIES IS COMPOUNDED BY THE UNCERTAINTY OVER HOW WELL THE TECHNOLOGY WILL WORK; THIS MAKES THE INVESTMENT IN ENERGY TECHNOLOGIES AND SUPPLY DEVELOPMENT PROCESSES ALL THE MORE DIFFICULT.

THE COAL INDUSTRY, WHICH WILL HAVE TO TRIPLE ITS INVESTMENTS IN THE NEXT TEN YEARS, MAY NEED SPECIAL PROJECTS TO SUPPORT REGIONAL MINING DEVELOPMENT OR BETTER ENVIRONMENTAL TECHNOLOGIES. INVESTMENT REQUIREMENTS IN COAL TRANSPORTATION, INCLUDING SUCH SYSTEMS AS SLURRY PIPELINES, COULD MAKE IT DIFFICULT TO ACHIEVE PRODUCTION OBJECTIVES.

CONSERVATION INVESTMENT ACTIVITIES INCLUDE, FOR EXAMPLE, A STRATEGY OF ENCOURAGING ELECTRIC UTILITY LOAD MANAGEMENT. SUCH PROJECTS AS POSITIVE LOAD CONTROL SYSTEMS AND TIME-OF-DAY METERING EQUIPMENT, COULD RESULT IN SUBSTANTIAL BENEFITS IN BOTH ENERGY AND FUTURE CAPITAL SAVINGS.

INVESTMENTS IN URANIUM MINING, MILLING, FABRICATION, AND WASTE MANAGEMENT - COMBINED KNOWN AS THE NUCLEAR FUEL CYCLE - MUST SUPPORT THE EXPANSION OF NUCLEAR CAPACITY. THESE ACTIVITIES ARE EXPECTED TO REQUIRE ON THE ORDER OF $2 BILLION OVER THE NEXT TEN YEARS.

IT IS IN THE CONTEXT OF THESE CIRCUMSTANCES THAT THE ENERGY INDEPENDENCE AUTHORITY HAS BEEN PROPOSED. ENERGY INDEPENDENCE WOULD BE AIDED THROUGH LOANS, LOAN GUARANTEES, AND OTHER FINANCIAL ASSISTANCE TO PRIVATE SECTOR ENERGY PROJECTS. THE EIA LEGISLATION IS DESIGNED TO ASSURE THAT OUTLAYS WOULD BE RECOUPED BY THE GOVERNMENT. COOPERATION WITH PRIVATE SECTOR FINANCING WOULD BE UTILIZED TO A GREAT EXTENT. THE AUTHORITY WOULD HAVE A LIMITED LIFE OF TEN YEARS. FINANCIAL RESOURCES WOULD TOTAL $25 BILLION OF EQUITY AND $75 BILLION OF DEBT. IT WOULD ONLY SUPPORT THOSE PROJECTS WHICH WOULD CONTRIBUTE DIRECTLY AND SIGNIFICANTLY TO ENERGY INDEPENDENCE AND WHICH WOULD NOT BE FINANCED WITHOUT GOVERNMENT ASSISTANCE. THE VICE PRESIDENT HAS ALREADY DESCRIBED FOR YOU THE SCOPE OF EIA'S INVESTMENT ACTIVITY.

MR. CHAIRMAN, THIS INITIATIVE HAS RECEIVED MUCH PUBLICITY SINCE ITS INCEPTION, AND THERE IS NO DOUBT THAT IT WILL BE VIGOROUSLY DEBATED BY BOTH CHAMBERS OF CONGRESS. AND WELL IT SHOULD, SINCE IT CONSTITUTES ONE OF THE MOST SIGNIFICANT UNDERTAKINGS THAT THIS NATION HAS CONSIDERED IN THE PAST TWO DECADES.

I WOULD LIKE TO ADDRESS BRIEFLY A FEW OF THE MAJOR CRITICISMS OF THE PROPOSAL AND, BY DOING SO, FURTHER EXPAND ON THE EIA CONCEPT AND, PERHAPS, ANTICIPATE SOME OF THE CONCERNS WHICH YOU MAY HAVE.

ONE OF THE MAJOR OBJECTIONS TO EIA IS THAT IT WOULD DIVERT TOO LARGE A SHARE OF CAPITAL FROM THE MARKET AND, THEREBY, CROWD OUT OTHER NECESSARY INVESTMENTS IN THE ECONOMY. THIS ARGUMENT IS UNFOUNDED WHEN WE LOOK AT THE PATTERN OF POST-WORLD WAR TWO CAPITAL FORMATION AND THE ENERGY SECTOR'S SHARE OF THE TOTAL. FOR THE PERIOD 1947-1974, THIS SECTOR'S SHARE OF OUTLAYS AVERAGED OUT TO 29 PERCENT. AT THE ESTIMATED $580 BILLION NEEDED BETWEEN NOW AND 1985, THE ENERGY SECTOR WOULD ABSORB ABOUT THE SAME HISTORICAL FRACTION, BUT CERTAIN AREAS WILL FIND IT DIFFICULT TO ATTRACT NEEDED CAPITAL. BY THE STIPULATION IN THE LEGISLATION THAT THE SECRETARY OF THE TREASURY CONCUR IN THE TIMING, METHOD, SOURCE, INTEREST RATE,

AND OTHER TERMS AND CONDITIONS OF EIA TRANSACTIONS, WE CAN BE ASSURED THAT THE CONDITION OF THE CAPITAL MARKETS WILL BE CAREFULLY CONSIDERED.

SOME QUESTION THE ADVISABILITY OF PROVIDING SUMS OF MONEY TO THE ENERGY INDUSTRY, WHICH HAS BEEN ACCUSED OF REAPING HIGH PROFITS IN RECENT TIMES. FIRST OF ALL, THE HIGHLY PUBLICIZED GAINS MADE BY THE OIL COMPANIES FOLLOWING THE EMBARGO ARE RECEDING, MAKING THEIR PROFIT POSITION COMPARABLE TO OTHER MAJOR INDUSTRIES IN THIS NATION. SECONDLY, WE ARE IN AN AREA WHERE THE COSTS OF ESSENTIAL ENERGY PROJECTS ARE UNKNOWN. WITH THE PRICING STRUCTURE IN THIS COUNTRY, WITH THE UNCERTAINTY OF GOVERNMENT DECISIONS REGARDING ENERGY, PRIVATE ENTERPRISE - NO MATTER HOW SOLVENT - WILL NOT MAKE AN INVESTMENT UNTIL THEY KNOW WHETHER THEY HAVE AN EXPECTATION OF EARNING A RETURN COMMENSURATE WITH THE RISKS. WE ARE SPEAKING HERE, OF COURSE, OF THE SO-CALLED ENERGY RISK VENTURES THAT WERE DESCRIBED PREVIOUSLY. IN THE AREA OF CONVENTIONAL ENERGY DEVELOPMENT, THE PETROLEUM INDUSTRY CAN BE EXPECTED TO RAISE THE MONEY NEEDED TO FUND SUBSTANTIAL INCREASES IN THE COST OF EXPLORATION AND DEVELOPMENT OF DOMESTIC OIL AND GAS, WITHIN THE CURRENT REGULATORY AND ECONOMIC FRAMEWORK.

ON THE SUBJECT OF RISK VENTURES, THERE ARE THOSE THAT CONTEND THAT THE EIA WOULD CERTAINLY LOSE MONEY, SINCE IT APPEARS THAT THE VENTURES ARE SO RISKY THAT PRIVATE ENTERPRISE WILL NOT TOUCH THEM. THE MERE FACT THAT THE PRIVATE SECTOR DOES NOT SUPPORT A CERTAIN PROJECT DOES NOT NECESSARILY MEAN THAT THE PROJECT WILL LOSE MONEY. EIA IS INTENDED TO PROVIDE RISK CAPITAL TO PROJECTS WHICH OFFER THE PROMISE OF CONTRIBUTING IN THE FUTURE TO ENERGY INDEPENDENCE BY OPERATING PROFITABLY ON A COMMERCIAL SCALE, PROJECTS WHICH COULD NOT OTHERWISE SECURE THE NECESSARY CAPITAL TO BEGIN THE FIVE- TO TEN-YEAR PROCESS OF SEEKING APPROVALS FOR, AND CONSTRUCTING, PRODUCTION FACILITIES. EVEN HERE, THE FORMULATION OF THIS PROPOSAL WAS DESIGNED TO LIMIT EIA'S EXPOSURE TO THESE KINDS OF VENTURES. LIMITATIONS, INCLUDING REQUIREMENTS FOR NECESSARY RESERVES, HAVE BEEN INCORPORATED IN THE PROPOSAL TO PREVENT ANY OVER-EXTENSION OF INVESTMENT COMMITMENTS.

IT SHOULD ALSO BE EMPHASIZED THAT NO PERMANENT OWNERSHIP, CONTROL OR OPERATION OF ENERGY FACILITIES BY THE FEDERAL GOVERNMENT THROUGH EIA WILL BE ALLOWED. WE ARE NOT ESTABLISHING ANOTHER LAYER TO THE GOVERNMENT BUREAUCRACY. THE AUTHORITY WILL HAVE A SPECIFIED LIFE OF TEN YEARS, WITH NEW FINANCING COMMITMENTS PERMITTED ONLY IN THE FIRST SEVEN YEARS OF ITS EXISTENCE. IN LINE WITH THIS IS THE CONCERN EXPRESSED BY MANY OVER THE CONTROL TO BE EXERCISED BY THE CONGRESS OVER THE OPERATIONS OF THE EIA. CONGRESS WILL HAVE A CONTINUING

ROLE IN THE REVIEW OF EIA ACTIVITIES. FIRST, IN THE ORGANIZATION PHASE OF THE AUTHORITY, THE FIVE-PERSON BOARD OF DIRECTORS WILL BE APPOINTED BY THE PRESIDENT, SUBJECT TO THE ADVICE AND CONSENT OF THE SENATE. IN ITS OPERATIONS, SINCE ANY EIA REQUEST FOR EQUITY CAPITAL WOULD BE SUBJECT TO THE NORMAL BUDGET AUTHORIZATION AND APPROPRIATION PROCESS, CONGRESS WILL HAVE THE OPPORTUNITY TO REVIEW THE POLICIES OF EIA. EIA WILL ALSO BE REQUIRED TO SUBMIT AN ANNUAL REPORT TO CONGRESS, AND THE GENERAL ACCOUNTING OFFICE IS SPECIFICALLY AUTHORIZED TO AUDIT THE ACTIVITIES OF THE CORPORATION.

FINALLY, THERE ARE SOME WHO WOULD CRITICIZE US FOR EVEN ATTEMPTING TO REACH THE GOAL OF ENERGY INDEPENDENCE, SINCE, IN THEIR MINDS, IT APPEARS TO BE A "PIE-IN-THE-SKY" HOPE. LET ME REITERATE THAT "ENERGY INDEPENDENCE" DOES NOT MEAN "ZERO IMPORTS." THIS ADMINISTRATION HAS BEEN WORKING TOWARD A REALISTIC AND VIABLE PLAN WHEREBY OUR DOMESTIC PRODUCTION OF ENERGY COULD BE INCREASED TO THE POINT AT WHICH, IN CONJUNCTION WITH VIGOROUS CONSERVATION PROGRAMS, OUR LEVEL OF IMPORTED ENERGY WOULD BE ACCEPTABLE. BY THAT I MEAN A LEVEL WHICH IF INTERRUPED BY ANY CAUSE, BE IT ARBITRARY PRICE HIKES OR EMBARGO, WOULD NOT ADVERSELY AFFECT THIS NATION'S ECONOMY OR FOREIGN POLICY FLEXIBILITY.

THE ENERGY INDEPENDENCE AUTHORITY NOW BEFORE YOU IS A CRUCIAL PART OF THIS OVERALL PROGRAM. I WOULD HOPE THAT WE COULD NOW

NARROW OUR DIFFERENCES, RESOLVE THEM, AND FORMULATE A PROGRAM TO COPE WITH OUR ENERGY PROBLEMS THAT MOBILIZES OUR DOMESTIC RESOURCES AND DEMONSTRATES TO OUR FRIENDS AND PARTNERS AROUND THE WORLD THAT WE ARE DETERMINED TO MASTER OUR ECONOMIC DESTINY.

Tab C - Need
for EIA

THE NEED FOR EIA
An Overview of the
National Energy Outlook

MAJOR FINDINGS OF THE NEO

The National Energy Outlook (NEO) recently published by the Federal Energy Administration clearly indicates that the United States must make a substantial commitment of policy and programs to achieve energy independence. Merely to maintain current levels of imports (6.0 million barrels per day in 1975), the Nation will have to accomplish the following (see Figure 1 and "Finding and Conclusions" in NEO for more details):

-- Increase domestic crude oil production from 8.4 million barrels per day (MMB/D) in 1975 to about 12.3 MMB/D by 1985; the contribution from synthetics will only amount to 300 MB/D of this total. This increase of almost 50 percent will have to occur despite the fact that currently producing onshore reserves will decline to 2.4 MMB/D by 1985, as older fields are depleted.

-- Increase natural gas production to over 22 trillion cubic feet (Tcf) by 1985, from about 20 Tcf in 1975 and stem the decline caused by present price regulations.

-- Expand coal production to over one billion tons by 1985 from 640 million tons in 1975, with most of the expansion coming in the West (increase from about 100 million tons to almost 400 million tons in 1985) and with continued uncertainty facing the coal market.

-- Increase nuclear energy's share of electric power generation to about 26 percent, from about 8.6 percent in 1975. This expansion will have to occur despite reduced load growth forecasts, delays in siting, and financial difficulties in the nuclear industry.

-- Expand research and begin commercialization of synthetic fuel technologies to utilize the Nation's most abundant resources and to expand use of solar and geothermal power.

-- Continue and expand current efforts to conserve energy use in automobiles, households, commercial buildings, and industry.

Each of these levels cannot be achieved unless pricing and government regulatory policies encourage it. Institutional barriers and policy uncertainty will also delay development.

If one or more domestic energy sources do not achieve these projected levels, imports (above current levels) will make up the shortage. Further, the energy investments for post-1985 needs will be enormous and will have to be made in the next several years.

The projected levels of domestic supply and conservation in the NEO Reference Scenario are derived after making several key assumptions:

-- gradual price deregulation for oil and natural gas

-- resolution of uncertainty over Clean Air Act and surface mining

-- no major restrictions on nuclear power growth

-- realization of average U.S. Geological Survey reserve estimates and accomplishment of current Outer Continental Shelf (OCS) lease schedule

-- adequate availability of financing

The last point is particularly relevant to the Energy Independence Authority (EIA). The FEA forecast assumes that utilities, oil companies, synthetic fuel projects, coal mines, and other energy projects occur if they are economic and that unavailability of financing does not constrain these projects.

ENERGY INVESTMENT NEEDS

The major energy investment requirements as forecast in the NEO are indicated below (see Chapter VI, Financing our Energy Future for more details):

° Energy supply investments in the U. S. will be about $580 billion (in 1975 dollars) in the next ten years (see Figure 2).

- While this investment seems large, it is about 30 percent of fixed business investment, which is energy's historical share.

- In certain sectors, such as utilities, large demands will be placed on the capital markets.

° Oil, gas, and electric utility capital spending will almost double in the next 10 years.

° The largest portion of the energy investment will be in the electric utility sector which could account for 47 percent of the total.

- Oil and gas investment depends greatly on the pricing and policy strategies adopted and could range from about $160 to $315 billion.

- Coal investment could increase to $18 billion or only 3 percent of the total, but representing a 200 percent increase from the 1965-1974 total of $6 billion.

- Investments to increase energy efficiency and promote conservation could also be significant, perhaps an additional $250 billion through 1985.

  - Conservation investments are difficult to separate from non-energy investments and will be spread throughout the economy.

Thus, FEA's forecast shows that, in the aggregate, energy investment for supply development can be expected to stay within its historical share of overall business investment. However, several energy sectors face current or potential problems in raising the money needed to meet the Nation's energy demands.

The petroleum industry can be expected to raise the money needed to fund substantial increases in the cost of exploration and development of domestic oil and gas, provided that it is not concurrently required to change significantly its existing practices to reduce its cash flow.

At the other extreme, the electric utilities, which have to raise more money than the oil companies from less than half the revenue base, can be expected to continue to have serious financial difficulties unless changes are made to provide for adequate rates and for a stronger cash flow. This industry will continue to be the most intensive user of the capital markets to finance expenditures.

Within the electric utility industry there are also a number of specific projects which would serve to replace oil or gas-fired plants, or to promote a newer, cheaper technology at a faster pace.

It is also clear that the development of a viable synthetic fuels industry will require some direct Federal financial stimulus. Synthetic fuel plants are at best marginally economic at today's prices and are unlikely to be built because of uncertainty over world oil prices, government price regulation, and siting difficulties.

The coal industry, which will have to triple its investments in energy in the next ten years, may need special infrastructure projects to support regional mining development, or better environmental technologies. The coal transportation investments could involve substantial commitments by railroads and the possible use of slurry pipelines. It is estimated that about 300,000 new hopper cars will be needed in the next ten years to meet coal transport needs (at a cost of about $7.5 billion). An additional $5 billion is expected to necessary for roadbed and locomotives.

Investments in uranium mining, milling, enrichment, fabrication, and waste management (known as the nuclear fuel cycle) must support expansion of nuclear capacity and could require over $7 billion.

In addition to the capital requirements for energy supply options, there will also be a need for investment capital to foster energy conservation. Measuring such expenditures is far more difficult than those for supply. It is clear that higher energy costs may encourage early replacement of an energy intensive machine or process, but it is less clear which part of the cost of the new equipment is an investment in conservation. There is also the problem of identifying the conservation investment for such purchases as lighter, cheaper cars that use less gasoline. These conservation investments could range between $165 and 325 billion dollars, with an intermediate estimate of $240 billion.

To meet these specialized capital needs, the President has proposed the creation of an Energy Independence Authority (EIA). It would supplement and encourage private capital investment to meet the energy needs of the Nation. The EIA would provide financial assistance to projects in the following categories:

- Technologies for the development, production, transportation or conservation of energy, not in widespread domestic commercial use;
- Production or use of nuclear power;
- Generation and transmission of electricity from fuel sources other than oil or natural gas;
- Projects in widespread domestic commercial use which are of large scope, or which require unusual institutional or regulatory arrangements;
- Protection of the environment necessary in connection with the above activities.

The EIA would stimulate projects that cannot obtain financing otherwise by providing loans, loan guarantees, and other means of financial assistance. It would help the Nation achieve energy independence.

The finance chapter shows that one of the major objections raised to EIA, the alleged crowding-out effect, is unfounded when viewed in the historical perspective of post-World War II capital formation, and the energy sector's share. The objection states that EIA will usurp too large a share of the capital market and crowd out other necessary investments. FEA estimates that capital requirements for supply development total $580 billion (in 1975 dollars). In the aggregate, this level of capital expenditures for the energy sector appears feasible; for the period 1947-1974, this sector's share of outlays averaged out to 29 percent; at a level of $580 billion during 1975-1984, the energy sector would absorb about the same historical fraction of projected plant and equipment expenditures (see Figure 3).

Admittedly, however, if capital demand in other sectors exceeded the historical experience, or if the capital formation levels anticipated in the macroeconomic projections failed to be realized, then there would undoubtedly be some tightness in the capital markets.

However, under the present outlook the possibility of a crowding out effect is not high. As emphasized when the EIA legislation was submitted last October, it is not a matter of deflecting additional capital to the energy sector, but assuring through EIA that the conditions exist to facilitate the required flow of capital. This, in turn, requires the risk-pooling and pump-priming measures which EIA would be capable of implementing.

How Will the U.S. Meet Its Growing Energy Demands by 1985?

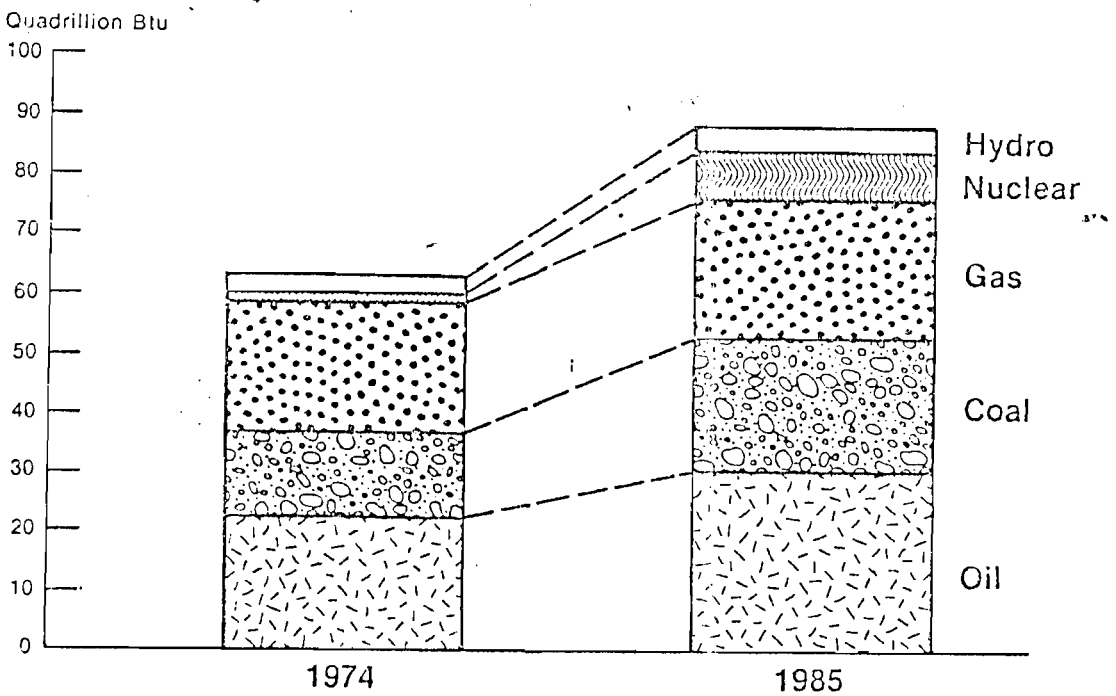


Figure 1

Cost of Energy Supply Investments

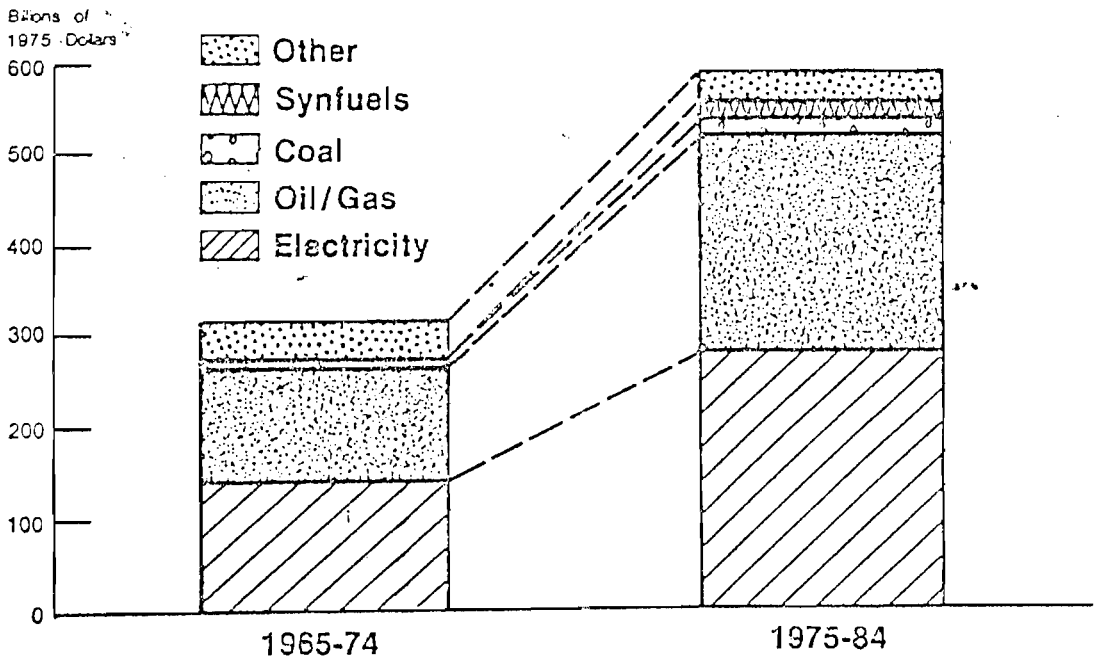


Figure 2

Energy's Annual Share of Business Plant And Equipment Investment

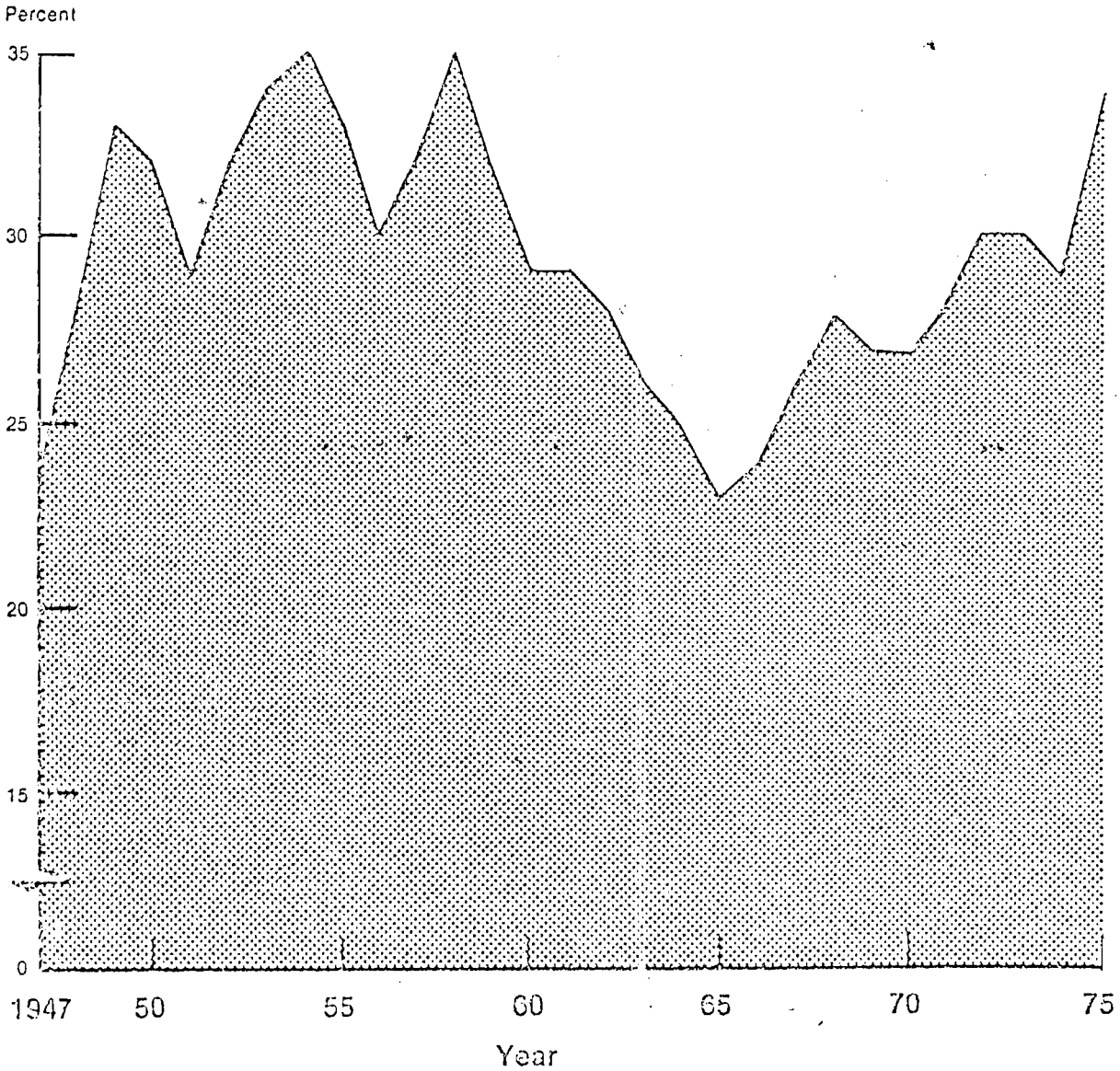


Figure 3

Tab D - EIA
Portfolio
Alternatives

TAB D: EIA INVESTMENT ACTIVITY; ILLUSTRATIVE PORTFOLIO

Introduction

Tab E of the EIA briefing book presents fact sheets on individual energy investment projects which might qualify for EIA support. The analysis is summarized in this Tab, and presented as an illustration of how EIA's resources could be committed.

It must be emphasized that this is only a hypothetical illustration, not a proposed financial plan. The purpose here is to assemble from many disparate sources a succinct view of candidate projects which appear to meet EIA criteria (no credit elsewhere, significant contribution to energy independence), and qualify statutorily under one or more of the scope specifications described in Section 303.

Assumptions

To the maximum possible extent, these estimates are based on FEA's $13 Reference Scenario for 1985, as described in the National Energy Outlook. Since EIA is to be allowed only seven years during which it can "make commitments", it seems reasonable to tailor its portfolio to requirements that are projected in the 1985 to 1990 timeframe. Admittedly, cash outlays could, and will, lag commitments by several years; however, the general tenor of EIA is an acceleration of efforts during the next 10-15 years.

Since EIA resources are not denominated as constant dollars in the legislation, all dollar figures relating to total project cost and EIA support are kept current, with an assumed inflation rate of 7% per year, consistent with the synfuels assumptions made previously by ERDA.

Methodology

To facilitate the presentation, investment activities are grouped within the five categories specified in Section 303:

- Technologies not in widespread commercial use for development, production, transportation, transmission or conservation of energy;

- Technologies, process or techniques essential to production or use of nuclear power;
- Generation of electricity from fuel sources other than oil or gas; transmission thereof;
- Projects of such size or scope that they would not be undertaken without EIA support; projects involving institutional or regulatory arrangements not in widespread commercial use;
- Protection of the environment in connection with activities of a type described above.

There is obvious overlap among these categories. In these tabulations, all nuclear activity is shown under Nuclear Power rather than under Oil/Gas Displacement. Some environmentally-protective projects, i.e., scrubbers installed on boilers converted to coal, are shown under Oil/Gas Displacement because total project costs include non-environmentallly-related costs such as coal-handling equipment, as well as scrubbers.

Scope of Activity

Table I presents the highlights of potential investment activities by EIA in the following format:

- Area: Keyed to a particular technology or energy resource category.
- Activity: More specific definition of the process.
- Remarks: Special assumptions or issues.

It should be noted that some investment areas are selective, while others are more comprehensive. For example, under Emerging Technologies several other projects, perhaps energy-conservation related, could be added; on the other hand, the Nuclear Power area is fairly comprehensive, in that it covers power plants, land-sited and floating, and aspects of the fuel cycle that are within EIA scope. Note that uranium enrichment, by whatever process, is assumed to remain within ERDA and then transferred to the private sector directly, rather than through EIA, or with EIA support.

Level of EIA Support

Tables IIA through IIE present the following investment and energy contribution estimates:

- Total project cost;
- EIA participation;
- Peak energy yield, in thousand barrels oil equivalent per day (MBOE/D), in megawatts (Mwe), or in physical units, as appropriate.

As noted above, all dollars figures are current. EIA participation is usually estimated at 75% of total project cost, unless there is reason to assume a different level of support. No estimates are made for EIA reserves required to support a price-guarantee program under synfuels, or any other project category, since this is too speculative to quantify at present. Given the assumed $13 world oil price, if this holds true then the only direct outlays for price support may occur under phase II of synfuels, for the coal liquefaction processes.

The summary results from this portfolio are as follows:

($ billion, current)

	Total Project Cost	EIA Participation
Emerging Technologies	57.0	34.9
Nuclear Power	26.0	19.9
Oil/Gas Displacement	30.0	22.6
Scope/Regulatory	28.3	21.2
Environmental Protection	5.6	5.4
TOTAL	147.8	104.0

Support for Electric Generation and Transmission

There are several project activities spread throughout the categories shown above which support electric generation and transmission, either directly or indirectly, in the electric utility sector and in the industrial sector.

Table III presents the sub-totals within the EIA portfolio which involve support for electricity.

In summary, it can be seen that approximately 70% of EIA's resources is committed to electricity support, with $45 billion for generating facilities, $12 billion for nuclear, coal and synthetically-derived fuels, $9.8 billion for infrastructure support, and $4.3 billion for current and advanced-technology scrubbers. It should be kept in mind that virtually all of this EIA support is conditioned by the three-party convenant, as the legislation is now written. The exceptions to this might be some categories of infrastructure, and perhaps some conservation-related projects.

Timing of EIA Commitments

EIA is prohibited from making new commitments after June 30, 1983, and from furnishing new financial assistance after June 30, 1986 (Section 803). Consequently, resource commitments are assumed to be made during the 1977-1983 interval. Table IV presents the schedule of these commitments. In summary, resources totalling $104 billion are committed as follows:

	1977	1978	1979	1980	1981	1982	1983
($ billion current)	9.7	10.4	12.4	16.9	24.5	15.0	15.6

It will probably be argued that this schedule is unrealistically optimistic, and that it represents peak borrowing of $24.5 billion in 1981, more than the securities market can absorb. With respect to the first point, it may be true that EIA will not be able to make commitments of $9.7 billion in 1977; however, if implemented the EIA may pick up a nucleus of on-going programs from ERDA, principally in Synfuels Commercialization.

Concerning capital market impact, the peak figure of $24.5 billion in 1981 does not represent cash outlays by EIA, or borrowing and equity take-down by EIA through the Treasury. Rather, as "commitments" most of these resources will represent guarantees which private sector venturers will use to assemble financing for their projects. Clearly, they will not be inclined, or able, to go to the securities markets in the same year of the EIA commitment to raise the total funding required by the project. Instead, based on project lead-times, typically 5-10 years for large, energy-related ventures, they will schedule their access to the capital markets to avoid carrying unnecessarily high levels of cash balances, since EIA will be charging full commercial interest rates, and fees for commitments and loan guarantees.

A preliminary estimate of securities market activity has been developed, based on an assumed typical project schedule of seven years, with funding support required per the following profile:

Years:	1	2	3	4	5	6	7
Percent of EIA support:	5	10	20	20	20	15	10

Converting these to current dollars, based on the EIA commitments schedule shown above and on Table IV, the following pattern of funding from the securities markets of EIA-backed obligations would take place:

Year:	1977	1978	1979	1980	1981	1982	1983
($ billion current)	.4	1.2	3.1	5.6	8.8	12.0	15.2

Year:	1984	1985	1986	1987	1988	1989
($ billion current)	15.8	15.2	12.3	8.7	4.4	1.9

It can be seen that the peak impact occurs during 1983 through 1985, at a level of approximately $15 billion per year. This should be viewed in the context of projected overall investment during that interval. By the estimates in Wharton's Long-Term Annual and Industry Forecasting Model for the FEA Base Case, aggregate fixed business and residential investment will be as follows:

Year:	1983	1984	1985
($ billion current)	521	589	660

It appears, therefore, that the presumed crowding-out effect would be minor. Further detail is provided in Tab I, Economic Impact of EIA.

One further aspect of EIA impact should be noted, i.e., national debt ceiling and debt management operations. In the case of guarantees by EIA, but no outlays, U. S. government exposure is created, and the liability under the EIA guaranteee becomes part of the Federal debt, but is not subject to the statutory debt limit. Moreover, unless defaults occur, no outlays which would require funding by the Treasury will result from the guarantee activities by EIA.

TABLE I: EIA PORTFOLIO; DESCRIPTION OF POTENTIAL INVESTMENT ACTIVITIES

Area	Activity	Remarks
1) Emerging Technologies		
1.1 Synthetic Fuels	-High Btu gas -Low Btu gas -Oil Shale -Coal Liquefaction -Biomass (waste)	-Phases I and II of Synfuel commercialization included; Phase II (one million barrels per day by 1985) is highly speculative
1.2 Other Coal Technologies		
a. Solvent-Refined Coal	-Fuel available as liquid or solid	-Phase II program support, picking up after ERDA-supported Phase I.
b. Fluidized Bed Boilers	-Burning of pulverized coal, treated and injected to behave like a fluid.	-Enables coal to be burned more completely with greater efficiency, containing particle emission below any contemplated standards.
1.3 Renewable Resources		
a. Geothermal Energy	-Electricity	-Non-electrical applications not included
b. Wind Energy	-1.5 Mwe generators	-Still close to R & D phase
c. Solar Thermal Energy	-Heating and cooling of buildings, including water heating	-Support for manufacturers, and commercial and industrial installations, not homeowners.
1.4 Conservation Technologies		
a. Combined Steam-Electric Plants	-Steam recovery and electricity from generators	
b. Utility Load Management	-Positive load control with time-of-day metering	-Medium scenario, 45% penetration of all utility customers by 1985.

Area	Activity	Remarks
2) Nuclear Power		
2.1 Nuclear Fuel Cycle		
a. Uranium Mining and Milling	-Support supply of U_3O_8	-Could cover part of estimated 1981-1985 shortfall, up to 20%
b. Spent Fuel Reprocessing	-Support one 1,500 tons/year plant	-Supports 50,000 Mwe of nuclear capacity; closes fuel cycle gap.
2.2 Nuclear Power Plants		
a. Land-Sited Plants	-25,000 Mwe light-water reactor capacity	-Supports 25% of new nuclear requirements through 1985 (Reference Scenario).
b. Floating Plants	-Four units of 1,150 Mwe each	-Modules; mass-production cost advantage over on-site construction.
3) Oil/Gas Displacement		
3.1 Conversion to Coal a. Electric Utilities b. Industrial Boilers	-Retrofit and new plant boiler conversion, industry and electric utilities	-Retrofit potential identified through surveys; new plant potential assumes conversion of boilers planned firmly for oil and gas.
3.2 Coal-Fired Power Plants		
a. Land-Sited Plantes	-31,500 Mwe of base-load capacity	-Supports 20% of forecasted coal requirements through 1985.
b. Floating Plants	-Eighteen ships, each with four 100 Mwe generators	-Concept is not new: barge-mounted turbines in NYC; WW II generator ships.
3.3 Hydroelectric Reclamation	-112 sites located throughout New England totalling 300 Mwe	-Small program, special region emphasis.
4) Scope/Regulatory		
4.1 Railroad Track and Equipment for Coal	-Upgrade and build branch lines	-Must be coordinated with DOT.
4.2 Major Infrastructure	-Oil/gas logistical systems	-Predicated on rate of resource development

Area	Activity	Remarks
4.3 Electric Transmission	-Link major new generating complexes with consumption centers	-May depend on location of EIA-supported activity in electrical generation.
4.4 Energy Parks	-Front-end investments for site assembly transmission right-of-way, and infrastructure development	-Lead times for site, preparation, and EIA's short life mean that EIA support is limited to site assembly phase.
5) Environmental Protection		
5.1 Current Technology Scrubbers	-Conversion of oil and gas boilers to coal -Installation on EIA-supported new coal capacity -Manufacturer support	-Scope of requirement for scrubbers, and future changes in requirements make these estimates speculative.
5.2 Direct Project Support	-Environmental safeguards for a major energy project, e.g., pipeline	-Externalization of environmental costs may raise objections.
5.3 Advanced Technology Scrubbers	-Four technologies, each in demonstration phase at present	-5000 Mwe of capacity to be supported.

TABLE IIA: EIA SUPPORT, EMERGING TECHNOLOGIES

	Total Project Cost (Current $ million)	EIA Participation (Current $ million)	Peak Energy Yield MBOE/D	Peak Energy Yield Mwe	
E-1 Emerging Technologies					
E-1.1 Major Synthetic Fuels					
a. Oil Shale	7,200	3,585	300		
b. High Btu Gas	6,955	5,410	280		
c. Low Btu Gas	6,375	3,120	250		
d. Coal Liquefaction	2,940	1,470	100		
e. Biomass Conversion	2,120	1,570	48		
Sub-Total, Synthetics	25,590	15,155			
E-1.2 Other Coal Technologies					
a. Solvent-refined coal	2,780	2,084	263		(Six plants)
b. Fluidized-bed Boilers	3,750	2,813	131		(Several, varied plants)
E-1.3 Renewable Resources					
a. Geothermal Electricity	4,619	3,464	140	5,000	
b. Wind Energy	4,209	3,157	110	5,000	
c. Solar Thermal Energy	7,400	1,000	40		
E-1.4 Conservation Technologies					
a. Combined Steam-Electric Plants	1,470	1,100	15	1,200	
b. Utility Load Management	8,091	6,068	125		
Sub-Total, Emerging Technologies	57,909	34,841			

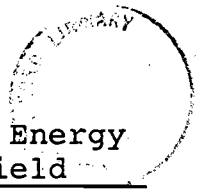
TABLE IIB: EIA SUPPORT, NUCLEAR POWER

	Total Project Cost	EIA Participation	Peak Energy Yield	
			MBOE/D	Mwe
E-2 Nuclear Power				
E-2.1 Nuclear Fuel Cycle				
a. Uranium Mining and Milling	1,600	1,600	°20,000 Short tons U_3O_8, 1981-1985	
b. Spent Fuel Reprocessing	1,366	1,050	°1500 ton/year supports 50,000 Mwe plant capacity	
E-2.2 Nuclear Power Plants				
a. Land-Sited Plants	19,453	14,590	725	25,000
b. Floating Plants	3,641	2,731	133	4,600
Sub-Total, Nuclear Power	26,060	19,971		

TABLE IIC: EIA SUPPORT, OIL/GAS DISPLACEMENT

	Total Project Cost (Current $ million)	EIA Participation (Current $ million)	Peak Energy Yield	
			MBOE/D	Mwe
E-3 Oil/Gas Displacement				
E-3.1 Conversion to Coal				
a. Electric Utilities	5,730	4,297	-20,400 Mwe retrofit -20,000 Mwe new	
b. Industrial Boilers	2,221	1,666	-16,300 Mwe retrofit -7,100 Mwe new	
E-3.2 Coal-Fired Power				
a. Land-Sited Plants	16,611	12,458	913	31,500
b. Floating Plants	5,213	3,910	210	7,200
E-3.3 Hydroelectric Reclamation	300	225	6	300
Sub-Total, Oil/Gas Displacement	30,075	22,556		

TABLE IID: EIA SUPPORT, SCOPE/REGULATORY PROJECTS



	Total Project Cost	EIA Participation	Peak Energy Yield MBOE/D	Peak Energy Yield Mwe	
E-4 Scope/Regulatory					
E-4.1 Railroad Track and Equipment for Coal	1,860	1,390			° Three projects providing 840 miles new track, 210 miles upgraded, 7 unit trains and loading units
E-4.2 Major Infrastructure	23,250	18,158			
E-4.3 Electric Transmission	960	720			° Two 300 circuit mile links, serving 10,000 Mwe each
E-4.4 Energy Parks					
a. Site-Banking	450	340			° 30 to 50 sites for electric power and/or synfuels
b. Preconstruction Preparation	450	340			
c. Transmission Right-of-Way	1,350	1,010			
Sub-Total, Scope/Regulatory	28,320	21,238			

TABLE IIE: EIA SUPPORT, ENVIRONMENTAL PROTECTION PROJECTS

	Total Project Cost	EIA Participation	Energy Yield MBOE/D	Energy Yield Mwe
E-5 Environmental Protection				
E-5.1 Current Technology Scrubbers				
a. Conversion to Coal	(Covered in item E-3.1, Oil/Gas Displacement)			
b. Coal-Fired Plants	4,725	3,540		31,500 Mwe supported (See item E-3.2.a)
c. Manufacturer Support	150	150		
E-5.2 Direct Project Support	N/A	1,000		
E-5.3 Advanced Technology Scrubbers	750	750		5,500 Mwe supported
Sub-Total, Environmental Protection	5,625	5,440		

TABLE III

EIA PORTFOLIO: ELECTRIC GENERATION AND TRANSMISSION

	Total Project Cost (Current $ million)	EIA Participation (Current $ million)	Peak Energy Yield MBOE/D	Peak Energy Yield Mwe
Generating Facilities				
Geothermal electricity	4,619	3,464	140	5,000
Wind energy	4,209	3,157	110	5,000
Combined steam-electric	1,470	1,100	15	1,200
Nuclear power plants				
land	19,453	14,590	725	25,000
floating	3,641	2,731	133	4,600
Coal-fired plants				
land	16,611	12,458	913	31,500
floating	5,213	3,910	210	7,200
Hydroelectric reclamation	300	225	6	300
Conversion to coal	7,951	5,963		45,800
Sub-Total	63,467	44,898		
Fuel				
Synthetic fuels from coal and biomass	8,495	4,690	298	
Solvent-refined coal	2,780	2,084	263	
Fluidized bed boilers	3,750	2,813	131	
Nuclear fuel cycle				
uranium mining and milling	1,600	1,600		
reprocessing	1,366	1,050		
Sub-Total	17,991	12,237		

	Total Project Cost (Current $ million)	EIA Participation (Current $ million)	Peak Energy Yield MBOE/D	Mwe
Support				
Utility load management	8,091	6,068	125	
Transmission	960	720		
Energy Parks	2,250	1,690		
Railroad track and equipment	1,860	1,390		
Sub-Total	13,161	9,868		
Environment				
Current technology scrubbers	4,725	3,540		31,500
Advanced technology scrubbers	750	750		5,500
Sub-Total	5,475	4,290		
Grand-Total	100,094	71,293		

TABLE IV: EIA PORTFOLIO

Schedule of Investment Commitments

	1977	1978	1979	1980	1981	1982	1983	Total
E-1 Emerging Technologies								
E-1.1 Major Synthetic Fuels	3340	880	800	2235	7660	240	--	15155
E-1.2 Other Coal Technologies	--	--	281	1069	1255	1446	846	4897
E-1.3 Renewable Resources	232	557	853	1000	1097	1378	2504	7621
E-1.4 Conservation Technologies	1248	1336	1427	1529	1628	--	--	7168
Subtotal	4820	2773	3361	5833	11640	3064	3350	34841
E-2 Nuclear Power								
E-2.1 Nuclear Fuel Cycle	--	75	395	470	545	545	620	2650
E-2.2 Nuclear Power Plants	1713	1913	2067	2475	3029	3048	3076	17321
Subtotal	1713	1988	2462	2945	3574	3593	3696	19971
E-3 Oil/Gas Displacement								
E-3.1 Conversion to Coal	498	533	570	754	934	1125	1549	5963
E-3.2 Coal-Fired Power	1809	1938	2036	2384	2550	2730	2921	16368
E-3.3 Hydroelectric Reclamation	51	53	59	62	--	--	--	225
Subtotal	2358	2524	2665	3200	3484	3855	4470	22556

TABLE IV: EIA PORTFOLIO

Schedule of Investment Commitments

	1977	1978	1979	1980	1981	1982	1983	Total
E-4 Scope/Regulatory								
E-4.1 Railroad Track and Equipment for Coal	161	172	184	197	211	225	241	1391
E-4.2 Major Infrastructure	563	2563	3125	3686	3363	2294	1844	17438
E-4.3 Electric Transmission	--	--	--	--	224	240	256	720
E-4.4 Energy Parks	50	85	169	204	339	421	421	1689
Subtotal	774	2820	3478	4087	4137	3180	2762	21238
E-5 Environmental Protection								
E-5.1 Current Technology Scrubbers	65	192	247	531	708	885	1062	3690
E-5.2 Direct Project Support	--	150	175	200	225	250	--	1000
E-5.3 Advanced Technology Scrubbers	8	30	38	110	150	189	225	750
Subtotal	73	372	460	841	1083	1324	1287	5440
Total EIA Commitments	9738	10477	12426	16905	24520	15016	15565	104,047