ENERGY INDEPENDENCE AUTHORITY ACT OF 1975

HEARINGS

BEFORE THE

COMMITTEE ON BANKING, HOUSING AND URBAN AFFAIRS UNITED STATES SENATE

NINETY-FOURTH CONGRESS

SECOND SESSION

ON

S. 2532

TO ESTABLISH THE ENERGY INDEPENDENCE AUTHORITY, A GOVERNMENT CORPORATION WITH AUTHORITY TO PROVIDE FINANCING AND ECONOMIC ASSISTANCE FOR THOSE SECTORS OF THE NATIONAL ECONOMY WHICH ARE IMPORTANT TO THE DEVELOPMENT OF DOMESTIC SOURCES AND THE CONSERVATION OF ENERGY, AND THE ATTAINMENT OF ENERGY INDEPENDENCE FOR THE UNITED STATES IN A MANNER CONSISTENT WITH THE PROTECTION OF THE ENVIRONMENT; TO IMPROVE FEDERAL GOVERNMENT OPERATIONS SO AS TO ASSIST IN THE EXPEDITING OF REGULATORY PROCEDURES WHICH AFFECT ENERGY DEVELOPMENT; AND FOR OTHER PURPOSES

APRIL 12, 13, AND 14; AND MAY 10, 1976

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MONDAY, APRIL 12, 1976

U.S. SENATE,
COMMITTEE ON BANKING, HOUSING, AND URBAN AFFAIRS,
Washington, D.C.

The committee met at 9:40 a.m., pursuant to call, in room 5302, Dirksen Senate Office Building, Senator William Proxmire (chairman of the committee) presiding.

Present: Senators Proxmire, Stevenson, Packwood, and Garn.

OPENING STATEMENT OF CHAIRMAN PROXMIRE

The CHAIRMAN. The committee will come to order.

This morning the committee begins 3 days of hearings on S. 2532, the Energy Independence Authority Act. This bill would create an independent government corporation authorized to invest $100 billion over the next 7 years in energy projects to make the United States more or less independent of energy imports by the middle of the 1980's.

Under the proposed legislation a number of different types of Federal financial assistance would be provided for a wide range of energy projects, including both new and conventional technologies.

We have with us today Hon. Nelson A. Rockefeller, Vice President of the United States, the chief architect of the Energy Independence Authority proposal. Accompanying him is Frank Zarb, Administrator of the Federal Energy Administration. After the Vice President and Mr. Zarb are finished we will hear two distinguished academics discuss the issues underlying the legislation from opposing viewpoints, Walt W. Rostow, University of Texas; and Barry Commoner of Washington University in St. Louis.

In the following 2 days we will have before us a number of witnesses who will speak to us about the various aspects of the legislation, including the potential impact on the environment and on capital markets.

The Energy Independence Authority proposal is the major initiative undertaken by the administration to address the serious problem of meeting our Nation's energy needs in the coming years and decades. There is no doubt that we need to confront this problem and we need to confront it now while there's still time to evaluate our options.

[Copy of S. 2532 may be found beginning at p. 35.]

I want to congratulate you, Mr. Vice President, on taking this initiative. I think although I have very serious reservations about this proposal as I will develop as we go along in the questioning part of our discussion this morning, I do think that you

performed a great national service in bringing this to the attention of the country and to the attention of the Congress and challenging us to come up, if not with this, with something that would be as effective as this would be. In all frankness, I must say I am skeptical however about this particular proposal. I question the wisdom of committing the Federal Government to $100 billion in off-budget spending for risky energy projects that cannot get financing in the private market. It seems to me that the market is the best indicator of whether a project is a good thing to invest in or not. If the Federal Government steps in and finances high cost projects that the private market won't touch we could end up with a lot of white elephants on our hands, the way I think we would have done on a much smaller scale if we had funded the SST and while blundering into the Lockheed loan guarantee. The proportions of this is this is the equivalent of 400 Lockheed loan guarantees, $100 billion, and of course one of the principal instruments of financing this could be by loan guarantee, but this has an effective life about 7 years during which commitments would be made. This would mean we would have a loan guarantee every week for 7 years of $250 million.

Now I also have problems with the way the legislation is drawn up. It's basically a $100 billion blank check. The bill would allow the Energy Independence Authority to fund almost any type of energy project, give any kind of financial assistance short of direct grants, including common stock investments, price support guarantees, with very few conditions, no cost-benefit analysis, and no effective congressional oversight.

Mr. Vice President, I hope you can explain to us why this isn't just another Albany Mall on a $100 billion scale.

STATEMENT OF NELSON A. ROCKFELLER, VICE PRESIDENT OF THE UNITED STATES

Vice President ROCKEFELLER. Mr. Chairman, distinguished gentlemen, I am very grateful for this opportunity to appear before your committee. I think perhaps I would do better going through the prepared text first and then come to some of the very provocative statements or questions to which you wish to get an answer. So perhaps I will just go through this to give it a backdrop and then make a few comments on the questions before Mr. Zarb gives his testimony.

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 2½ 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 percent of the oil consumed in this Nation.

In 1960, we received 18 percent of our oil from foreign sources. During 1 week last month, our foreign oil imports reached more than 50 percent 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 in both oil and natural gas is declining. The Northeastern part of this country is now dependent upon foreign sources for 75 percent 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.

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 percent. 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 percent 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 percent 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 maintained 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 million 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.

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 100 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 2 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 offshore 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 percent through conservation, increase domestic oil production by 50 percent, increase coal production by 100 percent, increase natural gas production by 10 percent, and increase nuclear power generation by 300 percent. 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 and conservation. 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.

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 leadtimes, such a project has more than just the ordinary risk. Many projects, such as floating nuclear powerplants, railroad reconstruction, or large pipelines, are of such size and scope that financing from the private sector alone may not be adequate. Because the electrical utilities have not been able to raise the financing necessary to construct them, 92 nuclear powerplants have been cancelled or postponed, in large part. 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 together to get this country off dead center in achieving energy independence without a giveaway or subsidy.

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 5 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. The time to act, in my opinion, is now.

Mr. Chairman, if I may comment briefly on a few of the comments you made, you pointed out that the private market was a pretty good judge of what was sound, and that if the thing is sound the private market would do it.

The problem we face here is that we are in a situation where the OPEC countries have acted on a political basis, not on a free market basis, to raise their price of oil in the world market. At home, the President has declared that our national policy is that we shall be independent as far as the production of energy is concerned.

Both of these statements—first the action by the OPEC countries and the statement by the President—cut across a free world market. The energy companies, I think many of them, are hopeful that the OPEC cartel will break up and that they will go back to cheap oil.

If that is the case, then why bother to spend money for higher cost production here at home, and that's a question, too.

The risks are very great because we have price control on natural gas and price control on oil. Therefore, it's hard to judge, if you produce new sources from new sources, whether your costs are going to relate favorably to controlled prices. We don't have a free market on prices. This concern is understandable because we have been through a period of rapidly rising costs and the Congress has taken action to hold down prices. However, this does adversely affect the free market, and does not support our national security or national well being. Therefore the EIA proposal is devised as a means whereby, during this interim period, an evolutionary period, as we adjust to higher world prices, the government can take those steps which are in the national interest. As and when these steps are taken, the properties would be sold and if there's a profit the government would realize this profit. It would not only get back its initial investment but would get back the additional money which would derive from the profit.

For instance, the production of oil from shale is still an unknown field on a commercial scale. A commercial operation would cost in the neighborhood of $200 million. We have reserves of 4 or 5 times the known reserves in the Arab world. To develop these reserves and find out what those costs would be is very much in our national interest. No private company is willing to do it because they don't know whether they would lose the $200 million and therefore they would rather go somewhere else.

This I think is the kind of thing which the government can contract for, just the way we did under the RFC with the Rubber Reserve Corp, when Jesse Jones set it up. They contracted with, I think, 6 private companies to develop synthetic rubber. Four or five processes were successful, but the whole thing was sold and we developed as a result a new industry in the United States.

This has been the history of this country and as far as the size is concerned, which is the second point you raised, $100 billion in relation to $6 or $8 hundred billion to achieve energy independence, in my opinion, is—in relation to costs today, and it's estimated that in the next 30 years we're going to use $4 trillion of new capital investment to meet the demands for growth—this is not a large amount. It is large in terms of the past, but not large in terms of where we are today or in the future.

So, from the point of view of size, the costs are astronomical in terms of our traditional way of thinking, but I think this is the time for bold action in this country if we want to preserve our leadership both in terms of economic growth at home and in terms of our responsibilities in the world.

So to me this is not one-quarter of our annual budget and it's not federal spending.

As to whether it's a blank check, of course, the definition of a blank check I guess would be a question as to Congress' control over the individual expenditures. In our system of shared responsibilities, as I understand it, the Congress sets the policies, creates the framework of laws within which then the executive branch and private

enterprise operate, so any well organized banking institution would be structured within this framework—and this would be equivalent to an investment bank. We had an example with Jesse Jones from the RFC, which was designed for a slightly different purpose, but the same concept. It depends on whether it's well run. Obviously, they're not going to make irresponsible investments if they are properly run. A board of 5, appointed by the President, approved by the Congress, has got to be made up of men and women of outstanding ability and character. They would be audited, so there's no question on that. I just think to say that it's a blank check implies that there's no control or that there would be no judgment or wisdom exercised in the making of the loans. The objectives in the legislation say the loans shall only be made for those projects that contribute to energy independence which cannot receive private capital. Since there's plenty of competitive interest in providing private capital between existing investment houses if the risks warrant the investment. Under the law, as you know, you cannot make an investment if the risks are beyond what seems reasonable or you're subject to suit by the investors.

So that there are limitations which are very sharp, but national interest dictates in my opinion that certain risks be taken which may contribute in a major way to the independence of this country in energy. We have the capacity. It's just a question of finding out what the costs are in various forms of energy production domestically, and I don't think we can overstress the importance of investing the $30 billion we now spend to import oil—$50 to $60 billion later—in the United States for U.S. employment as distinct from sending this money abroad. And now we're not only importing energy but we are now negotiating on a far more extensive basis to liquefy gas in Algeria and in the Soviet Union, which will make us further dependent when by action at home we can produce that energy here. We can gasify coal here and liquefy the gas so we can do exactly the same thing at home and Frank Zarb can tell you about the relative cost.

It would be better to do it at home, but we don't have the laws which encourage it.

So I appreciate tremendously the opportunity to be here and I would be delighted to answer any questions.

The CHAIRMAN. We would like to follow the procedures which would suit you, Mr. Vice President, and it's my understanding that Mr. Zarb might give his statement now and then we will question you.

STATEMENT OF FRANK G. ZARB, ADMINISTRATOR, FEDERAL ENERGY ADMINISTRATION

Mr. ZARB. Mr. Chairman, since many of the members of this committee have been listening to me for over a year now, I would propose that I submit my comments for the record. They are, for the most part, redundant to comments I have submitted before. With your permission, I will make a summary statement.

It seems to me, Mr. Chairman, that we have become a nation of experts in determining what is not feasible and why not. We have

yet to develop an expertise in determining what is feasible and how and when we will get it accomplished.

The facts are that to attain independence over the next 10 years we are going to have to get our oil production from 8.4 million barrels a day up to 12.3; our natural gas production up from 18 TCF to 22 TCF; our coal production from 640 million tons to 1.2 billion; and our nuclear electric generation capacity from 9 percent of total to 26 percent of total; and, through conservation, reduce our energy consumption growth from some 3.5 percent annually to something under 3 percent annually.

Beyond that, history has shown that we moved from wood to coal in 60 years and from coal to oil in another 60 years, and now we don't have another 60 years for the next generation of fuel sources inasmuch as oil and gas are finite and perhaps have a 30-year longevity.

So the proposed need by 1985 to have coal gasification plants scaled up and operating commercially, and liquefaction plants operating, and to have solar equipment in the utility sector up operating so it can make a major contribution between 1985 and 2000, as well as a determination on commercial shale production is quite clear. We start these things now or we are not self-sufficient by 1985. As we look beyond 1985, we have significant difficulty in being able to acquire energy at any price on the world market, we could face a shortage of that time even if we were willing to pay almost any price.

With the EIA proposal, we hear words like "boondoggle for big business" or "unwarranted intrusion into the free enterprise system" or "off-budget financing" or "crowding out private financing," all of which I think are due to be debated and should be debated openly and clearly.

I do hope, however, that when the debate is over we have succeeded to a greater extent than we have in the last year.

The fact is, if we don't solve the obstacles in the way of accomplishing these goals, then we are simply not going to get the job done and conditions will continue to worsen. We have not turned the position around, Mr. Chairman. Last year's debate has given us some movement in the right direction. We have made progress in conservation but it's going to take more investment in the private sector to improve our conservation rate. If we don't take these steps and solve these problems, on balance, the situation will worsen and, even though we have retarded the rate of production decline through the Alaskan pipeline and through some advances in the oil sector, unless we solve many extreme problems, in the later 1970's and early 1980's, I believe, we are going to wake up too late in the middle of a national crisis. Under such circumstances, I am fearful that we would move ahead in a panic response to a national crisis and we would eliminate any orderly consideration for the use of dollars, the environment and all the other criteria that we should include in a constructive solution to an ongoing problem.

So I would hope that in the weeks ahead when this particular program is debated we focus on ways to get the job done. It is critical to both the near-term and long-term welfare of this Nation that we get on with this particular job.

That's all I have, Mr. Chairman.

The CHAIRMAN. Gentlemen, I want to thank both of you for your statements. You certainly both deserve great credit for proposing to do something about the energy crisis and I think that's enormously important.

As Mr. Zarb just said, the proposal may not be the right option, but it is an option that does take us in the right direction. The difficulty is that I have had trouble, Mr. Vice President, with many of your assumptions as we go along.

For example, when you responded to my earlier points, you said that the $100 billion, while an enormous amount, is readlly not as it might seem in proportion to the $600 to $800 billion of investment we can expect the energy industry to make in the next 10 years.

Vice President ROCKEFELLER. It's required to make.

The CHAIRMAN. But I think we are not comparing fairly—I don't think it's fair to compare what you're proposing here with the total investment of the energy industry. That would include every gas pump, every gas tank, every utility that's built. It would include every coal hauler that's constructed, every tanker. It would include a huge number of investments that in this colossal energy industry of ours are going to be made whether or not we proceed with this.

It seems to me that the pertinent point is the amount that is being invested now in development of new technology. Now if you can establish the fact not only that that investment now is inadequate but that it is very likely to continue inadequate if controls are taken off and you both agree that that's necessary, and I would agree with that, it seems to me you would have a much stronger case.

It seems to me the comparison must be with what is being done now, and I don't see anywhere in these statements—and I have gone through Mr. Zarb's documentation—I don't see anything there that would indicate now much now is being expended in this area that this proposal would supplement, how much is likely to be expended if we take off controls, and how much more we need to achieve the goal of having imports reduced to 30 percent by 1985.

Vice President ROCKEFELLER. I would like to comment first, Mr. Chairman. This does not include the expenditures made by the energy industry overseas for their world markets. This is an estimate which is based on the steps that are necessary to become self-sufficient at home. Developments in Algeria or any other part of the world you want to pick would not be included in this because they don't contribute to our independence.

The CHAIRMAN. I understand that. I tried not to imply that.

Vice President ROCKEFELLER. So at the present time, I mentioned that 92 atomic power plants have been postponed or canceled. This is an essential part of this because the one area that can be expanded rapidly is the atomic power. In our calculations they should go from 9 percent of our present production of energy to 26 percent by 1985, which is over a 300 percent increase, because we will have a growth at the same time of almost 400 percent. Now at the present time there is virtual paralysis in that field because of the complexity of getting the clearances, the time required, and the fact that you cannot get your construction costs into the rate base until you're on-stream, so you have $1 billion plant and you can't get the financing.

Here's a field where the Government, if it has the money on an investment bank basis, could finance the construction of atomic power plants on a lease-purchase basis. This is a traditional system that's used in this country to finance airplanes and other things. Individuals who have nothing to do with the airline finance the purchase of the equipment and then it's leased when completed, on a lease-purchase basis, to the company that uses it. You could do exactly the same with the utility company for a nuclear power plant and they would start to pay when the energy was on-stream and when the rate base was adjusted to take into account the cost, and the Government would get its money back and the company would get the power.

Unless something of this kind is done, I don't see how these plants are going to be constructed. These cost $1 billion apiece, an efficient sized operation, and if you just take that one case it's hard to see how else we're going to accomplish that.

Now the industry says that if you remove all regulations and let the rate increases go up now they could finance it. Well, that could be true, but I don't think there's any chance that that's going to happen. Therefore, what is the Nation going to do? This is my point. How do we protect ourselves as a nation, in our national interests, when local regulatory bodies are under pressure, because I know in my own State costs are up close to 90 percent because, among other things, we went to nonsulfur fuels. That cost consumers about $800 million for Con Ed alone in New York and Westchester. Then came the scarcity of fuel and the price increase. The consumer will just not support any increase in prices at the present time.

The CHAIRMAN. Well, let me follow up by asking this: The basic question is why does the domestic energy industry need the Federal assistance? Their asset structure is strong. The demand is strong. Their profits are reasonably good. They were too low for a while and then they were perhaps too high and now they have leveled out at about the average. The private market has financed large commercial energy projects in the past, as the Alaskan pipeline, with private capital. If we get off price limitations on oil and gas, for which both you gentlemen agree must be done, it's hard for me to understand why the industry itself can't finance this.

Now it's my understanding—and we tried hard to get testimony from the people in the industry—they tell us they don't like this bill but they won't come in and tell us why. I wish they would. I think they're a little afraid of you. I don't know why they're afraid of you. You're a nice fellow and I don't know anybody you ever hurt. But they don't want to offend you somehow.

At any rate, it seems to me we should have some kind of record from the industry itself telling us what they could do if wage and price controls were taken off and if the industry were free of that kind of limitation on the price they can get. It seems to me we ought to have some documentation here from the industry in view of the fact that the industry, as I say, has progressed enormously over the past 100 years or so.

Vice President ROCKEFELLER. Well, as far as the oil industry is concerned, they really don't need much help except price and the

ability to get the leases for drilling. Those are complicated because of ecology and off-shore drilling and other restrictions. They also own coal and, of course, there's this whole question of surface mining of coal which is under wraps at the present time. So that probably they would go ahead if restrictions were taken off. But that is a small percentage. As Frank pointed out, we've got about 8 million barrels a day now—we've got to have at least 12. That 12 million would be mostly new because by 1985 the 8 million barrels we are producing today will have dropped by 75 percent, to 25 percent of present production. So the oil industry has got to find new sources.

But oil isn't the only answer to this. That's the problem. Oil is not our long-term answer. We've got to find substitutes. Coal is one. Shale oil is another one. Let's take shale oil. There are two ways to get oil out of shale. One is to mine the shale, cook it and get the oil out by heat. You end up with the shale which is fractionated and comes out in what I describe as talcum powder. There's very little water in Colorado where this shale oil is found. Therefore, what do you do with the powder? You can fill a valley with the powder, but if the wind blows it will blow all over the place and the ecologists and everybody else is going to object. So that seems rather unproductive.

The CHAIRMAN. May I just interrupt to ask, in the oil shale we've got some work being done there now as you say.

Vice President ROCKEFELLER. We've got leases taken. We've got research done.

The CHAIRMAN. We should get from them some kind of documentation as to what they feel they would need.

Vice President ROCKEFELLER. The risks are too great. They spent $1.8 billion in buying leases from the Department of Interior and nobody has put a shovel in the ground because the cost is too uncertain and the methods too uncertain.

To continue with this illustration, my feeling is that the Government should find out what we could do in developing that shale oil, which may be six times as great or five times as great as all the oil reserves of the Arab countries put together.

There are those who believe—and Frank disagrees and the oil companies don't believe it—but Livermore Laboratories says that if you used what is known as the in situ process—which is to drill down into the shale, set off an explosion, fractionate the structure, set it on fire, and draw off the gas while it is burning underground, which is the same process as on the surface, and then condense it on the surface—you can oil.

Now the question mark here is what does it cost. Livermore Laboratories thinks it will cost $7 or $8 a barrel. The industry thinks it will cost $20 or more per barrel. Until somebody does this on a commercial scale—they've done laboratory tests—until they have done it on a commercial scale, nobody is going to know. It would cost about $200 million to do a commercial operation. In my opinion, the Government should contract to find out, sell the process, if it's successful, for a profit, and then we've got a wholly new industry. But to do it on the surface I just don't think is going to work because I think ecologically speaking it will never be done.

The CHAIRMAN. But the question is how fast, how much, and whether or not this colossal jump in investment by the Federal Government is justified. For example, the Federal Government already has a very extensive energy program. ERDA research, development, and demonstration programs are funded in fiscal year 1976, this fiscal year, at $2.59 billion and it's going up to $3.38 billion in the next fiscal year, a 30-percent increase. The President requested that. In addition, Congress is now considering an administration proposal for a $2 billion loan program for synthetic fuels demonstration projects, and if you project that kind of an increase over the next 10 years you might get a $25, $30, $40, $50 billion research, development, and demonstration program.

Vice President ROCKEFELLER. But not demonstration.

The CHAIRMAN. But to move ahead in this particular way that you're suggesting is appealing, but it seems to me that it's not as responsible as Congress ought to be. We ought to know where we're going with every $1 billion or every $2 or $3 billion rather than provide $100 billion and say take it away and if there are losses then we will make appropriations, but I don't see how we responsibly under the Constitution with our clear responsibility for appropriations can provide that we will create an authority that can spend 100 billion and not even put it in the budget so energy needs can compete on a priority basis.

Vice President ROCKEFELLER. Senator, if we had known where we were going as a nation we wouldn't be here. To begin with, they wouldn't have come over on the Mayflower or down to Jamestown, and second, they never would have gone west. We're looking for a risk-free society and I think it's just a pipe dream. We've got to take risks and we've got to take gambles.

The CHAIRMAN. Well, I might take the risk but with the eyes open and I want to know where we're going. The Mayflower argument is one we heard on the SST, too, that we said "No" to.

Vice President ROCKEFELLER. That's good, but I don't think this is the SST. You've portrayed a 10-year picture with $50 billion in research, but we may be no further than we are now. In the meantime, we've got a situation in the Middle East right now that could blow up tomorrow and we could have another war. We could have another oil boycott. The east coast is now dependent 75 percent on energy from abroad. In 2 years we will be importing 25 percent of our energy from Arab countries because it's low-sulfur oil. But this 25 percent we will have from the Arab countries in 2 years. That's low-sulfur fuel. If that's cut off, we're going to have absolute economic and social chaos on the east coast because you can't transport oil to the east coast from other parts of the country.

I think we're going to see ourselves, if that happens, in a total breakdown. Now if it doesn't happen by a cutoff, by a boycott, at some point the Soviet Navy is going to be able to do this and if they don't do it they can blackmail us. I just don't think we have any concept of the dangerous position we are getting in. I think it can be the future of our survival as a society and, therefore, we should risk $200 million to do a test on a commercial basis, because ERDA cannot do it on a commercial basis and until you do it on a commer-

cial basis you can't tell what the costs are. Unless you know what the costs are you can't get private capital to go into it—they cannot afford it. The Government can. We're spending $100 billion this year on defense. This is a most important defense item. If our economy is destroyed, we haven't got any defense anyhow.

The CHAIRMAN. My time is up. Senator Packwood?

Senator PACKWOOD. Mr. Vice President, I agree very strongly with your last statement. It's very fragile indeed for this country to rest its economic, let alone its military security, on things over which we have no control. Congress so far has done nothing in the field of energy since I have been here. We've rejected all of the administration's plans, by and large, and passed nothing of consequence. The energy bill last year was worse than no bill.

There are two things that worry me in your proposal. Everybody agrees that consumers don't want any more price increases and that, by and large, the State regulatory price level for utilities; electric, for example, is not sufficient to allow utilities to charge prices they need to generate capital.

What happens if we pass this bill? The loans are available; the production facilities are built; and industry regulators say, well, here's $100 billion of outside capital; we can continue restricted regulation; we can continue to restrict the return to the companies. How do they ever get ahead if they just get a trade-off with more restrictive State regulation?

Vice President ROCKEFELLER. Because I think in order to enter into a contract with a private utility company to build on a lease-purchase basis, they would also have to have a contract with the local regulatory body that as and when that new facility came on line the rates would be raised to levels necessary to finance the plant.

Senator PACKWOOD. So, in essence, there's more to this bill than meets the eye because how are we going to bludgeon that out of the local public service commissions?

Vice President ROCKEFELLER. Well, the local public service commission understands the importance of having the power. Their problem is now, politically, they can't do it. If they can do it 11 years ahead it's a lot easier to do something 11 years ahead.

Senator PACKWOOD. You mean the public service commission in New Jersey or New York commits itself to 10 or 11 years ahead to a plant that's going to come on line at that time with different public service commissioners there by that time probably, but they make an irrevocable commitment that they cannot be relieved from?

Vice President ROCKEFELLER. Well, Frank has the details on that, but the concept has to be that.

Senator PACKWOOD. Let me ask you—I was just reading the Bankers Trust 1976 survey. This is their concluding paragraph and they have taken 3 cases. Case one is to pursue present continued imports. Case 2 is no imports by 1985. Case 3 is no imports by 1990. This is their last paragraph. "Of major importance to these conclusions, however, is the question of whether the energy industries can command or require a share of capital. Capital will only be available to the extent that the industries can offer a satisfactory rate of return in the competitive marketplace. At the present time, the Federal

government and many State and local governments are promoting policies, laws and regulations which impede the ability of energy industries to generate the profits necessary to attract investors. If this punitive attitude is maintained, the energy industries will strangle under resulting curtailment of capital, and the present stress on our energy supply will turn into an overwhelming crisis."

Just prior to that they conclude that if the regulations are taken off then we don't need a bill like this; then they will be able to generate their capital internally.

Vice President ROCKEFELLER. But when they say the regulations, it's not only price, but you've got the whole complexity of ecological statements——

Senator PACKWOOD. The report is willing to factor in ecology. What they are saying is that if we are going to impose upon them an air pollution standard or a water pollution standard, we have to allow them to recover the cost of the regulation.

Vice President ROCKEFELLER. Again, that's fine. Well, I have to say that if I thought Congress was going to do that tomorrow, then I'd say wait on this bill and let's see; but I just don't think Congress is going to. What you did was you passed a bill which lowered gas prices until after election. So everybody gets reelected and people spend more money on gas and now they're going back to big cars. You know, we've got to understand we live in a democracy.

Senator PACKWOOD. Well, we're robbing Peter to pay Paul. We won't do the things, for instance, deregulate. The public service commissions won't allow the rates to go up enough, so instead, we're going to borrow the money from the taxpayers and we're going to finance it through loans and it's taking it out of one pocket to put it in another.

Vice President ROCKEFELLER. Well, I don't agree with that, the way you put it. But you can say, as we had to in New York State because the private companies couldn't do it, the State must go ahead. The State is now building and has almost finished one nuclear plant, and is building another nuclear power plant. So the government can come in and do all of this.

My only concern is, one, I think the private enterprise system is more efficient and, two, I think by the time you get to $600 or $800 billion for energy alone coming from the government, somebody is going to balk and we just won't get there. So my feeling is that if you can do it for a fraction of that, 12 or 14 percent, and once the thing gets going and we get off dead center and we find out what those costs are, I think that private capital is going to flow in because it will know what the risks are.

Mr. ZARB. From where I am, I can't believe what I'm hearing. For a year now we have been talking about decontrolling energy prices and the alternatives to that. This morning we're talking as if it's automatic that we're going to decontrol prices. The fact is, we're going to have to decontrol our prices in oil over the next 40 months, if the Congress will allow us to do that. But we have not yet deregulated gas prices or come very close at all to what's required in that particular sector. I see absolutely no evidence that we are ready to have an overwhelming vote in both Houses to deregulate natural

gas prices. Even if we did we have lost so much time because of our sell-out to cheap oil throughout the 1960s and early 1970s and neglected so much of our domestic technology and capability in the coal area and the nuclear area, that we will not have that first scaled up gassification plant required to solve and analyze the energy and the environmental problems and all the uncertainies you have to go through when you march through one generation of a new industry. This includes a large scale liquefaction project or a large scale solar project or a large scale shale project. They will not have it even with deregulation which is essential to get us some modest results between now and 1985.

I cannot buy the concept that there's going to be some magic that will allow some of our utilities who have balance sheets such that they can't afford to invest in next year's supply of firewood.

I do know we are not going to have a capacity increase at the utility sector. I do know when we make such a loan guarantee or arrangement of that nature that the public service commission will have to adjust its rates instantaneously to put the construction work in progress.

Senator PACKWOOD. Let me ask about that. No miracle public policy is going to occur to allow deregulation of oil and gas and a rational attitude on the public service commission's part. Therefore, hopefully, this miracle of public policy in the form of this bill will pass and that will allow the capital to flow to the industries that need it.

Mr. ZARB. I'm saying that even if that first miracle does occur, we need this second one because we are so far behind, Senator. Let's take an example which is probably the easiest way to explain what we are talking about. A gassification plant takes a billion dollars of investment. There is a high degree of uncertainty as to its commercial viability. We have a pilot-plant sized capacity operating, but we don't have the large scale commercial capacity. Investors will put a billion dollars into that kind of a project with certain kinds of assurances. Now that assurance could be a price guarantee for some period after the project is completed and a guarantee that it won't be put under some kind of Federal regulation which would place the output under its real cost.

To provide that kind of comfort and thereby attract the private capital is what we are talking about. Even if we had decontrol of oil and decontrol of gas, and I see no evidence of that occurring, we still need a vehicle to ensure that we get that first commercial generation of advanced technology up and going over the next 10 years so that in the period between 1985 and the year 2000 we can make a major contribution to what's going to be required in our energy consumption pattern.

I am confident that if we don't do it this year and next year we are eventually going to have some kind of public program to insure that these programs go forward, because it's becoming clear that oil and gas are running out.

If you take the utility sector, and talk about some vehicle to insure that the economics of putting up a nuclear plant or a new coal-fired plant will be there, assuming some loosening of the regula-

tory process at the local level, first, it's not going to happen and, second, if it did we would not get the required investment within the time required. It just won't be there. I can go on and on with some of the other elements of this portfolio that will occur in the next 10 years, but even if we fully deregulate the industry, many of them would not.

Senator PACKWOOD. Let me ask you one last question and my time is up. Frank, if there's any place where your statement seems to me is lacking, and also the Vice President's, it's in the area of conservation. There are only four references, and they are very brief references, in the entire papers. Yours simply talks about, on page 6, electrical load factors. The Vice President talks about on page 2 and 3 that we should have a policy. But in this statement, according to the FEA, if you take all the necessary actions in the next 10 years we can reduce our energy needs by 5 percent in conservation. Is that the best we can do in this country?

Mr. ZARB. It's just a recognition that in a growing economy and in a growing country the best we can do is slow down our rate of growth.

Senator PACKWOOD. All right. By that 5 percent, you mean at the end of 10 years with all of our growth we would be using 5 percent less than now?

Mr. ZARB. No. I'm saying that we're still going to be growing but we're going to be growing at a slower rate. I said earlier that our historic rate of growth in this area has been 3.5 or 3.6 percent. If we strain, we can get it down to 2.2 percent.

What is meant by the 5 percent figure is that through the enactment of vigorous conservation measures, beyond what has already been achieved through price effects and through the conservation measures to be implemented through the EPCA, there is not much latitude for further savings from conservation. The 3.6 percent historical growth rate I alluded to will fall to approximately 2.8 percent as a result of current prices and conservation policies; more conservation, beyond these levels, would drive the growth rate down to 2.2 percent, which would effect approximately a 5-percent reduction in 1985 energy consumption, from what it would otherwise be under a 2.8 percent growth rate.

It should be noted that major changes in energy prices would affect these estimates.

But, Senator, I just think we have to begin telling the truth as it is. We are having trouble, as the chairman knows, in getting a very fundamental energy conservation bill through this Congress. It's been on the books for a year and a half and it still isn't completed and I'm fearful that, when it finally is, it's going to be the weakest part of our total energy package. So while we can talk about what needs to be done, even in this area, we see grave problems.

Now this EIA bill does provide for investment in conservation and environmental activity. If we're going to burn more coal we're going to have to burn coal efficiently and cleanly and this bill provides some assistance in that particular category.

Senator PACKWOOD. Thank you.

The CHAIRMAN. Senator Stevenson.

Senator STEVENSON. Mr. Vice President, as one who has spent several years attempting to quantify the effects of raising energy prices on the GNP and on inflation, I'm tempted to join the issue on that subject. It was no coincidence that the United States for the first time in its history experienced a combination of severe inflation and recession just after energy prices quadrupled. But you are not here this morning to talk about that major component of the energy crisis but instead to talk about the crisis of supply. So I will resist that temptation to join issue with you and Mr. Zarb, as well as my colleague, Senator Packwood.

I have to quarrel with some of the particulars in your statement, but I want first of all to commend you for the overall thrust of that statement and the urgency you place on the need to assure ourselves adequate supplies of energy in the future. I don't think that the dimensions of the threat to our economic welfare and to our national security are understood yet in the country.

In fact, some poll reported recently that only 28 percent of the American people thought that the energy problem was serious. That's appalling. The dimensions of this crisis exceed our powers of comprehension.

First of all, to continue with the chairman's question about the dimensions of the capital requirements, that is one point at which I might quarrel with you. I don't think it's really possible for us with confidence, to be, precise about capital requirements in the future.

Would it be fair to restate your position as saying that whatever the costs are, we'd better darn well be prepared to pay them and put the institutions and the mechanisms in place by which to meet those capital requirements as they come along, and, if our proejctions are excessive or exaggerated, the mechanisms don't have to be used to the full extent that's authorized by law?

I might add in that context, I'm always reminded of that old cartoon that you may recall, of the delegate at the Continental Congress rising to inquire, "May I ask how much this revolution is going to cost?" You mentioned eloquently this morning an aspect of the crisis which I think you would do well to enlarge upon, and it brings me to the main point that I'd like to take up with you, the dependence on foreign sources.

The embargo made us all well aware of the possibilities for the interdiction of supply at its point of production, but supply can also be interdicted in transit. How much of the world's oil supply passes through the straits of Hormuz?

Vice President ROCKEFELLER. 36 percent.

Senator STEVENSON. And how much of Europe's oil supply? Do you have that figure? I think it's about 60 percent. What would it take to block the straits of Hormuz?

Vice President ROCKEFELLER. One big tanker sunk.

Senator STEVENSON. Oil in transit can be blocked in the North Sea and the Eastern Mediterranean and around the periphery of Africa and the Red Sea, as well as at the mouth of the Persian Gulf. I think you mentioned that concern not to rattle the sabre or to sound the alarms of the cold war, but to indicate that the power to interdict oil supplies is power, power that can be used for a mul-

titude of purposes. It's leverage. It's influence, no matter what the issue is.

Now, let the record show that the Vice President is nodding his head.

Vice President ROCKEFELLER. Yes; I totally agree with what you're saying, so much so that I didn't feel it necessary to say anything because I just think that this is not realized in this country by the people, by the Congress or by the companies.

Senator STEVENSON. Now, Mr. Vice President, I think you indicated that even with an all-out domestic effort, the United States, according to the estimates of the FEA which are based on very optimistic assumptions, will still be dependent on foreign sources for between 30 and 40 percent of its oil requirements by 1985. Is that right?

Mr. ZARB. It's less than that. It's still 6 million barrels a day which represents about 25 percent of our total equivalent requirements.

Senator STEVENSON. On a most optimistic assumption——

Vice President ROCKEFELLER. By that time they will have built up a billion-barrel storage which will help capacity. Congress has approved that, not the money but the concept.

Senator STEVENSON. The point I want to make is that even with all that effort, with optimistic assumptions, the United States is going to remain dependent upon foreign sources of oil for a long time and as Canadian exports and perhaps exports from Venezuela and elsewhere dwindle, the dependence on Middle Eastern sources of oil could remain or become larger.

Vice President ROCKEFELLER. Particularly because it's low sulfur. Venezuela is high in production but that's high-sulfur oil.

Senator STEVENSON. A recent study by the U.S. Geological Survey concluded that about 50 percent of the oil in the world remaining to be discovered existed in the non-OPEC, presently noncommunist countries, principally in Latin America and in Africa. Project Independence, your proposal, seems to place exclusive reliance for independence on the development of domestic sources of energy.

My question to you is whether that is right. Shouldn't we also recognize that we can reduce our dependence on the most undependable foreign sources of oil by diversifying foreign sources of oil, and not only reduce dependence on the foreign sources that we are most concerned about now, but also produce energy at a relatively attractive economic cost? A barrel of new oil produced today in the United States costs about $8. New oil in the Third World costs between $2 and $3 a barrel. So for the sake of true independence, shouldn't we seek to develop additional foreign sources of oil, particularly in Latin America and in Africa and shouldn't this agency which you propose be authorized to help finance joint ventures and development abroad as well as at home?

Vice President ROCKEFELLER. Senator, I understand what you're saying. That's two questions. One, do you consider Angola, for instance, a dependable source? One wonders what some of these trends are. Venezuela now has its oil shut in because ConEd, taking New York as an example, would rather buy Algerian oil

which is low sulfur because of the restrictions on the use of high-sulfur oil. They can't burn sulfur oil because of those restrictions.

So this is a more complicated situation than purely where the oil comes from and whether you count on it. And lastly, while the Straits of Hormuz could be blocked off by the sinking of one tanker, there could be explosions of tankers at sea because they are sitting ducks, and after enough explosions one would have to wonder then whether the sea lanes are the most secure source of supply. So this is a complicated situation and my personal summary would be that we ought to have the capacity and proven capacity to become self-sufficient, whether we continue to import or not because of cost, so that you have that flexibility.

Mr. ZARB. Senator, your query is whether or not we can add to our own domestic production with what we might consider secure sources abroad, and from my own perspective the answer to that question has to be "No." I don't know of any totally secure sources anywhere else in the world. We have seen our good friends, the Canadians and the Venezuelans, price their product at OPEC levels. When it became clear to the Canadians that they needed their own product to serve their own needs, they began the process of withdrawal from our marketplace taking themselves out completely by 1980.

I can't find any evidence that would indicate that, given the world increase in demand on energy, that demand won't affect energy trade over the entire world. Getting back to what we define as self-sufficiency or invulnerability, using a modest case, we can get down to 6 million barrls of imported oil a day by 1985 with 1 year's worth of oil consumption in storage. We consider that self-sufficiency. But to begin calculating that there will be other supplies that are secure I think would be a mistake. We are not attending to our natural gas question here domestically and, in the meantime there are people talking about contracts from abroad for liquefied natural gas which will probably cost close to $3 per thousand cubic feet. I think it's quite clear, Senator, in this particular sphere we're not going to be able to depend upon anybody else's energy source except our own, save very small amounts which we could make up for with domestic capabilities in the case of a shutoff.

Senator STEVENSON. I am disappointed in that response because by your own most optimistic assumptions you are projecting reliance on foreign sources. I'm not suggesting a cutback of domestic effort. I'm saying we ought to make dependence on foreign sources manageable.

You mentioned Canada. One pipeline across Canada would cost about $10 billion; that's another opportunity for foreign participation by this agency that you're suggesting. That transportation system across Canada could not only help the Canadians bring down natural gas from the Mackenzie Delta and oil from the Beaufort Sea and meet their own requirements, but by doing so it would also help them continue, if not increase, exports of gas and oil to the United States.

Vice President ROCKEFELLER. That's a good test case. If Canada would agree to do that, this would be a very exciting and important problem because the sources of gas there are fantastic.

Senator STEVENSON. Their agreement will depend upon the extent of their resources, particularly in the Beaufort Sea, and we don't know that yet. This is one example of the need for financing outside the territorial limits of the United States. You picked Angola. I could pick many other examples a little less inflammatory at the moment.

Vice President ROCKEFELLER. Algeria wanted to sell us some more oil and since then they have had 2 changes in government. Now our relations with them are pretty uncertain.

Senator STEVENSON. Well, the point is that it seems to me we ought to be focusing some attention on exchanging American resources, including technology and capital, for assurances of supply at reasonable prices from abroad as well as at home, and to place exclusive reliance on the development of domestic resources continues what I would call a drain American first syndrome without giving us independence—it continues, by your own projections, dependence on foreign sources.

Vice President ROCKEFELLER. Senator, I understand what you're saying and were it possible to achieve secure supplies abroad, then I am totally with you. I think you pose a very difficult problem for any oil producing nation that's a member of OPEC. If they are a member of OPEC they cannot break the price and Venezuela and Ecuador are both members of OPEC. Although it's interesting to note that neither Venezuela nor Ecuador boycotted the United States, and yet when Congress passed a bill which removed the OPEC countries from the most favored nation laws, we removed Venzuela and Ecuador. They were furious and all of Latin America is furious because they didn't boycott us and we placed them on the same list. That was a year and a half ago. They have had delegation after delegation at congressional hearings and Congress has as yet refused to restore them to most favored nation status. How do you make friends and influence people when we do this kind of thing to our friends? So we have got some very real problems in dealing consistently.

I just came back from a trip to 9 countries around the world and I want to tell you everywhere I went the one question is: Can we count on the United States? It's a very serious problem that people are beginning to wonder whether we are going to be consistent in what we do. So when we talk about developing reliable sources, that involves our being reliable ourselves in our relationship with those countries.

The CHAIRMAN. Gentlemen, we have 2 other witnesses. I will be as brief as I can. I just have 1 or 2 other areas I want to explore on this. I will explore it as quickly as possible.

I don't mean to just harp on one note, but I just can't get over the size of this, $100 billion. I was just trying to see how we could put that in perspective. This is a 7-year program. You make your commitments over 7 years and they can run for another 3 years. So it would be 10 years in that sense. Take those 7 years, $100 billion means that you would have more than $1 billion a month, more than $250 million a week. On a 5-day week, you would have $50 million a day. An 8-hour day, you would have $6 million an hour, $100,000 a minute, about $1,500 a second.

Vice President ROCKEFELLER. That's a quarter of what the governments spends for that second.

The CHAIRMAN. Well, it may be, but the reason I raise that point is we are taking this colossal amount out of the budget. I have here a list of the loan programs and this isn't entirely a loan program—the loan programs that are in the budget. They include the Farmers Home Administration, most of the housing programs, all of the Export-Import Bank which used to be out of the budget but is now back in the budget, and the determination of the Congress and the Budget Committee to put everything it possibly can in the budget so different demands can compete on a priority basis. Here we have a program that is bound to have an effect on the availability of capital and the availability of resources. It's a program that does not simply involve loans but risky loans, loans that wouldn't be made in the private sector.

In the second place, it's a program that also involves common stock investments and, of course, that's even riskier. It's a program that also permits price supports. I don't know how it's possible to have a price guarantee program on this kind of scale without losing some money and you might lose several billion dollars.

Now it would seem to me that the Congress should therefore insist that this should be placed in the budget to compete with the other demands on our resources and require regular appropriations by the Congress.

Why do you insist on having this outside the budget? How important is that particular part of your bill?

Vice President ROCKEFELLER. Let me make 2 comments and then turn it over to Frank. One, you mentioned the Export-Import Bank and it's very interesting that the Ex-Im Bank does very much what we are talking about doing, but only for any investment by an American company abroad, which is an interesting thing. We are willing to support the sale of equipment to build a gassification or liquefaction plant in Algeria through the Ex-Im Bank, but we won't do it at home.

The CHAIRMAN. That's in the budget now.

Vice President ROCKEFELLER. EIA is also in the budget. The theory for putting it in was that the losses EIA would suffer would go in the budget, and only a small percentage of its investments would result in losses and actually be a government expense. The rest would be returned when the loans are paid off. Therefore, it did not seem to be equivalent to an expenditure by government. OMB's projection for 5 years indicates that they are anticipating a loss totalling only $1 billion in 5 years.

The CHAIRMAN. But isn't it true, Mr. Vice President, that some of these commitments, particularly the price support and very likely the common stock investment or preferred stock or whatever it is, the equity investments, are likely to be in effect expenditures?

Vice President ROCKEFELLER. Well, they could be, and that's why it is suggested that $25 billion be in equity and $75 billion be in loans.

Now as far as the other point you made, which is bound to affect the availability of capital, there's no question that today it's better

to finance a McDonald's hamburger stand because you can get a better return on your capital, but that may not be in the best interests of the United States. Somebody has got to decide where capital goes when it affects our national interest.

Now I have to admit that it's strange for me to be here testifying on this side of the issue. I'd expect to be here suggesting that government stay out of this and leave it in private hands. But my concern is, first, our national security and our national well-being. I am deeply concerned that this country is running risks well beyond what we can afford to run, and that we are vulnerable to a point that very few people in America realize.

The CHAIRMAN. Why not trust Congress to make these appropriations in the budget if they can be justified? It seems to me you have made a very strong case and a very appealing case. Why shouldn't that case have to be made whenever we decide whether to loan money here, whereas I say the overwhelming majority of our loan programs are in the budget and every kind of expenditure program is in the budget?

Vice President ROCKEFELLER. Senator Proxmire, if you told me right now Congress was ready to make $100 billion available and you wanted to put it in the budget, frankly, I'd say, fine, as long as you're going to do it. But I worry that if you put it in the budget someone is going to say, well, this is going to increase the budget from $400 billion to $410 billion and that that's too big a jump, and therefore it will not be done.

The CHAIRMAN. Otherwise, we are kidding ourselves if we don't put it in. You're making that $10 billion commitment of resources anyway, but you're not admitting it.

Vice President ROCKEFELLER. I don't agree. This is an investment, not an expenditure.

The CHAIRMAN. Mr. Vice President, every one of the loan programs is an investment and most of them are excellent investments returned with interest in full and frankly better investments probably than these would be. This may be more urgent in many respects than many of these projects.

Vice President ROCKEFELLER. Maybe the Government ought to have a budget that shows expenditures and a budget that shows capital investments and separate the two, because I think it's misleading to the public.

The CHAIRMAN. I agree, we ought to have a capital budget. We don't have a capital budget, however, and therefore, since we put capital investments into the budget now, it seems to me we should be consistent.

Vice President ROCKEFELLER. We can put some in. We're on the way.

Mr. ZARB. Mr. Chairman, if I may add a comment on this—$100 billion sounds like an awful lot of money. One way to put it in perspective is to look at the fact that we are going to pay out this $100 billion between now and December 1978 for imported oil. The total requirement of $580 billion, between now and 1985, represents about 30 percent of total investment in the energy sector which is historically the percentage taken.

Finally, in or out of the budget, I think it ought to be clear in terms of the maximum outlays to the budget. If everything went wrong and every project were wiped out, as you described earlier, that is going to expose us to some $25 billion over the 10-year program. It sounds big. But it isn't big in terms of the size of the job we need to accomplish. In view of the historical investment in this particular sector, with the proper controls and oversight capabilities of the Congress, I think a great deal of comfort can be given to the Congress that these investments will not be made in wild-eyed schemes but rather proven technology that's being brought into commercial stages.

The CHAIRMAN. Well, on that very point, you say not in wild-eyed schemes and proven technology; nevertheless, you have a no-credit-elsewhere requirement. What that means is you're not going to lend if they can borrow from a bank or borrow from some other group. That means, of course, that you have to make a judgment that this would be reasonably good even though they can't borrow the money.

Let me ask you this. The bill requires, and I quote, "that a project would not receive sufficient financing upon commercially reasonable terms." Does that mean that the EIA could authorize a project and fund a project that could borrow money at 12 percent? That might seem unreasonable. Could you then move in and provide the funds at 8 or 9 percent?

Vice President ROCKEFELLER. I don't think a utility could afford to pay the 12 percent because they couldn't get the rate increase that would support it. In other words, I apologize to you for using New York but that's what I'm more familiar with. None of the seven utility companies there can afford to build powerplants because they can't get the rate increase. They tried to get together and form a finance construction company. There were 18 regulatory bodies, State and Federal, and the lawyers worked for 2 years and could not satisfy all the provisions of all the regulatory bodies which would permit them to do it. This will slowly force Government reform and maybe that's something that this country wants to do.

The CHAIRMAN. Then the Federal Government would offer better terms than the private market in this situation.

Vice President ROCKEFELLER. No; it would offer prime rate. It wouldn't go below prime rate.

The CHAIRMAN. That's right, but it would still be better terms in this case—it might be 12 or 15 percent they could get in the market but that's considered unreasonable and they wouldn't proceed on that basis—but with 9 or 10 they might, and as you say, it would be at the prime rate or above, but still it would offer better terms than the private market would, given the risk. In that case, how could you possibly comply with the provisions in the bill requiring competition that the Federal position "not unduly enhance the recipient's competitive position?" Wouldn't that put the recipient in a strong position since he's able to borrow money for this kind of a project below the market and strengthen his competitive position since the risk is assumed by the Federal Government?

Vice President ROCKEFELLER. It's not his competitive position in the market. In other words, it wouldn't compete with the other pri-

vate investment houses. It's not competitive position producing electricity or gas which is needed by the consumers.

The CHAIRMAN. Well, you're right. I wouldn't argue with you on the competition with the financial sector, but I would with respect to the effect on the competitor in that particular energy industry.

Vice President ROCKEFELLER. No, because what it states in the bill is that this project should not be financed unless it is a significant contribution to energy independence and if it could be financed by somebody else. This is to fill a vacuum, not to compete. You talked about the amount of the money. If there are 18 different gas industries there will be 18 different gassification plants, coal gassification. You've got 92 atomic powerplants canceled. Let's say you went for 50. That's $50 billion. So that's $68 billion. Senator Stevenson talked about the $10 billion for a pipeline across Canada. I doubt very much whether private enterprise would be able to finance that. These things go very rapidly in terms of the amount of money that's involved and $600 or $800 billion is an awful lot of money.

The CHAIRMAN. Of course, that isn't new technology. That's not proving new technology. What that is is providing facilities that otherwise might not be provided to increase our production of energy.

Vice President ROCKEFELLER. That's right, but both are permitted under the terms of the bill.

The CHAIRMAN. One more point. For the record, would you provide in the fullest possible detail the assumptions for the statement that you make on page 3 in which you argue that appropriate policies would permit savings in conservation at a maximum of 5 percent over a 10-year period, increase domestic oil production by 50 percent, increase coal production by 100 percent, increase natural gas production by 10 percent and increase nuclear power generation by 300 percent. It's an assertion that may be true, but I think we need the most detailed documentation you can give us because it seems to me that can be challenged right along the line.

Vice President ROCKEFELLER. I took them all from Frank's book and we will give you the details.

Mr. ZARB. We provided that book to you.

The CHAIRMAN. You gave us some of that, but we wanted it a lot firmer than it is.

Mr. ZARB. It was published in the NEO which we released last month, Senator, but we certainly will be more precise for the record.

I'd just like to get back to the competitive questions with respect to available funds. Let's use two examples, two gassification plants. One gassification plant will be constructed by a group who can go into the private sector and get 15 percent money. They have made their calculations that that 15 percent money will lead to economic viability when the project is completed. Then there's another that says to the Federal Government, we will go ahead when we have 10 percent money. Clearly, the government isn't going to be in a position of providing that second group with 10 percent simply because they want a lower rate of return. The investment in reality will not

be made at 15 percent because the economic viability between now and 1985 will not be attractive and the private funds will not be there at that rate. So the notion of crowding out private money with government interference simply does not apply if we follow the principles set forth in the bill.

The CHAIRMAN. You see what kind of problems this leads to, but I appreciate that.

Senator Packwood?

Senator PACKWOOD. No other questions.

The CHAIRMAN. Senator Stevenson?

Senator STEVENSON. Mr. Chairman, just to get one point clear for the record, the Vice President mentioned again the possible pipeline across Canada for the transmission of gas. My question earlier was intended to be whether this financing entity could aid in the financing of American activities abroad, including Canada, including reprocessing of waste nuclear fuels abroad, or oil and gas production in Brazil; and from the reference to a pipeline for Canada, I assume that it would be available, but from the earlier response I thought it would not be available.

Vice President ROCKEFELLER. It would if it can be proven that it adds to our independence.

Senator STEVENSON. I see.

Vice President ROCKEFELLER. In other words, that gets back to your question of assured source of supply.

Senator STEVENSON. Then there's no disagreement between us.

Vice President ROCKEFELLER. I'd like to say one other thing on your earlier question about price and inflation which to me is very interesting and very important. To me, the man who has been clearest on his position on why OPEC has done what it's done is the Shah of Iran. The Shah of Iran stated that oil is a finite product and that it should be used with great care for those things for which it's essential, petrochemicals and so forth, and should not be wasted. Therefore, his concept is to set oil prices at a figure which encourages the development of substitutes for the things for which gas is now being used that it shouldn't be used for. You may not agree with this, but it's an interesting philosophy that really affects this question of inflation.

Senator STEVENSON. Mr. Vice President, I recently discussed not only oil pricing but also the Straits of Hormuz with his Imperial Majesty, and the pricing subject with, among others, Dr. Isagore, with whom you're also undoubtedly familiar, and he much to my pleasure, conceded—I trust it was not intended to be a private concession—that the Iranian Government, like other OPEC members governments, did not understand the effects of the energy crisis as they ripple out to inflate the cost of every commodity and every service. He indicated, and this is what I was trying to do earlier, that we need to quantify those effects, and that this ought to be a high priority to the producers and consumers conference in Europe.

So getting back to that earlier point of whether we should precipitously increase oil prices, which the OPEC countries do not intend

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to do now, I think, we ought to be very cautious and I would hope begin the analysis that can tell us all the economic impacts—inflationary and recessionary—from given changes in energy prices.

Vice President ROCKEFELLER. Mr. Chairman, may I just say in conclusion, I appreciate so much your having these hearings and what worries me is we are on dead center as a nation both in terms of the public's understanding of the problem, the congressional action, and the corporation action, and everybody is just sort of standing still. I think we cannot afford this as a nation. We have got to get off dead center and get going. I see no other way than the government which is responsible for the security and the well-being of the American people to take an initiative which gets us off that dead center. To me that is a viable initiative in the pattern which has been used before, including RFC, rubber, aluminum, et cetera, during World War II. If properly managed, EIA can do what is necessary and not do more, and the minute it gets energy production going it can pull in its horns. I think it's a sound, constructive role for government to play.

As I mentioned, we have done as a government those things which were necessary to achieve national objectives in these other areas by other means and I think this one is one that, thanks to you, is going to get the kind of attention and exposure which is so important in a democracy and I thank you, sir.

The CHAIRMAN. Well, thank you very much, Mr. Vice President, for an excellent presentation and for calling the attention of this committee and of the Congress to the urgency of this issue, challenging us to do something about it and as Senator Packwood said so well, if we turn this down, come up with something that will be better if we can. I think you have made a very fine presentation. I am still concerned. I have that Post Office syndrome. I don't want to make our oil industry like the Post Office. Somehow when the government gets in this deeply there are all kinds of problems. You have made a very fine presentation and we are off to a very good start on this.

[Complete statements of Mr. Rockefeller and Mr. Zarb and copy of the bill follow:]

STATEMENT OF NELSON A. ROCKEFELLER, VICE PRESIDENT OF THE UNITED STATES

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 ndependence 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.

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 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 maintained 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.

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 percent 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.

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. uncertainty of the risks involved, produce the capital investment required to fully develop these resources within a reasonable period of time. Private capi-

tal sources are—for good reason—reluctant to make capital available for domestic energy production projects because of the uncertainty of government regulation, costs 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 as floating nuclear power plants, financing from the private secor 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 uncerainties 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 incenives 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 captal 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 together to get this country off dead center in achieving energy independence without a giveaway or subsidy.

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 establish-

ment 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.

STATEMENT OF FRANK G. ZARB, ADMINISTRATOR, FEDERAL ENERGY ADMINISTRATION

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 effrts 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 he 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 activies 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 counted 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 offers 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 vialbe 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 interrupted 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.

94TH CONGRESS
1ST SESSION

S. 2532

IN THE SENATE OF THE UNITED STATES

OCTOBER 20, 1975

Mr. FANNIN (for himself, Mr. HUGH SCOTT, and Mr. TOWER) (by request) introduced the following bill; which was read twice and referred to the Committee on Banking, Housing and Urban Affairs

A BILL

To establish the Energy Independence Authority, a Government corporation with authority to provide financing and economic assistance for those sectors of the national economy which are important to the development of domestic sources and the conservation of energy and the attainment of energy independence for the United States in a manner consistent with the protection of the environment; to improve Federal Government operations so as to assist in the expediting of regulatory procedures which affect energy development; and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That this Act may be cited as the "Energy Independence Authority Act of 1975".

TITLE I—FINDINGS AND PURPOSES

FINDINGS

SEC. 101. The Congress finds and declares that:

(a) The achievement of energy independence for the United States by 1985 and the long-term security of energy sources and supplies are essential to the health of the national economy, the well being of our citizens and the maintenance of national security.

(b) Attainment of energy independence by the United States in a timely manner and in a manner consistent with the protection of the environment is not likely without financial commitments beyond those likely to be forthcoming from traditional capital sources in the traditional manner.

(c) Energy independence for the United States can be accomplished by reducing imports of energy resources and increasing domestic supply of energy resources so that the political and economic vulnerability of the United States to disruptions in oil imports is reduced.

(d) Achieving the goal of energy independence in an expeditious manner which gives due regard to the need to protect the environment can be facilitated by establishing an independent entity of limited duration which will provide additional capital, where possible in conjunction with private sources of capital, to assist the development and conservation of domestic energy resources and by encouraging the prompt

resolution of questions coming before Federal regulatory or licensing entities.

PURPOSES

SEC. 102. It is the purpose of this Act:

(a) To encourage and assure the flow of capital funds to those sectors of the national economy which are important to the development of domestic sources of energy or which are otherwise important to the attainment of energy independence for the United States by 1985 or the long-term security of energy sources and supplies, and to expedite and facilitate Federal regulatory and licensing decisionmaking;

(b) To provide financial assistance, where possible by the making or guaranteeing of loans in conjunction with private sector financing, for those activities which show the greatest potential of contributing to the development of domestic sources or the conservation of energy in a manner which preserves economically sound and competitive industry sectors, while minimizing any economic distortion or disruption of competitive forces;

(c) To hasten the commercial operation of new energy technologies subsequent to the research and development phase;

(d) To develop domestic sources of energy in a manner which gives due regard to the need to protect the environment;

(e) To supplement and encourage, and not compete with, private capital investment and activities in the development of domestic sources of energy, recognizing that the private sector must play the primary role in such development; and

(f) To assist in carrying out the foregoing purposes through the creation of the Energy Independence Authority, a self-liquidating corporate entity of limited duration formed to provide financial assistance for projects that will contribute significantly to the attainment of energy independence by the United States, and by providing for the timely and orderly liquidation of the Authority's investments and undertakings.

TITLE II—CORPORATE STATUS, GENERAL POWERS, SUBSIDIARIES AND TAX STATUS

ESTABLISHMENT

SEC. 201. (a) There is hereby created a body corporate, to be known as the Energy Independence Authority (hereafter referred to as the "Authority").

(b) The principal office of the Authority shall be located in the District of Columbia, but there may be established agencies or branch offices in such other places as may be determined by the Board of Directors of the Authority.

GENERAL POWERS

SEC. 202. In carrying out the purposes of this Act, the Authority shall have the power:

(a) To adopt, alter, and rescind bylaws and to adopt and alter a corporate seal, which shall be judicially noticed;

(b) To make contracts with individuals and private or governmental entities;

(c) To lease or purchase and to dispose of such real property as may be necessary for the transaction of its business;

(d) To acquire and dispose of personal and intangible property (including money);

(e) To sue and be sued, subject to the provisions of section 707 of this Act, in its corporate name and to complain and defend in any court of competent jurisdiction, State or Federal;

(f) To represent itself or to contract for representation in all judicial and other legal proceedings notwithstanding the provisions of title 28 of the United States Code or any other provision of law;

(g) Subject to the provisions of section 502 of this Act, to select, employ, and fix the compensation of such officers, employees, attorneys, and agents as shall be neces-

sary for the transaction of the business of the Authority and to define their authorities and duties, require bonds of them and fix the penalties thereof;

(h) To make provision for and designate such committees, and the functions thereof, as the Board of Directors may deem necessary or desirable;

(i) To determine and prescribe the manner in which obligations of the Authority shall be incurred and its expenses allowed and paid;

(j) To exercise all other lawful powers necessarily or reasonably related to the establishment and conduct of a corporate entity, to the achievement of its purposes and the exercise of its powers, purposes, functions, duties, and authorized activities;

(k) To use the United States mails on the same terms and conditions as the executive departments of the United States Government; and

(l) With the consent of any board, commission, independent establishment, or executive department of the executive branch to make use of services and facilities thereof, with or without reimbursement, in carrying out the provisions of this Act.

SUBSIDIARIES

SEC. 203. (a) In accordance with the procedure set forth in subsection (c) of this section, the Authority may create or cause to be created one or more wholly owned sub-

sidiary corporations to carry out one or more of the functions in which the Authority is authorized to engage pursuant to this Act. Each such corporation so created is hereafter referred to as a "subsidiary".

(b) Each subsidiary shall have and enjoy the same privileges and immunities under the laws of the United States and the several States and their political subdivisions as the Authority, and shall have such functions and powers as shall be provided in its charter, provided that no charter shall grant authority for a subsidiary to engage in a function or to exercise a power which would be beyond the functions or powers of the Authority under this Act.

(c) Any provision of this Act which limits or restricts the functions, powers or financial commitments of the Authority shall be deemed to apply to each subsidiary.

(d) For the purposes of any provision of this Act which relates to the financial condition of the Authority, the Authority and the subsidiaries shall be treated on a consolidated basis in accordance with generally accepted accounting principles. All reports, including audits, relating to the Authority which are required under this Act shall include all subsidiaries.

(e) The functions and powers of every subsidiary shall be set out in a charter, which shall be valid only when certified copies thereof are filed with the Secretary of the

Senate and the Clerk of the House of Representatives and published in the Federal Register, and all amendments to such charters shall be valid only when similarly filed and published. No subsidiary shall have a term of existence beyond the authorized life of the Authority.

(f) The Directors of the Authority shall serve as the Directors of each subsidiary and the Chairman of the Board of the Authority shall serve as the Chairman of the Board of each subsidiary, and neither the Chairman nor the Directors shall be entitled to compensation for their services to a subsidiary except as provided in section 501 of this Act. The provisions of subsections (b) through (f) of section 502 of this Act shall be deemed to apply to each subsidiary, provided that any provision of such subsections which limits the number of any category of officers or employees shall be deemed to apply to the Authority and all subsidiaries taken collectively. Officers and employees of a subsidiary shall have the same rights and liabilities as officers and employees of the Authority under this Act.

(g) Nothing in this section shall be deemed to prevent the Authority from investing funds of the Authority in corporations other than subsidiaries.

TAX STATUS

SEC. 204. The Authority, its franchise, capital, reserves, surplus, and income shall be exempt from all taxation now or

hereafter imposed by the United States, by any territory, dependency, or possession thereof, or by any State, county, municipality, or local taxing authority; except that: (i) any real property owned in fee by the Authority shall be subject to State, territorial, county, municipal, or other local taxation to the same extent, according to its value, as other similarly situated and used real property, without discrimination in the valuation, classification, or assessment thereof, and (ii) any entity acquired or established, or activity undertaken, by the Authority (except financial assistance as that term is defined in section 301 of this Act) which engages directly in the production, conservation, transportation, transmission, distribution, or sale of energy, fuels or energy-related commodities, facilities, or products, shall be subject to taxes imposed by the United States or any State or subdivision thereof in the same manner as if such entity or activity were not acquired, established, or undertaken by the Authority.

TITLE III—FINANCIAL ASSISTANCE

GENERAL DEFINITIONS

SEC. 301. As used in this Act: (i) the term "business concern" shall mean any individual, corporation, company, association, firm, partnership, joint venture, society, or other private entity which is engaged, or proposes to engage, in

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projects involving energy development, production, transportation, transmission, distribution or conservation, and (ii) the term "financial assistance" shall mean any form of advance, extension of credit, investment, participation or guarantee, including, without limitation, loans, guarantees of obligations, guarantees of price, purchase and leaseback of facilities, and the purchase of convertible or equity securities, but excluding grants-in-aid.

AUTHORIZATION OF FINANCIAL ASSISTANCE

SEC. 302. Subject to the limitations set forth in this title, the Authority is authorized and empowered, in its sole discretion and upon such terms and conditions as it may determine, to provide financial assistance to any business concern which is engaged, or proposes to engage, in a project described in subsection 303 (b) in order to enable such business concern to finance the ownership, construction, conversion, or expansion of productive facilities; or the acquisition of equipment, plant, machinery, supplies, or materials or the acquisition or development of land, mineral rights and services; or to provide such business concern with working capital needed to carry out the project in an efficient manner. Financial assistance, and the terms and conditions thereof, may be renewed, modified, or extended by the Board of Directors as it may determine. No provision of this Act shall

be deemed or construed so as to require or obligate the Authority to provide financial assistance to any individual project or particular type of project. To the extent practicable, in the judgment of the Board of Directors, financial assistance provided under this title shall be in the form of loans and loan guarantees, rather than equity investment or guarantees of price. All contractual commitments of the Authority to provide financial assistance shall be general obligations of the United States backed by its full faith and credit.

PROJECTS TO WHICH FINANCIAL ASSISTANCE MAY BE PROVIDED

SEC. 303. (a) The Authority is empowered to provide financial assistance for any project, described in subsection (b) below, if, in the judgment of the Board of Directors, such project will make a significant contribution to the achievement of energy independence by the United States or the long term security of energy supplies for the United States and would not receive sufficient financing upon commercially reasonable terms from other sources to make the project commercially feasible: *Provided, however,* That the maximum amount of financing from sources other than the Authority, preferably private sources, shall be sought in connection with any project for which financial assistance is provided.

(b) The Authority shall provide financial assistance for only those projects which in the judgment of the Board of Directors:

(1) employ, or would stimulate the application of, technologies, processes or techniques which are essential to the development, production, transportation, transmission, or conservation of energy and which are not in widespread domestic commercial use at the time of the Authority's commitment of financial assistance; or

(2) employ, or would stimulate the application of, technologies, processes or techniques which are essential to the production or use of nuclear power; or

(3) employ, or would stimulate the application of, technologies, processes or techniques for the generation of electricity from fuel sources other than oil or natural gas or for the transmission of such electricity; or

(4) employ technologies, processes or techniques for the development, production, transportation or transmission of energy which at the time of the Authority's commitment of financial assistance are in widespread domestic commercial use, provided that such project is (i) either of such size or scope that it would not be undertaken without the assistance of the Authority, or (ii) involves an institutional or regulatory arrangement not in widespread domestic commercial use

the success of which would lead to improvements in the development or production of energy, or individual transportation or transmission facilities related to projects described in clauses (i) or (ii); or

(5) employ, or would stimulate the application of, technologies, processes or techniques for the protection of the environment necessary in connection with activities of a type described in paragraphs (1) through (4).

LIMITATIONS ON PROVISION OF FINANCIAL ASSISTANCE

SEC. 304. (a) Financial assistance provided by the Authority shall be made upon such terms, and subject to such conditions and restrictions, as shall be deemed by the Board of Directors to be commensurate with the purposes of this Act and the needs of the recipient. Adequate provision shall be made by the Authority to insure that, when financial assistance provided by the Authority results in the profitable operation of a project, the Authority shares in such profits on a basis commensurate with the degree of risk assumed by the Authority. Financial assistance will be provided in a manner which, to the extent possible, does not enhance unduly the recipient's competitive position.

(b) The Authority shall not provide financial assistance to a project which would otherwise qualify for such financial assistance if, in the judgment of the Board of Directors: (i) such project involves technology which is in the research

and development phase; or (ii) the project applicant does not display satisfactory levels of efficiency, management capacity, or similar factors which are customarily considered by private sources of financing before making an investment decision.

(c) The Authority may provide financial assistance for a project conducted by a business concern whose rates are regulated by any State or local regulatory body only if: (i) the State or local regulatory body regulating such rates has issued a certificate of necessity for the project as prescribed by the Authority and (ii) such State or local regulatory body, the business concern so regulated and the Authority have entered into a three party agreement which shall require the State or local regulatory body to permit, without prior hearing, quarterly rate adjustments on a basis such that had such adjustment been in effect for the twelve preceding months the net earnings of the business concern would have provided a minimum level of coverage of annualized interest charges. The Authority shall establish the minimum level of coverage of annualized interest charges, to be applied uniformly until changed, which shall, in the judgment of the Board of Directors, be sufficient to assure repayment of the Authority's investment and restore the credit rating of the business concern so regulated to a level capable of obtaining conventional capital at favorable in-

terest rates without additional financial assistance from the Authority. For the purposes of this subsection: (i) the term "net earnings" shall mean actual earnings before total interest charges and taxes on income adjusted for the annualization of any rate changes during the preceding twelve months, and (ii) the term "annualized interest charges" shall mean the annualized amount of total interest charges, including interest components of leases and rents, but excluding any effect of future debt issues.

(d) No financial assistance may be provided unless an application therefor has been submitted to the Authority in such manner and containing such information as the Authority may require, and the Authority has reviewed such application, taking into account competitive alternatives to meet the same energy need. Nothing herein shall preclude the Authority from providing financial assistance to two or more similar projects if it determines such assistance is appropriate and consistent with the purposes of this Act.

(e) In no case shall the aggregate amount of financial assistance made or committed under this title to any one business concern or affiliated business concerns exceed at any one time 10 per centum of the sum of the original authorized capital stock of the Authority and the aggregate principal amount which the Authority is originally authorized to borrow, without regard to any reduction of such

authorized capital stock or borrowing level pursuant to section 311.

LOANS MADE BY THE AUTHORITY

SEC. 305. Each loan made under this title shall bear interest at such rate as the Board of Directors of the Authority may determine, giving consideration to the needs and capacities of their recipient, the prevailing rates of interest (public and private) and the need of the Authority to sustain continuing operations out of returns on investment: *Provided, however,* That such rate shall not be less than the greater of:

(i) the then current estimated borrowing costs of the Authority for borrowings of comparable maturity to the loan plus a reasonable amount to cover administrative expenses, or

(ii) the interest rate paid by credit worthy borrowers to private lenders for borrowings on comparable terms (other than interest rate) for projects of a similar nature, taking into account generally available indices or credit worthiness and, where applicable, the purpose and effect of any three-party agreement as provided in section 304(c):

Provided further, however, That in a case in which sufficient information is not available to make the computation described in clause (ii), such rate shall not be less than the

rate specified in clause (i). Except as provided in section 308 of this title, all loans provided by the Authority shall, in the opinion of the Board of Directors, be made upon such terms as to reasonably assure retirement or repayment, and may be made or effected either directly or in cooperation with banks or other lending institutions. Loans may be made directly upon promissory notes or by way of discount or rediscount of obligations tendered for the purpose. Subject to the provisions of section 312 of this Act, the Authority under such conditions as it shall prescribe, may take over or provide for the administration and liquidation of any collateral accepted by it as security for such loans.

LOAN GUARANTEES MADE BY THE AUTHORITY

SEC. 306. The Authority is specifically authorized, on such terms and conditions as the Board of Directors may prescribe, to guarantee any lender against loss of principal and interest on securities, obligations, or loans (including refinancings thereof) issued to provide funds to any business concern where such funds substantially contribute to accomplishment of the purposes of this Act. All guarantees entered into by the Authority under this section shall constitute general obligations of the United States of America backed by the full faith and credit of the Government of the United States of America. Any guarantee made by the Authority under this section shall not be terminated, can-

celed, or otherwise revoked, except in accordance with the terms thereof; shall be conclusive evidence that such guarantee complies fully with the provisions of this Act and of the approval and legality of the principal amount, interest rate, and all other terms of the securities, obligations, or loans and of the guarantee; and shall be valid and incontestable in the hands of a holder of a guaranteed security, obligation, or loan, except for fraud or material misrepresentation on the part of such holder. Prior to issuing any such guarantee or making any other type of commitment to provide financial assistance which would have substantially the same legal effect and substantially the same effect on the market for United States Government obligations as a guarantee by the Authority, both as determined by the Secretary of the Treasury, the Authority shall obtain the concurrence of the Secretary of the Treasury as to the timing and substantial terms and conditions of such guarantee or commitment. The Authority shall be subrogated to the rights of any third party receiving payments of interest or principal out of funds provided by the Authority under a guarantee arrangement authorized hereunder.

LIMITATION ON TOTAL AMOUNT OF FINANCIAL ASSISTANCE

SEC. 307. The total amount of financial assistance by the Authority outstanding at any time, computed to include the sum of: (i) the full amount of the Authority's actual and

potential liability under all guarantees, (ii) reserves for all other contingent liabilities, and (iii) all loans and other forms of financial assistance authorized under this section, all as determined under generally accepted accounting principles, shall not exceed the sum of: (i) the authorized capital of the Authority and (ii) the amount the Authority is authorized to borrow under section 402 of this Act.

LIMITATION ON CERTAIN TYPES OF FINANCIAL ASSISTANCE

SEC. 308. The Authority may make high-risk loans or direct investments, or provide product price guarantees or other direct financial assistance, which in the judgment of the Board of Directors will further the purposes of this Act. The Board of Directors shall create such reserves as may be necessary to meet contingent liabilities which may be created under this section: *Provided, however,* That notwithstanding any other provision of this Act, the Authority may not provide any financial assistance (except pursuant to previously made binding commitments) or make any further commitments for financial assistance if, after audit, the Authority is required under generally accepted accounting principles to establish a reserve or reserves for bad debts, price support commitments, contingent liabilities, or other unrealized losses, but excluding any reserve with respect to liabilities incurred pursuant to section 401 of this Act, which reserves in the aggregate exceed the sum of (i) the Authority's authorized

capital stock previously paid in (whether or not then outstanding), (ii) its earned surplus, and (iii) net gains realized upon dispositions described in section 311 (whether or not the proceeds thereof have been previously applied to retirement of the Authority's obligations and capital stock), all of which shall be determined in accordance with generally accepted accounting principles.

FEES

SEC. 309. The Authority shall charge reasonable fees for issuing guarantees and for making commitments to provide other forms of financial assistance pursuant to this title.

DISPOSITION OF SECURITIES

SEC. 310. The Authority may sell in public or private transactions all or any part of the common or preferred stock, capital notes, bonds or any other evidences of indebtedness or ownership acquired by the Authority pursuant to this title.

APPLICATION OF PROCEEDS FROM RETIREMENT OF FINANCIAL ASSISTANCE

SEC. 311. (a) Upon the sale by the Authority of any stock, bond or other evidence of ownership or indebtedness or any other asset acquired by the Authority in consideration for the extension of financial assistance or upon the repayment by any business concern of any loan or upon the cancellation of any guarantee or other contingent liability

constituting financial assistance (other than cancellation of a commitment to extend financial assistance prior to the extension of such assistance), any proceeds therefrom shall, except to the extent provided in subsection (b), be immediately applied to retire all indebtedness of the Authority issued pursuant to title IV of this Act, in accordance with the terms of such indebtedness, and thereafter to redeem all outstanding capital stock of the Authority. For the purposes of section 307 of this Act, each such sale or other disposition shall automatically reduce the authorized borrowing or authorized capital stock of the Authority, as the case may be, by an amount equal to the amount of financial assistance liquidated by such sale or other disposition.

(b) Notwithstanding any provision of subsection (a), any gain realized by the Authority in connection with any transaction referred to in such subsection may be retained by the Authority to the extent of any losses theretofore realized by the Authority (with respect to which losses funds have not theretofore been retained pursuant to this subsection).

CONTROL OF OPERATING ASSETS

SEC. 312. (a) As used in this section: (i) the term "operating asset" shall mean any real or personal property used in the development, production, transportation, transmission, distribution, or conservation of fuel or electric power,

and (ii) the term "control" shall mean the power to direct the use or disposition of operating assets, through direct ownership or through ownership of a majority of voting securities of a corporation or other entity owning or leasing operating assets: *Provided, however,* That "control" shall not be deemed to result from the ownership of operating assets which are leased to and in the possession of parties independent of the Authority.

(b) The Authority shall not acquire or retain control of operating assets, except—

(i) when control is acquired by foreclosure of a security interest or pursuant to a default under a lease, and such control is not retained for more than four years, or

(ii) when control is acquired prior to the commencement of commercial use of the operating assets and is retained for no more than two years after commencement of commercial use.

ACCESS TO INFORMATION

SEC. 313. Every applicant for financial assistance under this Act shall, as a condition precedent thereto, consent to such examinations as the Authority may require for the purposes of this Act, and shall further consent that any reports of examinations of the applicant by constituted authorities may be furnished by such authorities to the

Authority upon request therefor. The Authority shall require such reports as it deems necessary from any business concern receiving financial assistance under this Act regarding activities carried out pursuant to this Act. The Authority is authorized to prescribe the keeping of records with respect to all financial assistance and shall have access to such records at all reasonable times for the purpose of insuring compliance with the terms and conditions upon which financial assistance was provided.

ADVISORY PANEL

SEC. 314. The President may appoint a panel, of such duration, organization, and membership as he may deem appropriate, to study and report to the President, the Congress, and the Authority concerning the effects of issuance of obligations and provision of financial assistance by the Authority on the functioning of the Nation's capital markets, including effects upon the volume and distribution of capital flows to and within the energy development sector of the economy, and such other related matters as the President may specify.

TITLE IV—CAPITALIZATION AND FINANCE

CAPITAL STOCK OF THE AUTHORITY AND DIVIDENDS

SEC. 401. The Authority shall have capital stock of $25,000,000,000, subscribed by the United States of America acting by and through the Secretary of the Treasury, pay-

ment for which shall be subject to call in whole or in part by the Board of Directors of the Authority and subject to the availability of appropriations therefor. There is hereby authorized to be appropriated to the Secretary of the Treasury $25,000,000,000 for this purpose. Not later than one hundred and eighty days after the close of each fiscal year of the Authority, the Authority shall declare and shall thereafter pay a dividend on its outstanding capital stock, in an amount determined in the discretion of the Board of Directors but not less than the amount, computed by multiplying a percentage determined by the Secretary of the Treasury, taking into account the current average annual percentage yield on marketable obligations of the United States as of the close of such fiscal year, times the paid in value of such outstanding capital stock: *Provided, however,* That the Authority may defer payment of any such dividend if the Authority has no earned surplus as of the close of such fiscal year or the Board of Directors determines that the funds otherwise available for payment of the dividend should, in furtherance of the purposes of this Act, be used to provide financial assistance pursuant to title III of this Act. Any dividend deferred pursuant to this section shall, until paid, bear interest at a rate, determined by the Secretary of the Treasury and adjusted at the commencement of each fiscal year, taking into consideration the then current average an-

nual percentage yield on marketable obligations of the United States.

OBLIGATIONS OF THE AUTHORITY

SEC. 402. (a) The Authority is authorized to issue and to have outstanding at any one time notes, debentures, bonds, or other obligations in the aggregate principal amount of $75,000,000,000: *Provided, however,* That the Authority shall not issue any such obligation without the prior concurrence of the Secretary of the Treasury as to the method, source, interest rate, timing and other terms and conditions of such obligation. The Secretary of the Treasury may direct that any such issuance by the Authority be sold to the Department of Treasury for its own account or to the Federal Financing Bank.

(b) For purposes of purchasing the obligations of the Authority pursuant to this section 402, the Secretary of the Treasury is authorized to use as a public debt transaction the proceeds from the sale of any securities hereafter issued under the Second Liberty Bond Act, and the purposes for which securities may be issued under the Second Liberty Bonds Act are extended to include such purchases. Each purchase of obligations by the Secretary of the Treasury under this section shall be upon such terms and conditions as to yield a return at a rate not less than a rate determined by

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the Secretary of the Treasury, taking into consideration the current average yield on outstanding marketable obligations of the United States of comparable maturity. Interest due on obligations of the Authority held by the Treasury may be deferred, at the discretion of the Secretary, but any such deferred interest shall bear interest at the rate specified in this section. The Secretary of the Treasury may sell, upon such terms and conditions and at such price or prices as he shall determine, any of the obligations acquired by him under this section. All redemptions, purchases, and sales by the Secretary of the Treasury of such obligations under this section shall be treated as public debt transactions of the United States.

(c) All obligations of the Authority issued under this section shall be fully and unconditionally guaranteed as to principal and interest and shall constitute general obligations of the United States, backed by the full faith and credit of the Government of the United States of America. Such guarantee shall be expressed on the face of all such obligations.

BUDGETARY TREATMENT

SEC. 403. The receipts and disbursements of the Secretary of the Treasury in connection with the purchase or redemption of, and income from, capital stock of the Authority shall not be included in the totals of the budget of the

United States Government. The receipts and disbursements of the Authority in the discharge of its functions shall not be included in the totals of the budget of the United States Government and shall be exempt from any general limitation imposed by statute on expenditures and net lending (budget outlays) of the United States: *Provided*, That the totals of the budget of the United States Government shall be adjusted to include the net earnings or losses of the Authority, as reported in the annual audit required by section 505(c) of this Act.

LAWFUL INVESTMENT

SEC. 404. Obligations of the Authority issued pursuant to this Act shall be lawful investments, and may be accepted as securty for all fiduciary, trust, and public funds the investment or deposit of which shall be under the authority or control of the United States or any officer or officers thereof.

FORMS OF NOTES, BONDS, AND OTHER OBLIGATIONS

SEC. 405. In order that the Authority may be supplied with such forms of notes, debentures, bonds, or other such obligations as it may need for issuance under this Act, the Secretary of the Treasury is authorized to prepare such forms as shall be suitable and approved by the Authority, to be held in the Treasury subject to delivery, upon order of the Authority. The engraved plates, dies, bed pieces, and

so forth, executed in connection therewith shall remain in the custody of the Secretary of the Treasury. The Authority shall reimburse the Secretary of the Treasury for any expenses incurred in the preparation, custody, and delivery of such notes, debentures, bonds, or other obligations.

MONEYS OF THE AUTHORITY

SEC. 406. All moneys of the Authority not otherwise employed may be—

(a) deposited with the Treasury of the United States subject to withdrawal by the Authority, by check drawn on the Treasury of the United States by a Treasury disbursing officer, or

(b) with the approval of the Secretary of the Treasury, deposited in any Federal Reserve bank, or

(c) with the approval of the Secretary of the Treasury, and by authorization of the Board of Directors of the Authority, used in the purchase for redemption and retirement of any notes, debentures, bonds, or other obligations issued by the Authority.

TITLE V—MANAGEMENT

BOARD OF DIRECTORS

SEC. 501. (a) The power of the Authority to act shall be vested in the Board of Directors, except as to those functions, powers, and duties assigned to the Chairman of the Board as provided in this Act and such matters as may be

delegated to the Chairman, directors and officers of the Authority pursuant to this title. The Board of Directors shall consist of five voting members appointed by the President by and with the advice and consent of the Senate, who shall hold office at the pleasure of the President. The President shall designate one of such members as Chairman of the Board, and shall have the power at any time and from time to time to designate a new Chairman of the Board from among the members of the Board. Of the five members of the Board, not more than three shall be members of any one political party. The Chairman shall devote his full working time to the affairs of the Authority (and its subsidiaries) and shall hold no other salaried position.

(b) With respect to each Director, other than the Director who shall serve as Chairman of the Board, the President shall determine whether such Director shall serve in a full-time or part-time capacity (including service as a Director of any subsidiaries). Directors who are serving part time may hold other positions but shall devote such time to the affairs of the Authority (and its subsidiaries) as is necessary to discharge their duties. Directors who are serving full time shall devote their full working time to the affairs of the Authority (and its subsidiaries) including such responsibilities as may be assigned by the Board of Directors or the Chairman of the Board, and shall

hold no other salaried position. Directors of the Authority, whether serving full time or part time, shall be compensated at an annual or daily rate to be determined by the President. Directors shall be reimbursed for reasonable expenses which are incurred in connection with their services as Directors of the Authority and its subsidiaries.

(c) Before assuming office, each Director shall take an oath faithfully to discharge the duties thereof. Whenever a vacancy shall occur on the Board of Directors, the President shall, with the advice and consent of the Senate, appoint a person to fill such vacancy. All Directors shall be citizens of the United States.

(d) The Board shall meet at any time pursuant to the call of the Chairman and as may be provided by the bylaws of the Authority. A majority of the duly appointed and serving Directors shall constitute a quorum, and any action by the Board shall be effected by majority vote of a quorum. The Board of Directors shall adopt, and from time to time amend, such bylaws as are necessary for the proper management and functioning of the Authority.

OFFICERS AND EMPLOYEES

SEC. 502. (a) The Chairman of the Board shall be the chief executive officer of the Authority, and as such shall be responsible for the management and direction of the Authority (including the making of expenditures associated

with administration of the Authority). The President shall fix the compensation of the Chairman of the Board.

(b) The Chairman of the Board may appoint and fix the compensation of all such personnel as may be necessary for the transaction of the Authority's business in accordance, except as otherwise authorized in subsections (c) and (d), with the provisions of title 5 of the United States Code. Except as expressly provided in this section, title 5 of the United States Code shall apply to such personnel in the same manner and under the same conditions required for the civil service generally.

(c) In addition to the number of positions which may be placed in GS–16, 17, and 18 under existing law, not to exceed one hundred positions may be placed in GS–16, 17, and 18. The provisions of title 5 of the United States Code governing classification and appointment in the competitive service shall not apply to twenty-five of such positions, as designated by the Chairman of the Board.

(d) In addition to personnel authorized to be employed under other provisions of this section, a reasonable number of executive officers may be employed by the Authority, on terms and conditions specified by the Chairman of the Board, under employment agreements for terms not exceeding five years and without regard to the provisions of title 5 of the United States Code governing classification and ap-

pointments in the competitive service and without regard to the laws, including title 5 of the United States Code, which fix compensation for officers and employees of the United States. Without prejudice to rights under any employment agreement any person appointed by the Chairman pursuant to this subsection may be removed in the discretion of the Chairman.

(e) The Chairman shall define the duties of the officers and employees of the Authority, and provide a system of organization to fix responsibility and promote efficiency.

(f) The Chairman of the Board shall have authority to obtain the services and fix the compensation of experts and consultants in accordance with the provisions of section 3109 of title 5 of the United States Code.

(g) Under such regulations as the President may prescribe, officers and employees of the Government who are appointed, without a break-in service, to any position for carrying out functions under this Act are entitled, upon separation from such position other than for cause within three years of employment, to reemployment in the position occupied at the time of appointment or in a position of comparable grade and salary to that held with Authority.

(h) The employees of the Authority, including full-time Directors and the individuals described in subsection (d), shall be considered employees of the United States Govern-

ment for purposes of eligibility for benefits related to employment.

CONFLICTS OF INTEREST

SEC. 503. The provisions of chapter 11 of title 18, United States Code, shall apply to the directors and all officers and employees of the Authority, and the Board of Directors shall have authority to promulgate regulations thereunder.

DELEGATION

SEC. 504. The Board of Directors may, by resolution, delegate to the Chairman of the Board such of its functions, powers, and duties assigned to the Board under this Act as it deems appropriate. The Chairman of the Board may, by written instrument, delegate such functions, powers, and duties as are assigned to the Chairman by or pursuant to the provisions of this Act to such other full-time directors, officers, or employees of the Authority as the Chairman deems appropriate.

FISCAL YEAR, REVIEWS AND AUDITS

SEC. 505. (a) The fiscal year of the Authority shall coincide with the fiscal year of the United States Government.

(b) On or before June 30 in any year, the Authority shall submit to the Director of the Office of Management and Budget a financial and management plan, in such detail

as the Director may prescribe, for the succeeding fiscal year.

(c) The Authority shall retain a firm or firms of nationally recognized public accountants who shall prepare and report an annual audit of the accounts of the Authority including the statements identified in section 851 of title 31, United States Code. The General Accounting Office is authorized to conduct such audits of the accounts, and to report upon the same to Congress, as such Office shall deem necessary or as Congress may request. All books, accounts, financial records, reports, files, papers, and property belonging to or in use by the Authority and necessary to facilitate an audit shall be made available to the person or persons conducting the audit and facilities for verifying transactions with the balances or securities held by depositories, fiscal agents, and custodians shall be afforded to such person or persons.

REPORTS

SEC. 506. (a) The Authority shall submit a quarterly report to the Congress and the President. The report will state the aggregate sums then outstanding or committed as loans, loan guarantees, or other financial assistance and a listing of the business concerns so involved with the Authority. The quarterly report in which any expenditure or

commitment to a business concern or project is first noted shall contain a brief description of the factors considered by the Board of Directors in making such expenditure or commitment. The report shall also show, on an unaudited basis, the assets and liabilities of the Authority as of the end of the Authority's fiscal quarter preceding the date of the report and the number, functions, and compensation of persons employed or under contract by the Authority at salary rates exceeding $2,500 per month.

(b) The Authority shall submit to the Congress and the President an annual report containing the audited financial statements and report prepared by the independent public accountants pursuant to section 505. The annual report shall also contain, in addition to the information required in the quarterly report, a general description of the Authority's operations during the year, a specific description of each project or activity in which the Authority is involved, a status report on each such project or activity, and an evaluation of the contribution which the project or activity has made and is expected to make in fulfilling the purposes of this Act (including, where possible, a precise statement of the amount of domestic energy produced or to be produced thereby).

(c) On or before June 30, 1983, the Authority shall

submit to the Congress and the President a report evaluating the overall impact made by the Authority and describing the status of each then current activity or program of financial assistance. This report shall contain a liquidation plan. The liquidation plan shall describe in the greatest detail practicable how each activity, project, or obligation involving financial assistance, and every substantial asset or liability of the Authority will be liquidated, terminated, satisfied, sold, transferred, or otherwise disposed of. Each annual report thereafter made by the Authority will describe what progress is being made in effecting such liquidation plan.

(d) On or before January 31, 1986, the Authority shall submit to the President a report setting forth the recommendation as to whether or not the existence of the Authority should be extended for the limited period and purpose described in section 803 (c).

RECORDS OF OUTSIDE CONTACTS

SEC. 507. The Authority shall develop and publish procedures for recording communications received (in writing or otherwise) from persons outside the Authority, including private individuals and public officials, expressing an opinion or viewpoint on the merits or terms of any proposal that the Authority extend financial assistance pursuant to title III

of this Act. The Authority shall establish procedures for making such records available to the public upon request.

TITLE VI—FEDERAL AGENCY PROCEEDINGS

DEFINITIONS

SEC. 601. As used in this title:

(a) The term "Federal agency" means an "Executive agency" as defined in section 105 of title 5, United States Code, including an independent regulatory commission.

(b) The term "energy project" means any activity in connection with the planning, initiation, construction, or operation of facilities involving the production, distribution, transmission, or transportation of energy, fuels, or energy-related commodities, facilities, or products.

(c) The term "license" means "license" as defined in section 551 (8) of title 5, United States Code and the term "licensing" means "licensing" as defined in section 551 (9) of title 5 of the United States Code.

(d) The term "proceedings" means any action taken by a Federal agency in initiating or carrying out the process leading to granting or denying a license for any energy project.

(e) The term "Administration" means the Federal Energy Administration or any successor entity thereto.

EXPEDITING FUNCTIONS OF THE FEDERAL ENERGY ADMINISTRATION

SEC. 602. (a) The Administration shall have the following duties and authorities in the energy project licensing process:

(1) The Administration shall keep apprised of the processing of energy project licensing proceedings at the Federal, local, State, and regional levels and, where appropriate and consistent with applicable Federal, State, and local law, may suggest procedures for expediting such Federal proceedings and similar local, State, or regional review and for consolidating Federal, local, State, and regional applications and actions to reduce duplication of effort and expedite the overall licensing process.

(2) When a Federal agency has rendered any preliminary or final decision in the course of a proceeding, the Administration may, where the applicable law or rules and regulations of the Federal agency permit administrative appeal or reconsideration: (i) request such Federal agency to reconsider its decision, by way of appeal or otherwise, or (ii) join in any such administrative appeal or petition for reconsideration by the applicant. Any petition brought by the Administration or in which the Administration joins shall be granted or denied within thirty days of receipt by the Federal agency to which the petition is addressed.

(b) The Administration may, if it deems it desirable and in the interest of expediting proceedings, develop and promulgate a composite form of license application which shall be the sole application required by all Federal agencies with regard to the review and approval of all or a portion of, as the form may specify, the proceedings related to an energy project. In such event, the Administration may also provide that such composite license applications be filed only with the Administration, in which case the Administration shall promptly forward the license applications, or relevant portions thereof, to the Federal agencies required by law to consider them. Such a composite license application may be composed of removable and insertable sections in order to accommodate the information necessary for different energy project licensing decisions. The Administration shall consult with Federal agencies having licensing authority over energy projects prior to promulgating any form of composite license application, and such agencies shall cooperate with the Administration in developing such an application. Nothing in this section shall reclude any Federal agency from requesting, in an individual case, such additional information relating to public health and safety or such other essential information as may be necessary to carry out its licensing functions.

CERTIFICATION BY THE FEDERAL ENERGY ADMINISTRATION

SEC. 603. (a) The Administration may certify that an energy project, whether or not receiving financial assistance from the authority, is of critical importance to the achievement of the purposes of this Act (hereafter referred to as "certification"). In determining whether or not an energy project is critical to the achievement of such purposes, the Administration shall consider, among other factors, the contribution that the energy project itself would make to the achievement of energy independence and the stimulative effect that its successful and expeditious completion and operation would have on additional similar projects. The Administration shall briefly state, in any certification it issues, the facts and reasoning supporting its finding that the energy project in question is of such critical importance. The Administration may suspend or cancel such certification: *Provided, however*, That prior to such suspension or cancellation the party on whose behalf the certification was given shall be allowed an opportunity to express its views on the proposed suspension or cancellation. The action of the Administration in granting, denying, suspending, or canceling such certification shall be final and conclusive for all purposes with respect to all questions of law and fact and not subject to review by a court by mandamus or otherwise.

(b) Certification shall be made by the Administration only pursuant to application therefor in form and substance satisfactory to the Administration. The application shall state the reasons why the applicant believes such certification is appropriate.

(c) The Administration, within forty days of receiving and accepting an application for certification, shall publish in the Federal Register a notice of the requested certification, including pertinent parts of the application therefor, inviting written comments from the public on such requested certification for a period of twenty days. The Administration shall consider such comments and act on the application within twenty days of the closing of the public comment period. In deciding whether or not to certify an energy project as critically important, the Administration shall consider the need for Federal agencies to complete all licensing decisions without undue delay and the effect which certifications (individually and cumulatively) will have on the orderly handling of licensing decisions by the affected Federal agencies.

(d) The recipient of a certification may submit it to any Federal agency which is authorized by law to license or review any part or any phase of the energy project to which the certification relates, including the initiation, development, completion, or operation of the energy project,

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(e) Any Federal agency which receives a certification shall forthwith commence all necessary proceedings which may be required for the licensing of any aspect of the affected energy project, and is authorized to give such proceedings preference over all other questions pending before it except other proceedings involving similar certifications. Diligent efforts shall be made to complete all such proceedings and render a decision within eighteen months (or such shorter period as the Administration may for good cause specify) from the date of submission of the certification to such Federal agency.

(f) Each Federal agency which conducts proceedings related to energy projects shall, within ninety days of the enactment of this Act and in cooperation with the Administration, promulgate regulations implementing procedures to carry out the expedited treatment required by this tile. Such procedures shall include reports from the Federal agency to the Administration, in such form and at such frequency as they shall agree, on the progress of proceedings.

(g) Each Federal agency shall report semiannually (commencing on the July 1 or January 1 first occurring after the enactment of this Act) to the Congress and to the President with respect to each certified matter in which the

Federal agency has not completed any proceeding or rendered a decision within eighteen months from the date of certification, or such shorter period as the Administration may have specified pursuant to subsection (e): (i) the reasons therefor; (ii) actions being taken to complete the proceedings as expeditiously as possible; (iii) the measures being taken to prevent such delays in the future; and (iv) any recommendations for further legislation which such Federal agency deems advisable for the purposes of avoiding such delays.

(h) Certification by the Administration as contemplated by this section shall not be considered a major Federal action significantly affecting the quality of the human environment within the meaning of section 102 (2) (C) of the National Environmental Policy Act of 1969.

JUDICIAL REVIEW

SEC. 604. Any judicial review of a Federal agency's final action concerning an energy project which has been certified under section 603 of this Act, and appeals therefrom, shall take precedence on the docket over all cases, except as to cases which the court considers of greater importance, and shall be assigned for hearing and trial or for argument at the earliest practicable date and expedited in every way.

TITLE VII—UNLAWFUL ACTS AND PENALTIES

FALSE STATEMENTS

SEC. 701. Whoever makes any statement, knowing it to be false, or willfully overvalues any security, for the purpose of obtaining for himself or for any applicant any loan or extension thereof by renewal, deferment of action, or otherwise, or the acceptance, release, or substitution of security therefor, or for the purpose of influencing in any way the action of the Authority or a subsidiary, or for the purpose of obtaining money, property, contract rights, or anything of value, under this Act, shall be punished by a fine of not more than $5,000 or by imprisonment for not more than two years, or both.

FORGERY

SEC. 702. Whoever (1) falsely makes, forges, or counterfeits any note, debenture, bond, or other obligation, or coupon, in imitation of or purporting to be a note, debenture, bond, or other obligation, coupon, or thing of value issued by the Authority or a subsidiary, or (2) passes, utters, or publishes, or attempts to pass, utter, or publish, any false, forged, or counterfeited note, debenture, bond, or other obligation, coupon, or thing of value purporting to have been issued by the Authority or a subsidiary, knowing the same to be false, forged, or counterfeited, or (3) falsely alters any note, debenture, bond, or other obligation, or coupon, issued or

purporting to have been issued by the Authority, or a subsidiary, or (4) passes, utters, or publishes, or attempts to pass, utter, or publish, as true any falsely altered or spurious note, debenture, bond, or other obligation, coupon, or thing of value issued or purporting to have been issued by the Authority or a subsidiary, knowing the same to be falsely altered or spurious, shall be punished by a fine of not more than $10,000 or by imprisonment for not more than five years, or both.

MISAPPROPRIATION OF FUNDS AND UNAUTHORIZED ACTIVITIES

SEC. 703. Whoever, being connected in any capacity with the Authority or a subsidiary, (1) embezzles, abstracts, purloins, or willfully misapplies any moneys, funds, securities, or other things of value, whether belonging to it or pledged or otherwise entrusted to the Authority or such subsidiary, or (2) with intent to defraud the Authority and subsidiary or any other body politic or corporate, or any individual, or to deceive any officer, auditor, or examiner of the Authority or such subsidiary, makes any false entry in any book, report, or statement of or to the Authority or such subsidiary, or, without being duly authorized, draws any order or issues, puts forth or assigns any note, debenture, bond, or other obligation, or draft, bill of exchange, mortgage, judgment, or decree thereof, or (3) with intent to defraud, participates,

shares, or receives directly or indirectly any money, profit, property, or benefit through any transaction, loan, commission, contract, or any other act of the Authority or such subsidiary, or (4) gives any unauthorized information concerning any future action or plan of the Authority or such subsidiary which might affect the value of securities, or, having such knowledge, invests or speculates, directly or indirectly, in the securities or property of any company, bank, or corporation receiving loans or other assistance from the Authority or such subsidiary shall be punished by a fine of not more than $10,000 or by imprisonment for not more than five years, or both.

INFRINGEMENT ON NAME

SEC. 704. No individual, association, partnership, corporation, or business entity shall use the words "Energy Independence Authority" or a combination of these words which a court of competent jurisdiction shall find reasonably likely to mislead or deceive, as the name or a part thereof under which he or it shall do business.

UNLAWFUL CONTRACTS

SEC. 705. The provisions of sections 431 through 433, inclusive, of title 18, United States Code, shall apply to contracts or agreements with the Authority or subsidiary pursuant to this Act. Such contracts or agreements include, but are not limited to loans, loan guarantees, purchase agree-

ments, advances, discounts and rediscounts, acceptances, releases, and substitutions of security, together with extensions or renewals thereof.

ADDITIONAL PENALTIES

SEC. 706. In addition to any other penalties provided in this title, the defendant in any action brought pursuant thereto shall, on conviction, be liable to the Authority or Subsidiary for any loss by the Authority or such Subsidiary and any profit or gain acquired by him as a result of the conduct constituting the offense for which he was convicted.

SUITS BY THE ATTORNEY GENERAL

SEC. 707. No suit shall be brought alleging that the Authority (or any director, officer, employee, or agent thereof) has engaged in any action, practice or policy inconsistent with this Act; has violated any provision thereof; has obstructed or interfered with any activities authorized thereby; or has refused, failed, or neglected to discharge duties or responsibilities mandated by the Act except by the Attorney General of the United States or his delegate. The Attorney General may, by petition in any Federal district court in any State where the Authority is transacting business or where any such individual resides (or in the District of Columbia), seek such equitable relief as may be necessary or appropriate to prevent or terminate such conduct. Noth-

ing in this section shall be deemed or construed to prevent the enforcement of the other provisions of his title by appropriate officials of the United States, nor to preclude the application of the Federal Tort Claims Act against the Authority nor to prohibit suits by private parties against the Authority based on breach of contract.

TITLE VIII—GENERAL PROVISIONS

COORDINATION WITH OTHER ENTITIES

SEC. 801. Prior to extending, or making any commitment to extend, financial assistance for any project, the Authority shall seek the advice and recommendations of the members of the Energy Resources Council, and such other Federal agencies as the President may by Executive order designate, to assist in determining whether the provision of financial assistance for such project will further the purposes of this Act and how such proposed financial assistance relates to other programs and national policies. Any such advice or recommendation shall be provided to the Authority within thirty days of its request.

SEVERABILITY

SEC. 802. If any provision of this Act, or the application of any such provision to any person or circumstance, shall for any reason be adjudged by any court of competent jurisdiction to be invalid, the remainder of this Act, or the application of such provision to persons or circum-

stances other than those to which it is held invalid, shall not be affected thereby.

TERMINATION AND LIQUIDATION OF THE AUTHORITY

SEC. 803. Notwithstanding any other provision of this Act:

(a) The Authority shall make no new commitments for financial assistance after June 30, 1983, and shall furnish no new financial assistance after June 30, 1986.

(b) From and after June 30, 1983, the Board of Directors of the Authority shall diligently commence all practical and reasonable steps to achieve an orderly liquidation of the Authority's affairs on or prior to June 30, 1986. Such steps may include the sale or transfer to any agency of the United States, or the sale directly to the public, including any business concern, of all or any portion of the Authority's assets.

(c) The Authority shall terminate on June 30, 1986, or at such earlier date as the President shall determine: *Provided, however,* That if the President shall determine that the orderly liquidation of the Authority's affairs requires the continuation of the Authority beyond June 30, 1986, the President may, by Executive order, extend the authorized life of the Authority for not more than three years after such date.

(d) If, on the date of termination of the Authority, its

Board of Directors shall not have completed the liquidation of its assets and the winding up of its affairs, the duty of completing such liquidation and winding up of its affairs shall be transferred to the Secretary of the Treasury, who for such purposes shall succeed to all the powers and duties of the Board of Directors and Chairman of the Board of the Authority under this Act, and nothing herein shall be construed to affect any right or privilege accrued, any penalty or liability incurred, any criminal or civil proceeding commenced, or any authority conferred hereunder, except as herein provided in connection with the liquidation of the remaining assets and the winding up of the affairs of the Authority. Following such transfer, the Secretary of the Treasury may assign to any officer or officers of the United States in the Treasury Department the exercise and performance, under the Secretary's general supervision and direction, of any powers and duties so transferred until the Secretary of the Treasury shall find that such liquidation will no longer be advantageous to the United States and that all of its legal obligations have been provided for, whereupon the Secretary shall retire any capital stock then outstanding, pay into the Treasury as miscellaneous receipts the unused balance of the moneys belonging to the Authority, and make the final report of the Authority to the Congress. Thereupon the Authority shall be deemed to be dissolved.

RELATIONSHIP TO OTHER LAWS

SEC. 804. (a) The provision of financial assistance for a project pursuant to title III of this Act shall be deemed to be a "major Federal action significantly affecting the quality of the human environment" for purposes of section 102 (2) (C) of the National Environmental Policy Act of 1969, as amended ("NEPA"), where (i) no other agency of the Federal Government is required to prepare an environmental impact statement pursuant to section 102 (2) (C) of NEPA with respect to the project, and (ii) the provision of financial assistance does, in fact, constitute a major action significantly affecting the quality of the human environment. In any instance where another agency of the Federal Government is required to prepare an environmental impact statement pursuant to section 102 (2) (C) of NEPA with respect to a project to which financial assistance has been committed or extended, the Authority shall provide the agency with such information as may be reasonably requested by the agency in order to prepare such statement.

(b) Except as may be provided elsewhere in this Act, the Authority shall not for any purpose be considered an "Executive agency" as defined in section 105 of title 5, United States Code, or an "agency" as defined in section 551 of title 5 of the United States Code.

(c) The provisions of the United States Code relating to

public contracts and public buildings and works, including the Federal Property and Administrative Services Act of 1949, shall not apply to the operations of the Authority: *Provided, however,* That all laborers and mechanics employed by contractors or subcontractors in any construction, alteration, or repair (including painting and decorating) of projects for which financial assistance is provided by the Authority or a subsidiary shall be paid at wages not less than those prevailing on similar construction in the locality, as determined by the Secretary of Labor in accordance with the Davis-Bacon Act, as amended (40 U.S.C. 276a through 276a–5). The Secretary of Labor shall have, with respect to such labor standards, the authority and functions set forth in Reorganization Plan Numbered 14 of 1950 (15 Fed. Reg. 3176, 64 Stat. 1267 and 40 U.S.C. 276(c)). Federal labor standards and equal employment opportunity requirements and provisions shall apply to the Authority and business concerns receiving financial assistance from the Authority.

(d) The securities laws of the United States, including but not limited to the provisions of the Securities Act of 1933, the Securities Exchange Act of 1934, the Public Utility Holding Company Act of 1935, the Federal Power Act of 1935 and the Investment Company Act of 1940, all as amended, shall not apply to the Authority. Any se-

curities issued by the Authority (including any guarantee by the Authority, whether or not limited in scope), and any securities guaranteed by the Authority as to both principal and interest, shall be deemed to be exempted securities within the meaning of section 77c (a) (2) of title 15, United States Code and section 78c (a) (12) of title 15 of the United States Code.

(e) Nothing in this Act shall be deemed or construed to make the Government Corporation Control Act (31 U.S.C. 841, et seq.) applicable to the Authority.

(f) Nothing in this Act shall be deemed to change the Mineral Lands Leasing Act of 1920, as amended (30 U.S.C. 181 through 287), the Outer Continental Shelf Lands Act (43 U.S.C. 1331 through 1343), nor any other law governing the ownership, management, and disposition of Federal minerals or lands: *Provided, however,* That the Authority may acquire Federal minerals or lands in accordance with such laws.

RESERVATION OF RIGHT TO AMEND OR REPEAL

SEC. 805. The right to alter, amend, or repeal this Act is expressly declared and reserved, but no such amendment of repeal shall operate to impair the obligation of any contract made by the Corporation under any power conferred by this Act.

The CHAIRMAN. Now, gentlemen, Mr. Rostow and Mr. Commoner, would you sit at that table? We are now honored to have as our witnesses a panel of Walt Rostow, professor of economics and history at the University of Texas, Austin, Tex., a man of great distinction who served this country with great ability and controversy in the Johnson Administration; and Mr. Barry Commoner, director for the Center for the Biology of Natural Systems, Washington University, St. Louis, Mo., whose name is synonymous throughout the country with conservation and with the struggle for a better, cleaner environment.

Dr. Rostow, will you start?

STATEMENT OF WALT W. ROSTOW, PROFESSOR OF ECONOMICS AND HISTORY, UNIVERSITY OF TEXAS

Mr. ROSTOW. The bill before you and the testimony of the Vice President and Mr. Zarb make the basic case for the prompt creation of the Energy Independence Authority: the progressive rise in our dependence on imported oil to a level over 40 percent of consumption; the likelihood of a further rise in that dependence with economic recovery; the need rapidly to increase domestic energy production and conservation under circumstances where private profit incentives, for a variety of reasons, do not suffice to generate the necessary level of investment.

I have accepted your invitation to appear today to make two points which go somewhat beyond the conventional case for the Energy Independence Authority. I support the case as it was just made.

First, until something like that Authority is at work and the rate of American investment in energy and energy conservation is rising rapidly, I doubt that a fruitful negotiation between OPEC and the major oil importers will be possible. Right now, we do not have a national or an OECD energy policy worthy of the name. Our only serious leverage on OPEC, aside from economies induced by higher energy prices—and, I might add, two soft winters—has been the severe recession experienced in the past 2 years. That is now, to a degree, ending. OPEC's leverage will, therefore, increase. For reasons set out on pages 13 and 14 of my attached paper, "The Case for Sectoral Planning", I believe a rational long-range negotiation with OPEC is conceivable; but unless we move forward on the lines of the Energy Independence Authority I see no reason OPEC should enter such a negotiation.

I turn now to an even more urgent reason for supporting the Energy Independence Authority: Without greatly enlarged levels of investment in energy, energy conservation, and certain other directions I shall specify, I doubt that we can return quickly to anything approximating full employment. The great economic expansion in North America, Western Europe, and Japan since 1945—the most remarkable phase of economic expansion the world has experienced in the last 200 years—was based on two kinds of forces: on the diffusion of the automobile, durable consumer goods, and the life of suburbia; and on a sharp rise n real outlays for certain services, notably higher education, health services, and travel. The rise in

energy prices has directly and indirectly weakened both these pillars of growth and prosperity. Directly, the rise in energy prices has reduced purchases of automobiles and durable consumers goods. I agree with Senator Stevenson that was it essentially the rise in energy prices that brought about the stage of stagflation that we have experienced and are experiencing throughout the world. The industries producing automobiles and durable consumers will obviously continue to play a large role in our economy; but it is unlikely that, after some quick revival from the pit of recession, they will continue to expand at the same rate as in the era of cheap energy which accelerated their diffusion. Indirectly, the rise in energy prices has also reduced outlays for housing: by lowering real incomes, accelerating inflation, and raising interest rates. In addition, as private real incomes stagnated or fell, a political revolt swept through the OECD world, from New Zealand to California and beyond a revolt against increased public outlays at the old rate. Some of these outlays, in any case, have been approaching natural limits, linked to demography. Looking ahead, I do not expect outlays for public services greatly to decline; but I doubt that they will continue to increase at the extraordinary pace of the past 20 years.

I am talking here about marginal changes in the structure of our economy; but they are significant marginal changes.

The result of these marginal changes is a universal prediction that the present recovery will leave us still with something like 7 percent unemployment in the United States at the end of 1976. For the OECD as a whole, the latest prediction is that, despite a moderate recovery, unemployment will actually increase during 1976 ["OECD Observer," December 1975, p. 3].

This continued stagflation is not only corroding the social and political life of the advanced industrial societies, but it has radically slowed down economic and social progress in southern Europe, Latin America, Africa, and Asia, except for the oil exporters. This slackening in the world economy is obviously creating situations which provide a temptation to ambitious leaders to press outward their power and influence. It is worth recalling that protracted economic problems in the West helped quite directly to set in motion the military adventures which brought on the Second World War. In a world precariously balanced between movement towards peace and movement towards increased violence and disintegration, we need an environment of rapid economic and social progress to maximize the chance that the movement towards peace will prevail.

As for remedy, it obviously makes no economic (let alone political) sense to unbalance grotesquely the Federal budget so that consumers can go on buying big automobiles and energy-intensive durable consumers goods at the old rate. A neo-Keynesian focus on the direct expansion of demand will no longer suffice.

How, then, do we get back to full employment? We must mount rapidly expanded investment in energy production, energy conservation, mass transit facilities, insulated housing, and in solar energy with existing technology; programs to clean the air and the water and otherwise to preserve the environment; programs to assure the long run viability of our invaluable agricultural base; and for rea-

sons set out in my accompanying paper to expand outlays for research and development over a wide front.

I might add parenthetically, that this is the fifth time in the last 200 years the world economy has faced a period of relative expensive food and raw materials. In each case in the past we came back towards balance by opening up new physical frontiers. There are still a few physical frontiers in Alaska, the North Sea, the sea beds and so on. But basically, the world must come back to structural balance this time through research and development, by generating new technologies which will, in effect expand our resources and conserve them and the environment.

Prosperity over the past 30 years has been based on the direct expansion of consumers income and services, with investment resulting from that expansion. In the next phase, prosperity will have to be based somewhat more on increased investment in the supply side of the equation, with economic and social progress flowing from the resulting level of steady full employment.

In commonsense terms, that is just what one would expect in a world where energy is likely to be expensive until some great technological breakthroughs occur in solar energy or fusion power; where we will experience over the next quarter century the maximum pressure of population increase on the food supply, until birth rates recede in the developing world; where we have at last recognized that we must steadily allocate significant resources to assure clean air and water. In general, we must expand in degree our allocations to sustain the inputs of energy and food, air and water on which our industrial civilization depends. We cannot go on assuming that they will be cheap or free.

In all these areas—not merely energy—there is a significant marginal role for government as well as private enterprise. We shall, I believe, have to free ourselves in the coming days from the rhetoric and policies of confrontation between public and private enterprise and encourage a systematic partnership—and spirit of partnership.

Therefore, I was delighted to hear you, Mr. Chairman, and the Vice President, join in a proposition that I had already written into my text. We ought to split our Federal budget into investment and noninvestment components and be prepared to use the powers of government vigorously to expand both private and, where necessary, public investment in the directions I have indicated. The Energy Independence Authority could play a vital role in such an effort.

I will not burden you with an explanation of why our conventional economists—Republican and Democrat, liberal and conservative—find it difficult to perceive this is the way out of chronic 7 percent unemployment. But I would call your attention to the manner in which 2 studies, at least, have backed into the same broad conclusion as that I am presenting here by asking if there is going to be a capital market "crunch"—whether investment rates must be increased.

First, the study of Capital Needs in the Seventies by Barry Bosworth, James Duesenberry, and Andrew Carron. The full employment path of 4 percent they assume requires for its fulfillment sharply increased investment outlays in energy-related investment, mass transport, and pollution control. Second, in the January 1976

Economic Report of the President to the Congress, the Council of Economic Advisers report (pp. 39-47) a study of capital requirements down to 1980 conducted within the Department of Commerce. Here the target was to bring unemployment below 5 percent by the end of the decade. Once again, increased outlays for pollution abatement and to reduce our energy dependence on imports are critical to the conclusions reached.

My argument is, then, that the prompt creation of the Energy Independence Authority is not only necessary to reduce our balance of payments burden and our strategic vulnerability but also to acquire the bargaining leverage necessary for a rational long-term agreement with OPEC and to free us from the danger of chronically high levels of unemployment.

I urge you, therefore, to throw your weight fully behind the Energy Independence Authority. I urge you to set aside the odd alliance between some shortsighted representatives of private industry and some extremist conservationists who now oppose this bill. Their arguments, if heeded, will neither strengthen the private sector nor enhance the environment. They will simply increase our dependence on OPEC in a continued setting of stagflation. Continued stagflation weakens private enterprise and makes more difficult the generation of the resources required to clean the air and water and otherwise preserve our environmental heritage. If you commend this bill to the Congress, you will turn, I believe a decisive corner in solving both our energy and unemployment problems and open the way to a rational approach to the difficult but manageable problems of the next generation.

The CHAIRMAN. Thank you very much, Dr. Rostow.

Dr. Commoner?

STATEMENT OF BARRY COMMONER, CENTER FOR THE BIOLOGY OF NATURAL SYSTEMS, WASHINGTON UNIVERSITY, ST. LOUIS, MO.

Mr. COMMONER It is widely acknowledged that the United States lacks a national policy to govern the production and use of energy, and that this defect has caused serious economic difficulties and threatens us with worse ones in the future. The energy problem is huge in its size, complex in its design, and pervasive in its effects on the nation's economy. The Energy Independence Authority Bill matches these needs only in the huge size of the expenditures which it proposes to authorize. To balance energy use against domestic supplies ("energy independence"), we know, from the laws of thermodynamics, calls for a complicated match between the quality of the source and the quality of the task In response to that complex situation, the bill proposes only to assure the flow of capital to domestic energy production. And the bill fails utterly to deal with the powerful effects of the productivity of the capital that it proposes to invest (that is, the amount of energy produced, or saved, per dollar of capital invested) on the cost of energy and of capital itself, and the pervasive effects of these costs on the entire economy.

These are fatal flaws, and because of them, I believe that the bill is much more likely to widen the gap between energy demand and

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domestic supply than to accomplish its stated purpose of reducing that gap and of achieving "energy independence."

The gravely flawed character of the bill is revealed in its chief purpose, as set forth in section 102(a):

> To encourage and assure the flow of capital funds to those sections of the national economy which are important to the development of domestic sources of energy or which are otherwise important to the attainment of energy independence for the United States by 1985. . . .

Thus the bill is basically designed to meet the intense demand for capital by the energy industries. However, presumably the purpose of disbursing these huge amounts of capital is to receive value in return, specifically enhanced domestic energy production, or its equivalent in the matter of achieving "energy independence," reduced demand (for example, through conservation). What is relevant in judging the effectiveness of this bill is the productivity of capital—for example, the amount of annual energy production achieved per dollar of capital invested in a given energy source.

The productivity of capital invested in various energy sources is shown in the attached table, which can guide us in judging the effectiveness of the bill. This table shows that different fuels vary by more than twentyfold in the amount of energy that they yield per dollar invested. Thus, if capital is invested in the production of shale oil or of synthetic fuel from coal—new technologies which, according to the fact sheet on the energy independence authority released by the White House on October 10, 1975, would be given high priority by the authority—it yields about one-tenth as much energy as the same amount of capital invested in enhanced oil or coal production. If, as is evident from the language of the bill, the authority would operate under a mandate to increase the flow of capital into energy production it will obviously tend to spend its funds on those forms of energy production which generate the highest demand for capital, and those will be the forms that do so precisely because they are so inefficient in converting the invested capital into actual production of energy. This aim is explicitly acknowledged in the White House fact sheet, which emphasizes the need for funds to support, specifically, those methods of energy production shale oil, synthetic fuels, and nuclear power) that yield a poor return in energy produced per dollar of capital invested. That, after all, is the very reason why these sectors of the energy industry are so badly in need of capital. Those particular sectors of energy that the bill wants to support are inefficient users of capital in the production of energy. This is a kind of a parody of the wartime efficiency awards to U.S. industry. The bill would create a program of what we might call very costly, inefficiency awards to the energy industry. They would reward inefficiency in the production of energy.

So I think that the bill's purpose would, in effect, guarantee that huge amounts of public funds would be spent wastefully. And in this particular case, the waste of public funds would represent not only an added tax burden, but would also create an additional inflationary effect, for energy production at low capital productivity can be profitable only if the energy is sold at a high price. This bill, if it goes through, will guarantee the acceleration of the rising price of

energy. In fact this was publicly acknowledged last February when Mr. Ford and Secretary Kissinger called for a floor on crude oil prices in order to protect private investments in synthetic fuel production. They didn't get OPEC to agree, and now they are coming to Congress with another gambit for doing the same thing—which is to raise the price of energy.

So it seems to me that what this bill would do would waste the taxpayers' money and reduce the value of what he has left to spend.

That the proponents of the bill themselves anticipate that it would enormously reduce the productivity of capital—the efficiency with which the investment is converted to actual energy production—is evident from a comparison of figures provided by the White House fact sheet with those reported in the attached table. According to the fact sheet "The $100 billion for energy projects could help assure that the equivalent of up to 10-15 million barrels of oil per day of new energy production is realized by 1985." This would represent a capital productivity of about 200,000 to 310,000 btu's of energy per year per dollar invested. I computed the energy productivity of that figure in the same terms that are used in the accompaning table—that is converting over to btu's gained per dollar invested—and the figure comes out to 200,000 to 310,000 btu's of energy per year per dollar investment. The gross economic inefficiency of this investment can be judged from the capital productivity of overall energy production in the United States in 1973: 1,845,000 btu's per dollar invested. Thus the productivity of the capital invested by the authority would be about 85 percent lower than the overall productivity of capital invested in energy in 1973—a difference which would be even greater if inflation were taken into account. In other words, they're asking for money to support the most wasteful ways of converting capital into energy.

One reason why this comes about is that you're dealing with nonrenewable fuel, such as crude oil and natural gas which becomes increasingly capital-intensive as production continues. Each barrel of oil taken out of the ground makes it more expensive to produce the next one.

As you can see from the attached table (p. 110), compared with 1974 the projected figure for 1988 shows a fourfold drop in the productivity of capital invested in oil production. Solar energy represents the one way to escape this law of diminishing returns because after all if you capture one sunbeam it has no effect on capturing the next one. In keeping with its perversely wasteful approach to energy production the bill and the associated documents largely ignore the issue of using solar energy for achieving energy independence.

Now I want to make a few very brief remarks about the scientific background of this issue because I don't think they can be understood otherwise. There is often a tendency to separate the question of producing energy and using it. However, laws of thermodynamics tell us in that the efficiency of converting energy into the only thing that gives it value, namely work, is a result of a proper match between the character of the source and the character of the task. Without going into detail I'd like to simply mention the shocking fact that the first estimate of the efficiency with which we will use energy according to the Second Law of Thermodynamics was made

only last year and it revealed that we probably operate with an efficiency of 10 to 15 percent overall. This means that there is an enormous potential for conservation and I think the figure which we have heard here of a maximum of 5 percent saving by conservation is a ridiculous under-estimation of the potential.

It's not going to be done simply by stuffing attics full of insulation. For example, what will have to be done is to see to it that electricity is not used for heating homes because that's an exceedingly thermodynamically wasteful way of providing space heat.

The CHAIRMAN. May I say, Dr. Commoner, if you want to skip down, the entire text will be printed in full in the record.

Mr. COMMONER. I just want to go down to one final point on the capital issue: Capital used for energy is already cutting into the availability of capital for business in general. Between 1970 and 1973 energy production absorbed 24 percent of the capital invested in U.S. business as a whole. Present estimates of the capital needed for energy production in the 1975–85 period are likely to raise this proportion to more than one-third. And, for the reasons cited above, if the bill is enacted it would stimulate the development of precisely those energy sources that are most wasteful in their use of capital and so considerably worsen the position of nonenergy industries and of consumers in the competition for capital. In effect, the bill would encourage the already dangerous tendency of the energy industry to devour its own customers.

The last thing I want to say is that I am staggered by the unexplained assumptions in this bill. The business of national security has already been discussed. In my opinion, if this is a bill to defend the country, then its supporters ought to come before the people of the country and tell us that that's the issue.

The consideration of private enterprise raises very serious questions. If the bill is designed to provide capital for those industries that need it and can't raise it, then why aren't we doing that with the railroads; instead of having the railroads rip up tracks we ought to be giving them money to build tracks. Why aren't we providing capital for the auto industry which has to have it if it's ever going to retool to build a new kind of car, or to agriculture which has become one of the most capital intensive industries but can't raise it very well?

In other words, I think that to be fair and honest these issues have to be brought out in the open and if Mr. Rockefeller believes that private enterprise can't take care of the country any more I wish he would say so openly and let's have a debate on that subject. In other words, I think the bill fails to meet the requirements of legislation. I don't think it will accomplish its purpose. I think it's wasteful and I think it fails in the major responsibility of having an open and honest approach that the country can debate on this issue.

[Complete statements of Mr. Rostow and Mr. Commoner follow:]

STATEMENT BY W. W. ROSTOW

The Bill before you and the testimony of the Vice President and Mr. Zarb make the basic case for the prompt creation of the Energy Independence Authority: the progressive rise in our dependence on OPEC oil to a level over

40% of consumption; the likelihood of a further rise in that dependence with economic recovery; the need rapidly to increase domestic energy production and conservation under circumstances where private profit incentives, for a variety of reasons, do not suffice to generate the necessary level of investment.

I have accepted your invitation to appear today to make two points which go somewhat beyond the conventional case for the Energy Independence Authority.

First, until something like that Authority is at work and the rate of American investment in energy and energy conservation is rising rapidly, I doubt that a fruitful negotiation between OPEC and the major oil importers will be possible. Right now, we do not have a national or an OECD energy policy worthy of the name. Our only serious leverage on OPEC, aside from economies induced by higher energy prices, has been the severe recession experienced in the past two years. That is now, to a degree, ending. OPEC's leverage will, therefore, increase. For reasons set out on pages 13 and 14 of my attached paper ("The Case for Sectoral Planning"), I believe a rational long range negotiation with OPEC is conceivable; but unless we move forward on the lines of the Energy Independence Authority, I see no reason OPEC should enter such a negotiation.

I turn now to an even more urgent reason for supporting the Energy Independence Authority: without greatly enlarged levels of investment in energy, energy conservation, and certain other directions I shall specify, I doubt that we can return quickly to anything approximating full employment. The great economic expansion in North America, Western Europe, and Japan since 1945 was based on two kinds of forces: the diffusion of the atuomobile, durable consumers goods, and the life of suburbia; and on a sharp rise in real outlays for certain services, notably higher education, helath services, and travel. The rise in energy prices has directly and indirectly weakened both these pillars of growth and prosperity. Directly, the rise in energy prices has reduced purchases of automobiles and durable consumers goods. The industries producing these products will obviously continue to play a large role in our economy; but it is unlikely that, after some quick revival from the pit of recession, they will continue to expand at the same rate as in an era of cheap energy. Indirectly, the rise in energy prices has also reduced outlays for housing: by lowering real incomes, accelerating inflation, and raising interest rates. In addition, as private real incomes stagnated or fell, a political revolt swept through the OECD world against increased public outlays at the old rate, some of which may, in any case, have been approaching natural limits. Looking ahead, I do not expect outlays for public services greatly to decline; but I doubt that they will continue to increase at the extraordinary pace of the past twenty years.

I am talking here about marginal changes in the structure of our economy; but they are significant marginal changes.

The result of these marginal changes is a universal prediction that the present recovery will leave us still with something like 7% unemployment in the United States at the end of 1976. For the OECD as a whole, the latest prediction is that, despite a moderate recovery, unemployment will actually increase during 1976 (OECD Observer, December 1975, p. 3).

This continued stagflation is not only corroding the social and political life of the advanced industrial societies, but it has radically slowed down economic and social progress in southern Europe, Latin America, Africa, and Asia, except for the oil exporters. This slackening in the world economy is obviously creating situations which provide a temptation to ambitious leaders to press outward their power and influence. It is worth recalling that protracted economic problems in the West helped quite directly to set in motion the military adventures which brought on the Second World War. In a world precariously balanced between movement towards peace and movement towards increased violence and disintegration, we need an environment of rapid economic and social progress to maximize the chance that the movement towards peace will prevail.

As for remedy, it obviously makes no economic (let alone political) sense to unbalance grotesquely the federal budget so that consumers can go on buying big automobiles and energy-intensive durable consumers goods at the old rate. A neo-Keynesian focus on the direct expansion of demand will no longer suffice.

How, then, do we get back to full employment? We must mount rapidly expanded investment in energy production, energy conservation, mass transit facilities, insulated housing, and in solar energy with existing technology; pro-

grams to clean the air and the water and otherwise to preserve the environment; programs to assure the long viability of our invaluable agricultural base; and for reasons set out in my accompanying paper (pp. 16–18) to expand outlays for research and development over a wide front.

Prosperity over the past thirty years has been based on the direct expansion of consumers income and services, with investment resulting from that expansion. In the next phase, prosperity will have to be based somewhat more on increased investment in the supply side of the question, with economic and social progress flowing from the resulting level of steady full employment.

In commonsense terms, that is just what one would expect in a world where energy is likely to be expensive until some great technological breakthroughs occur in solar energy or fusion power; where we will experience over the next quarter-century the maximum pressure of population increase on the food supply, until birth rates recede in the developing world; where we have at last recognized that we must steadily allocate significant resources to assure clean air and water. In general, we must expand in degree our allocations to sustain the inputs of energy and food air and water on which our industrial civilization depends. We cannot go on assuming that they will be cheap or free.

In all these areas—not merely energy—there is a significant marginal role for government as well as private enterprise. We shall, I believe, have to free ourselves from the rhetoric and policies of confrontation between public and private enterprise and encourage a systematic partnership—and spirit of partnership.

Therefore, we ought to split our federal budget into investment and non-investment components and be prepared to use the powers of government vigorously to expand both private and, where necessary, public investment in the directions I have indicated. The Energy Independence Authority could play a vital role in such an effort.

I will not burden you with an explanation of why our conventional economists—Republican and Democratic, liberal and conservative—find it difficult to perceive this is the way out of chronic 7% unemployment. But I would call your attention to the manner in which two studies, at least, have backed into the same broad conclusion as that I am presenting here by asking if there is going to be a capital market "crunch"—whether investment rates must be increased.

First, the study of Capital Needs in the Seventies by Barry Bosworth, James Duesenberry, and Andrew Carron. The full employment path of 4% they assume requires for its fulfillment sharply increased investment outlays in energy-related investment, mass transport, and pollution control. Second, in the January 1976 Economic Report of the President to the Congress, the Council of Economic Advisers report (pp. 39–47) a study of capital requirements down to 1980 conducted within the government. Here the target was to bring unemployment below 5% by the end of the decade. Once again, increased outlays for pollution abatement and to reduce our energy dependence on imports are critical to the conclusions reached.

My argument is, then, that the prompt creation of the Energy Independence Authority is not only necessary to reduce our balance of payments burden and our strategic vulnerability but also to acquire the bargaining leverage necessary for a rational long-term agreement with OPEC and to free us from the danger of chronically high levels of unemployment.

I urge you, therefore, to throw your weight fully behind the Energy Independence Authority. I urge you to set aside the odd alliance between some shortsighted representatives of private industry and some extremist conservationists who now oppose this Bill. Their arguments, if heeded, will neither strengthen the private sector nor enhance the environment. They will simply increase our dependence on OPEC in a continued setting of stagflation. Continued stagflation weakens private enterprise and makes more difficult the generation of the resources required to clean the air and water and otherwise preserve our environmental heritage. If you commend this Bill to the Congress, you will turn, I believe, a decisive corner in solving both our energy and unemployment problems and open the way to a rational approach to the difficult but manageable problems of the next generation.

The Case for Sectoral Planning

I

I am told by the organizers of this conference that I was invited to speak today because of the following passage in a paper I recently published: [1]

"We must operate in a world somewhere between a Keynesian mixed economy and an indefinitely prolonged war economy. We need to cultivate again the kind of indicative sectoral planning developed in Western Europe in the postwar years of reconstruction, but this time on a broader international level."

I believe that proposition holds for the next quarter-century, and perhaps for longer.

I take that view because I believe planning the sectoral pattern of investment is the key to the problem of returning to full employment and resuming a high rate of growth in the United States, the OECD world, and in the developing nations; and it is equally the key to the structural adjustments in energy, agriculture, raw materials, and the environment required to maintain the viability of the world economy. As in wartime, we must concern ourselves not merely with the level of investment and output or with the real rate of increase in investment and national output. We must concern ourselves also with the composition of investment and the composition of output. Our concern is not, of course, as detailed as it is in a war economy where reasonably precise sectoral targets are required over a wide range: uniforms and blankets, planes and ships, tanks and guns. But we are and shall remain in a world where certain types of energy and agricultural output, certain levels of purity in the air and water, certain kinds of raw materials production are achieved and sustained in our own country and in other regions of the world. And it is my central judgment that the approximation of those targets requires a significant degree of national and international planning which is not now taking place.

The point I seek to make is at once quite simple and quite difficult. In arguing it over the past year with neo-Keynesian economists, I am reminded of Keynes' observation in the Preface to his General Theory [2] on the probable reaction to his book of classical economists who "will fluctuate, I expect, between a belief that I am quite wrong and a belief that I am saying nothing new." The difficulty arises because a sectoral approach to investment and output clashes directly with the reigning modes of economic thought. These suffuse our minds more powerfully than we know. They drive us towards highly aggregated concepts focused almost exclusively on the level of effective demand which make it difficult to think systematically about our structural problems of supply. Evidently, population, food, raw materials, energy, air, water, and research and development have moved to the center of the stage in the world economy. We must act to try to make them move in the right directions. But these are variables which in modern economics are dealt with in one of four ways: they are left out of our equations (e.g., air and water); they are assumed to be fixed; they are introduced as exogenous, from outside our equations (e.g., population); or they are assumed to be easily and automatically evoked, in the correct amounts and patterns, by the price and profit incentives set up by our equations (e.g., food, energy, etc.). For good or ill, the kind of world in which we live and shall live is not well illuminated by frames of thought which are both highly aggregated and structured so as to rule out or to make dependent critical aspects of supply. An authentic revolution is economic thought is involved in the propositions I shall develop today. As always, the constructs of the past have not been rendered wholly irrelevant. As I said at the beginning, we shall continue to live, in part, in a Keynesian mixed economy where we shall continue to need the tricks and methods of modern income analysis. But Walter Heller spoke with precision as well as wit when he said in December 1973: "We [economists] have been caught with our parameters down." A great deal of useful ad hoc work is now going forward, conducted by economists and others, addressed to the problems of energy, population, food,

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[1] "The Developing World in the Fifth Kondratieff Upswing," Annals, No. 420, July 1975, p. 114.

[2] J. M. Keynes, The General Theory of Interest, Employment, and Money, New York: Harcourt, Brace and Company, 1936, p. v.

etc. But before we have a firm grasp on our times and its problems—before politicians and citizens see the panorama we confront and what we must do to cope with it—we economists will have to create new structures of thought, which fit these problems into a comprehensible dynamic theory of production and prices. That dynamic theory must be based on a different set of parameters than those now conventionally taught or buried implicitly in our arguments and prescriptions; and, in the end, it should provide the intellectual basis for the sectoral planning we require.

II

So much by way of introduction. I shall develop this theme in four segments:

First, the relation of sectoral planning to our return to full employment;

Second, the relation of sectoral planning to the medium term structural adjustment required in the world economy (and the United States) between now and 1985 and, indeed, over the next quarter-century, as nearly as we can perceive;

Third, a brief aside on inflation;

Finally, some observations on the implications of all this for the position of the United States in the world arena, our security, and the prospects for peace.

First, then, the return to full employment. The debate about the current state of the American economy is characterized by a curious paradox. The paradox illustrates the clash between highly aggregated and sectoral methods of analysis. On the one hand, we are worried about the sluggish recovery now taking place in the United States and the OECD world. The forecast is that by the end of 1976 we shall still be wallowing along with something like 7% unemployment. If past patterns, hold, this implies perhaps 12% unemployment for non-whites, 18% unemployment for those (white and non-white) 16–19 years old. In Europe, governments tend to look for an export-led return to full employment; but, as the London Economist recently reminded its readers,[3] "You Can't All Export at Once." At the moment, the estimates are that the OECD world will move ahead in the second half of the 1970's much more slowly than in the 1960's, with serious decelerating consequences for the rate of growth in the developing regions.

On the other hand, economists and others are worried about a capital market crunch. Adding up the volume of investment required for new forms of energy and energy conservation, antipollution programs, and other investment implications of stated public objectives, many feel instinctively that, in the time ahead, the United States will require a higher investment rate in relation to gross national product than in the past. The OECD energy analysts, for example, after estimating a rise of 44% in the proportion of energy to total gross fixed capital formation, between 1977 and 1985, with oil at $9 per barrel, counsel against seeking a much higher level of energy independence because of its potential conflict with "other objectives of government policy concerning income distribution, industrial structure, and policies aimed at combating inflation."[4]

In their analysis of *Capital Needs in the Seventies*, James Duesenberry and his colleagues examined carefully whether 'we could afford the future' in terms of capital requirements for high priority social purposes.[5] They conclude: "We can afford the future, but just barely"; that is, they calculate increased outlays for energy, anti-pollution measures, and public transport, are more or less balanced out by relatively diminished outlays for education and the interstate highway system if there are no new major social programs, if we move to a federal budget surplus, and if a high average rate of growth yields its flows of both private investment resources and government revenues.

The paradox of severe unemployment and unused capacity versus the capital crunch was vivid but unresolved in the response of Walter Heller to Secretary

[3] July 12, 1975, p. 68.

[4] "Energy Prospects to 1985," summarized in OECD Observer, No. 73, January-February 1975, pp. 18-19. The caution is expressed with respect to a full exploitation of OECD's energy import replacement potential, which could reduce the proportion of imports by 1985 to 2-7%, as opposed to 36% in the early 1970's, 21% in the "$9 case".

[5] Barry Bosworth, James S. Duesenberry, and Andrew S. Carron, Capital Needs in the Seventies, Washington, D. C.: The Brookings Institution, 1975.

of the Treasury Simon's proposal this summer for increased tax incentives for private investment.[6] Heller points to American industry operating at about 80% capacity. He implies that to cut business taxes now would be pushing on a string: there would be no significant investment response. He argues that the aggregate level of investment in relation to GNP has remained stable over the past decade; that a high rate of economic growth would generate the savings and investment to meet the investment needs of the next decade; and that we require, therefore, increased general stimulus to consumption and a closing of tax loopholes rather than regressive tax changes to stimulate investment at a time of large, idle industrial capacity. As a debating matter, Professor Heller scores some good points; but this is because the Ford administration then posed the problem in an over-aggregated way, permitting Heller to reply in similar terms. With great respect, I submit that both Simon and Heller fail to get at the root of the matter.

What is required in the United States (and in other OECD countries) to get back to full employment is not an undifferentiated expansion of investment; but a rapid expansion in certain particular directions. We now know those directions in the United States: new energy resources; energy economy; investment to clean the air and water; insulated housing; mass transport. To these I would add, for reasons I shall later develop, radically expanded investment in R&D and, quite possibly, investment to rehabilitate agricultural acreage we believed was arable until we took off acreage restrictions and found the land sub-marginal.

My central point, then, is quite simple: the return to full employment should come from rapidly expanded investment in certain key sectors; private enterprise has a role in each of these sectors; but in none of them will investment expand promptly enough and on a sufficient scale to bring us back to full employment unless the government acts in various ways to make investment flow. In some cases, direct government outlays are necessary; in others, the settlement of conflicts between production and environmental criteria; in others, legislation is required; in others, one form or another of subsidy or guarantee.

Thus, to get back promptly to full employment requires more of government policy than either Simon or Heller imply; although, evidently, intelligent fiscal and monetary policies retain an important role. A return to full employment on a viable basis requires intimate and painstaking sectoral collaboration between the public and private parts of our society.

As one who would prefer to see private enterprise carry forward the economy to the maximum and who believes government intervention has its costs, as well as benefits, let me put the question bluntly: Why is it that neo-Keynesian prescriptions for reducing unemployment through stimulus to consumers demand are not now sufficient? The answer is that the inescapable imperatives of higher energy prices and, for some advanced industrial countries, a sharp unfavorable shift in the terms of trade, have cut into real income. These factors (reflecting both price and income elasticities of demand) have radically reduced consumers' outlays on postponable items; notably, automobiles and other consumers durables. They have also reduced the demand for housing. Against this background, and the combination of inflation and recession, governments cannot compensate adequately by rapidly expanding real outlays for social services (e.g., education and health care). These may, in any case, be approaching natural limits. The rapid expansion of OECD exports to the OPEC countries has been a balancing factor in terms of employment. But it also constitutes a quite insufficient compensation for these decelerating private and public outlays. Thus, the rise in energy prices has weakened the leading sectors which have carried forward economic growth in North America, Western Europe, and Japan over the past quarter-century. Resumed prosperity and growth require a massive shift of investment in new directions; and these directions (unlike automobiles, durable consumers goods, and suburban houses) require an enlarged government role and serious, sustained public-private collaboration.

Put another way, it is the multiplier (expanding income and employment through new forms of investment) rather than the accelerator (expanding investment through the increase in income), that will be rather more required

[6] "Taxes and the 'Capital Shortfall,'" Wall Street Journal, August 19, 1975.

than in the recent past to pull the OECD world out of recession and back to sustained growth. In a sense, we are returning to the dynamics of the pre-1914 world economy—the world of railroads, steel, and the opening of new territories—as opposed to the environment we have known since the 1920's when the leading sectors of high mass-consumption emerged, and investment was closely linked to the expansion of consumers' outlays on durable goods and certain services. This proposition relates, of course, to a marginal shift in the relative role of the two inter-acting mechanisms, not to a complete reversal. Surely, various built-in supports to the level of income and consumption have cushioned the recession of 1974–75 in the OECD world, as have government deficits; and this cushioning has prevented even greater declines in investment levels than those which have in fact occurred. And surely, as I have said, fiscal and monetary policy must contribute further to the return to full employment. Nevertheless, the marginal shifts required in the workings of the OECD economies are of significant orders of magnitude. They are the basis for my short-run case for sectoral planning.

III

I turn now to the longer run case for sectoral planning. A new phase in the history of the world economy began at the close of 1972 when bad harvests and the Soviet grain deal caused a convulsion in grain prices. World food reserves, waning in the 1960's as a proportion of world consumption, suddenly disappeared. At the same time, United States gas and oil reserves in relation to consumption were declining, and production began absolutely to decline after 1970. Then in the autumn of 1973 came the quadrupling of the oil price. Raw material prices simultaneously moved up across the board under pressure of a powerful worldwide boom. Although raw material prices have considerably softened in the subsequent recession of the industrial world, most analysts would agree that the prospects in the time ahead are for relatively expensive energy and food; and if the world economy recovers its lost momentum, in raw materials as well. The price revolution of 1972–75 yielded an accelerated general inflation; an extremeley high range of interest rates; pressure on the real wages of industrial labor and on those with relatively fixed incomes; a shift of income and in the terms of trade favorable to producers of food as well as energy.

This is the fifth time in the last two hundred years that such a shift in relative prices has occurred; and on each of the other four occasions it has been accompanied by exactly the manifestations we have experienced since 1972. The other four occasions occurred in the 1790's; the early 1850's; the second half of the 1890's and the late 1930's. On each occasion these prices then remained in a relatively high range for about a quarter-century. A roughly equal period followed in which the trends reversed. Each of these periods was, in an important sense, unique; but the fact is that the world economy for almost two centuries has been subject to a rough and irregular pattern of long cycles in which periods of about 20 to 25 years of high relative prices for food and raw materials gave way to approximately equal phases of relatively cheap food and raw materials. The last downswing ran from 1951 to 1972. I am not wedded to the notion that these cycles will continue into the future. But I would guess that the inexorable pressure of excessive population increase in the developing world; the tendency of the poor to spend increases in income disproportionately on food; the rising demand for grain-expensive proteins; the pace of industrialization among those catching up; and the strains of the energy crisis will persist. Given these powerful and sustained demands operating on food, energy and raw material prices, and the costs we shall have to incur to achieve and maintain clean air and water, I believe we are in for a long period when the prices of these basic inputs to the economy will remain relatively high. Down to 1914 the classic response was to open new agricultural and raw material producing areas: the American West, Canada, Australia, Argentina, the Ukraine. The great movements of international capital during this era were, in substantial part, induced to bring new supplies into the market and to restore balance in the industrializing world by the price system, combined with new technologies of transport and production. But we confront this trend period in a setting quite different from that of the past. We cannot rely wholly on the automatic workings of the price system and pri-

vate capital markets to restore and maintain balance. All over the world, in one way or another, policy toward resources is in the hands of governments or is strongly influenced by governments. At every stage, therefore, public policy will be involved, seeking, if we are wise, to reinforce—and in some cases to control—the incentives and constraints set up by the price system.

What, specifically, do we have to do to bring the world economy back towards some kind of balance?

First, we need a concerted effort among energy importers to generate a mixture of expanded output and energy conservation sufficient to give us the bargaining leverage to negotiate a rational and equitable long-term agreement with OPEC. A. large part of that effort must be undertaken by the United States, given the availability here of alternative energy resources and, perhaps, greater margins for energy economy. As among Western Europe, Japan, and the United States, only we command the capacity to reduce sharply our OPEC imports by 1985. We owe it not only to ourselves but to all energy importers to do so. If we do, there is a fair chance that an agreement could be reached between OPEC and the importers reconciling the three criteris which ought to be respected; an energy price sufficiently high in the United States and other advanced industrial countries to encourage economy and conservation and to induct the R&D required to supplant oil and gas as a primary energy source by, say, the end of the next generation; a politically and economically reliable flow of oil to consumers in advanced industrial countries at a price which does not impose chronic economic stagnation through excessive balance of payments pressures; a reliable long-term flow of oil to non-OPEC developing nations which would permit them to accelerate agricultural production and resume over-all growth at high rates, either via a concessional oil price or via long-term OPEC aid on a scale (along with OECD aid) capable of achieving the same dual objectives. To achieve the requisite bargaining position, the OECD world evidently requires a concert among national programs of energy production, conservation, economy, and R&D we have not yet achieved. The price system is slowly pushing us in the right directions; but the price system by itself is palpably insufficient. And then we shall have to achieve a diplomatic concert for the negotiation with OPEC which also does not now exist.

Second, agriculture. It is now agreed in the international community that while the OECD world can help, the task of feeding the inescapable increase of population in the developing world between now and the year 2000 must be undertaken primarily through a sharp increase in the rate of growth of agricultural output in Latin America, Africa, the Middle East, and Asia. This is an important consensus and a major result of the various international meetings of the past two years. As I say, the OECD world can help in various ways: by generating reserves for famine; supplying capital and technical assistance; offering enlarged markets for some agricultural exports. But the crucial variable may be the rate of increase of chemical fertilizer consumption in the developing regions. To achieve that increase will require public-private collaboration on a truly international basis. The domestic agricultural policies of developing nations are involved as they affect the incentive for farmers to use more fertilizers; their policies towards foreign private investors in their countries are, in some cases, involved; the direction of public as well as private aid flows is involved; the possibility of guarantees may have to be considered in case of temporary fertilizer surpluses, so that investment in fertilizer capacity can proceed at a higher rate without excess anxiety; and, finally, there is the question of the price of fertilizer feedstocks, which comes to rest on OPEC's price or OPEC's aid. Here, evidently is a task for sectoral planning on an international level of critical importance.

Third, international anti-pollution measures. In the OECD world, nations have generally moved to increase investment significantly to clear the air and water. This is proving a manageable but expensive task. We may argue about standards, time periods to achieve them, and trade-offs; but the fact is that we have irreversibly accepted the fact that air and water are not free goods; and we shall have to argue about and plan the air and water sectors for as far ahead as any of us can peer. But we have barely begun the task of coming to grips with the international dimensions of the problem, notably with respect to the seas and oceans. Here, again, sectoral planning will have to become international if the Atlantic and Pacific, the Baltic, Mediterranean, and Rhine are to be tolerably maintained.

Fourth, raw materials. The world recession has, for the moment, cut raw material prices. If the world economy resumes and maintains high growth rates, a range of issues similar to but less acute than those we confront in energy will assert themselves. As in the case of energy, there is no known physical limit to raw material resources on the planet. But a great deal of creative effort will be required to continue to fend off diminishing returns; to conserve and recycle; and to create an international framework within which the legitimate interests of producers and consumers are reliably guaranteed.

Fifth, R&D. I cannot prove it, but I am morally certain that the maintenance of a rapidly growing industrial civilization requires a substantial increase of investment in the form of R&D. The imperatives of our situation are already at work in the energy sector. The most thoughtful analysis of American agriculture I know commends an increase in agricultural R&D; that is, the report on Agricultural Production Efficiency [7] done by the National Academy of Sciences. We ought to be learning more about climate, as well as new anti-pollution technologies. I would expect us to have to be creative with respect to raw materials over the next generation. We owe it to the developing nations to find birth control methods that are cheaper, psychologically easier to accept, and longer lasting than any we now have. There is a lot more to bringing birth rates down rapidly than birth control devices. But their inadequacy has diminished the effectiveness of family planning efforts in the southern continents.

The list could, evidently be extended; but the underlying reason for my judgment about the necessary scale of R&D is that, as compared to the longer past, we cannot generate the new, necessary inputs to the world economy simply by opening up new territories. There is no American West, Argentina, Canada, or Australia to redress the balance of industrial civilization. A few frontiers there are: Alaska and the North Sea, Siberia and the seabeds. But every projective analysis of the longer future I know—pessimistic or optimistic—comes to rest technically on the capacity of the human race to continue to defeat classical diminishing returns with R&D and thus to provide a viable base for a global industrial civilization whose vast scale will be determined by both the inescapable expansion of the world's population over the next century and the determination of the developing world to achieve a meaningful version of affluence.

From the special perspective of this discussion of planning, R&D is a form of investment that requires a significant public role. A great deal can be done and should be done by the private sectors in response to private profit incentives; but public policy must set priorities and otherwise assure that R&D is directed to ends which respect non-economic values (including the environment and national security) and which guarantee work is done which is too large, risky, or distant in time for the private sector to undertake.

And if, as I believe, R&D may prove to be our scarcest and most vital sector for the next generation at least, there is, as with energy, agriculture, raw materials, and the environment, a whole new world of diplomacy to pioneer in achieving effective coordination of national efforts geared to commonly perceived priorities.

So much for my positive longer run case for sectoral planning. I could, of course, debate the matter much more simply. The fact is governments are in the sectoral planning business, including the government of the United States. Indeed, bad sectoral planning, here and abroad, accounts not for the existence but for the severity of our current agricultural and energy problems. Governments are deeply involved in R&D. There is no indication governments are about to get out of the sectoral planning business. The objective, therefore, is to do the best job intelligence and a sense of proportion permit. But to arrive at this conclusion, by one route or another, is the beginning, not the end of the matter.

Governments face tasks as basic as new forms of data collection and as difficult as guiding the private sectors on to the right patterns of investment without frustrating them and destroying their powers of initiative. With respect to energy, for example, Edward Teller's report [8] concludes with four-

[7] Washington, D. C.: National Academy of Sciences, 1975.

[8] *Energy: A Plan for Action,* New York: Commission on Critical Choices for Americans, 1975.

teen substantive recommendations for federal action under the heading of conservation; nine bearing on energy in relationship to the environment; seven with respect to oil and gas production; four with respect to coal; seven with respect to nuclear reactors; two with respect to electricity; twenty-two with respect to R&D; five bearing on demonstration plants; one concerning underground nuclear plants; three with respect to highly specific forms of international cooperation; and four general and institutional recommendations, including the creation of a National Resource Mobilization Corporation, a recommendation to which the Ford administration has already responded. Every one of these seventy-one recommendations involves technical and/or policy complexities, including, in some cases, legislation.

The Ford Foundation report on energy concludes with almost as long a list.[9] Studies of family planning, agriculture, raw materials, and the environment emerge with similar catalogues of recommended public action, national and international.

Without accepting or rejecting any particular prescriptions, they all reflect a simple fact: in the modern political world the price system will not suffice to bring about the kinds of structural adjustments—the changed patterns of investment—our common situation requires. This does not mean we must create large new bureaucracies. The bureaucratic raw materials for effective national planning are sprawled all over this city, in a variety of poorly coordinated departments and agencies. What we lack are three things:

The kind of data intelligent sectoral planning demands;

A Council of Economic Advisers and a centralized Economic Policy Council organized so that they can set, in coordination with the Congress, national sectoral targets in relation to what is going on in the world economy as a whole;

And, above all, new attitudes of mind in the Executive Branch and the Congress, the business community and the public, which would support the collaboration of private and public segments of our society in achieving large common purposes.

But behind each of these requirements is the basic need for a consensus on where we are in the sweep of our own economic history and the evolution of the world economy; and a common sense of direction for the next years and generation.

IV

Now one observation about inflation which is, evidently, as large a subject in itself as planning. Inflation relates to planning technically because wage-push inflation complicates the investment tasks we face, erodes provisions for the future, inhibits the vigorous pursuit of full employment, and, by setting each group in society against every other, makes difficult the national consensus we badly need for effective planning.

My observation is that the coming together of the public and private institutions of our society needed for selective sectoral planning should also make it easier for us (and the OECD nations in general) to bring under control the pathology of wage-push inflation. As an early observer of European income policies remarked, a disciplining of wages and prices must be "part of a coordinated effort to achieve a clearly defined national objective."[10] The appropriate objective of the OECD nations should be clear enough: to resume regular growth in ways which maximize the chance that their own societies and the larger civilization of which they are a part remain viable. Within the framework of that kind of consensus, it ought to be possible to achieve stable social contracts relating money wages to increases in productivity, and to do so in ways which do not result in an excessive surge of profits. My own preferred formula is radical by the standards of contemporary neo-Keynesian economists but more understandable to students of economic history who have examined the protracted periods in the past when wages were stable, prices falling, and real wages rising. It should also commend itself to those who have examined the dangerous problem of wage struggles and strikes in the public service sector of our economy. My formula is: a protracted wage freeze for at least

[9] *A Time to Choose: America's Energy Future,* Cambridge, Massachusetts: Ballinger Publishing Company, pp. 325-343.

[10] Mark Leiserson, *A Brief Interpretative Survey of Wage-Push Problems in Europe,* Study Paper No. 11 for Consideration of the Joint Economic Committee, 86th Congress, 1st Session (Washington, D. C.: GPO, 1959), p. 55.

five years, accompanied by strong, credible measures to ensure that increases in productivity are passed along to the consumer in lower prices and not trapped in excessive profits. This would require not merely mutual assurances among business, labor, and the Executive Branch, but also the backing of the Congress. Ultimately, what is involved, however, is not a technical formula, but a coming together of labor, business, and government to achieve a common goal. And, in this case, the common goal reflects the authentic long-run interests of business and labor, since both groups suffer severely, on balance, from the multiple consequences of wage-push inflation. I am well aware that it is not easy to create a negotiating framework in which authentic long-run interests triumph over even chimerical short-run interests. The mediocre record of efforts in this direction by OECD nations over the past generation underlines the psychological, institutional, and policial difficulties involved. I raise this issue without naivety. But in a time when a higher sense of communal purpose will be, in any case, required to move the major sectors in the right directions, the chances of instituting more stable social contracts, capable of disciplining wage-push inflation to common advantage, should be enhanced.

V

Now a final word about the relationship of this argument about sectoral planning to the larger questions of the American role in the world and the task of moving towards stable peace.

If I am right about the character of the period we entered at the close of 1972 and the character of its remedy, the responsibilities of the United States and our potential for influencing constructively the world economy have risen in a rather dramatic way. The American role emerges from five circumstances.

First, the United States, if it continues to nurture its agricultural base, is and should remain the dominant source of food exports, including exports required to certain developing nations until their own production can be expanded at a higher pace. About 75% of the world's grain surplus flows from the United States. The United States agricultural export capacity is also a significant cushioning factor in our balance of payments strengthening the relative position of the dollar among the major currencies and making more possible large oil imports. In addition, the flow of grain from the United States is important to the Soviet Union, Eastern Europe, and China, all of which are now in a chronically deficit position. The deficit each year varies with the harvests, but it is not likely to disappear. This important requirement does not give the United States a blackmail power over the foreign policy and international behavior of these nations. But it is a fact of life with which they must reckon—and a stabilizing fact of life.

Second, as I noted earlier, the United States alone commands sufficient alternative energy resources to reduce sharply OECD dependence on OPEC oil and, thereby, set the stage for well-balanced agreement between oil producers and consumers. If we do so, OPEC would face the choice of reducing its prices or forcing certain of its members (notably, Saudi Arabia) to cut output to unacceptable levels. The combination of good weather last winter and the OECD recession began to pose this problem to OPEC at its recent meeting. But they have thus far been protected because the United States lacks an energy policy worthy of the name. If we are to get a rational oil policy in the world—relieving the burden imposed by OPEC on the poorest nations, easing the vulnerability of the OECD nations, insulating our foreign policy from blackmail—it will come about only if we break the costly impasse between the President and the Congress and get on with the job.

Third, the energy and energy-related investment requirements in the United States are so large that it should be easier for the United States to return quickly to full employment and thereby help lead the OECD world in that direction. Changed patterns of investment will be required in all OECD countries in the next phase of growth. They cannot rely wholly on a prior American revival permitting a return to full employment based on expanded exports to the United States. Nor can they continue to rely, as over the past generation, on rapid expansion in production of automobiles, durable consumers goods, and other energy-intensive products. But the scale of additional investment required in the United States in the expansion of energy output, the diffusion of methods for energy conservation, mass transport facilities, insulated

housing, and energy R&D are such as to make it somewhat easier for the United States than for others to return to full employment on such foundations and to help, at least, to lead the OECD world back to full employment and regular growth.

Fourth, the United States evidently has special advantages and responsibilities in the R&D sector as a whole. The American advantage stems from the absolute sclale of our R&D resources and the potentialities for orchestrating them efficiently within a single national community. The proportion of United States GNP spent on R&D has fallen into the same range as that, say, of Germany and the United Kingdom (say, 2.2% per annum); but the absolute level of American R&D expenditures still towers over that of the other major industrial nations—by a factor of ten. If organized around the appropriate priority tasks they are an asset of universal value; and they place on the United States a special responsibility in bringing about effective international cooperation in this domain.

Finally, the United States has a special responsibility for political leadership in dealing with the new economic agenda. In part, this flows from our potentialities in agriculture, energy, research and development. But it is also the case because if the United States fails to lead there is, as yet, no nation or political group that can fill the gap: Western Europe is insufficiently unified; Japan too vulnerable; the Soviet Union too constricted by its ideological commitments to lead comfortably a heterogeneous mixture of polities; China is similarly constricted and at a stage of development when its inner problems and border anxieties must dominate its energies. Leadership in this context in no way implies dominance. It requires a mixture of three elements: a national capacity to act significantly with respect to the major issues; a capacity to define common objectives in ways that are not excessively self-serving; and, then, the capacity to help translate those objectives into a working agenda, and to help move it forward with dogged stubbornness. These are assets the United States potentially commands.

After a wobbly start in 1974, the United States began to exercise this potentiality in the critical area of North-South relations during the September 1975 special session of the United Nations Assembly. Over the previous year things went badly. There was the acrimonious United Nations General Assembly debate of April 1974; the population meeting at Bucharest; the food conference at Rome; and the sterile session on the law of the sea at Caracas. In all of them, the air was filled with rhetoric about imperalism; with claims for the unilateral transfer of resources from the rich to the poor; with the ardent assertion of national sovereignty by the less developed nations, combined with equally ardent demands that the more developed states surrender sovereignty and behave in terms of the requirements of the international community. It was not difficult to envisage all this yielding a neomercantilist fragmentation of political, economic, and military affairs—and disaster for the human race—as men and nations squabbled meanly for scarce resources in a nuclear age.

The September 1975 meeting was better not only because the United States outlined the headings for a North-South partnership but for two other reasons. The developing nations, which in 1974 were talking about the excessive raw material consumption of the North, had felt fully the effects of recession in the North. Their exports and export prices were down and their development prospects were badly damaged. In addition, they had come to appreciate how badly damaged they were by OPEC's price policy. The somewhat specious unity of OPEC and other developing nations in 1974 was strained. The result was a wide-ranging series of formally agreed resolutions covering aid, trade, agricultural production, the transfer of technology, commodity agreements and the other legitimate headings for action if North-South confrontation is to be converted into the partnership the facts of interdependence demand.

But it was only a beginning. United Nations resolutions do not automatically translate themselves into action. Hard work lies ahead. Moreover the United States took its distance from several important resolutions including that which reaffirmed the United Nations aid target for the 1970's: an expansion in official aid by 1980 up to the level of 0.7% of GNP as opposed to the present figure of about one-third that proportion.

Right now, the potentialities of North-South partnership—and much more—are endangered. The danger is not of a great depression. It is of a protracted period of chronically high levels of unemployment, with its damaging social

consequences compounded by continued high rates of inflation. These could bring about a kind of progressive weakening of our society like that experienced by Great Britain between the two world wars. It would enfeeble the OECD world and drag down the rate of recovery of the developing nations. The World Bank staff recently estimated that if the OECD countries grow in the second half of the decade at an average rate of 4.9%, the lower income developing countries will more ahead at 1.2% per capita—an inadequate but positive rate. If the OECD countries grow at only 3.5%, the poorest nations will virtually stagnate. Moreover, it is extremely doubtful that, if the OECD world continues to experience a disappointing recovery and sluggish growth rate, it can generate the political will to liberalize trade, expand aid, and do the other things a serious North-South partnership requires.

Something of the same can be said for the prospects of detente and the stability of Europe, the Middle East, and Asia. It is worth recalling that the chronic debilitation of Great Britain between the two world wars weakened in quite direct ways the balance of power and palpably played a part in bringing on the Second World War. It is not difficult to envisage an America, failing to solve its domestic economic problems, wracked by increasing social unrest, turning away from its responsibilities in Europe, the Middle East, and Asia. In that process, the potentialities of detente could easily be lost and important parts of the world plunged into chaos or worse.

On the other hand, if we can shake loose from the neo-Keynesian framework which distorts the vision of our task, define our agenda, and act on it with the President and Congress united, the prospects are rather hopeful. The stabilization of the Middle East and Asia as well as Europe is not impossible; the economic tasks of the quarter-century ahead are difficult but doable and, in their way, rather exciting.

In a toast to the Royal Economic Society in December 1945, shortly before his death, Keynes spoke of economics and economists as "the trustees not of civilization but of the possibility of civilization." That has never been more true than of this time when we must shift from an obsessive focus on effective demand—which Keynes' *General Theory* set in motion—to the generation of the sectoral inputs required to sustain an industrial world economy. Keynes would have been among the first to urge us to make that shift.[11]

STATEMENT OF BARRY COMMONER, DIRECTOR, CENTER FOR THE BIOLOGY OF NATURAL SYSTEMS, WASHINGTON UNIVERSITY, ST. LOUIS, MO.

It is widely acknowledged that the U.S. lacks a national policy to govern the production and use of energy, and that this defect has caused serious economic difficulties and threatens us with worse ones in the future. The energy problem is huge in its size, complex in its design, and pervasive in its effects on the nation's economy. The Energy Independence Authority Bill matches these needs only in the huge size of the expenditures which it proposes to authorize. In response to the enormously complex problem of balancing energy use against domestic supplies ("energy independence")—which, as we know from the Laws of Thermodynamics, requires a detailed matching of the thermodynamic qualities of different energy sources to the qualities of the numerous tasks to which energy must be applied—the Bill proposes only to "assure the flow of capital funds to domestic energy production." And the Bill fails utterly to deal with the powerful effects of the productivity of the capital that it proposes to invest (that is, the amount of energy produced, or saved, per dollar of capital invested) on the cost of energy and of capital itself, and the pervasive effects of these costs on the entire economy.

These are fatal flaws, and because of them, I believe that the Bill is much more likely to widen the gap between energy demand and domestic supply than to accomplish its stated purpose of reducing that gap and of achieving "energy independence."

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[11] This observation reflects not merely a judgment about Keynes' flexibility of mind but the fact that, as a young man, he was much concerned with the problem of the relative (See, notably, his note "Return of Estimated Value of Foreign Trade of United Kingdom at Prices of 1900," *Economic Journal*, 1912, pp. 630–31.) This anxiety suffused his *Economic Consequences of the Peace*, especially Chapter II. His focus shifted quickly, however, when the break of relative prices in 1920-21 confronted Britain with excessively favorable terms of trade, weakened export markets, and chronic high unemployment.

The gravely flawed character of the Bill is revealed in its chief purpose, as set forth in Sec. 102(a) "To encourage and assure the flow of capital funds to those sections of the national economy which are important to the development of domestic sources of energy or which are otherwise important to the attainment of energy independence for the United States by 1985 . . .". Thus the Bill is basically designed to meet the intense demand for capital by the energy industries. However, presumably the purpose of disbursing these huge amounts of capital is to receive value in return, specifically enhanced domestic energy production, or its equivalent in the matter of achieving "energy independence", reduced demand (for example through conservation). What is relevant, then, is the productivity of capital—for example, the amount of annual energy production achieved per dollar of capital invested in a given energy source.

The productivity of capital invested in various energy sources is shown in the attached table. Different fuels vary by more than twentyfold in the amount of energy that they yield per dollar invested. Thus, if capital is invested in the production of shale oil or of synthetic fuel from coal—new technologies which, according to the Fact Sheet on the Energy Independence Authority released by the White House on October 10, 1975, would be given high priority by the Authority—it yields about one-tenth as much energy as the same amount of capital invested in enhanced oil or coal production. If, as is evident from the language of the Bill, the Authority would operate under a mandate to increase the flow of capital into energy production, it will obviously tend to spend its funds on those forms of energy production which generate the highest demand for capital—precisely because they are so inefficient in converting the invested capital into actual production of energy. This aim is explicitly acknowledged in the White House Fact Sheet, which emphasizes the need for funds to support, specificially, those methods of energy production (shale oil, synthetic fuels and nuclear power) that yield a poor return in energy produced per dollar of capital invested. That, after all, is the very reason why these sectors of the energy industry are so badly in need of capital. In a kind of parody of the wartime "Efficiency Award" to U.S. industry, the Bill would create a program of costly "Inefficiency Awards" to the energy industry.

In effect paragraph 102(a) of the Bill's purposes essentially guarantees that huge amounts of public funds would be spent wastefully. And in this particular case, the waste of public funds would represent not only an added tax burden, but would also create an additional inflationary effect, for energy production at low capital productivity can be profitable only if the energy is sold at a high price. This fact was publicly acknowledged by the Administration when President Ford and Secretary Kissinger, in February, 1975, called for a floor on crude oil prices in order to protect private investments in synthetic fuel production. In this sense the Bill does have its own perverse kind of efficiency: in a single move it would simultaneoulsy waste the taxpayer's money, and reduce the value of what he has left to spend.

That the proponents of the Bill themselves anticipate that it would enormously reduce the productivity of capital—the efficiency with which the investment is converted to actual energy production—is evident from a comparision of figures provided by the White House Fact Sheet with those reported in the attached table. According to the Fact Sheet "The $100 billion for energy projects could help assure that the equivalent of up to 10–15 million barrels of oil per day of new energy production is realized by 1985". This would represent a capital productivity of about 200,000 to 310,000 BTU's of energy per year per dollar invested. The gross economic inefficiency of this investment can be judged from the capital productivity of overall energy production in the U.S. in 1973: 1,845,000 BTU's per dollar invested. Thus the productivity of the capital invested by the Authority would be about 85 percent lower than the overall productivity of capital invested in energy in 1973—a difference which would be even greater if inflation were taken into account.

It is worth noting that a nonrenewable fuel, such as crude oil and natural gas, becomes increasingly capital-intensive as production continues. Each barrel of oil taken out of the ground makes it more expensive to produce the next one. The law of diminishing returns is at work and, as shown by the first two items in the attached table, capital productivity is bound to fall. In contrast, a renewable energy source, such as the sun, is not affected in this way; after

all, capturing one sunbeam makes the capture of another one no more costly. Thus, investment in solar energy is the one way to produce energy that avoids escalating capital costs. By reducing future fuel expenditures at escalating prices, solar energy is also a powerful hedge against inflation. And, in keeping with its perversely wasteful approach to energy production the Bill gives a noticeably low priority to solar energy.

In order to appreciate more fully the enormously wasteful approach that the Bill represents it is useful to consider the basic relations between the physical and economic aspects of the energy problem. In physical terms the end-use of any source of energy is work, and the amount of work that energy yields is the basic measure of its economic value. Therefore if we are to measure the actual value to be got out of a capital investment in energy production we must determine not only the amount of energy yielded, but also the efficiency with which that energy can be converted into work. The Laws of Thermodynamics—the science of energy—tell us that the efficiency with which an energy source is converted into work depends not only on the nature of the source, but also on how well it is matched to the energy-using task. Thus, mechanical motion (for example, of a vehicle) demands energy of a high thermodynamic quality, while space heat can be provided by low-quality energy. Similarly, the electricity produced by a power plant represents energy of high thermodynamic quality, while the low temperature heat which the plant rejects into the environment represents low-quality energy. Thus, to maximize the efficiency with which such energy is used, the power plant's electric output should be used exclusively for tasks (such as transportation, and other motor-drive activities) that demand high quality energy, while its low quality output of rejected heat should be used for low-quality tasks such as space heat. Thus, when electricity is used to provide space heat—a process which is very widespread and still being encouraged by some power companies—the true thermodynamic efficiency is about one percent. When the overall efficiency with which energy is used in the U.S. is computed according to these thermodynamic principles, it turns out that it is not more than about 10–15 percent. This shockingly low thermodynamic efficiency—which was estimated for the first time about a year ago by a study group of the American Physical Society—tells us that the most important way to reduce the present gap between energy demand and domestic energy supply is to improve the efficiency with which it is used. How far we are from even addressing this task is evident from the fact that although the most efficient means of land transport is the electrified railroad, less than one percent of our railroad locomotives are electrified. If there is a real need to close the gap between energy demand and domestic energy production, the sensible route to take—which has thus far been grossly neglected by the Administration—is energy conservation, based on these thermodynamic principles.

If the Bill is enacted it would encourage not only the wasteful production of energy, but also its wasteful use—and thus tend to widen the gap between domestic supply and demand. This would result from the emphasis—which is evident in the language of the Bill and of the White House Fact Sheet—on meeting the intense demand for capital for nuclear power production. As shown in the attached table, the productivity of energy production in the form of electric power is considerably less than the capital productivity of direct fuel production. This makes good economic sense because of the high thermodynamic quality of electricity: once it has been produced it can be applied to high-quality tasks such as motion with essentially 100 percent efficiency. However, the extra capital cost of producing electricity is economically sound only if the electricity is used for high-quality tasks (which, as indicated above, it is not), and the rejected low-quality heat is used for low-quality tasks such as space heat. However, because nuclear power plants are too risky to be sited in urban centers there is no way to use them with maximum thermodynamic efficiency by piping their rejected heat into nearby homes.

Perhaps the most dangerous feature of the Bill is that it is a "hit-and-run" attack on the energy question. In less than ten years the Authority would pump a huge amount of capital into the most wasteful forms of producing energy and would then go out of business—washing its hands of the inevitable economic chaos that would result. Using the "flow of capital" as its criterion of success, and mandated to disburse its capital at what amounts (given the complexity of the problem) to breakneck speed, the Authority would inevitably fund those energy projects that can be quickly assembled. This would, of

course, favor single, huge projects, thereby avoiding the need for locally suitable—and therefore more varied and numerous—designs. Inevitably, the Authority's funds would be spent for relatively few, huge synthetic fuel and nuclear plants rather than for solar projects which, given the wide distribution of sunshine and wind, are best designed as relatively small, decentralized units. Inevitably, the Authority would saddle the nation with few, huge, enormously costly—and risky—projects, for as pointed out by the White House Fact Sheet, it is precisely those energy sources which suffer from "technological uncertainties" or are "too large and economically risky to be financed by the private sector alone," that would be supported by the Authority. In sum, the Bill would not only lead to a wasteful, inflationary use of capital, but also tie up that capital in projects which, given their "technological uncertainties" are likely to produce not so much huge energy sources as huge white elephants.

As a final irony, the Bill, if enacted, might direct so much of available capital into the wasteful maw of huge energy projects as to starve the customers that the energy industry is supposed to serve of the capital that *they* need to buy the cars, homes and factories that are, after all, the reason for energy production in the first place. Between 1970 and 1973 energy production absorbed 24 percent of the capital invested in U.S. business as a whole. Present estimates of the capital needed for energy production in the 1975–85 period are likely to raise this proportion to more than one-third. And, for the reasons cited above, if the Bill is enacted it would stimulate the development of precisely those energy sources that are most wasteful in their use of capital and so considerably worsen the position of non-energy industries and of consumers in the competition for capital. In effect, the Bill would encourage the already dangerous tendency of the energy industry to devour its own customers.

Finally, there is the matter of two very meaningful, but unexplained assumptions that are embedded in the language and design of the Bill. One of these is that energy independence is essential to "national security", presumably because dependence on foreign sources of energy would weaken the nation's defense capabilities. However, if the Administration wishes to come before the American people and ask for the committment of $100 billion of public funds for such a purpose, they have the obligation to explain why this should not be necessary. After all, we have now depended on energy imports for a number of years with no apparent threat to our national security, and it seems to me that anyone proposing such drastic action to eliminate this dependency by 1985 is obliged to explain exactly why this course of action, in preference to alternative ones that are less based on belligerence has now become essential. None of this reasoning is revealed in the Bill, or in any of the associated Administration statements.

Another unexplained assumption is that although private enterprise is to be encouraged, it is the government's obligation to do so by providing taxpayer's funds when private entrepreneurs are unable to produce the capital needed to maintain the nation's production system from their own resources. It seems to me that this assumption raises more questions than it answers. If, as the Bill and the White House Fact Sheet acknowledge, the energy industry is faltering because it cannot raise sufficient capital, on what grounds has it been determined that this industry is more entitled to a vast injection of public capital than any other equally capital-short industry? The business community has recently placed heavy stress on the serious shortage of investment capital that is expected to develop in the next ten years. Why should not the Bill's economic principle be applied to the railroads (which are being forced to abandon capital, in the form of trackage that will surely be essential in the nation's energy-short future, rather than restoring it); to the auto industry (which clearly lacks the capital needed to retool in order to produce the radically new types of vehicles that will be essential to save energy and reduce pollution); to agriculture (which, although it has become one of the most capital-intensive sectors of production is—because of the relatively small size of the average enterprise—limited in its ability to raise capital)? On what grounds can the Administration argue that it is reasonable to use public funds to support private enterprise—and stimulating inflation thereby—when it also argues that the use of public funds to meet urban and other urgent social needs is inflationary, and therefore unwise? And indeed, since private enterprise has long claimed that the capitalist system, if unencumbered by government intervention, is the most successful possible means of meeting the nation's materia.

and human needs, is it fair and honest to the American people to base this Bill on evidence that this claim is no longer true without openly discussing the enormous implications of this conclusion? If, as the Bill argues, the national need for goods as essential as energy cannot now be met by private enterprise are we not obliged to discuss, openly and honestly, the reasons for this default and to debate the basic issue of how we can retain public control of public funds that are to be invested in a faltering production system?

In sum, the Energy Independence Authority Bill, if enacted, would fail in the basic responsibilities that any legislative action must meet. It would worsen, not improve, the problem which it is supposed to solve: the gap between energy demand and domestic production. It would reward energetic and economic waste and neglect the most effective way of closing the gap: energy conservation and the promotion of solar energy. And it would fail in the most important responsibility of government to the American people: to make an open appraisal of the problems that we face, and honestly debate the real issues that it reveals.

Capital Productivity of Alternative Energy Sources

Energy source:	*Capital productivity (Btu's per year per dollar of capital invested)*
Crude oil production [1]	
1974 (actual)	16, 800, 000
1978 (projected)	4, 480, 000
Coal (strip mined) [2]	2, 000, 000
Shale oil production [3]	420, 000
Synthetic fuel from coal (liquid)	254, 000
Coal gasification [3]	160, 000
Coal-fired electricity generation ($800/kw) [4]	28, 683
Nuclear electricity generation ($1,000/kw) [4]	22, 423

[1] The capital productivity of oil production was derived from information in *Oil: Possible Levels of Future Production*, Final Task Force Report, Project Independence, FEA (Washington, D.C., November, 1974), pp. IV–2 and IV–21.

[2] The capital investment required to produce one ton of coal was obtained from *U.S. Energy Outlook: Coal Availability* (Washington, D.C.: National Petroleum Council; 1973), p. 38.

[3] The capital investment required to produce different synthetic fuels was obtained from the *Project Independence Task Force Report on Synthetic Fuels from Coal*, p. 35, and also the *Task Force Report on Oil Shale*, p. 65. FEA, U.S. Dept. of the Interior, Washington, D.C.: U.S. Government Printing Office; November, 1974.

[4] The estimates for coal-fired and nuclear power plants are for base load power generation, operating at 5% of capacity for 1 year.

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The CHAIRMAN. Now, Dr. Commoner and both of you gentlemen, thank you for giving us two very provocative as well as rather controversial viewpoints on this matter.

Dr. Commoner, you argue that the way this bill is designed it would automatically fund the less efficient technologies and provide a diversion of capital into the area where the technologies are less efficient. It seems to me that overlooks two points. It makes the assumption that the technology is frozen and that the investment of these funds won't improve the technology.

The whole point, as I understand it, in providing for the development phase is so that during the development phase you can work out the bugs, you can find out where the inefficiencies are and make it more efficient. Where it may cost now $13 or $14 a barrel to produce oil from oil shale, the notion is that once you establish a method and do it on a large basis you can find a way of getting it down to $7 or $8 and thereby make it more efficient. That's no. 1.

No. 2 is that you don't confront the fact that the efficient energy is so finite and so limited as was stated. We have something like 30

years of oil at best available and we are depleting that very, very fast, whereas we have 200 or 300 years of coal and we have a great deal of oil shale. Therefore, it would seem that even if the nonpetroleum energy sources are less efficient, that is the only game in town. The more efficient are just not available. How do you meet those arguments?

Mr. COMMONER. I'll take the first one first. The language of the bill makes it clear that only those forms of energy production which are ready to be exploited technologically will be funded the agency waved tend to spend money so fast that there will be no time for development; there's language in the bill which indicates to me that only those technologies that are already to go will be funded. The whole thing will be over in 7 years; there's no time for research or even for development.

The CHAIRMAN. Well, it's not a research bill. It's a development bill.

Mr. COMMONER. Exactly. So I have to disagree with you, there is no evidence that there will be technological improvement in the course of the operation of the energy sources funded by this bill. This is not the intent of the bill. The bill is supposed to take available technologies and put them to work..

As a matter of fact, I might add that I think some of the technologies that are proposed for priority support will become less efficient in their use of capital as they get more experience. Let me give you one example.

The CHAIRMAN. Some of them may, but others would not. I presume that the judgement they would make would be to move in the areas where the investment would make them more efficient. If they didn't they are certainly incompetent.

Mr. COMMONER. This field is full of technological surprises. In the 400-odd page report of the FEA on synthetic fuels they don't mention the one critical fact which in my opinion is going to make it enormously more complex than they think, and that is that the product causes cancer.

The CHAIRMAN. The product what?

Mr. COMMONER. The product causes cancer. Synthetic fuel oil is carcinogenic. Shale oil is carcinogenic. This has been known since 1876. When shale oil was used in the cotton milling industry in England, a whole series of cases of skin cancer resulted. Now what that means is that it's going to be far more complicated to process and use that product than you might think. In the same way, nuclear power plants became more and more capital intensive as the environmental consequences were discovered—and you know the rate of capital expenditure per kilowatt of nuclear power plants is going up three times faster than coal-fired plants. These are risky technologies and risky technologies have very nasty ways of running into capital cost overruns just because we don't understand them.

In other words, I appreciate your faith that technology is going to make things better, but the fact of the matter is our experience with these advanced technologies such as nuclear power is exactly the other way around.

The CHAIRMAN. Well, I share that concern very strongly. There's no question that the environmental problems develop, but what I'm arguing, however, is that technologies, by and large, as we have experience with them, become more efficient. If they don't become more efficient, then there certainly is no argument at all for making a nickel of investment.

Mr. COMMONER. I disagree. If you measure efficiency as I do by the efficiency of converting capital into power, nuclear power has become decidedly less efficient over the years. It used to be estimated that you could build a nuclear power plant for $250 or $300 per kilowatt. Now it's $1,000 and it's going up at $31 a year per kilowatt. In other words, it is literally becoming less efficient in converting captial into energy because it's full of surprises and the surprises mean increased capital costs. I think we are heading for exactly the same thing with coal conversion and shale oil production.

The CHAIRMAN. Let me ask you, Dr. Rostow, you mentioned the Bosworth, Duesenberry study of capital needs in the seventies. That concludes that there will be enough capital available from the private market to meet energy investment need just barely but there will be enough available. A Bankers Trust study published this year reaches the same conclusion, even considering the most stringent case of energy independence by 1985.

Now if we deregulate prices, why can't the private market meet our energy investment needs? Why do we need an EIA on top of the private capital markets and where is the documented case in view of these studies that I have pointed to for the other side?

Mr. ROSTOW. In part, the argument is that we do not now have deregulation. In additon, there is the problem discussed between you and the Vice President; that is, the development on a commercial basis of new evergy production techniques. For example, how do we move from in situ mining experiments to commercial in situ conversion? In a number of fields the question is: How would you get from laboratory tests to commercial tests? How would you get new coal gassification techniques? It's my understanding from the industry that they are still using technologies a quarter of a century old. How shall we find out if some of the newer technologies could be more efficient?

As your aside, when you were listening to Dr. Commoner, indicated, there is a distinction between research and development. As nearly as I can perceive from all the energy studies that I have read, a considerable potential exists on the development side with respect to both production and conservation. We know things may by promising; but we will not be certain until we try. And we need something like the Authority to finance the first stage of commercial development.

In addition, there's the question of projects which are too big for the private sector. I know of one major coal gassification project for the West Coast in which 3 of the biggest firms in the country have worked together. They finally decided the project was too big for them and abandoned it.

The CHAIRMAN. Let me interrupt to point out that the Alaskan operation has been privately operated, number one. Number two,

there's a limit in this bill of $10 billion and the Alaskan operation is about 7.

Mr. Rostow. Some of these projects have very long lead times. Private firms, therefore, require guarantees of rate of return at the end of the line. The risks over such long periods may go beyond the simple freeing of gas and coal prices, utility prices and so on. As I understand the bill, it would permit them to go forward with the government holding their hand so they can undertake projects that otherwise would be too risky, given the lead time and the ambiguities at the end of the line so that these plants could get built. This kind of reassurance may be relevant to a good deal of the utilities investment we, as a nation, require.

As I look at the figures on current energy investment, they are well below any curve that would promise to bring us anywhere near energy independence in a meaningful sense.

The Chairman. Well, you have the Bankers Trust study and you have the Bosworth study.

Mr. Rostow. The Bosworth study is quite abstract, although I regard it as a useful exercise. I'd like to turn it from an inquiry into the "capital crunch" into a full employment study. They took gross categories and made some assumptions. They thought the national highway program would level off. That freed some capital.

The Chairman. Isn't that a pretty good assumption?

Mr. Rostow. Yes, I hope it's true. They made some assumptions about various categories of public expenditures: housing, for example. They then took some energy independence investment figures from an early planning study. They did not go into the question of whether the private sector would, in fact, finance those figures. They simply inserted those conventional estimates of 6 to 8 hundred billion or whatever it is that people then estimated energy independence would require.

They did not, then, address themselves to the problem before this Committee; that is, whether, without government assistance, energy investment will, in fact, follow the curve they assumed. They were trying to answer the question: Will there be a capital crunch? They said no, if there were no new starts in social programs in this country; if we leveled off on housing and some educational expenditures; leveled off on interstate highway outlays. And there were other ifs. Then they assumed 2 big items would increase: outlays to achieve energy independence and investment required by the anti-pollution laws adopted by the Congress. They concluded those increases could just about be accommodated within the level of gross investment to GNP typical of recent years. They did not address themselves—and it was not the purpose of that study—to the question we have before us here; that is, whether uncertainty, the condition of the markets, etc. would, in fact, permit the level of energy investment they assumed actually to take place. I don't think the Bosworth study really gets at the subject we are dealing with at this morning, sir.

The Chairman. Senator Packwood?

Senator Packwood. Dr. Commoner, did you hear Vice President Rockefeller or Frank Zarb's statement about 5 percent energy saved?

Mr. COMMONER. Yes, I certainly did.

Senator PACKWOOD. In your estimation is that accurate?

Mr. COMMONER. No. I think they are way off. They are thinking about the wrong law of thermodynamics. There are 2 laws of thermodynamics. The first law simply says energy can't be destroyed or created, in which case you compute the efficiency with which you use it and that tells you how much conservation is possible simply by finding out how much of the heat goes up the stack.

When you do a computation of that let's say on an oil burner you get an efficiency of about 65 or 75 percent. That means that there's not much room for improving it for conservation.

But that's the wrong law of thermodynamics because what you want out of energy is work, and work is lost every time you take it out of the energy. The first computations by the second law made on oil burners and a few other things were made just about 1 year ago, and the computation on the efficiency of the average oil burner, by the second law, is 8 percent. That means there's a huge opportunity for conservation in space heating. In other words, the 5-percent figure is a very serious underestimation of the potential of conservation.

Senator PACKWOOD. I'm neither a chemist nor a physicist. I don't want to dispute your answer because I think you agree with the conclusion I come to, that there's got to be a bigger saving in energy conservation in this country than 5 percent.

Mr. COMMONER. I think easily in physical terms. It may take a good deal of organization. We could have a 50-percent saving. The sort of thing that has to be done is to recognize that a powerplant has two energy outputs. One is electricity and the other is low-temperature heat which is ordinarily wasted and released into the environment. Now a home has two energy inputs. For one of these it needs electricity to run the motors and for the other it needs low-temperature heat for hot water and space heating.

Well, when you have an all-electric home, which is what is often fostered now, you've got the home plugged into the wrong outlet in the power company. This means that we have to design powerplants in such a way that the waste heat can be piped around as it is incidentally in Moscow and in downtown New York. But with a nuclear powerplant you can't possibly do it because you can't keep the plant near people's homes. It's that kind of thing that will give us a big conservation.

Senator PACKWOOD. Let me ask you a specific question. In the table on the last page of your statement. "Capital Productivity of Alternative Energy Sources," you've got Btu's per year per dollar. Where does solar fit into that? It's not on the chart.

Mr. COMMONER. It's very hard to come up with the figure on that because the capital cost of solar equipment is changing so rapidly. One way I could put it to you is this: In a city like St. Louis if solar heat is used for hot water, building a device at the present construction cost and the present cost of capital, borrowing all the money and paying interest—a device to take care of half of your hot water requirements today in St. Louis, would save 10 percent on your hot water bill. In other words, it's in the ball park of competing with capital costs of let's say electric power. However, solar

collectors are being handmade now and I think the cost can come way down if there was any sort of mass production.

Senator PACKWOOD. Of course, the same argument might be true for some of the other, at this moment, more esoteric sources that are very high because they're not mass made.

Mr. COMMONER. I disagree with you because this is the same point. Let me put it this way. A solar collector is a metal box with a glass lid and a pipe running through it to collect heat. I can't conceive of any surprises that anybody is going to run into about hazards that were unforeseen in a metal box with a glass lid. I don't think there's going to be a problem of unexpected carcinogenicity or radioactivity. It's a very simple device.

Senator PACKWOOD. Except I'm old enough to remember 25 years ago when clean, safe atomic power was going to be the salvation of the future and everybody believed it. All the eastern scientists and environmentalists looked at it as preferable to dams.

Mr. COMMONER. Not everybody. There were an awful lot of us who didn't believe in it at all because it wasn't true. That was just AEC propaganda. Sure, it looks clean, but you can't see radioactivity. That's the trouble. And you see, these new, very large-scale, intense technologies always raise problems. Another thing about the solar thing is that you can have small-scale operations. There is no economic advantage of scale in any solar device because it costs you exactly as much to add on as to what you have already done. That immediately puts that kind of device in a completely different economic situation.

Another thing about solar energy is that instead of driving inflation—which any one of these other things will do—it's a hedge against inflation because what you do is invest money now in something that will avoid expenditures on rapidly escalating fuel prices later.

Senator PACKWOOD. Let me ask you a third question, and it comes in your statement where you're talking about this being essential to national security. If we're going to sell it on that basis we ought to sell it on that basis. I think the administration is trying very hard. Certainly the Vice President and Mr. Zarb talked about it, and I'm inclined to agree that it's important, but what I'm intrigued with is your statement. "It seems to me that anyone proposing such drastic action to eliminate this dependence by 1985 is obliged to explain exactly why this course of action, in preference to alternative ones which are less based on belligerence, has now become essential."

Well, the Arabs, by and large, precipitated the boycott because they didn't like our support of Israel. What should we have done? It's been our policy toward Israel in order to—I don't think it's a belligerent one—avoid the boycott?

Mr. COMMONER. Well, I assume that Mr. Rockefeller was not talking about the Arabs but about the Russian Navy and I assume that's really what's behind it. I really don't believe that the security of the United States is threatened by Saudi Arabia. Mr. Rockefeller said that there's been a lot of propaganda about the Russian Navy, that it might interdict, as he said, the transport of oil.

Well, I'd like to hear that talked about because in my understanding of the danger of war with the Soviet Union is that it would be a nuclear war. It would be over in a matter of hours and the question of shipping oil——

Senator PACKWOOD. Well, wait a minute. His statement about the Soviet Navy was just an aside. To come back to the Middle East, what could we have done? How are we going to assure ourselves if we depend upon overseas power of an adequate source of power without it being cut off by somebody whether or not we're belligerent? I don't think we were belligerent in the Middle East. It was just Saudi Arabia. But if 5 years down the road there erupts another war in the Middle East and we say to Israel, we will support you, and the Middle East cuts us off of oil, we're going to be in serious difficulty in this country.

Mr. COMMONER. Well, I think what I really meant by that statement is that the United States has been belligerent for the last 20 years. You know, what was the figure? We're selling arms which represents about a third of our balance of trade. Any country that builds and sells arms all over the world can't be regarded as a proponent of peace. Any country that has a record that we do in Vietnam and, as we now know, in Chile, in Guatamala, which threatens the Cubans—is, in my opinion, belligerent. Now Walt Rostow is going to say this belligerence is essential to maintain the security of the planet and so on, but looked at let's say from Mars, you look down and ask who's been making war, building war machines—we are one of those countries. I think that it would be a lot better if we found more peaceful ways to relate to the rest of the world, but that's a matter of political philosophy which we can debate some other time.

I do think that the national security aspect of this issue has got to be discussed openly. What are we talking about? A naval blockade by the Soviet Union with missiles all over the place? It's a very unrealistic kind of discussion and I think what the people of this country want is openness right now rather than inferences that we have got to pour money into big energy corporations in order to save the country from the Russians.

Senator PACKWOOD. It looks like Mr. Rostow wants to comment. I'm not sure. But I hate to think what the situation would be for Israel if we didn't supply the arms.

Mr. COMMONER. Sure. I'm not really an expert on that. I'm not particularly interested in debating that issue right now. But I do think that any bill that presumes to deal with national security in such a fundamental way really has to be based on a discussion of national security instead of just making assumptions.

Senator PACKWOOD. Mr. Rostow, let me ask you, because I just came off of 4 weeks of hearings in the Finance Committee on tax reform and every industry that has been there has talked about we need capital and we're capital short and the power industry was there also. As another avenue, should we grant them additional tax incentives for investment in mass transportation, pollution control, and power generation?

Mr. Rostow. I believe as the paper I filed with your committee suggests, sir, that what we require now is the use of indirect and occasionally direct methods, not to raise the level of investment in general, but to raise it in specific areas. I have not worked through the details of the capital requirements by sectors sufficiently to give you advice with the refinement your responsibilities justify. But in terms of the broad analysis that I have just completed of where we stand in the sweep of history I would underline again the areas I think are important, where the use of the indirect and, if necessary, at the margin, the direct powers of the Government are justified to increase investment.

First, energy. Second, energy conservation I share with my colleague of this morning, Dr. Commoner, the view that if you can invest economically—as a practical matter—in energy conservation it's better than investing in energy because of the positive environmental effects. It's worth a lot of creativity, including exploring the practical implications of the second law of thermodynamics. Third, in agriculture. I'm much impressed by a serious, but not alarmist, report from the National Academy of Sciences on Agricultural Production Efficiency. It suggests that certain of the technologies which have helped us in the remarkable surge of the last quarter-century in agricultural production are now yielding, as is normal, diminishing returns. Therefore, we need greatly to increase our investment as a nation in agricultural R. & D. We ought to be finding new technologies for food production, notably in the area that spinsoff from the breakthroughs in biology at the basic scientific level. The authors of that report are also troubled because, when the Government took off acreage controls, a good deal of our land we assumed to be part of the productive reserve turned out to be submarginal, even with prices high. I can't think of anything more important for our nation as we look ahead, or for the world, than to nurture our agricultural base by enlarged investment in R. & D. and in preserving our land.

Then, I believe we ought to be doing what we can in mass transport. It would be good if we could separate, at reasonable cost, the use of the automobile for recreational purposes from commuting.

As we build new houses, we ought to be insulating them and providing incentives for insulation. I don't know why private enterprise won't pick it up, but if it won't, I'd like to see some Government encouragement for the diffusion of solar heating, and, if the technology improves enough, as some suggest it will, for house cooling. Here we must solve the front-end financing problem. I don't know why Detroit hasn't gone into this business. It's a great expert on front-end financing. Most of us buy our cars through front-end financing devices. Perhaps the margin of capacity and employment by which the automobile industry will be diminished by higher gas prices could be taken up by mass production and diffusion of solar energy. I quite agree with Dr. Commoner that solar energy is important; although, as near as I know, at the moment the technology of solar energy is rather limited as to its practical possibilities. Then there's cleaning the air and water, and R. & D. over a wide front.

That's quite a list. Some of my friends now argue that we should change our thinking about unemployment. They argue that the structure of the working force has changed. We've got more women, more young people. Seven percent unemployment doesn't mean what it meant. But, as I look at the group of tasks that we as a society ought to undertake, I think we need everybody we've got. There's no excuse for not getting unemployment down to, say, 4 percent. But it will require a way of inducing higher levels of investment in those directions: if possible, indirectly through taxes and through guarantee devices such as those the Energy Independence Authority would command. We need public-private collaboration to induce investment in the right directions.

Thus, my major difference with my old friends who are advising a good deal of the Democratic Party is that I do not believe we will get back to full employment merely by a further gross unbalancing of the Federal budget. I differ with my respected colleagues on the right who say let's just have a generalized investment tax credit. I don't think that's a correct view. We don't want to stimulate all forms of investment. There are some sectors we want to stimulate and others we don't want to stimulate. What we've got to do is to decide the directions of investment our economy and the world economy need to be brought back into balance. We should be clear that this price convulsion which started in 1972 had a long history. It was building up in the 1960's. If you look at the declining proportion of world food reserves to consumption, or the U.S. proportion of oil and gas reserves to consumption, you can see how deeply out of balance we have become. And I think we're going to have raw material problems if the world resumes high and steady growth rates. We're going to have to invest purposefully on the supply side. All I can give you is a rough suggested list, as an economist and historian. I am confident, however, that we should use the great power that we have through taxation and other indirect devices to induce people to do things that are right in terms of the national purpose, while minimizing direct governmental bureaucratic involvement.

Senator PACKWOOD. Thank you.

The CHAIRMAN. First, I want to agree wholeheartedly with Senator Packwood and with the remarks of Dr. Commoner on the potentiality for saving in conservation. It's ridiculous to say the best we can do is to reduce the rate of increase by 5 percent in the next 10 years. I think they have said something like 3½ percent to 2½ percent increase, something like that. There's so many arguments on that.

No. 1, we use five times as much per capita as the Japanese. We all know how shamefully extravagant we are in our automobile travel, both the miles per gallon we get in our cars and the number of people who travel per car. There are just many, many ways in which we can save energy. We won't do it by talking about it. We have to have a method. The clearest method and maybe the cruelest method is to let the price go up. We'd get conservation overnight if the price went to $1 a gallon probably.

There are other ways to do it, but I think we are going to unfortunately, painfully, especially those of us who have to look to an

electorate to be elected or reelected or hope to—are going to have to probably come to a higher price per gallon and higher price of gasoline.

Dr. Rostow, I'd like to ask you, because this national defense issue has been discussed and I think I agree wholeheartedly with Dr. Commoner on that, but I'd like to have you disabuse me if you could.

I didn't have a chance, because our time was finite, to challenge Mr. Rockefeller on his national defense assumption. Somehow, once you say national defense and wrap yourself in a flag it's a Pavlovian response, okay, we're for it. We're all patriotic. We want to go that way. We all want a strong defense.

But it would seem to me we have to have a breakdown. How much oil do we need for our Air Force, our Army, our Navy? Then how much do we need for the very essential economic support in our country, our agriculture, the energy that we need to produce other essential goods?

When you talk about national defense you envision some kind of a war situation. What kind of a war situation is realistic? An all-out war now, of course, would be over probably in a few hours, if not a few minutes. If we have a war of a more limited nature, what kind of energy does that call for? If we're simply talking about remaining strong so we can deter a war, then what do we have to have?

All we got from the main proponents of the bill this morning was that this was essential to national defense. No documentation, no spelling out of what the assumptions are, no indications of how much more we needed and how this would affect national defense if we can go ahead with this proposal. So you favor the proposal. You're one of the outstanding experts in the country on national defense and so if you could give us your justification on that——

Mr. Rostow. That's a good and fair question. I think we face a spectrum of potential threats. Let's take the least likely but the most serious threat; that is, the use of the naval power of the Soviet Union to interdict the flow of energy supplies from abroad to the United States.

I don't believe that our political authorities are so irrational that we shall become vulnerable to a first nuclear strike. I think the wisdom of the Congress and the executive branch are going to be sufficient to continue to make Soviet initiation of nuclear war irrational.

But the fact is that since the nuclear age we have had a good many occasions of danger, all of which involved conventional arms. We had the Berlin blockade and the Cuban missile crisis. We also had two cutoffs of Mideast oil, one in 1956–57 period and then again more recently.

I do not believe the direct use of the Soviet Navy to cut our lines of supply is a very high risk because it would be a very dangerous act. On the other hand, looking statistically at what's happened in this turbulent world since the Second World War, I think it would be most unwise for us to put ourselves in the——

The Chairman. Wouldn't having a reserve of energy, of oil, help?

Mr. Rostow. I think that's right. But I'd also say we need a reserve naval position and an energy position that would make such action irrational, so they won't be tempted.

The CHAIRMAN. That's the answer to that kind of catastrophe.

Mr. ROSTOW. Well, I think not to a naval blockade. A naval blockade requires a navy to respond.

The CHAIRMAN. Well, of course.

Mr. ROSTOW. I was delighted to see that the energy bill of 1975 gave us some oil reserves. But there's a second element which I think the Vice President referred to and which I would rate high. It is, perhaps, the most important consideration. If I understand the statistics, we are now up to about 41 percent dependence on imported oil. The proportion is rising; and it probably will rise further this year because of the revival of our economy. We hold in the world a particular kind of responsibility to our allies mainly or partly because of our own policy. We have discouraged Japan and other allies from developing independent nuclear weapons capabilities. We are the only power that can deter the Soviet Union and the only power that has the freedom of action to act credibly at a time of intense crisis; as in the case of Berlin, the Mideast, or Cuba. What I'm afraid of, rather more than of a direct military confrontation, is the loss of our bargaining power and our credibility—both to our allies and with our potential adversaries—as they see us move up to 41, 42, 50, or whatever our energy dependence becomes. With that rising degree of dependence, they may well feel that we are so dependent that we are incapable of acting decisively in a crisis not of war but of diplomacy like the Berlin crisis, like the Cuban missile crisis, like the Middle East war of 1967.

The CHAIRMAN. But why is the reserve not the answer to that particular problem rather than a $100 billion development program?

Mr. ROSTOW. I think the diplomats of the world are not going to calculate that's a sufficient answer. They will worry about the will and capacity to lead of a nation that would put itself into that degree of dependence when it obviously commanded the resources to prevent such dependence. I think they will regard us as being much more vulnerable in a period of tension and diplomatic blackmail than if we had, in a meaningful sense, energy independence. We just don't look like serious people.

But that's not the only reason I feel this is important. If you look at our situation from the point of view of OPEC, we look like a giant that can't pull up his pants. They know very well what our energy potential is. They know that we have let ourselves go into further dependence. They know that we are giving them increased leverage over price every day that goes by that we don't get on with the job. The fact is that there's a lot of thought in OPEC that there ought to be a stable deal between the OECD world and themselves. But I don't think that under present prospects for U.S. oil dependence we have a chance of negotiating in the Paris committee a wise agreement on behalf of ourselves, OPEC and the developing world. We should remember that the worst sufferer from this high price is not the United States, Western Europe, and Japan. It's the poorest people in the world whose chances to get fertilizers and essential imports are greatly reduced by the high oil price. Therefore, I believe that our own security, the strategic stability of world, and the balance of the world economy would be greatly enhanced if we

could get a firm long-term agreement with OPEC. But I don't think we have a chance if we go along with the energy policy we have, with no serious effort made to achieve a high degree of energy independence.

The CHAIRMAN. Let me ask you, Dr. Commoner, you indicated this bill could raise the price. I can't buy that. You may be right, but it seems to me that the bill would increase the supply. It would develop and refine and improve techniques of production so the price would be lower than it would be without the bill. It would bring on scene some energy resources we don't have now. Vice President Rockefeller said this morning, for example, that this might help us construct the Canadian gas pipeline we don't have at the present time. That would mean we would have more gas here, and on any basis we would have a greater supply of energy available if we pass this bill than if we don't pass the bill, if they use it.

So how can you have a situation—in which you increase the supply and yet the price goes up. How does that work?

Mr. COMMONER. Well, the main point I tried to make in my presentation is that the bill would specifically produce the energy by using the least efficient techniques for converting capital into energy. Therefore, this will be expensive.

The CHAIRMAN. Not necessarily. How about the pipeline? Why would that be?

Mr. COMMONER. I don't have the figures on the pipeline but the main thing we're talking about is shale oil, coal conversion, nuclear power.

The CHAIRMAN. Well, they are also talking about delivery. They are talking about the fact you've got natural gas in remote areas of the world and if you can deliver that here you can obviously——

Mr. COMMONER. I'm sure that you could get relatively cheap supplies that way, but take shale oil or synthetic oil. The latest figures are upward of $25 a barrel, right now, without their having run into the snags that I assure you they are going to run into as they go along, and then the price will go up and up. In other words, the bill points toward investing in those aspects of the energy which inevitably, from our experience, from what we know about the way things work, will eat up more and more capital. They will therefore require higher and higher profits in order to maintain a decent rate of return. It's simply headed in the wrong direction.

As I say, the Administration recognizes that because it has said that it wants to keep the price of oil up so that private industry will be willing to invest in this expensive kind of energy. I think the bill represents a crossroads. If we go in that direction we are going to intensify the present escalation of the price of energy. The only solution is to turn in the direction which represents a hedge against high prices of fuel because you don't use any fuel—conservation and solar energy.

The CHAIRMAN. Now let me ask Mr. Rostow, I think that Dr. Commoner has made an extremely strong case here and I think it's a case that would stand up unless you can show us how to answer it. In your paper you make a strong case for investment in research and development to supplant oil and gas as a primary energy source.

This bill wouldn't do that. All this bill would do is take existing technologies and bring them on scene a little faster. In doing so it would channel funds away from research and development in new technology. We would have less aggressive pursuit of solar energy, for example, which is clean and inexhaustible and, as Dr. Commoner has said so convincingly, it offers such an attractive answer for us.

Now how, then, would you justify the EIA proposal in view of the fact that it would seem to reduce, rather than increase, the kind of research which is most promising that we need?

Mr. ROSTOW. First, I don't see why it should reduce the amount of R&D devoted by the United States and the other countries to the two prime candidates for supplanting existing forms of energy when hydrocarbons run down. Thos candidates are: Solar energy with some new technology we do not now know which would efficiently concentrate this abundant but diffuse resource; and fusion power as a basic form of energy for industrial civilization. If our experts are anywhere near correct, we shall need one or both down the line and not so far down the line. No dollar should be spared working on those two and perhaps other candidates; because, unless all our experts are wrong, we are going to need them in about 30 years. I can't think of higher priority investment in our industrial society. But I don't believe the order of magnitude involved in R&D—the maximum absorptive capacity of serious R&D institutions—is of an order of magnitude that would in any way interfere with the exercise that we are talking about, which is designed to preserve our position from now until the time such new technologies become efficiently available.

Now, the second point——

The CHAIRMAN. Well, let me say this is a tremendous increase in bringing these new technologies on. I think that we were really fed a fast one when it was compared to the total investment in the entire energy industry and said that's $600 to $800 billion and therefore $100 billion isn't very much, but $100 billion in this particular area is an enormous increase. It seems to me it would absorb all kinds of limited highly skilled experts who otherwise might be working in this area for one thing, and also would necessarily, whether you put it in the budget or not—it's got to go in the budget, I'm convinced of that—it would mean that we would emphasize that aspect of energy rather than the research which is more promising.

Mr. ROSTOW. You know very well—having worked on energy as hard as you have—that we have 2 major historic problems. One, to get through from here until we get a breakthrough which does not now exist in either solar energy or in fusion power; and, two, to create that new energy source which is perhaps the biggest challenge industrial civilization has faced since the beginning 200 years ago.

The bill we are talking about is addressed primarily to the first of those tasks: Getting from here to there; giving us some cushion in time. We do have coal and we do have shale. And we may even have to use them for a longer period than 30 years, in case fusion power and a new technology for solar energy don't come through.

But there's another point. I have long believed in and would advocate and support maximum rational expenditures we could get under this authority or from other public funds to increase the rate of savings in enegy. As an economist and a historian, I know something about how technology is produced and diffused. Dr. Commoner said, quite properly, that electric heating of houses may now be wasteful at existing energy prices. But if you're going to reconvert all the electrically heated houses in the United States promptly on to warm water from electric power plants, you're in for one tremendous capital bill, a bill which he didn't present to us. It may be rational but it's going to take time; and it will be mighty expensive. Yes, there may be potentialities in the second law of thermodynamics.

The CHAIRMAN. Aren't you a lot less likely to convert if at the same time you're absorbing such a colossal amount of your energy dollar into these established technologies that are less efficient?

Mr. ROSTOW. I'd like to see these ideas about energy savings and economy translated into a relatistic program, with costs and benefits measured. The bill before us is so written that it permits the Energy Independence Authority to invest in energy conservation. If we could get away from rhetoric and the waving of scientific slogans and get down to some practical energy-saving methods, I would be pleased to see the role of energy conservation raised in this bill. But what we have, Mr. Chairman, is this: opposition to this bill based on vague talk about solar energy and energy conservation. The net effect of all this talk and the postponement of action has not been greater use of solar energy or greater energy conservation. For 2 years the net effect has been simply to put us every day into greater dependence on OPEC. That is the operational consequence of putting things off and projecting dreams into the sky of how solar energy is going to solve all our problems. The fact is: We don't have the solar energy technology to meet most of our basic energy requirements efficiently. I wish we did. It can do some things for us now. Those things should be done. But if we exaggerate, we are simply putting ourselves deeper into hock every day.

The CHAIRMAN. Let me ask Dr. Commoner to answer that.

Mr. COMMONER. I have really got to speak emphatically on this solar energy issue. It is a fact that today, with existing technologies we could build, solar collectors to take care of at least half of the residential requirements for space heat and hot water at a cost of about $200 billion, which would be recoverable in the amount of energy saved over a period of about 10 years.

Mr. ROSTOW. I agree; but Dr. Commoner said residential heating, which is fine, but——

Mr. COMMONER. Residential and commercial as well. There is nothing that is as well suited to solar energy as the flat roof of the modern shopping center. It's just perfect. It's made for that. This idea originated with one of the officers of the National Science Foundation, Dr. Joel Snow. Probably the most practical way, if you insist on closing the gap between domestic demand and supply—the most practical way to do it is to set up a program of let's say $200 to $300 billion spent over a 10-year program on loans which would

be paid back in energy savings; that plus about a 5-percent saving due to insulation would close the gap. In other words, if you really want to do it, that is the most practical way. The technology is simple. It can be done on a widely dispersed geographic scale and the collectors could be built in anything from an idle auto plant to a small garage-sized factory.

The CHAIRMAN. How much of that can be done in the private sector? Would it be all public sector?

Mr. COMMONER. Every last bit of it.

The CHAIRMAN. Every last bit of it would be what?

Mr. COMMONER. Could be done in the private sector except I'm sure there will have to be Government-sponsored loans, not to the corporations but——

The CHAIRMAN. How big do the Government-sponsored loans have to be? You said $200 billion was the total cost? How much of that would have to come from the Government?

Mr. COMMONER. Well, I think that you'd have to compute the sort of progressive savings in fuel and I imagine it could be handled like a mortgage in which the savings in fuel would be used to pay back the initial costs. I'm no expert in financing this sort of thing but I would guess that if you took the $100 billion and used it as a rotating mortgage fund you could get most of this thing done.

The CHAIRMAN. You've got a tough economic-social problem inasmuch as nobody right now will make a killing out of it. You don't help the oil companies. It would hurt them. It won't help the utility companies. It will hurt them. So you don't have any vested group that's going to come to Congress and get it moving.

Mr. COMMONER. Except the people in the country.

The CHAIRMAN. You're absolutely right.

Mr. COMMONER. Everybody asks me why aren't we developing solar energy and you've got the answer there. Solar energy has no advantage to big business, no advantage at all because you can do just as well by building the kind of thing I have on my farm which is an 8- by 2-foot box to provide hot water. It's just as cheap relative to the amount of energy produced, to do that as it is to build a huge intallation out in the desert. I think what we have to face is, as you put it, a very serious, essential question: Are we going to handle the energy question with the self-interest of the people of this country in mind or are we going to assume that there's no way to do it other than pouring money into the energy corporations that are asking for it? I think that is what has held up the resolution energy question. I think that there hasn't been an honest look at what the real needs are, what the real opportunities are. For example, there are existing techniques of producing electricity from solar energy. All you do is put a boiler on a tower and surround it by mirrors. It's simply a question of how to build the mirrows that are cheap enough and finding good ways to keep them clean. That's really the major problem in producing electricity from solar energy at this moment, with existing technology.

Now there's a word that is appropriate here—mystification. I think the solar energy situation in this country is totally mystified.

There's been a cloud put over it so that people fail to realize the enormous potential there is in solving exactly the kind of problems that we have discussed here. I think that Walt Rostow's requirement for a practical program could be met today largely by using solar energy to provide low-quality heat for space heat and hot water. I think this would be the most practical way to begin to move in the direction that we will have to take, which is to depend on the sun.

The CHAIRMAN. Well, gentlemen, I want to thank both of you very, very much. You are two excellent witnesses. You have given us different viewpoints and an insight into the bill which is most valuable.

The committee will stand in recess until 10 o'clock tomorrow morning.

[Whereupon, at 12:45 p.m., the hearing was recessed.]

ENERGY INDEPENDENCE AUTHORITY ACT OF 1975

TUESDAY, APRIL 13, 1976

U.S. SENATE,
COMMITTEE ON BANKING, HOUSING, AND URBAN AFFAIRS,
Washington, D.C.

The committee met at 10:05 a.m. in room 5302, Dirksen Senate Office Building, Senator William Proxmire (chairman of the committee) presiding.

Present: Senators Proxmire, Stevenson, and Garn.

The CHAIRMAN. The committee resumes its hearings on S. 2532, the bill providing for the creation of an Energy Independence Authority.

Our first witnesses this morning are Mr. Monte Canfield, Jr., Director of the Office of Special Programs for the General Accounting Office, to be accompanied by Mr. J. Dexter Peach, Deputy Director, and Mr. John Sprague, Associate Director.

STATEMENT OF MONTE CANFIELD, JR., DIRECTOR, OFFICE OF SPECIAL PROGRAMS, GENERAL ACCOUNTING OFFICE; ACCOMPANIED BY JOHN SPRAGUE, ASSOCIATE DIRECTOR; RALPH CARLONE AND CHARLES ADAMS

Mr. CANFIELD. Good morning, Mr. Chairman.

We changed the lineup a little bit.

The CHAIRMAN. All right.

Mr. CANFIELD. I have Mr. Ralph Carlone, Assistant Director of our Resources and Economic Development Division in charge of operations at the ERDA audit site.

The CHAIRMAN. All right.

Mr. CANFIELD. On my right is Mr. John Sprague, Associate Director in charge of energy programs in my office, and on his right, Mr. Charles Adams of my staff.

The CHAIRMAN. All right. Go right ahead. The statement will be printed in full in the record.

Mr. CANFIELD. Energy development is a slow process. Legislative action will occur years in advance of actual impacts. While we recognize that legislative decisions will be required without full information, it is important that the Congress and the Nation focus on some critical issues and tradeoffs that can enhance the quality of the decisions to be made.

First: There are no simple choices. Each technology has to be weighed against the benefits and costs of competing options. Those options are not only on the domestic production side. For example, while often overlooked, conservation is truly one of our least costly

supply options. Consideration of financing conservation improvements as alternatives to, and complements to, large capital-intensive supply technologies is essential to rational decisionmaking.

Second: Although no consensus exists among financial experts, sufficient capital will probably not be forthcoming to support the entire range of developing energy technologies.

We can't do everything—we must choose.

Further, since it is unlikely that private industry will be able to capture the benefits of many of the more expensive and risky research and development options, some form of Government financing will probably be necessary to stimulate new energy technologies. Developing the criteria to choose among competing technologies and choosing the funding levels for each will be difficult, but equally essential.

For each option, we should pursue the question: When could the technology be commercialized?

Also, the energetics, or thermodynamic efficiencies, should be carefully weighed. Such a weighing of the net energy output for each technology will enable us to make energy efficiency comparisons among competing technologies.

Adverse environmental effects and social costs of development must be considered as part of the total cost of any energy development project. External influences, such as dependence on foreign oil, must be considered in choosing among future options.

Even once a decision is made to pursue a given option, we are not home free. Deciding among the most desirable methods for encouraging development, including various forms of Government ownership, tax policy, import controls, loan guarantees, price supports, et cetera, all depend upon the technology and the energy strategy and goals.

It is useful to recognize that there are three main types of legislative proposals to financially assist the development of new energy technologies. Only by looking at all three areas comprehensively can a true picture of the total costs of energy development emerge.

First: What is termed "front-end" assistance is proposed. This amounts to subsidies to States and local governments in regions which are largely rural and unindustrialized to help them plan for development and to provide the public facilities necessary as a result of the development.

Assistance could be in the form of loans, loan guarantees, and planning grants, as proposed in S. 3007 [H.R. 11792], the "Federal Energy Development Impact Assistance Act of 1976." Legislation now under consideration to aid coastal states impacted by OCS oil and gas development is another good example.

Second: Since private investors are reluctant to build and operate new risky commercial or near-commercial facilities, incentives in the form of loan guarantees, interest subsidies and tax writeoffs are proposed. S. 2532 and H.R. 10267, the "Energy Independence Authority Act of 1975," includes many of these incentives.

Finally, even after commercial-sized plants are subsidized and operating, there is a potential that synthetic fuels will be too high priced to compete with alternatives such as domestic oil and coal or oil imports. Therefore, subsidies to producers in the form of price supports or to users in the form of tax incentives or low-interest

loans have been proposed to enable higher cost technologies to compete in the marketplace.

The Energy Independence Authority Act includes authority for price supports. H.R. 10108, the "Permanent Tax Reduction Act of 1975," provides tax incentives and H.R. 8524 would provide low-interest loans to users installing solar heating equipment. Legislative proposals, such as 973, also have been submitted, which would guarantee purchase of products.

The point is that no one piece of proposed legislation covers in any comprehensive way the entire range of financial support being considered. While legislation on energy development need not be comprehensive, it should seem obvious that a balanced and consistent energy strategy can provide a useful framework within which individual proposals can be evaluated. Attachment No. 1 discusses a "sample" of pending legislation in this area.

Rather than go through attachment 1, I understand you will include it for the record.

The CHAIRMAN. Yes, we will.

Mr. CANFIELD. The administration's most comprehensive energy development proposal would establish an Energy Independence Authority (EIA). The bill, S. 2532, would encourage the development and commercial operation of domestic energy sources and to a lesser extent encourage energy conservation. A total of $100 billion would be available to the EIA. The proposal would authorize direct investment in energy technologies, loans, loan guarantees, and price guarantees.

Our detailed comments on this legislation are in attachment II to this statement, which I hope will be made part of the record. I will simply sketch some of the key points in our comments.

Our central concern lies in the proposal's lack of balance. The bill exhibits a clear preference for initiatives of the supply-increasing variety. According to one provision of the bill, the conservation projects eligible for funding appear to be those not in widespread use.

This would appear to preclude, for example, assistance to a utility-administered residential insulation project, since home insulation is already in "widespread domestic commercial use."

No equivalent condition is attached to supply increasing options.

The bill would hamper conservation efforts rather than simply fail to promote them. This is true because the bill would result primarily in the allocation, not creation of capital.

The EIA's loan funds would, in large part, be raised in the private capital market. Its guarantees would make projects it assists financially more attractive to private capital than conservation projects not backed by Federal guarantees.

Thus, both its loans and its guarantees will siphon private capital away from conservation projects which might have been able to obtain private financing in the absence of EIA operations.

The choice of projects to receive financial assistance, and the form of assistance, ought to be based upon reasonable forecasts of the degree to which each project will advance the goal of independence per dollar of assistance afforded it. We believe the bill should contain specific criteria for evaluating the relative merits of claims for

financial assistance whether the initiatives are within either the conservation or supply category.

An example of the kind of approach we are suggesting is the method for evaluating conservation techniques developed by the Federal Energy Administration. Stated broadly, this approach divides the dollar investment required to obtain increased energy efficiency in a particular application by the barrel of oil equivalent which would be saved. Thus, it results in a dollar figure per equivalent barrel of oil which represents the real value of the initiative.

Using this technique, conservation initiatives can be readily compared with each other and with supply-increasing options. We believe that many initiatives in the direction of conservation hold the promise of moving the country farther down the road toward energy independence per dollar spent than do most supply-increasing options.

Also, any criteria established by the legislation should recognize and prefer projects with energy gains which have a multiplier effect in a wider economic sector. For example, an energy savings in the manufacture of a particular paper product which causes it to become economically more attractive than some energy-intensive plastic will multiply the original saving if there is substitution of the paper for the plastic over an entire sector of use.

In addition, the bill is underlaid by some assumptions regarding national policy which are by no means settled. Its predilection toward nuclear power generation is the most obvious example. Another is seen in its willingness to give the Government a large quasi-commercial interest in energy supplies which would be in competition with imported crude oil.

Since the bill does nothing to limit imports directly, the underlying assumption appears to be that world crude prices will stay high enough to insure the profitability of the EIA's investments in alternative domestic supplies. Thus, the Government would have a financial interest in keeping world crude prices artificially high when, in the opinion of many, the interest of the United States would be best served by an opposite policy.

A further concern is that the bill would create a Government corporation to undertake its stated purposes. Our office has consistently taken the position that the public interest is best served when congressional control over activities is exercised through annual reviews and affirmative action on planned programs and financing requirements which attend the appropriation processes. We believe that departures from this standard should be permitted only on a clear showing that an activity cannot be successfully operated in the public interest within that framework.

We note also that the Energy Research and Development Administration is not mentioned in the bill, although ERDA already has extensive responsibilities to plan, program and assist funding of demonstration energy projects and technologies. In view of this potential duplication between ERDA and the proposed Energy Independence Authority, we believe that S. 2532 should specifically address its intended effects on ERDA.

Finally, we are generally concerned that the bill seems to treat a number of established, statutory policies as obstacles to be overridden or avoided in pursuit of its goals. One provision would exclude

EIA from the definition of "agency" within the meaning of the Administrative Procedures Act, which, as one consequence, exempts it entirely from the provisions of the Freedom of Information Act. Another provision would exempt EIA from all federal laws relating to public contracts and public buildings and works. In addition, the requirements for filing environmental impact statements pursuant to the National Environmental Policy Act are not clear.

During the past year we have been extensively involved in the Government's role in energy development and related methods of financing. Last October we completed an evaluation of the administration's proposed Government assistance to private uranium enrichment groups and a related proposal submitted to ERDA by a private organization—the Uranium Enrichment Associates. Last month we commented on the administration's proposed synthetic fuel commercialization program. Copies of the full reports are available for committee use.

All existing uranium enrichment technologies in the United States are owned by ERDA. Since 1971 the executive branch has encouraged private industry development in any expansion of uranium enrichment capacity.

During June 1975 the President proposed legislation which would authorize ERDA to provide various forms of Government assistance and assurances to private firms that wish to build, own, and operate enrichment plants. In particular the President proposed that the next increment of capacity be privatized and turned over to private development with major guarantees for the viability of the effort.

Our analysis showed that a basic difference exists between a decision on providing the next increment and further increments of uranium enrichment capacity. The next increment of capacity will be the last-of-kind using existing technology and, in our view, could best be built by adding onto the existing Government enrichment plants. Additional future capacity will use advanced technologies and, given the uncertainties, will need Government assistance and assurances.

Our March 1976 report discussed an administration proposal to authorize ERDA to provide up to $6 billion in loan guarantees for, among other things, commercial demonstration facilities for the production of synthetic fuels. To encourage industry to participate in synthetic fuels commercial demonstration programs, the administration recommended Government incentives consisting of loan guarantees, price supports, and construction grants. Because of time constraints we did not evaluate the pros and cons of the various forms of Federal assistance considered by the administration in arriving at its recommendations.

We did note, however, that important policy and judgmental questions were involved in arriving at the recommendations. A different emphasis on certain considerations such as impact on the budget, degree to which an alternative preserves and enhances competition, ability to achieve program goals, and extent of Federal involvement in management of operations—could conceivably lead to a different choice of alternative forms of assistance.

Our view is that the Congress should consider awaiting further studies which ERDA expects to complete in July 1976 before approving any legislation.

Finally, Mr. Chairman, GAO is undertaking further work which will deal with alternative methods of financial support for synthetic fuels. It will address the tradeoffs involved in choosing among such alternatives and in allocating limited Federal dollars to synthetic fuel projects, as opposed to other competing energy projects. To the extent possible, we will address some of the pros and cons of implementing financial support programs on a piecemeal basis as opposed to a comprehensive umbrella approach. Here are some examples of tradeoffs which we believe should be considered.

Questions should be raised regarding the desirability of subsidizing high cost synthetic fuel output when the price of domestic oil is regulated at an average price, currently $7.66 a barrel. A recent study prepared for the Federal Energy Administration stated that an increase in crude oil prices could increase recoverable reserves of crude oil by billions of barrels by extending well life and by enabling increased use of secondary and tertiary recovery operations.

This indicates additional potential for oil and gas recovery if secondary and tertiary operations and technological research were given Government support. At the high price levels discussed for synthetic fuel production, such recovery techniques may be a more attractive option than, say, synthetic fuel development.

Another question which should be looked at is the question of incremental versus average pricing of synthetics. Rolling in the price of synthetics could make them appear more cost competitive than they actually are. On the other hand, incremental pricing requires payment of the true product cost and, therefore, has a different impact on final consumption patterns. Incremental pricing would also require synthetic fuels to compete with other alternatives to imported oil, such as energy conservation and solar energy, where rolled-in pricing is impossible or limited.

Consideration should be also given to optional uses of the fuel produced by synthetic fuel plants. For example, the administration is now considering where oil for the recently authorized strategic petroleum reserve is going to come from, how much it will cost, and whether, in fact, the oil can be obtained at all. The possibility could be considered of using the output from a synthetic fuels program—particularly if costs and government involvement are extensive.

As you can see, Mr. Chairman, there are many serious matters requiring closer examination. We hope our continuing study of these issues and tradeoffs can provide some useful insights. We hope to complete our study early this summer, in the same general time frame in which ERDA plans to complete its follow-up studies on synthetic fuels.

Thank you, Mr. Chairman. We are available to answer questions for the committee.

[The complete statement follows:]

STATEMENT OF MONTE CANFIELD, JR., DIRECTOR, OFFICE OF SPECIAL PROGRAMS ON DEVELOPING AND COMMERCIALIZING ENERGY TECHNOLOGY, GENERAL ACCOUNTING OFFICE

Mr. Chairman and Members of the Committee, we welcome the opportunity to be here today to consider with you the difficult problems of developing and commercializing energy technology. I would like to lay out a perspective and then focus my comments on three things:

An overview of the scope and variety of bills now before the Congress that would provide various combinations of Federal financial support for developing and commercializing energy technologies.

Our specific views on the bill under consideration by this Committee to create a $100 billion Energy Independence Authority which would provide financial support for developing and commercializing energy technologies.

A brief description of recent and ongoing GAO work bearing on the question of Federal financial assistance for developing and commercializing energy technologies.

PERSPECTIVE ON ENERGY DEVELOPMENT

A large number of issues and choices face Congress in dealing with energy development. Energy development is a slow process. Legislative action will occur years in advance of actual impacts. While we recognize that legislative decisions will be required without full information, it is important that the Congress and the Nation focus on some critical issues and trade-offs that can enhance the quality of the decisions to be made.

First, there are no simple choices. Each technology has to be weighed against the benefits and costs of competing options. Those options are not only on the domestic production side. For example, while often overlooked, conservation is truely one of our least costly supply options. Consideration of financing conservation improvements as alternatives to, and complements to, large capital-intensive supply technologies is essential to rational decisionmaking.

Second, although no consensus exists among financial experts, sufficient capital will probably not be forthcoming to support the entire range of developing energy technologies. We can't do everything—we must choose. Further, since it is unlikely that private industry will be able to capture the benefits of many of the more expensive and risky research and development options, some form of Government financing will probably be necessary to stimulate new energy technologies. Developing the criteria to choose among competing technologies and choosing the funding levels for each will be difficult, but equally essential.

For each option we should pursue the question: When could the technology be commercialized? Also the energetics, or thermodynamic efficiencies, should be carefully weighed. Such a weighing of the net energy output for each technology, will enable us to make energy efficiency comparisons among competing technologies. Adverse environmental effects and social costs of development must be considered as part of the total cost of any energy development project. Also, external influences, such as dependence on foreign oil, must be considered in choosing among future options and short term security.

Even once a decision is made to pursue a given option, we are not home free. Deciding among the most desirable methods for encouraging development, including various forms of Government ownership, tax policy, import controls, loan guarantees, price supports, etc. all depend upon the technology and the energy strategy and goals.

ENERGY DEVELOPMENT LEGISLATION

With this perspective in mind, it is useful to recognize that there are three main types of legislative proposals to financially assist the development of new energy technologies. Only by looking at all three areas comprehensively can a true picture of the total costs of energy development emerge.

First, what is termed "front-end" assistance is proposed. This amounts to subsidies to states and local governments in regions which are largely rural and unindustrialized to help them plan for development and to provide the public facilities necessary as a result of the development. Assistance could be in the form of loans, loan guarantees, and planning grants, as proposed in S. 3007 (H.R. 11792; the "Federal Energy Development Impact Assistance Act of 1976." Legislation now under consideration to aid coastal states impacted by OCS oil and gas development is another good example.

Second, since private investors are reluctant to build and operate new risky commercial or near-commercial facilities, incentives in the form of loan guarantees, interest subsidies and tax write-offs are proposed. S. 2532 (and H.R. 10267), the "Energy Independence Authority Act of 1975" includes many of these incentives.

Finally, even after commercial-sized plants are subsidized and operating, there is a potential that synthetic fuels will be too high priced to compete with alternatives such as domestic oil and coal or oil imports. Therefore, subsidies to producers in the form of price supports or to users in the form of

tax incentives or low interest loans have been proposed to enable higher cost technologies to compete in the market place. The Energy Independence Authority Act includes authority for price supports. H.R. 10108, the "Permanent Tax Reduction Act of 1975," provides tax incentives to users and H.R. 8524 would provide low interest loans to users installing solar heating equipment.

Legislative proposals also have been submitted which would guarantee purchase of products. One (S. 973) would set up a board to purchase synthetic fuels and solar energy, and auction them off to the highest bidder. Some of these proposals cover more than one of the three financing categories discussed; but none is truly comprehensive.

The point is that no one piece of proposed legislation covers in any comprehensive way the entire range of financial support being considered. While legislation on energy development need not be comprehensive, it should seem obvious that a balanced and consistent energy strategy can provide a useful framework within which individual proposals can be evaluated.

ENERGY INDEPENDENCE AUTHORITY

The Administration's most comprehensive energy development proposal would establish an Energy Independence Authority (EIA). The bill, S. 2532, would encourage the development and commercial operation of domestic energy sources and to a lesser extent, encourage energy conservation. A total of $100 billion would be available to the EIA. The proposal would authorize direct investment in energy technologies, loans, loan guarantees and price guarantees.

Our detailed comments on this legislation are in Attachment II to this statement which I hope will be made part of the record. I will sketch some of the key points in our comments.

Our central concern lies in the proposal's lack of balance. The bill exhibits a clear preference for initiatives of the supply-increasing variety. According to one provision of the bill the conservation projects eligible for funding appear to be those not in widespread use. This would appear to preclude, for example, assistance to a utility-administered residential insulation project, since home insulation is already in "widespread domestic commercial use". No equivalent condition is attached to supply increasing projects.

The bill would hamper conservation efforts rather than simply fail to promote them. This is true because the bill would result primarily in the allocation, not creation of capital. The EIA's loan funds would, in large part, be raised in the private capital market. Its guarantees would make projects it assists financially more attractive to private capital than conservation projects not backed by Federal guarantees. Thus, both its loans and its guarantees will siphone private capital away from conservation projects which might have been able to obtain private financing in the absense of EIA operations.

The choice of projects to receive financial assistance, and the form of assistance, ought to be based upon reasonable forecasts of the degree to which each project will advance the goal of independence per dollar of assistance accorded it. We believe the bill should contain specific criteria for evaluating the relative merits of claims for financial assistance whether the initiatives are within either the conservation or supply category. An example of the kind of approach we are suggesting is the method for evaluating conservation techniques developed by the Office of Energy Conservation and Environment, Federal Energy Administration. Stated broadly, this approach divides the dollar investment required to obtain increased energy efficiency in a particular application by the barrel of oil equivalent which would be saved. Thus, it results in a dollar figure per equivalent barrel of oil which represents the real value of the initiative. Using this technique, conservation initiatives can be readily compared with each other and with supply-increasing options.

We believe that many initiatives in the direction of conservation hold the promise of moving the country farther down the road toward energy independence per dollar spent than do most supply increasing options.

Also, any criteria established by the legislation should recognize and prefer projects with energy gains which have a multiplier effect in a wider economic sector. For example, an energy savings in the manufacture of a particular paper product which causes it to become economically more attractive than some energy intensive plastic will multiply the original saving if there is substitution of the paper for the plastic over an entire sector of use.

In addition, the bill is underlaid by some assumptions regarding national policy which are by no means settled. Its predilection toward nuclear power generation is the most obvious example. Another is seen in its willingness to

give the Government a large quasi-commercial interest in energy supplies which would be in competition with imported crude oil. Since the bill does noting to limit imports directly, the underlying assumption appears to be that world crude prices will stay high enough to insure the profitability of the EIA's investments in alternative domestic supplies. Thus, the Government would have a financial interest in keeping world crude prices artificially high when, in the opinion of many, the interest of the United States would be best served by an opposite policy.

A further concern is that the bill would create a Government corporation to undertake its stated purposes. Our Office has consistently taken the position that the public interest is best served when congressional control over activities is exercised through annual reviews and affirmative action on planned programs and financing requirements which attend the appropriation processes. We believe that departures from this standard should be permitted only on a clear showing that an activity cannot be successfully operated in the public interest within that framework.

In this regard, we note that the Energy Research and Development Administration (ERDA) is not mentioned in the bill, although ERDA already has extensive responsibilities to plan, program and assist funding of demonstration energy projects and technologies. In view of this potential duplication between ERDA and the proposed Energy Independence Authority, we believe that S. 2532 should specifically address its intended effects on ERDA.

Finally, we are generally concerned that the bill seems to treat a number of established, statutory policies as obstacles to be overridden or avoided in pursuit of its goals. One provision would exclude EIA from the definition of "agency" within the meaning of the Administrative Procedures Act which, as one consequence, exempts it entirely from the provisions of the Freedom of Information Act. Another provision would exempt EIA from all Federal laws relating to public contracts and public buildings and works. In addition, the requirements for filing environmental impact statements pursuant to the National Environmental Policy Act are not clear.

RECENT GAO STUDIES

I will complete my testimony today by briefly describing recent and on-going GAO work. During the past year we have been extensively involved in the Government's role in energy development and related methods of financing. Last October we completed an evaluation of the Administration's proposed Government assistance to private uranium enrichment groups and a related proposal submitted to ERDA by a private organization—the Uranium Enrichment Associates (RED–76–36, October 31, 1975). Last month, we commented on the Administration's proposed synthetic fuel commercialization program (RED–76–82, March 19, 1976). Copies of the full reports are available for Committee use.

URANIUM ENRICHMENT REPORT

All existing uranium enrichment technologies in the United States are owned by ERDA. Sinc 1971 the Executive Branch has encouraged private industry development in any expansion of uranium enrichment capacity. During June 1975, the President proposed legislation which would authorize ERDA to provide various forms of Government assistance and assurances to private firms that wish to build, own, and operate enrichment plants.

ERDA and private firms have determined that some form of Government assistance and assurances is needed in view of several major uncertainties: The technology is classified, licensing uncertainties exist, the processes had never before been used in a commercial environment, and large capital requirements and long payback periods are required.

In evaluating the issues that emerged from these uncertainties we considered the following questions. What are the advantages and disadvantages of having private industry involvement in terms of cost, competition, and other factors? Should technology proven to be successful in Government plants be used or should the development of other promising, but untried, technologies be expedited? What type of competitive environment would exist to create a reasonable price with private involvement? What Government guarantees will be needed to involve private enterprise and what will be the related budgetary impact?

Our analysis showed that a basic difference exists between a decision on providing the next increment and further increments of uranium enrichment

capacity. The next increment of capacity will be the last-of-kind using existing technology and, in our view, could best be built by adding onto the existing Government enrichment plants. Additional future capacity will use advanced technologies and, given the uncertainties, will need Government assistance and assurances.

SYNTHETIC FUELS REPORT

Our March 1976 report discussed an Administration proposal to authorize ERDA to provide up to $6 billion in loan guarantees for, among other things, commercial demonstration facilities for the production of synthetic fuels. To encourage industry to participate in synthetic fuels commercial demonstration programs the Administration recommended Government incentives consisting of loan guarantees, price supports, and construction grants.

Because of time constraints we did not evaluate the pros and cons of the various forms of Federal assistance considered by the Administration in arriving at its recommendations. We did note, however, that important policy and judgmental questions were involved in arriving at the recommendations. A different emphasis on certain considerations such as impact on the budget, degree to which an alternative preserves and enhances competition, ability to achieve program goals, and extent of Federal involvement in management of operations—could conceivably lead to a different choice of alternative forms of assistance.

We stated our view that the Congress should consider awaiting further studies which ERDA expects to complete in July 1976 before approving any legistion. The studies should provide better information on the scope and magnitude of Federal assistance needed to carry out the programs, including better information on the type and number of plants needed.

ON-GOING GAO WORK

Finally, GAO is undertaking further work which will deal with alternative methods of financial support for synthetic fuels. It will address the tradeoffs involved in choosing among such alternatives and in allocating limited Federal dollars to synthetic fuel projects, as opposed to other competing energy projects. To the extent possible, we will address some of the pros and cons of implementing financial support programs on a piecemeal basis as opposed to a comprehensive unbrella approach. For purposes of illustration, let me describe some examples of tradeoffs which we believe should be considered.

Questions should be raised regarding the desirability of subsidizing high cost synthetic fuel output when the price of domestic oil is regulated at an average price, currently $7.66 a barrel. In a typical oil reservoir, only something on the order of one-third of the total oil in the ground is recovered before abandonment because there is a lack of economic incentive for further secondary and tertiary recovery. To indicate the potential here, a recent study prepared for the Federal Energy Administration stated that an increase in crude oil prices could increase recoverable reserves of crude oil by billions of barrels by extending well life and by enabling increased use of secondary and tertiary recovery operations. This indicates additional potential for oil and gas recovery if secondary and tertiary operations and technological research were given Government support. At the high price levels discussed for synthetic fuel production such recovery techniques may be a more attractive option than, say, synthetic fuel development.

Another question which should be looked at is the question of incremental versus average pricing of synthetics. Rolling in the price of synthetics could make them appear more cost competitive than they actually are. On the other hand, incremental pricing requires payment of the true product cost and, therefore, has a different impact in final consumption patterns. Incremental pricing would also require synthetic fuels to compete with other alternatives to imported oil, such as energy conservation and solar energy, where rolled in pricing is impossible or possible only on a more limited scale.

Consideration should be also given to optional uses of the fuel produced by synthetic fuel plants. For example, the Administration is now considering where oil for the recently authorized strategic petroleum reserve is going to come from, how much it will cost, and whether, in fact, the oil can be obtained at all. The possibility could be considered of using the output from a synthetic fuels program—particularly if costs and Government involvement are extensive.

As you can see, Mr. Chairman, there are many serious matters requiring closer examination. We hope our continuing study of these issues and tradeoffs can provide some useful insights. We hope to complete our study early this summer, in the same general time frame in which ERDA plans to complete its follow-up studies on synthetic fuels.

Thank you, Mr. Chairman.

Attachment I

A Sampler of Legislative Initiatives

Bill number	*Title or purpose*
S. 875	To authorize HUD to make direct low-interest loans to assist homeowners and builders in purchasing and installing solar heating equipment.
S. 973	To amend Internal Revenue Code to provide incentives for efficient use of gasoline and increased use of coal and to encourage development of synthetic fuels and solar energy.
S. 2066	To assure Federal support (through ERDA) of a joint Government and industry program capable of producing at least 1 million (equivalent) barrels of oil per day by 1985 and to provide loan guarantees for construction and operation of plants.
S. 2087	To amend Small Business Act to establish a direct low-interest loan program to assist homeowners and builders in purchasing and installing solar heating equipment.
S. 2109	To amend Internal Revenue Code to provide deductions for expenses for treatment processes to convert coal to low-pollutant synthetic fuels.
S. 2532	To establish an Energy Independence Authority, a Government corporation to provide financing and economic assistance for development of domestic energy sources, conservation of energy, and attainment of energy independence.
S. 2869	Similar in purpose to S. 2066.
S. 3007	To provide assistance to states for extraordinary fiscal impacts resulting from development of Federal energy resources (through Department of the Interior).
H.R. 917	Similar in purpose to S. 2109.
H.R. 3217	Identical to H.R. 917.
H.R. 3849	Similar in purpose to S. 875.
H.R. 4619	Similar in purpose to S. 875.
H.R. 6598	To authorize ERDA to acquire sites, coal and oil shale reserves, and to construct synfuel plants for lease to private enterprise and for subsequent sale of such plants.
H.R. 8524	Similar in purpose to S. 2087.
H.R. 8704, 8705, 8920, and 9621 are identical to H.R. 8524.	
H.R. 9723	To authorize ERDA to provide loan guarantees for synthetic fuel conversion.
H.R. 9749	Identical to H.R. 9723.
H.R. 9906	As part of a National Coal Policy, provides for 1-year amortization of the cost of synthetic fuels facilities and authorizes Federal purchases of fuels produced from coal.
H.R. 10108	To provide tax incentives for the expansion of electric power facilities other than petroleum-fueled.
H.R. 10559	To amend the Federal Nonnuclear Energy Research and Development Act of 1974 to include loan guarantees for the construction of demonstration synthetic fuel plants.
H.R. 11612	To promote through ERDA establishment of experimental projects utilizing synthetic fuels.
H.R. 17792	Similar in purpose to S. 3007.
H.R. 11916	To amend the Federal Nonnuclear Energy Research and Development Act of 1974 to establish a program of loan guarantees for commercial demonstration facilities for synthetic fuels and energy conversion technologies.
H.R. 12112	To provide additional assistance to ERDA to advance nonnuclear energy by supporting commercial demonstration programs for synfuels and other desirable energy forms.

Appendix II

GAO Comments on S. 2532—94th Congress

The bill would establish the Energy Independence Authority (EIA), a Government Corporation with authority to provide financial assistance for those sectors of the economy which are important to the attainment of energy independence for the United States, and would change Federal Government operations so as to assist in the expediting of regulatory procedures which affect energy development.

The main purposes of the bill, as stated in section 102, are to encourage the development of domestic energy sources or the conservation of energy, and to hasten the commercial operation of new energy technologies, with a goal of energy independence by 1985. Section 302 provides that, to the extent practicable, the form of the encouragement will be EIA loans or loan guarantees to private business concerns. However, the EIA is permitted to invest directly in energy-related enterprises and to guarantee prices. Only grants-in-aid are specifically precluded. (Sec. 301)

The bill authorizes an appropriation of $25 billion to the Treasury for the purchase of EIA capital stock. (Sec. 401) In addition, the EIA is authorized to borrow and incur obligations totalling $75 billion. (Sec. 402(a)) The aggregate amount of $100 billion is fixed as the upper limit of the EIA's actual and potential liability stemming from direct investment, loans, and guarantees of loans and prices. (Sec. 307)

Our central concern with this bill lies in its lack of balance. The goal of energy independence can be furthered by increases in domestic supply, by reductions in domestic consumption, or a combination of both. This allows a larger fracton of our total energy use to be satisled out of indigenous supplies. This bill exhibits a clear preference for initiatives of the supply-increasing variety and pays little attention to energy conservation. It states that conservation is among its purposes (sec. 102(b)), but its basic supply orientation is evident from the kinds of projects for which EIA financial assistance would be available. In the listing of eligible projects under subsection 303(b), only the first item mentions conservation and that category of energy projects is limited to those that "are not in widespread domestic commercial use." This last proviso would appear to preclude, for erample, assistance to a ultility-administered residential insultation project, since home insulation is widespread. No equivalent condition is gains which multiply themselves in a wider economic sector. For example, an energy saving in the manufacture of a particular paper product which causes it to become economically more attractive than some energy intensive plastic will multiply the original saving, if there is substitution of the paper for the plastic.

A second primary concern is that the bill would create a Government corporation to undertake its stated purposes. Our Office has consistently taken the position that the public interest is best served when congressional control over activities is exercised through annual reviews and affirmative action on planned programs and financing requirements which attend the appropriation processes, and through the application of statutes and regulations which usually govern the operations of Government agencies. We believe that departures from the standard should be permitted only on a clear showing that an activity which is susceptible of operation through a new regular Government agency or through an expansion of similar programs in existing Government agencies cannot be successfully operated in the public interest within that framework.

In this regard, we note that the Energy Research and Development Administration (ERDA) is not mentioned in the bill, although ERDA already has extensive responsibilities to plan, program, and assist funding of demonstration energy projects and technologies under sections 4 through 7 of the Federal Nonnuclear Energy Research and Development Act of 1974, approved December 31, 1974, Pub. L. No. 93-577, 88 Stat. 1878, 1880, 42 U.S.C.A. §§ 5903-5906 (Pamphlet No. 1 Feb. 1975). The authorized forms of Federal assistance therein include: (1) joint Federal-industry experimental, demonstration, or commercial corporations; (2) Federal purchases or guaranteed price of the products of demonstration plants; and (3) Federal loans to non-Federal entities conducting demonstrations of new technologies. In addition, the report

entitled "Recommendations for a Synthetic Fuels Commercialization Program," submitted by the Synfuels Interagency Task Force to the President's Energy Resources Council in June 1975, would place ERDA in the role of promoting commercial synthetic fuel plants. Moreover, we note that H.R. 10559, 94th Congress, which would authorize loan guarantees for the construction and operation of commercial demonstration facilities for the conversion of domestic coal and oil shale into synthetic fuels and for the construction and operation of facilities generating energy from renewable sources, would be administered by ERDA. In view of this potential duplication between ERDA and the attached to the supply-increasing projects listed, such as those designed to stimulate coal or nuclear power generation.

We believe that many initiatives in the direction of conservation hold the promise of moving the country farther down the road toward energy independence per dollar spent than do most supply increasing options. Still, we recognize the merit of putting momentum behind utilization of domestic energy supplies, especially for the longer term. Accordingly, we believe a bill with the ambition of attaining energy independence ought, at least, to be even handed in its treatment and offer as express and unrestricted financial assistance to conservation efforts as it does to supply efforts.

In this connection we note that the bill is not neutral on conservation options. Actually, it would hamper conservation efforts rather than simply fail to promote them. This is true because the bill would result in allocation, not creation, of capital. The EIA's loan funds would, in large part, be raised in the private capital market. Its guarantees would make projects it assists financially more attractive to private capital than conservation projects not backed by Federal guarantees. Thus, both its loan and its guarantees will siphon private capital away from those conservation projects which might have been able to obtain private financing in the absence of EIA operations.

The choice of projects to receive financial assistance, and the form of assistance, ought to be based upon reasonable forecasts of the degree to which each project will advance the goal of independence per dollar of assistance accorded it. We believe the bill should contain specific criteria for evaluating the relative merits of claims for financial assistance whether the initiatives are within either the conservation or supply category. An example of the kind of approach we are suggesting is the method for evaluating conservation techniques developed by the Office of Energy Conservation and Environment, Federal Energy Administration. Stated broadly, this approach divides the dollar investment required to obtain increased energy efficiency in a particular application by the barrel equivalents which would be saved thereby, arriving at a dollar per barrel figure which represents the real value of the initiative. Such figures for different conservation techniques can be readily compared with each other and with cost figures for supply-increasing options.

It is also important for the criteria established by the bill to recognize and prefer those projects with energy proposed Energy Independence Authority, we believe that S. 2532 should specifically address its intended effects on ERDA.

Nevertheless, if a corporation is considered best suited as the mechanism for achieving the purposes of the bill, we suggest that the corporation be made subject to the provisions of the Government Corporation Control Act, 31 U.S.C. § 841 et seq. (1970). Subsection 804(e) of the bill presently exempts EIA from coverage by the Government Corporation Control Act. We are particularly concerned that EIA would not be subject to the budgetary review process contemplated by sections 102, 103, and 104 of the Government Corporation Control Act, 31 U.S.C. §§ 847–849 (1970).

The bill is underlaid by some assumptions regarding national policy which are by no means settled. Its predilection toward nuclear power generation is the most obvious example. Another is seen in its willingness to give the Government a large quasi-commercial interest in energy supplies which would be in competition with imported crude oil. Since the bill does nothing to limit imports directly, the underlying assumption appears to be that world crude prices will stay high enough to insure the profitability of the EIA's investments in alternative domestic supplies. Thus, the Government would have a financial interest in keeping world crude prices up when, in the opinion of many, the interest of the United States would be best served by an opposite policy.

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In addition, we question the amount of the financial assistance this bill envisions. Depending on the extent to which conservation options are made eligible for assistance and on the treatment of supply options, the overall assistance could reasonably be smaller or considerably larger. Comprehensive cost and economic analyses are called for on this matter.

Notwithstanding these problems, the bill does exhibit an important recognition that unmodified market forces will be insufficient to achieve the goal of energy independence, however defined. Therefore, in commenting further we accept the basic premises of the bill and make some suggestions with respect to particular provisions.

As is indicated in subsection 101(d), an objective of the bill is to provide "additional" capital for energy projects, and it would not be in the national interest for energy projects to be financed by the Federal Government if they otherwise might receive private financing. However, the bill is vague in its requirements and does not adequately insure that the projects eligible for assistance would not otherwise be built with private financing. The specific financial eligibility criterion established by subsection 303(a) is that the project "would not receive sufficient financing upon commercially reasonable terms from other sources to make the project commercially feasible." Subsection 303(b) describes five types of eligible projects. Subsection 303(b)(1) limits assistance to those energy technologies or processes not in widespread commercial use, and subsection 304(b) further limits eligibility to projects that are beyond the research and development phase. Some clarification would be helpful in the latter two subsections to better define "widespread commercial use" and better delineate when "research and development" ends and "commercialization" begins.

In addition, it is apparent from subsection 303(b) that electric utilities could receive significant amounts of assistance, since two of the five categories of eligible projects apply almost exclusively to utilities. We suggest that section 303 be revised to limit Federal assistance to electric utilities in only those specific instances where a utility would propose to employ a promising, innovative energy technology or process not currently in widespread commercial use, but could not, without Federal assistance, justify the additional cost or increased risk. The Federal Government would thus assume the risk from specific utilities employing unproven energy processes or technologies. Hopefully these new technologies will become proven as experience is gained in their application and widespread commercialization will occur, resulting in more effective use of the Nation's energy resources and reduced foreign dependence.

Subsection 304(c) requires that before any State or locally regulated firm (such as an electric or natural gas utility) could receive financial support, the regulatory body would be required to certify the need for the project and sign an agreement stating that it would allow, without public hearings, quarterly utility rate increases adequate to maintain a revenue requirement as determined by the Authority. This subsection appears to require State regulatory commissions to abdicate part of their responsibility of determining the revenue requirements of the utilities they regulate.

Section 307 limits the Authority's total financial assistance to the sum of its authorized borrowing. A more practical limit would be one based on paid-in capital, actual borrowings, and accumulated earnings or deficits.

Section 308 states that the EIA may not provide any financial assistance or make any further commitments for financial assistance if, after audit, it is required under generally accepted accounting principles to establish reserves. We believe that the words "after audit" on page 19, line 19, should be deleted since generally accepted accounting principles would dictate establishment of the types of reserves mentioned here.

In view of the formula for automatic reduction of authorized borrowing and authorized capital stock as contained in subsection 311(a) and the limitation on the amount of financial assistance contained in section 307, the reserves required by section 308 must be based on the outstanding capital stock and the net gains realized upon dispositions, which have not been previously applied to retirement of the EIA's obligations and capital stock. Accordingly, section 308, lines 1 to 7 on page 20 of the bill, should read: "capital stock outstanding, (ii) its earned surplus, and (iii) net gains realized upon dispositions described in section 311 (which have not been previously applied to retirement of the Authority's obligations and capital stock), all of which shall be determined in accordance with generally accepted accounting principles."

Use of the phrase "in consideration for the extension of financial assistance" in subsection 311(a) raises the question whether the securities or assets acquired are (1) payment for extending financial assistance (such as points paid for mortgage loans), (2) collateral for loans made and/or guaranteed by EIA, (3) investment (bonds, notes, etc.) by EIA, or (4) any combination of the above. If the assets are acquired as collateral, EIA would obtain ownership only in the event of default, and its right to sell them outright may be limited accordingly.

The provision in section 401 (page 24, lines 21–25, and continued on page 25, lines 1 and 2) is not clear as to whether interest on deferred dividends is to be computed on the basis of compounded interest or simple interest (using the interest rate in effect at the beginning of each year).

Subsection 501(b) states that "Directors of the Authority, whether serving full time or part time, shall be compensated at an annual or daily rate to be determined by the President." Further, subsection 502(a) states that "The President shall fix the compensation of the Chairman of the Board." These provisions would affect a total of six positions. We do not favor the setting of salaries in this manner and are not aware of any existing provision in law granting the President authority to fix pay without any restrictions. Generally, limits are placed on executive branch authority to fix pay which preserves internal alignment relative to the highest General Schedule grade or executive level positions. We would suggest the addition of specific language regarding compensation to be paid officers or employees; for example, "at a rate not to exceed level 1 of the executive schedule."

Section 503 makes the provisions of chapter 11 of title 18, United States Code, concerning conflicts of interest, applicable to the directors and all officers and employees of the Authority. The Board of Directors are also authorized to promulgate regulations thereunder. We believe greater protection against conflicts of interest would be provided if the bill were amended to include the following prohibitions:

"The directors, officers, and employees of the Authority, and members of their immediate family, shall not own any interest in any business concern to which financial assistance is provided under this act."

We also believe that the Board of Directors should be required to promulgate conflict of interest regulations, rather than be merely authorized to do so.

Subsection 505(c) of the bill authorizes the General Accounting Office to conduct audits of the accounts of the EIA. In lieu of the language contained therein which is applicable to GAO, we would suggest the following:

"The Comptroller General shall audit the programs, activities, and financial operations of the Authority for any period during which Federal funds are available to finance any portion of its operations and shall report to the Congress at such times and to such extent as he deems necessary to keep the Congress informed on the status of such programs, activities, and operations, and to make recommendations for achieving greater economy, efficiency and effectiveness. The audit shall be made under such rules and regulations as he may prescribe.

"For the purpose of such audits, the Comptroller General, or any of his duly authorized representatives, shall have access to and the right to examine all books, accounts, records, reports, files, and all other papers, things or property belonging to or in use by Authority."

In conclusion, we are generally concerned that the bill seems to treat a number of established, statutory policies as obstacles to be overridden or avoided in pursuit of its goals. As a general matter, we believe it is wiser for new legislation to consider existing policies on their own merits and either modify them as required by new circumstances or follow them if they remain valid. Examples of such troublesome provisions are: (1) the provision in subsection 804(b) which excludes EIA from the definition of "agency" within the meaning of the Administrative Procedure Act, 5 U.S.C. § 501 (1970), which, as one consequence, exempts EIA entirely from the provisions of the Freedom of Information Act, 5 U.S.C. § 502 (1970); and (2) the provision in subsection 804(c) exempting EIA from all Federal laws relating to public contracts and public buildings and works. In addition, the impact of subsection 804(a)(ii), relating to the filing of environmental impact statements pursuant to subsection 102(2)(C) of the National Environmental Policy Act of 1969, as amended, 42 U.S.C. § 4332(2)(C) (1970), is not clear.

The CHAIRMAN. Thank you, Mr. Canfield, for a remarkably thoughtful and helpful analysis of this bill.

It is a very critical analysis. You criticize it for a whole series of reasons. You point out something that I hadn't caught before, that the legislation does take this out of the Freedom of Information Act, ignores ERDA, slights conservation, provides no cost-benefit as well as being out of the budget which was something we have been concerned about.

You say that this bill lacks any cost-benefit criteria for evaluating competing plans for financial assistance. You point out it exhibits a clear preference for supply-increasing projects as opposed to conservation.

How about the basic argument Vice President Rockefeller made for this legislation, which is that our national security is dependent on our becoming self-sufficient in energy?

If you were to write your cost-benefit criteria into law, how would that affect the choice of projects funded?

For instance, would EIA fund any synthetic fuels projects if it used the criteria which you suggest?

Mr. CANFIELD. I don't know whether synthetic fuels would be as competitive in the abstract as conservation options in a lot of instances. I think the EIA could still decide to finance synthetic fuel plants, but I think the point is that there are many ways in which this nation can become selfsufficient in energy.

One way is to become more efficient in energy and put into practice a number of conservation technologies which we already know how to do, but for which there is no financial infrastructure. So we are concerned that these kinds of things get a fair shake.

We are talking here about balance, rather than saying let's have a conservation bill, and not have a supply-increasing bill. I think this nation needs both.

We probably will, in fact, need synthetic fuels. Synthetic fuels have a lot of problems, not the least of which is the tremendous loss in thermodynamic efficiency when you convert something which you could otherwise burn under a boiler, like coal, to something which you would use otherwise.

All I am arguing is that we need to allow conservation opportunities to compete in this arena. The price range on the dollar value of synthetic fuels coming out of the pipeline is remarkably wide. It runs all the way from as low as $12 or $14 to as high as $30 a barrel.

A lot of that $30 a barrel fuel is not going to be competitive if you put a cost-benefit ratio in, and allow the utility company to come in and compete for the funding of projects such as putting time-of-day metering on its residential and commercial customers, or you could allow them to finance low-interest or interest-free loans to residential users for putting in insulation in their walls and ceilings and storm doors and windows.

The CHAIRMAN. Has the GAO found that conservation efforts are less expensive by and large than supply-increasing efforts? Have you made any studies in that regard? Do you have any figures or facts?

Mr. CANFIELD. We don't have the analysis completed. The next study we do will look at some of the tradeoffs and options. The FEA has done a number of studies in their Office of Conservation and Environment, which has used the little gimmick of the cost of oil per barrel equivalency.

The CHAIRMAN. Mr. Zarb testified yesterday, he is the head of the FEA, and he testified along with Vice President Rockefeller. He indicated the only significant saving that was realistic in conservation, he felt, would provide for perhaps a 5 percent reduction in the rate of increase in consumption.

In other words, instead of the rate of increase going up 3 and a fraction percent, it would go up slightly less than that.

He spoke with considerable force on what he felt was a lack of realism and feeling that we could accomplish this.

He has been pleading for taking price controls off oils, something a lot of us, including me, have been resisting because of the effect it would have on the economy.

In fact, I think one of the big reasons for unemployment and inflation is because the prices have gone up so rapidly in the past, and this could abort our present beginning recovery.

Do you have any preliminary judgment that would dispute that notion that the savings in conservation are extremely, realistic savings are limited?

Mr. CANFIELD. Yes, Mr. Chairman. I think that, with all due respect, Mr. Zarb's figures are probably an order of magnitude too low. Prior to coming to the General Accounting Office, I was the deputy director of the energy policy project for the Ford Foundation. That $4½ million, 3-year effort yielded detailed analysis of conservation opportunities.

In toto, we argued that using existing technologies, existing efficiencies which are economic, given a little financial boost here and there, the same kind we want to do for gasification and liquefaction, et cetera, that the savings to this Nation from conservation opportunities are on the order of 30 to 50 percent of current consumption patterns.

That is a heavily documented project——

The CHAIRMAN. If you are going to do that, don't you have to take the cruel, though step of letting the price of oil and gas go up even higher, which, as I say, has a very perverse, not only perverse economic effect, but a very unjust effect?

If, for example, when you pulled up to the filling station, instead of paying 60 cents a gallon, you had to pay $1 a gallon or $1.25 a gallon, people would conserve and drive less, they would insist on cars that give them more miles per gallon.

But the effect on the economy could be catastrophic, and the effect on economic justice would be very serious.

Mr. CANFIELD. That is one way you can do it. You don't have to do it that way.

The CHAIRMAN. What is the other way?

Mr. CANFIELD. You can legislative explicit requirements and criteria.

The CHAIRMAN. We have been trying to do that, as you know, and we have done it to some extent.

Mr. CANFIELD. The Energy Policy and Conservation Act is a step in the right direction. We have done that to some extent now with automobile gasoline mileage. We could do a lot more. Incentives, guarantees, loans, et cetera, could be made available to the public to insulate their homes or incentives to buy smaller cars. These kinds of activities do not require the price of gasoline to go to a $1.25 a gallon in order to achieve conservation efforts.

We are talking only about conservation efforts which are economically attractive to the people. I am arguing in essence if conservation efforts will not be competitive with synthetic fuels, for example, or oil shale, then don't do them. Do the synthetic fuels and do the oil shale.

But if they are economically competitive, do the conservation.

The CHAIRMAN. It is awfully hard to get it through, this committee has just reported and gotten through the Senate, we had a tough fight over it, a bill that would mandate conservation in home heating.

We are having a rough time with the House. We are going to go to conference with the House, but it is going to be extremely difficult for us to get even that kind of conservation legislation adopted. Very difficult.

Everywhere you turn and look, there is resistance to this kind of thing, although I think you are right.

What, in your view, would be the best way to amend this bill to achieve a better balance between supply and conservation?

Mr. CANFIELD. I think essentially by writing in some explicit legislative criteria which would demand that energy options be compared based on the dollar value of the oil equivalent, or you could use British thermal units or some other sort of common standard: but writing in that those things which are most efficient in terms of dollars, not just in energy, would be the ones which would be preferred and funded by such legislation.

This would allow conservation to also compete. Also, in all those sections of the bill where we describe the sectors which would be financed, and it goes production, distribution, transmission, et cetera, in each of those sectors if you add the word "conservation," it would begin to give the bill some balance as well.

The CHAIRMAN. Should we make a conventional conservation technology eligible for assistance, do you think, or confine supply to new technology?

Mr. CANFIELD. I think unless we make conventional technologies available for assistance, we won't get them developed. The following example is rather conventional in Europe and France. Electricity De France has a two-part rate structure for its electrical use. So after 10 o'clock, why, people in large buildings heat rocks in their basement and blow air over them during the daytime because they can flatten their peak loads that way.

There is no financial infrastructure in the United States to support this kind of rate structure. I can assure you if you were building an office building in Washington, D.C. and went to one of our city's banks and asked for a loan to blow air over hot rocks, they

would not give it to you. So I think we can begin to do things which look like conventional wisdom, but in that conventional wisdom are savings available of 30 or 40 percent.

The CHAIRMAN. Senator Stevenson?

Senator STEVENSON. Mr. Canfield, I agree with the Chairman. I think you are putting your finger on many of the most serious defects in this bill. That is not to say that the notion of allocating or assuring the allocation of capital to a high national priority is itself inefficient, I don't think you are saying that.

Mr. CANFIELD. I am not saying that.

Senator STEVENSON. Let me ask you a few questions about your criticisms, not to be critical of your criticisms, but to try to refine them a little with a view to perfecting this proposal, if that is possible.

To begin with, I agree with you about conservation, and that we should require all projects, including conservation, to be valued and compared according to their productivity.

But it seems there are other factors at work in the case of conservation. The conservation opportunities occur at every stage in the production, distribution, transportation of every commodity, every service, every human being in the United States, which creates capital delivery difficulties in the case of conservation that aren't present in the case of supply projects.

Now, accepting the general proposition that conservation is more productive than supply, how would you propose to deliver the capital to all of these conservation opportunities which exist in our economy? Is that not a factor that somehow has to be addressed, first in preparing legislation and second, in determining of investment priority?

Mr. CANFIELD. Well, in the first place, you are right, that the conservation opportunities occur over a much broader area, a much more diverse number of opportunities.

Therefore, figuring out the infrastructure necessary to take advantage of all the conservation opportunities is more difficult. We do, however, have institutions in the society which can capture some of the bigger conservation things. I think that while it would be useful to go after the electric toothbrushes, it really isn't what we are after.

There are four or five big things we are after in conservation which you could attack using existing institutions.

Specifically, we have a massive series of institutions called public utilities which are doing certain things which do not encourage the conservation of electrical energy.

Now, using that infrastructure to work with homeowners, we could begin to capture a lot of the opportunities in insulation, in peak load pricing, in questions of load and demand control, beginning to use heat pumps in residential and commercial applications, through perhaps, for example, loan guarantees which could be billed as part of the actual utility bill.

Another area where we could capture major savings is through the automobile. We have mandated with the Energy Policy and Conservation Act standards of performance on gasoline mileage on the average for the American automobile. If you wanted to pursue

that even further and a little harder, there would be ways by which tax writeoffs, rebates, et cetera, would be available for purchasing smaller cars.

If you would then go in each segment, like commercial building, for example, heat efficiencies and transfers, you could begin to find out certain segments of society where an application would be applicable broadly. That was the second criteria we recommended in this testimony that the bill be amended to include.

That is, the legislation should prefer applications which have broad implications and not narrow ones. I don't think it should prefer, for example, the building of a single nuclear powerplant in a State in the Midwest just because that particular utility couldn't get financing for that plant. But if it were talking in terms of developing new technology to capture waste heat, for example, the steam that goes up after you generate electricity, then that kind of thing could be then applicable to other plants nationwide which would be the type of project that should be preferred.

Senator STEVENSON. Are you suggesting then that the small businesses, the farms, the poor should be excluded from the direct benefits of this proposal because to distribute them broadly is, however large the energy savings would be, impracticable?

Mr. CANFIELD. I don't think it is impracticable. I think there are ways by which we could provide the opportunities through low-cost or no-interest loans to insulate poor people's homes.

Senator STEVENSON. But what is the mechanism? Are you suggesting a bank type model, relying on the commercial banks to make the loans through participations, or gurantees from this authority or what?

Mr. CANFIELD. A loan fund could be set up in the hands of utilities which would make funds available based on an assessment of the necessity for the insulation in a given home, and it could be made available through the utilities to the homeowner or to the apartment owner, and then billed to that apartment owner or homeowner over the period of amortization by the utility. That availability of funds could be in the form of a revolving fund which would have income coming back into it as the insulation was repaid.

Tax writeoffs are another way. But tax writeoffs oftentimes are not enough incentive for somebody who doesn't have the cash to go out and do it. I think if we can be imaginative enough to figure out how to build $300 million systhetic fuel plants, we ought to be imaginative enough to figure out how to get the money out to do conservation type work.

Senator STEVENSON. Well, we ought to be, and that is what I want to get at right now.

Mr. CANFIELD. But I would try to use these institutions we already have that exist, like the utilities, et cetera.

Senator STEVENSON. Then to pursue this basically sound suggestion, wouldn't such a formula as you suggest attach the highest investment priority to development of oil in Brazil, Mozambique, elsewhere in the world, where it costs $2 a barrel as opposed to your hypothetical $15–$30 a barrel for synthetic fuel, or would you exclude diversification of our foreign oil sources by excluding development of foreign energy sources?

Mr. CANFIELD. Well, I guess it is a difficult one, and I haven't thought it through. I would argue in essence that if you want to develop basic domestic capacity and reduce the reliance on imported fuels, that you would exclude those things. If there is in fact $2 oil in Venezuela, it is competitive right now and doesn't need domestic financial assistance.

Senator STEVENSON. I don't think that's right. There are a lot of other noneconomic factors at work including political factors which make it very difficult for the multinationals to even get into some countries.

Mr. CANFIELD. Oh, yes.

Senator STEVENSON. And there are limits to the availability of technology, capital, manpower, and so on, outside the multinationals.

I don't know if you overheard the testimony yesterday. Under the most optimistic assumptions, including an all-out domestic effort, the United States will remain heavily dependent on foreign sources.

In another sense I am saying what do we mean by independence; shouldn't any rational definition of independence include an end to the "drain America first" syndrome, face the fact we are going to be dependent and try to make that foreign dependency manageable, including through a diversification of foreign sources, which if they do begin to produce, will begin to minimize OPEC influence, put pressure on the OPEC price, which along with supply is a big part of the problem we face?

Mr. CANFIELD. I am of the impression that whatever else we do in terms of diversifying energy supply, we have got an awful lot to do here at home to improve our efficiencies. We did in fact address ourselves to how we might allocate our domestic capital to internal domestic projects to improve our "energy independence," however you define that.

I know you don't define it at 60 percent dependent upon foreign sources, et cetera. If we got ourselves down to the range where we were still importing about 20 percent, say, of our energy from foreign sources, then I could say at that point we might want to talk about Federal subsidies in terms that you are describing. But until we can get our own house in order, I guess I would argue that these opportunities apply to domestic supply increasing and conservation options, essentially what we were addressing here. But we haven't studied that in detail.

Senator STEVENSON. Let's give that some more thought.

Yesterday Mr. Zarb and the Vice President took the same position, but after raising with them the question of how we finance the delivery of gas from Alaska, including the possibility of bringing down Canadian resources, gas and oil, with the view not only to transporting American gas to America across Canada, but also to increasing Canadian supplies and their exports of oil and gas to the United States, they said, "Well, we don't need to exclude financing of pipelines to foreign countries." Do you?

Mr. CANFIELD. I didn't mean to include it. I hadn't thought about it. The honest answer is we didn't mean to include it. We were talking about all of these domestic opportunities when we evaluated this, and I think we ought to go back and reassess it. I must say that——

Senator STEVENSON. Even the proponents of that particular project concede that there is not sufficient financing available in the private markets. That one project is a $10 billion project.

Mr. CANFIELD. That's right. We are doing some additional analysis, incidentally, of that for the Senate Commerce and Interior Committees—but we haven't completed that work.

Senator STEVENSON. I think any further thoughts on those questions would be very helpful to us.

Just one more.

The administration proposal, as I understand it, is intended to make financing available to the private sector to the exclusion of any agency in the public sector, which is one question. Is that wise?

And, two, should we make financing available for projects which have a mixed purpose?

For example, consider an advanced municipal waste treatment facility: first of all, it is in the public sector; secondly, it is producing a source of energy; third, it is recovering other resources, steel, aluminim, as well as disposing of solid wastes. Such facilities, using technology already in existence, can economically accomplish multiple purposes, only one of which is the production of energy. They are not being put in place across the country for lack of capital.

Should capital be made available through this mechanism to the public as well as to the private sector, for such mixed projects?

Mr. CANFIELD. Both of those are major questions in this study we now have under way, particularly the public—private one. And the options that are available, other than privatization options, that is, government financing, government support, government corporations, et cetera, that is the analysis we are just now getting under way. That is what we didn't have time to do in the study we issued in March.

Let me say simply at this point that those very questions are precisely what we are addressing. The question of mixed purpose projects, in order to be consistent with the standard I was arguing for earlier, could be eligible for funding if the energy efficiency of that project were better than other alternatives.

Senator STEVENSON. Yes, but in my example, the energy production might be very low. But if you took an overall look at it, and included the value, aluminum, steel, and so on, the value of that municipality disposing of waste, it might be the most productive on a cost-benefit basis.

Mr. CANFIELD. I agree. You might—I guess I would argue for taking a special look at those kinds of things, particularly as it goes to municipal waste recovery. I don't think I would necessarily want to throw it into this kind of legislation. But the legislation you are describing, where the net impact is positive, is something the country ought to be looking at very hard.

I would not argue that it should be part of this particular legislation. We can take a further look at that, if you would like, as part of this study.

Senator STEVENSON. Would you? I think it would be very helpful. I don't think we want to set up a new financing agency for every kind of project that comes down the pike.

Mr. CANFIELD. We will explicitly look at that.

Senator STEVENSON. You might look at the role of the banks. The Eximbank already has made some financing available to foreign countries for the development of energy and energy research, most notably nuclear reactors. But not very long ago, when the administration was proposing to make +6 Eximbank a major vehicle for the financing of energy for the Societ Union, we raised serious concern. What would the role of +6 Eximbank vis-a-vis this agency be if the latter were created and gets into development abroad?

That is all I have time for at the moment.

Mr. CANFIELD. Mr. Chairman, one figure you might find interesting, referring to the earlier question of capital availability, et cetera, was analyzed as part of the Ford Foundation report. We analyzed what these conservation options would cost to be implemented, if we implemented them starting in 1975 through the year 2000. We compared that with what it would cost to supply the higher demand of a supply-oriented scenario.

The figures are mind boggling in either case, but the supply increasing scenario estimate, based on 1973 dollars, was $1,750 billion. The figure for the conservation options was $1,450 billion; thus, a savings," available for use in other sectors of the economy of $300 billion by going the conservation route.

A lot of people tend to think conservation costs more, but the analysis we did then indicates it costs considerably less.

The CHAIRMAN. Let me ask you about one other area that hasn't been discussed.

The administration proposes to establish this colossal authority with $100 billion outside the budget. You expressed some reservations in your statement about creating appropriations not subject to the appropriations process.

What do you think will be the consequences of keeping this EIA off the budget?

Mr. CANFIELD. Do you mean "Why would they want to do it off the budget?"

The CHAIRMAN. No; what would be the consequences of it?

For example, does putting this agency or any agency off budget hamper GAO's ability to audit its activities and make recommendations to Congress?

Mr. CANFIELD. I think you would write in the legislation all the necessary requisites to allow us to do the kind of auditing that we traditionally do. We are more concerned about what it would do to you, to the Senate and the ability of the Senate and the House to oversee the activities. It has to make quarterly reports and an annual report, et cetera; but you just don't have the kind of control over operations of that nature——

The CHAIRMAN. What bothers me, if we had a capital budget which I have favored for a long, long time, that would be one thing. We don't have it, number one.

Number two, this isn't simply a loan program. It is a stock investment program, it is a price-support program, a program that will result in the expenditure of a lot of resources. I don't see why we shouldn't have all these programs compete in the budget. If you leave it out of the budget, you don't do that.

How about the size of this authority? Is $100 billion more than is necessary? Should it be bigger? Should it be smaller?

Mr. CANFIELD. I have no idea. We have struggled with that ourselves for several months since the proposal first came out. We wrote a delightful sentence in our comments which, in essence, says it could be bigger or littler. It was a real waffle. It was about the best we could do.

The CHAIRMAN. It seems the least the Congress can do is determine how much it ought to be. Should it be 10, 50, 100, 200?

Mr. CANFIELD. It is far less than the total amount needed. But if you think of it in terms of getting leverage and getting certain processes moving and developing the first steps of an infrastructure——

The CHAIRMAN. We need more capital, but this isn't to provide all the capital you need. This is presumably to bring on those energy-producing and saving activities that couldn't be brought on through the free market.

Mr. CANFIELD. We can look into it and try to estimate. When you start adding up all of the actvity you are talking about, people blithely throw around figures of——

The CHAIRMAN. Whatever you give us will be very helpful.

One other question:

On balance, do you support the bill or not? Does the GAO take a position?

Mr. CANFIELD. The GAO has not taken a specific position on the bill. We are not against this type of legislation. We think that this type of legislation, modified as we talked about it, is better than no legislation in the area. We think financial assistance for these kinds of things is necessary, including for the supply increases, so we are not against the bill. We think that the bill, a modified bill, would be useful.

The CHAIRMAN. Senator Stevenson?

Senator STEVENSON. Thank you, Mr. Chairman.

Just one further thought, which, if it hasn't already been addressed, perhaps it should be.

Instead of putting all the risks to the taxpayers as this measure proposes, and all the opportunities for profit on the industries, have you given any consideration to equity participation by this entity in the projects it finances?

If not, shouldn't that also be considered?

Mr. CANFIELD. We have not. We will add that to the section of our study on financial options.

Senator STEVENSON. Thank you.

The CHAIRMAN. It is my understanding that this does provide 25 percent which will be or can be equity.

Mr. CANFIELD. That's right. If you have additional suggestions that you would like to make to us of items to consider in this second study, it is just getting started, and we would be happy to receive them.

Mr. Sprague's office will receive those suggestions.

The CHAIRMAN. Thank you very much.

Senator STEVENSON. Mr. Chairman, I am not sure I heard what you said. I think the financing of the energy authority can be partly

through equity, but I was not suggesting that. I was suggesting that consideration be given to EIA's financing.

The CHAIRMAN. That is provided, too. There are 2, number one, energy authority is 25 percent equity.

Number two, they are allowed to buy equity securities to make loans. At least that was the way we have looked at it. I have had the staff go over it pretty carefully.

I am pretty sure that is true.

All right. Thank you very much, Mr. Canfield, for a fine presentation. It is one of the best the GAO has given us and that is a fine agency.

Our next witness is Mr. Andrew J. Biemiller, director of Department of Legislation, AFL–CIO.

STATEMENT OF ANDREW J. BIEMILLER, DIRECTOR, DEPARTMENT OF LEGISLATION, AFL–CIO; ACCOMPANIED BY FRANK POLLARA AND RAY DENNISON

Mr. BIEMILLER. Good morning.

The CHAIRMAN. Mr. Biemiller, you have a brief, concise, to the point statement. Go right ahead.

Mr. BIEMILLER. Thank you, Mr. Chairman.

In addition to our statement, I would like to submit for the record a copy of a speech by secretary-treasurer Lane Kirkland of the AFL–CIO, a statement of the AFL–CIO executive council on the Energy Independence Authority, and a copy of our convention resolution dealing with the whole question of energy.

The CHAIRMAN. Very good. We are very happy to have that.

[Copy of the speech follows:]

TEXT OF A SPEECH BY AFL-CIO SECRETARY-TREASURER LANE KIRKLAND TO THE INDUSTRIAL UNION DEPARTMENT CONFERENCE ON ENERGY

It may be hard to believe, but two years and five months after the Arab oil embargo, America still does not have an energy policy worthy of the name. The nation is now even more dependent on foreign sources of oil than it was prior to the oil embargo.

Responsibility for incredible situation rests with the President and Congress alike. Both have placed partisan political considerations above the national interest. Both have determined to make political capital out of each others delinquency.

Domestic production of oil has declined steadily over the last several years. At the same time, American dependence on foreign sources has been increasing. Imports of petroleum products have been averaging over 7 million barrels of oil per day—about 40 percent of the nation's oil consumption—compared to under 6 million barrels before the embargo. Most of that increase in imports has come from Arab countries from whom the United States imports 1.7 million barrels daily, nearly double the 900,000 barrels prior to the embargo.

The gasoline lines have disappeared, but the threat of an Arab oil embargo hangs like an ax over the American economy. Another cutoff by the Arab countries would have a devastating effect.

Even without a cutoff, the nation labors under the continuing threat of further oil price increases.

The fivefold increase in oil prices since the Arab oil embargo was a major factor in the double-digit inflation of last year and the severe recession that still grips the nation.

America cannot continue to live under this dual threat. America must make clear that it will not tolerate oil blackmail. This is not a weak nation. It has the

economic strength to strike back against nations threatening America with an oil embargo.

Blackmailers must not be allowed to threaten the economy of the Free World with impunity. Embargoes should be met with economic countermeasures. No item, including military equipment as well as agricultural and industrial commodities, should be shipped to such countries. Their assets in this country should be frozen. All technical assistance should be withdrawn. The United States government should treat an oil embargo as economic warfare and retaliate with all the economic weapons at its command.

If this nation is to achieve energy independence it is essential that stringent and mandatory conservation measures be adopted. Every gallon of oil saved and every 1,000 cubic feet of natural gas saved means that much more oil and natural gas for economic growth and job creation.

As we understand conservation, it does not mean a change in life style. It does not mean an abandonment of the quality of American life. Consumers in Denmark, Switzerland and West Germany—all countries that have living standards comparable to the United States—use less than one-half as much energy per person as American consumers.

Energy consumption per person in the United States is the equivalent of 2,520 gallons of oil compared with 1,092 gallons in Denmark, 714 gallons in Switzerland, and 1,092 gallons in West Germany.

Conservation does not mean that Americans must stop driving their cars. It means driving cars that will get 28 miles per gallon of gas instead of 14 miles per gallon.

Conservation does not mean cold, drafty, uncomfortable houses. It means warm, comfortable, fully insulated and energy efficient homes that consume minimum quantities of energy.

Nor does conservation mean no growth. We hold no brief for those who are pushing conversation as a part of a no-growth philosophy. Growth in the economy and conservation of energy can—and must—go hand in hand. The Ford Foundation, in its report on energy, states that the "United States can grow and prosper and have plenty of jobs and still conserve energy."

However, conservation alone will not solve the energy crisis. It just cannot be done. While conservation measures are indispensable in the effort to achieve energy independence, it is just as indispensable to increase the nation's supplies of energy.

No single source of energy represents the ultimate fuel. All sources of energy must be developed. However, it is clear that even with the most intensive exploration and development efforts, domestic sources of oil and gas are declining. It is urgent that steps be taken to convert industrial and power plants that now use gas and oil to alternative sources of energy. At the same time newly-constructed industrial and power plants should be required to operate on fuels other than oil or gas. Of the alternative fuels, coal and nuclear are the ones which the national must rely on in the immediate future.

America must also direct its efforts to such sources of energy as solar, geothermal, shale oil, coal liquefaction and gasification. Development of these energy sources will neither be cheap or occur overnight.

Nuclear energy is the target of a well-organized drive to ban its use. The basis of that campaign is that nuclear energy is not safe. We do not agree with that assessment. In the more than 20 years that nuclear energy has been in use there has been not one death due to radiation effects. The record of safety in the nuclear industry is among the best in industry.

The occupational safety record of the nuclear industry stands out when compared with competing energy industries. In a government survey of the mining, processing and transportation of coal and nuclear energy, there were ten times more deaths in coal and almost ten times more workdays lost. In this century, more than 100,000 miners have lost their lives digging coal out of the ground.

That same government survey showed a better occupational safety record for the nuclear compared with the oil industry. There were 60 percent more deaths in the oil industry and almost twice as many workdays lost.

In addition, transportation of oil across the ocean and offshore oil drilling pose a threat to the environment and marine life. In recent years the wreckage of the Torrey Canyon in the English Channel and the Arrow off the coast of Nova Scotia, as well as the oil spill at Santa Barbara, all did great damage. The point is not that we should stop shipping oil in tankers or discontinue offshore drilling,

but that other sources of energy have their risks, and there is no wholly safe and environmentally pure alternative.

But the safety record of the nuclear industry is no guarantee for the future. That is why we insist that safety standards must be the most stringent, the most uncompromising for any indusry. There can never be a total guarantee against accidents. We in the labor movement have been in the forefront of the battle to establish the most rigid safety and health standards to protect the workers of America. And we serve notice to the nuclear industry, that we intend to see to it that the most rigid safety regulations continue to be applied to the nuclear energy industry so that the possibility of accidents will be minimzed.

Amercan cannot afford to mark time in grappling with the energy problem. In order to protect our national interest and promote the economic health and prosperity of this country, immediate steps must be taken to assure the country an adequate supply of energy without dependence on insecure foreign sources.

It is for that reason that the AFL–CIO strongly supports the concept of a 100 billion dollar Enegry Independence Authority as proposed by Vice-President Rockefeller. As we see it, that Authority would help establish energy independence for the United States through direct loans, loan guarantees, and other financial assistance to private industry and public bodies.

That Authority would:

1. Provide financial assistance for the whole gamut of energy technologies, including the construction of new plants.

2. Provide financial assistance to convert power plants that use oil or gas to alternative sources of energy.

3. Provide financial assistance to projects to conserve energy usage including construction of energy efficient buildings and retro-fitting old ones.

4. Engage directly in the production and distribution of energy whenever the national interest calls for it and private industry is unwillng or unable to do so.

America cannot stand idly by leaving its well-being in the hands of undependable, irresponsible foreign sources. Another oil embargo may never come or it may come next week or next month or next year. Oil prices may remain stable or they may skyrocket three, four or five times the present level due to actions by the Arab countries. Either another oil embargo or skyrocketing oil price will have a devastating effect on the American as well as the world economy.

We believe America can and must and will make the hard decisions for the future.

We must not be coerced by Neanderthals or blackmailers. And we insist that our government take the lead in developing an energy policy worthy of the name—a policy which will insure energy independence and a healthy America for the generations to come.

Mr. BIEMILLER. Thank you.

We have tried to follow your instructions and have a brief summary, and I am accompanied by Mr. Frank Pollara, who is an assistant to President Meany and secretary of our standing committee on energy, and Mr. Ray Dennison, one of our legislative agents, who sort of monitors this committee a bit, as you will recall.

Mr. Chairman, the AFL–CIO urges the establishment of an Energy Independence Authority, capitalized at $100 billion, to help establish energy independence for the United States through direct loans, loan guarantees, price guarantees and other financial assistance to private industry and public bodies unable to secure private capital.

The United States is increasingly dependent on the importation of oil from insecure foreign sources. As long as that dependence continues, so long will there be an energy problem.

For the first time in history, foreign oil imports recently exceeded domestic production. It is this situation that makes the Nation today even more vulnerable than in 1973 to an Arab oil embargo.

Because gasoline lines have disappeared, the nation should not delude itself into believing that the energy crisis is over. America

must not wait for another oil embargo before coming to grips with this problem.

There is no simple solution. There is no instant panacea. Rather, what is required is a massive commitment to explore and develop all avenues of approach that would lead to energy conservation and increases in domestic supplies.

As a first step, it is essential that the nation embark on a stringent and mandatory conservation program. Such a program would call for the production of energy-efficient automobiles, the construction and retro-fitting of buildings of maximum energy efficiency the development of mass transit systems, the production of gas and electric appliances that use considerably less quantities of energy than our current appliances, and other energy conservation measures.

The kind of conservation that we are talking about does not mean an abandonment of the American way of life. Conservation, as we understand it, goes hand-in-hand with economic growth, full employment, and a prosperous economy.

Conservation measures are indispensable. But by themselves, they will not solve the energy crisis. It is just as essential to increase the Nation's supply of energy.

There is no one source of energy that represents the ultimate solution to the Nation's energy deficiency. The choice is not between coal or nuclear or solar power. All sources of energy—coal, nuclear, oil, gas, solar, geothermal, shale oil, coal liquefaction and gasification—must be promoted. Nevertheless, it should be understood that for the near term coal and nuclear power represent the nation's best hope.

However, it is clear that even with the most intensive exploration and development efforts, domestic sources of oil and gas—the standbys of the past—are declining. Therefore, we would urge that newly constructed industrial and power plants be required to operate on fuels other than oil or gas and that steps be taken to convert plants now using gas and oil to alternative sources of energy.

We are persuaded that private industry, left to itself, cannot and will not resolve the energy crisis. It is urgent that the government directly involve itself in this matter so vital to the national interest. America cannot afford to mark time.

The kind of authority that we envision would:

(1) Provide financial assistance for the whole gamut of energy technologies, including the construction of new plants.

(2) Provide financial assistance to convert power plants that use oil or gas to alternative sources of energy.

(3) Provide financial assistance to projects to conserve energy usage, including construction of energy efficient buildings and retrofitting old ones.

(4) Engage directly in the production and distribution of energy whenever the national interest calls for it and private industry is unwilling or unable to do so.

The CHAIRMAN. Thank you very much, Mr. Biemiller.

Mr. Biemiller, is there any opposition to this position in the AFL–CIO? Is it pretty much unanimous, general consensus?

Mr. BIEMILLER. To the best of my knowledge, it is a general consensus. It certainly is among the members of the executive council

who, as I say, adopted a resolution that I am submitting for the record.

The CHAIRMAN. No other unions have taken a contrary position to the AFL–CIO?

Mr. BIEMILLER. None that I am aware of, and I am sure we would have heard about it if they had.

The CHAIRMAN. You say, "We are persuaded that private industry, left to itself, cannot and will not resolve the energy crisis."

Now, a study published earlier this year by Bankers Trust using assumptions that seemed fairly logical—at least they were the same assumptions as Vice President Rockefeller and Frank Zarb used—came to the conclusion that over $900 billion would be needed to achieve energy independence by 1985, and that private capital markets could provide that and would provide that.

Furthermore, a study by Dusenbury and Bosworth, two very competent economists, as you know, came to the same conclusion. They said it would be close, but, in their view, there would be enough funds in the private sector to finance this operation in the market place.

What is your response to that?

Mr. BIEMILLER. I think it is quite possible that the funds could be raised, but we haven't shown any willingness on the part on industry to proceed in the direction that we think they ought to be proceeding. We know that, for example, on the gasification of coal, they are waiting for the type of assistance that is contemplated by the Energy Independence Authority.

This would be a price situation. You were correctly pointing out in the previous colloquy that the Energy Independence Authority would provide various kinds of financing and also price sustenance money.

I do not think that you are going to get private industry in this country to do the job that, in our opinion, needs to be done, unless it is spurred on by the Government.

The CHAIRMAN. Yesterday, we had testimony by Barry Commoner, a very eminent environmentalist, and a highly competent man, who argued that this would be counterproductive, because it would tend to encourage technologies that are inefficient, bring in higher-priced fuel. He argued it would raise the price of fuel and that the disposition of this kind of an authority would be to fund coal and shale and would ignore solar energy, which he feels is by far the most promising but doesn't have a vested interest push.

What would be your response to that criticism?

Mr. BIEMILLER. I don't see why solar energy would be ignored by an Energy Independence Authority. We have made it quite clear that we think all approaches to increasing our energy supply should be developed and utilized.

The immediate prospects, though, for solar energy, in our opinion, are not great. We think that solar energy can be developed; it is going to take some experimentation beyond the current state of that technology.

As you know, there are numerous small projects underway, but there are no big projects underway at the moment in the solar energy field. Just as, unfortunately, there are not in coal gasification or anything else.

71–787—76——11

The CHAIRMAN. You say very little in your statement—of course, it is a concise statement. I understand why you had to be careful about getting into fields that you didn't feel were absolutely essential. But you say very little about jobs, the effect of this on jobs.

The Vice President argues that this would increase the number of jobs by 1.2 or 1.3 million, a figure which didn't seem to me very logical. We didn't challenge him on it, because there were so many other things to discuss.

But one of your central concerns is jobs. You and your organization have fought very hard to reduce unemployment, provide more work. What, in your view, would be the effect of this on employment in the country?

Mr. BIEMILLER. We think it is absolutely essential if we are to maintain any kind of a full employment economy in this country. I don't have to remind you or anyone else who serves on this committee that we are below the trough of all postwar depressions at the moment.

In our opinion, current unemployment is actually over 10 million and not the figure that the Government is using.

We cannot get those jobs without sufficient energy, and this is what our concern is.

The CHAIRMAN. But as far as the direct effect is concerned, many facilities would be located in remote areas, Canadian permafrost, Colorado mountains.

You feel the principal effect of this in bringing employment in the center cities, for example, would be in making energy more abundant and at a more reasonable price?

Mr. BIEMILLER. There would be, of course, some jobs created in the construction of plants and energy lines and the like. And in a shale project, for example. But the main thing is, we want a source of energy available.

We see real problems. You are aware, I am sure, that the consumption of energy, while in the last couple of years hasn't been jumping, was jumping at tremendous strides in this country. We think if we are going to make use of the 25 percent of current industrial facilities that are not utilized at all, that we are going to have to have more energy in this country.

The CHAIRMAN. It is good to see you come down as hard as you did on conservation, too. That was most constructive and helpful.

Senator Stevenson?

Senator STEVENSON. Mr. Biemiller, does the AFL–CIO support this bill, or is it the concept of assuring adequate capital for the conservation and production of energy that the AFL–CIO supports?

Mr. BIEMILLER. The concept, and we think the bill is a framework with some of the suggestions we have made.

One of them, I believe, is a suggestion that you have been working on for some time, Senator, and that is to get a TVA-type demonstration going in the area. We would feel very strongly that that type of thing should be added to the bill.

Senator STEVENSON. Well, they would complement themselves, this could become a partial means of financing. The corporation I propose, that corporation could become the best vehicle for the diver-

sification of foreign sources which, as you know, is also very important.

But I do not think Mr. Commoner, either, was quarreling with the concept. He was quarreling with the priorities which he feared this particular bill, the EIA, would produce.

But the bill, within this framework, can be rewritten. The EIA could be given some guidelines and some productivity standards to produce different priorities.

The Chairman asked if there was opposition; I am not aware of much opposition, either by labor or others, to the concept of assuring adequate capital to develop new conservation efforts and energy sources.

Thank you, Mr. Chairman.

The CHAIRMAN. Thank you very, very much, Mr. Biemiller. It was a helpful presentation.

Mr. BIEMILLER. Thank you, Mr. Chairman.

The CHAIRMAN. Our final four witnesses I am going to ask to come forth together as a panel. Mr. Russell Cameron, chairman of the board, Cameron Engineers, Denver, Colo. Mr. John Simpson, chairman of the Atomic Industrial Forum, Pittsburgh, Pa. Mr. Joe Browder, Environmental Policy Center, Washington, D.C. Mr. Joseph Curry, Consumer Power, Jacksonville, Fla.

STATEMENT OF RUSSELL J. CAMERON, CHAIRMAN OF THE BOARD, CAMERON ENGINEERS, DENVER, COLO.

Mr. CAMERON. Good morning.

The CHAIRMAN. You gentlemen come to us with extraordinary backgrounds in the energy area. We are happy to have you here to give us advice on what would be an enormously big commitment by the Congress.

Mr. Cameron, will you begin?

Mr. CAMERON. Thank you, Mr. Chairman.

I regret that, due to a mixup in communications, I didn't receive information and background data on the EIA until too late to prepare written testimony. But I will be glad to submit testimony for your record.

The CHAIRMAN. Very good.

Incidentally, I should have said we would appreciate it if the four of you gentlemen could confine your remarks as much as possible to 5 or 7 minutes, something like that; abbreviate your testimony if you can, so we will have some time for questions.

Go right ahead, sir.

Mr. CAMERON. I might take a couple of words, if you don't mind, since Cameron Engineers is not a household word, to tell you that our firm is one of the pioneers in synthetic fuels technology. We have been advisers to both industry and government for the past 20-odd years.

I have participated myself in synthetic fuels development through service at the U.S. Bureau of Mines oil shale project at Rifle, Colo. since the late 1940's and got involved in energy matters here in Washington in 1974, when I came in as a special adviser to Mr. Simon and

Mr. Sawhill, in considering the concept of Project Independence and helping to establish the framework within the FEO for such a program.

Synthetic fuels is the area to which I would like to direct your attention. Our definition of "synthetic fuels" is oil and gas produced from coal, oil shale, oil sands, and recently from organic wastes.

Without getting into a lot of history, I think it might be useful to note that we are not talking about new technology to produce synthetic fuels in so much as we are talking about modern engineering methods for producing these materials. The term "coal oil" which you heard back as a boy was a synthetic fuel produced from the distillation of coal. That has gone back for at least 200 or 300 years.

You are familiar, of course, with the German synthetic fuel industry of World War II, in which coal was used to provide about 100,000 barrels a day of liquids—gasoline, diesel fuel, aviation fuels and lubricants for their war machine.

Here in the United States during and following the war, we had a synthetic liquid fuels program that was sponsored by Senator O'Mahony of Wyoming. The Bureau of Mines took the German technology, tested and demonstrated it here, and by 1955, had shown that we could use our coal, our technology with the basic German-developed chemistry—as well as oil shale technologies used elsewhere throughout the world—and make usable fuels from our domestic coals and oil shales.

Today, South Africa has a modern coal-based synthetic fuels industry. South Africa started its work in 1955, building a small commercial plant. Just this past year, a contract was awarded to a major U. S. engineering company for a $1 billion expansion of that project.

So we have as background for synthetic fuels production the technologies that have been developed over the last 30 or 40 years, based on modern engineering practices. Research in the United States, both by private industry and by government, also has provided us adequate technical background to proceed now to pioneer commercial plants.

We have the same sort of story for oil shale as with coal. Scottish oil shale industry existed prior to the time oil was discovered in Pennsylvania, and the foundations of chemical engineering practice were actually developed in Scotland during the late 19th century in processing oil shale and producing from it usable lubricants, waxes, and illuminating oils. At that time gasoline was not an important product.

Today, the U.S.S.R. has a modern oil shale industry producing the equivalent of 100,000 barrels a day of energy in the form of liquids, gases, and electric power. Mainland China has a large oil shale industry, perhaps one of the largest industrial complexes in the world, mining coal and oil shale to provide most of the fuel for the industries of Manchuria.

Brazil has a modern oil shale plant. My company designed the plant which has been in operation for several years.

We have had a long period of research in this country on oil shale, and, as I indicated earlier, are ready to go with commercial production.

I think it is also very important in the considering legislation such as the EIA that we recognize that the United States is not poor in

the resources to provide for energy self-sufficiency. Coal as a resource certainly can provide raw material for the equivalent of some millions of barrels per day of synthetic gas and synthetic oil, once we have established the basis for a commercial industry,

Oil shale resources, you have heard the numbers, get into the hundreds of billions of barrels. The number most often quoted is 600 billion barrels which is somewhat larger than all of the oil reserves known throughout the world today.

But this is a conservative number, because once we establish a technology, once we get into second and third generations of the application of this technology, we will use lower and lower-grade resources. So in oil shale we have the most plentiful potential oil resource on the face of the earth in the reserves of Colorado, Utah, and Wyoming, adding up to a trillion barrels or more.

Garbage can provide a significant part of the gas and the industrial fuel requirements of many localities where it can be efficiently gathered and processed. A study we made of the city of Denver indicated that by the year 1990 10 to 20 percent of Denver's gas could be produced from the gasification of the municipal waste gathered in the area.

Now to economics. Synfuels are high-cost energy sources. This has been indicated by the other witnesses, I am sure, and I will be glad to provide more detailed information.

Oil from coal is in the $20 to $25 a barrel range. Synthetic gas from coal is $3 to $4 per million Btu. Oil shale is somewhat lower, perhaps from $12 to $20 a barrel, depending on how highly refined it is and where it is produced. Energy from garbage is in the same $3 or $4 range as gas from coal.

The high investment is one of the principal deterrents to synthetic fuels development. Inflation has doubled costs during the past 5 years for industrial equipment so that at today's cost, 1976 costs, a $1 billion investment is required for a plant to produce the equivalent of 50,000 barrels of oil per day, whether it be gas from coal or oil from oil shale.

This really brings into focus the role for Government in the initiation of a synthetic fuels industry—a sharing of the risks of the pioneer plants in order to provide the basis for significant future production of synfuels when our oil and gas supplies become even more critical.

There are 34 commercial synthetic fuels projects in some form of planning or development by industry in the United States today. There are 75 R. & D. projects, most of which are industrially operated, many of them industrially financed.

There has been no lack of interest or activity by industry to get us to where we are today, which is at the threshold of commercial applications. But with price controls over oil, with the large front-end capital requirements that continue to be increased by inflation, with the possibility that foreign oil prices might influence domestic oil prices if the OPEC cortel were broken, industry has not been able to go ahead with this first wave of commercial plants.

I would therefore agree with the concept of the EIA, that some form of government risk-sharing is required. I would limit it, how-

ever, to the first group of pioneer plants, so that we can actually determine the real costs, determine the real environmental problems that have to be solved, and to provide the industrial base for expanding synthetic fuels in a competitive energy economy, as we move into the next decade.

It is quite clear that industry cannot get the money from the financial community to go into these huge projects without some form of backup from the Government. I strongly favor the legislation what was passed by the Senate last year, rejected by the House, but is now again before the House, for a limited synthetic fuels program, in order to provide thie head start to obtain the knowledge we need to determine where synthetic fuels fits into our energy picture, as we move into the last part of the century.

Thank you.

The CHAIRMAN. Thank you very much, Mr. Cameron.

Mr. Simpson?

STATEMENT OF JOHN W. SIMPSON, CHAIRMAN, ATOMIC INDUSTRIAL FORUM, PITTSBURGH, PA.

Mr. SIMPSON. Mr. Chairman and members of the committee, my name is John W. Simpson. I am chairman of the atomic industrial forum and director-officer and chairman of the energy committee of the Westinghouse Electric Corp. I appreciate the opportunity to appear before you today as chairman of the forum. The following views of S. 2532, the Energy Independence Authority Act, are consistent with those I forwarded to the President last November on behalf of the executive committee of the forum's board of directors.

As you may know, the forum is a not-for-profit trade association comprised of over 600 organizational members in the United States and 25 other countries. Our members share a common interest in the development and application of atomic energy for peaceful purposes. Our membership is very diverse, and includes, among others, utilities, manufacturers, engineer-constructors, service companies, mining and milling companies, universities, labor unions, professional firms, financial institutions, and governmental organizations. As the name "forum" implies, one of our major roles is to identify relevant technical, legal, and policy issues and provide a mechanism for determining the views of our members. We then seek to convey these views to appropriate decisionmakers in ways such as this testimony before your committee.

The forum's executive committee fully supports the goal of energy independence and believes that the proposed Energy Independence Authority could be a key milestone toward that goal. The concept of U.S. energy independence remains timely and extremely important. Energy independence would remove a great vulnerability of the United States' present foreign policy and would improve the national security. It would strengthen the United States economically by reducing our dependence upon high-priced foreign energy sources in order to meet the future demand for electric power. Even if full energy independence is not achieved, a close approach to that goal would undeniably ameliorate some of our most pressing national problems.

We believe, therefore, that it is imperative for the United States to accelerate development of its domestic sources of electrical energy supply and, concomitantly, reduce our national dependence on foreign energy sources. Electric power today provides 25 percent of U.S. energy requirements and in the future is expected to supply proportionately more—50 percent—by the year 2000. In view of our limited and ever decreasing domestic natural gas and petroleum supplies, it is evident that only domestic coal and uranium for nuclear energy can contribute importantly to augmenting the United States' electrical capacity in the next two decades. One of the major problems now stalling this growth is the availability of investment capital to build the necessary and very costly electrical generating plants and supporting facilities.

To be sure, other problems also exist. Insofar as nuclear power is concerned, its safety and general desirability are under active challenge by vocal opponents before both the Federal and State levels of government. We are confident, however, that these concerns will ultimately, and we hope speedily, be resolved in favor of accelerated nuclear development. The problem then will be similar to what it is now: Can utilities who wish to exploit the nuclear option, in part because of long-term economic benefits, get over the short-term economic hurdles? The Energy Independence Authority may be able to play a vital role in helping to finance the leadtime capital intensive facilities, including fuel cycle facilities for such supportive activities as fuel enrichment and reprocessing, so that the nuclear option may remain viable.

The administration's statement accompanying the release of S. 2532 last year noted that capital requirements for energy independence will total about $600 billion over the next 10 years. Although no information has been provided on the allocation of this sum, recent industry studies show that the utility industry alone will require $200 billion in external financing during the same period, assuming moderate growth in demand for electrical energy. This will thus approximate one-third of all U.S. investment projected during this period. Accordingly, the utilities' financial needs will be met only if investor funds can be attracted in large amounts.

Traditionally, investors have been attracted to the utility industry because of the relative security and adequate return on funds placed therein. While growth in the utility assets standing behind each invested dollar—book value—was only moderate compared to that in many other industries, it was nevertheless sufficient to help attract investment.

In the immediate past, this situation worsened significantly as a result of drastic increases in fuel costs propelled by the OPEC cartel. At the same time, the effect of inflationary forces and sharply higher interest rates was also felt, so that regulatory bodies found it politically difficult to raise electric rates rapidly enough to provide an adequate rate of return on invested capital. This led to a serious deterioration of earnings. The financial rating of many utilities were downgraded during this period, making it much more costly to raise capital via long-term debt, the most common source of funds. Furthermore, utilities frequently found it necessary to dilute their stock by offering new equity shares at market prices well below book value.

In addition, increased operating costs, soaring construction costs, delays in licensing, and a decreased rate of power growth greatly reduced internal cash flow. This further aggravated the current financial difficulties of the utilities.

Over the next decade, industry may be unable to acquire sufficient new funds to finance its future needs from traditional sources. Measures like the Energy Independence Authority which substitute for the traditional method of stimulating investment in the utility industry, while certainly inadequate for the long run, may be helpful and acceptable if they are structured so as not to bring any unneeded permanent involvement of the Government into our basic free market system. Far preferable, however, would be enactment of specific measures which would ensure that regulatory bodies would act promply and allow utilities to earn a fair rate on invested capital. This would provide a more direct and potentially less disruptive resolution of the current utility dilemma.

Turning from electrical generation per se to nuclear fuel cycle support facilities such as uranium enrichment and processing plants, we would agree that this area may be in need of the type of assistance envisioned by the act. S. 2532 would assist in accelerating energy independence by financially aiding energy-related concepts which are not likely to be undertaken by private industry, because they have not been commercially developed and may be considered economically high-risk endeavors or are of such large size that industry would not proceed alone.

Such areas in the energy field have traditionally not been fully served by private investment capital, and some of these may be extremely important to a satisfactory national energy program, thus requiring some form of Government participation. These areas typically involve development of highly capital intensive or high-risk technologies which private industry alone cannot, or is unwilling to, undertake, for example:

Programs involving high-risk investment where satisfactory return may not exist for the individual participant, but which may, overall, be beneficial to the Nation; programs of a highly capital intensive nature involving first-of-a-kind demonstration programs, such as conversion to solid form and storage of high level radioactive wastes discharged from nuclear fuel reprocessing plants; and as the administration has already recognized in its proposed Nuclear Fuel Assurance Act, programs of a highly capital nature which private industry will only enter given certain assurances and Federal policy decisions.

Any Government supplemental program in these areas must, to be effective, be designed so that as each project approaches a higher degree of commercialization it will involve a lesser degree of governmental involvement and a higher degree of participation from the private sector. With this essential principle in mind, the act's potential to assist in this critical area is encouraging.

Finally, I would like to mention briefly and commend two of the act's salient details. The provisions directing the Federal Energy Administration to accelerate the licensing and regulatory processes could indeed go a long way toward accelerating the use of nuclear

power. The act constitutes in this regard a constructive step in an area where political and jurisdictional disputes threaten to thwart true progress towards energy development. These interagency relationships deserve and will continue to deserve close congressional scrutiny. We strongly urge, however, that a shorter time period than 18 months be set for issuing licenses after the proposed certification is approved. Such a period, notwithstanding legitimate difficulties, would be more consistent with the national emergency which is addressed here.

Second, we strongly endorse the provision that financial assistance which may be made available to business concerns regulated by State or local regulatory bodies should be contingent upon an assurance of quarterly rate adjustments which, in the judgment of the Authority, will provide restoration of the business concern's credit rating to a level capable of obtaining conventional capital at favorable interest rates without additional financial assistance from the Authority. Concurrently, we urge Federal leadership in enacting additional legislation to allow utilities a rate of return on their investments, including funds invested in construction work in progress, that will permit them to compete in the money market and thereby maximize the financing of our nation's expanded energy resources without further government assistance.

In conclusion, we believe that the approach represented by S. 2532, if properly molded and implemented, could make a substantial contribution to nuclear development and energy independence, and thus merits broad industry support. However, other Federal efforts, particularly those to: (1) place utility rates of return on a sound economic footing; (2) insure private nuclear enrichment capabilities through the scheme of the Nuclear Fuel Assurance Act; and (3) accelerate governmental activity in the high-level waste management portion of the fuel cycle; must proceed vigorously, in parallel, if significant results are to be obtained.

Thank you again for the opportunity to present this statement.

The CHAIRMAN. Thank you very much, Mr. Simpson.

Mr. Browder?

STATEMENT OF JOE B. BROWDER, ENVIRONMENTAL POLICY CENTER, WASHINGTON, D.C.

Mr. BROWDER. Thank you, sir.

First I want to let you know that this statement also represents the position of the Sierra Club, which has asked me to represent its views here today, too.

The CHAIRMAN. Very good.

Mr. BROWDER. And in order to put Mr. Simpson's statement in a broader context, one of the documents that I gave you, sir, is a memo from a consultant to the Westinghouse Corp., Mr. Patrick Caddell, outlining for Westinghouse the public relations campaign suggested to the Atomic Industrial Forum for discrediting all those interests who might have questions about the safety and efficiency of nuclear power, or questions about any other energy industry, or criticisms of the industry's influence on national policy.

Two of the other documents there, are one prepared by one of our staff members, for the Council on Environmental Quality, about the need for energy facilities in the United States, and another about water demands in the Upper Missouri Basin, which reflects directly on some of the interests of The Oil Shale Corp. and others represented by Cameron Engineers.

I won't go through this whole statement, but I would just like to emphasize a couple of points.

First, it is our belief that the Energy Independence Authority is an attempt to satisfy two interests that combine the worst elements of both.

One is the least productive sector of the energy industry and the other is the pork-barrel sector of our Federal Government. Because we don't want to be—appear to be partisan about this, I want to say that President Ford is reflecting a viewpoint that is also shared by a great many Democrats.

There is almost no difference between the intent or consequences of President Ford's bill or Senator Henry Jackson's National Energy Production Board Act. President Ford's bill looks like it was drafted by a bond counsel, and S. 740 looks more like the Emergency War Powers style of legislation from which it evolved.

They both accomplish essentially the same thing. Both Mr. Ford and Mr. Jackson are now working on what they agree is the first step toward the achievement of the broader legislation, that is, subsidies for the commercial production of synthetic fuels, the legislation the first witness on this panel mentioned favorably.

In our view, the Energy Independence Authority and Senator Jackson's bill would force the United States to make radical changes in its political and economic system.

They both would blur the distinctions between private and public capital. They would centralize the decisionmaking about the geographic distribution of capital.

They would weaken the political authority of the Congress and State and local governments, and further concentrate political and economic power in the executive branch of the Federal Government.

These policies are offered to us with the promise of more jobs, and freedom from OPEC countries, but we think that they would do more to increase the economic and political strength of the OPEC countries than anything the oil-exporting countries could do for themselves.

Here at home these programs would divert capital away from genuinely productive energy programs and leave us with even less money for housing, manufacturing, health care, education, national defense or the other needs of our economy.

The specific energy programs that benefit most from the structure of this legislation are an emphasis on expanding coal production in the Rocky Mountains and Northern Great Plains instead of the Midwest and Appalachia.

That would cause a massive shift in capital, public works spending, tax revenues and job opportunities away from the present industrial regions of our country in the Midwestern and Eastern States to the now largely agricultural regions of the Central Rockies and Northern Great Plains.

A similar shift would result from subsidizing the commercial production of synthetic fuels, and the creation of a subsidized synthetic fuels industry would lead to further increases in the price of all energy.

In our view, the worst feature of this bill is its program for subsidizing the electric power industry, that would just reinforce business as usual in the industry that is the least efficient, most capital-intensive in the country, at a time when the industry's planning calls for a quadrupling of per capita electric power consumption in the United States within the next 25 years.

The desire to give and take pork barrel always produces a willingness to distort the econouic and social consequences of Federal programs. But if we look at the most conservative estimates, the ones coming from the Treasury Department, for example, more than a third of all capital invested in this country in the next 10 years is going to be for energy development.

We think that while there is a real need to put usable energy into our society, if we let energy be treated politically or economically like an SST kind of pork-barrel program, then that sort of thing, I think, will bankrupt us.

I would like to give two political examples, and we could go into much technical detail about the environmental impacts of oil shale production or coal gasification as you want, but these two political examples are, I think, really significant.

One is what happened last year on the House side at the science and technology hearings on the synthetic fuels commercialization subsidy bill, when Governor Lamm of Colorado testified that he wanted to be a partner of Federal Energy Administrator Frank Zarb's in subsidizing a commercial oil shale industry for Colorado.

That statement of Governor Lamm's was a shock to a lot of people who had supported him and worked with him before his election. After the hearings, a couple of us expressed our shock that he would want to be a partner of Frank Zarb's, and he said, "I have to be either his partner or his slave." And he meant it.

That is the attitude that is being stimulated by the Federal Energy Administration's reinforcing the background music from the industry, that the crisis we face is so intense that traditional economic, traditional political responsibilities, relationships, just have to go out the window.

In our view, at least, any sort of a rational review of resource availability, the cost of processing, energy demand, and the ability of existing jurisdictions to handle problems like siting and licensing of production facilities would not justify the kinds of radical changes being proposed, either in the National Energy Production Board Act legislation that some of the Democrats favor or in President Ford's legislation.

The other example really should be a perfect demonstration of how priorities can be distorted during the development of the sort of hysterical "we have to solve the crisis" atmosphere. At the time when the New York City fiscal crisis was at its most visible peak, when President Ford was acting like New York was typical of the big cities that had to be punished because they had been sinful and wasteful, that they don't deserve Federal assistance, even in the form of

guarantees for their debt, so they can maintain basic services—at that same time the White House was drafting legislation as a part of this synfuel subsidy bill to give Federal guarantees for the municipal bonds of cities that haven't been designed, their locations haven't even been decided on yet, they haven't even been incorporated—so that the Federal Government could help subsidize the company towns that would spring up if the oil shale plants got their subsidies so that they could produce fuel that is so expensive that no one but the Federal Government could afford to buy it.

There is almost an absurdity about, in our view, at least, the economics and the politics of this issue.

Another point that I think you ought to pay particular attention to. I don't see how the committee could even take this Energy Independence Authority legislation seriously. All it is, is boilerplate special purpose authority legislation.

It could have been lifted from the Port Authority of New York, a transit authority in Miami, a housing authority anywhere. It is just difficult to see how the application of a system of controlling revenues and political power that has failed so demonstrably in so many areas is now supposed to come up and solve one of the most important problems that the country faces.

Finally, I would like to talk about the general credibility of the Ford administration in the assumptions that it puts before the committee that justify this kind of legislation.

We believe that the White House, including the Ford White House, has lied consistently about its programs, its real energy policies. Those distortions and lies about what the administration really wants as opposed to what it says in energy policy predate the era of embargo, but became most flamboyant during the days of the embargo and immediately after.

I didn't have enough copies of it in time to distribute a lot of them, but I can give you one copy of one of the administration's planning papers for Project Independence.

It is called "Energy Independence An Overview". It was distributed a few weeks after Secretary Kissinger distributed, at the World Energy Conference in 1974, the U.S. public position about energy independence.

During that time the White House was talking about how we weren't going to let those nasty Arabs influence our policies, and how we were going to become energy selfsufficient.

But within a few weeks this paper circulated. It redefines energy independence as maximum secure imports, talks about setting up military and economic relationships with the Saudis before that had been made public at all, and made it quite clear that the intent of the administration was to increase the amount of oil that we import from those countries.

Now with regard to the wisdom of what level of imports is good for our economy and can be achieved at a price, political or otherwise, that is not too much to pay, I think it is important to consider the basic dishonesty of the administration in putting forth a big public relations campaign, Project Independence, that appeals to the most patriotic impulses of all elements of our society, asks them to make

sacrifices including real economic sacrifices; in the name of this implication that we are going to be free of the foreigners, while at the same time the administration, from the very beginning, has based its energy policy on the increased import of foreign fuels.

The White House has continued to manipulate data about energy resources. Just in the last few weeks the administration ordered the UCGS to stop giving information to the Congress about coal resources on the public lands, because the USGS information contradicted what President Ford had said about the impact of the President's veto of strip mining legislation.

The data given to justify the administration's energy facilities siting legislation, the vast numbers of energy facilities that can't be sited without Federal intervention in the process, was false.

I would just hope that you would all take a look, a really close look, at the basic justifications for this kind of legislation before you get into debates about section A and section B, or how to accomplish the purposes of this legislation, because in our view, at least, the whole thing isn't worth anything at all.

[Material received from Mr. Browder and statement from the Sierra Club follow:]

STATEMENT OF JOE B. BROWDER

The Energy Independence Authority is an attempt to satisfy two interests in a way that combines the worst elements of both. One is the least productive sector of the energy industry. The other is the porkbarrel sector of the Federal government. We don't think that our economy, our environment, or our political system can withstand the distortions required to achieve the objectives of this legislation.

To be fair, it should be noted that President Ford is reflecting a viewpoint that is also widely held within the Democratic Party. There is almost no difference between the intent or the consequences of President Ford's bill and Senator Henry Jackson's National Energy Production Board Act. President Ford's bill looks like it was drafted by a bond counsel, and Senator Jackson's looks more like a wartime emergency powers proclamation, but their substance is the same. And the President and Senator Jackson are working together now on the Jackson bill that the White House says is the first step of the Energy Independence Authority program, federal subsidies for the commercial production of synthetic fuels. So our comments should not be interpreted as partisan.

This legislation rests on an assumption that combines helplessness and hysteria—that our 200-year-old political system no longer works. The discovery of oil and the development of the oil industry has certainly put a strain on that system. But there is no basis in fact for the assumption that a transition from oil to other energy sources requires a transformation in the kind of government we have, unless you assume that the government must function to assure that the oil industry survives the transition and controls the energy sources of the future.

The Energy Independence Authority and Senator Jackson's bill would force the United States to make the most profound changes in our country's economic and political structure since the development of industrial society. They would blur the distinctions between private and public capital, centralize the decision-making about the geographic distribution of capital, weaken the political authority of the Congress and of State and local governments, and further concentrate political and economic power in the Executive Branch of the Federal government.

The energy policies that would be advanced by such changes are those now being pushed by the Ford Administration and by Senator Jackson and others

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in the Congress whose views about energy are biased by their interest in development of resources under the jurisdiction of the Interior Committees. They propose the development of our lowest-grade and most remote resources, and the subsidy of the most costly and least productive conversion technologies, at the highest possible rate of overall energy consumption, at the highest possible price.

These policies are offered to us with the promise of more jobs and freedom from the OPEC countries. But the Ford and Jackson energy programs would do more to increase the economic and political strength of the OPEC countries than anything the Arab or other oil-exporting countries could do themselves. And here at home, these programs would divert capital away from the production of needed energy and leave us with even less money for housing, manufacturing, health care, education, defense, and other needs.

To be specific: the emphasis on expanding coal production in the Rocky Mountains and Northern Great Plains instead of in the Midwest and Appalachia would cause a massive shift of capital, public works spending, tax revenues, and jobs, away from the eastern and midwestern industrial regions to the agricultural regions of the west. A similar shift would result from subsidizing the commercial production of synthetic fuels—and creation of a synthetic fuel industry will lead to further increases in the price of all other fuels. Worst of all, subsidies to the electric power industry would reinforce business-as-usual planning in the least efficient, most capital intensive industry in the United States, at a time when that planning includes a quadrupling of per capita electric power consumption in the U.S. in the next twenty-five years.

It is understandable that some people in Congress are making mixed-up proposals, because they are getting contradictory signals. Oil and coal companies, hardware suppliers, and utilities now call themselves the energy industry. This combination of interests demanding the quasi-public authority generally given only to regulated monopolies, while also demanding the freedom from regulation generally given only to competitive enterprises, is creating pressure for radical changes in governmental authority and in civil rights and private property rights. Private oil, mining, and processing companies are now trying to apply the scarcity and public interest principles to the extraction of resources that are abundant and to the construction of facilities that are sited and developed for competitive reasons. Considering the oil industry's disregard for the rights of ranchers and farmers in the west, the coal industry's continued use of the broad form deed in Appalachia, and the competitive nature of the supposedly public interest routes of the Trans-Alaska Pipeline, the Arctic gas pipeline, and the coal slurry pipeline, it is almost ludicrous for the oil industry to talk about the sanctity of private property and private enterprise.

The environmental, consumer, and resource management problems growing out of this debate are obvious. But the first two problems I mentioned, those of the unproductive industries and those of political figures who see all public policy questions as opportunities for distributing federal money, are producing what we think is a crisis for our economic and political system. The desire to give and take porkbarrel has always produced a willingness to distort the economic and social consequences of government programs. But if we accept the most conservative estimates, that more than a third of all capital invested in the United States in the next ten years will be for energy production, and if we believe that there is a genuine need to put usable energy into our society, then we simply can't let energy be treated as a porkbarrel issue. The same kind of thinking that wanted to distort our transportation priorities by subsidizing the SST will bankrupt us if applied to energy.

I'd like you to consider two specific examples of the political consequences of these energy policies. The Ford Administration considers Senator Jackson's synthetic fuel subsidy program to be the first step toward adoption of the Energy Independence Authority. President Ford and Senator Jackson both say that synthetic fuels should be the foundation of America's program for energy independence. At more than a billion dollars a plant, with the plants producing fuel so expensive that no one could possibly afford to buy it, the opportunities for subsidy are almost endless.

Some people consider that kind of porkbarrel to be a victimless crime. But please think about a comment made last year by Dick Lamm, the Governor of Colorado, after a hearing by the House Committee on Science and Technol-

ogy. Some of us had told the Governor that we were disappointed that he had declared himself to be a willing partner of Federal Energy Administrator Frank Zarb in subsidizing the development of an oil shale industry in Colorado. And Dick said to us, talking about Zarb, "I have to be either his partner or his slave."

At that same time, President Ford was telling the country that New York had to be punished for its wasteful ways, and that the Federal government could not possibly guarantee New York City bonds, that the city was just going to have to suffer. But while the President was telling New York to cut back on services, the White House was working out a program to give Federal loan guarantees to back up the municipal bonds of cities in Colorado that haven't been built, that haven't even been located or incorporated yet. Because President Ford wants to help Governor Lamm and the oil shale companies pay for the new company towns that will spring up if the oil shale companies are subsidized to produce the fuel that is too expensive for anyone but the Federal government to buy.

It is probably true that such a biasing of our economy could not be achieved without a transfer of political power to some kind of Energy Czar. But there is certainly nothing new or creative about the proposed Energy Independence Authority. The Authority, with extraordinary powers and almost no political or fiscal accountability, is wrapped in boiler-plate language that is characteristic of special-purpose authorities. It could be a port authority in New York, a transit authority in Miami, or a housing authority in almost any city in our country. The transfer of revenues and responsibility to such authorities has not done much to solve the problems of our cities. It is intellectually and politically bankrupt of President Ford and Senator Jackson to believe that this approach should be applied to our country's energy problems.

In case the Committee might be told that the proponents of these special energy authorities or corporations have not meant to recommend such a radical concentration of economic, land use planning, and political authority in the Federal executive branch, I hope you can investigate enough to understand that quite the contrary is true. Senator Jackson's National Energy Production Boards have evolved from his interest in Federal control over the development of energy production centers, dating back to 1972. The National Energy Production Boards would work to identify "any significant delays in domestic energy exploration and production programs which are exclusively the result of regulatory delay or procedural impediments at the Federal, State, or local level." Expedited Energy Projects approved by the Boards could, unless Congress objects, be exempt from compliance with the regulatory procedures of any Federal agency.

Almost identical language is found in the Project Independence planning documents of the Nixon and Ford Administrations. A review of Administration documents shows a consistent high-priority effort, complying with recommendations from the Office of Management and Budget and the Federal Energy Administration, to overcome what the Administration believes to be the regulatory obstacles to increased production.

A document entitled "Presidential Objectives," circulated by FEA in the spring of 1974, outlined nine FEA "Presidential" objectives for fiscal 1975. Objective IX is described as "Expand the domestic production of major fuel sources." Among the "Major Activities" listed as needed to achieve expanded production is: "Assist in the accelerated development of domestic energy resources through mitigation of the effects of and removing unnecessary impediments imposed by Federal, state, and local regulations."

We believe that the Energy Independence Authority can best be understood by looking at the intellectual framework that has shaped the Ford Administration's positions on energy production. The Administration's beliefs, goals, and plans have been formed and executed in secret, without regard for the public positions taken by the White House. The White House continues to engage in a massive public relations effort to cover up the Administration's actual energy policies. The Administration has been deceitful about its energy programs, lying to Congress and to the public, from the time of the Arab embargo up to the present.

For example, two years ago, a few weeks after Secretary Kissinger had publicly circulated the first outline of the Administration's plans for Project Independence, and while the White House was denouncing the Arabs and proclaim-

ing that the United States would soon become self-sufficient in energy, the White House secretly circulated another document among the Administration's top economic and energy officials. This document, called "Energy Independence, an Overview," redefined energy independence as maximum secure imports and discussed plans for closer military and economic ties to the Arab countries. Events since that time would indicate that the Ford Administration has continued to follow the original Nixon Administration energy program, including the recommendation for accumulation of more economic planning and resource management power within the Executive Branch.

The White House has so manipulated data about energy resources and energy demand that we don't think it is possible to believe the assumptions put forward by the Administration in defense of the Energy Independence Authority. Within the last few weeks, the Administration has ordered the U.S. Geological Survey to stop giving Congress information about coal resources on the public lands, because data from the U.S.G.S. contradicted President Ford's claims about the impact of strip mining legislation on coal production. President Ford's federal energy facility siting legislation, another component of the Energy Independence Authority program, was introduced with a claim that State governments are simply incapable of handling the hundreds of backlogged plans for construction of energy facilities. A review of that claim shows it to be just as false as the President's statements about coal production.

And in regard to another of the principle objectives of the Energy Independence Authority, the need to provide subsidized financing for the electric utility industry, the Administration is on even shakier ground. At this point, I'd like to refer to a memo prepared by Marc Messing, one of our staff who specializes in energy facility siting and energy demand studies.

"In comparing the costs of large-scale powerplants (800–1200MWe) and small scale units (below 500MWe) it is important to consider the reserve capacities associated with each. Obviously if you add a single large unit to any system, rather than a couple of small units, you stand more of a chance of shortage if the powerplant fails. That argument is important, but is compounded by the fact that large powerplants have generally proven less reliable than small powerplants. The electric utility industry has reluctantly admitted this fact (*Electrical World*, November 1975), but is presently arguing that this is only because the plants are immature, that they eventually will prove as reliable as their smaller counterparts.

"In the meantime, this historical data has forced the utilities to plan extra reserve capacity (above maximum peak demands) to compensate for the unreliability of large new plants. As the FPC stated in June 1974, 'the trend toward larger generating unit sizes, and the relatively poor availability records of records of many large units, operate to increase reserve margin requirements over that which is needed when smaller, mature units predominate on a system.' As a result, the FPC noted that the utility reserve capacity planned for the next decade tended toward 'the upper end of the 15 to 25 percent band currently observed.'

"If we take FEA's projected capacity figures for 1985, it is easy to calculate the additional capacity involved. With a projected total generating capacity of 922 GWe, if we assume a 25% reserve margin is included, this would involve 738 GWe of base capacity and 184 GWe of reserve: a 15% reserve capacity would leave 801 GWe of base with 121 GWe of reserve. If we assume a cost of $1 billion per GWe (1 GWE=1000MWe) the additional capital cost of the extra 10% reserve capacity would be $63 billion."

The capital cost of constructing that additional reserve capacity might seem like an urgent national priority to General Electric and Westinghouse, and to utility shareholders whose earnings have an inverse relationship to the utility's efficiency. But it is our feeling that the financial structure of the electric utility industry is the most important and most destructive of all the pressures operating on the economics of the energy system in the United States, on a scale much greater than the pressures caused by the structure of the oil industry. Until some way is found to reward utility investors on the basis of the productivity of the utility, growth in electric power capacity and production will drain money, energy, and jobs from our economy, as well as provide continued incentive for the most wasteful and environmentally damaging resource management policies.

We would respectfully urge you to reject this legislation. Thank you.

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WATER FOR INDUSTRY IN THE UPPER MISSOURI RIVER BASIN

A REPORT PREPARED FOR THE ENVIRONMENTAL POLICY INSTITUTE ENERGY INFORMATION PROJECT
BY BOB ALVAREZ 3 April 1976

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INTRODUCTION

This paper presents a general picture of the industrial development plans being advanced by the Federal government, and private industry; and their relation to the use of Upper Missouri water. The mineral resources work group of the Northern Great Plains Resource Program (Department of Interior and State Planning Agencies) predicts that coal production in the Upper Missouri Basin will increase rapidly from less than 20 million tons in 1972 to nearly 90 million tons by 1980.[1/] Although coal presently being mined in this region is being shipped to eastern and mid-western markets, future plans call for large increases in mine-mouth generation of power as well as coal liquification and gasification. What is not mentioned is that oil shale development, iron ore extraction, steel production, uranium mining and milling, not to mention nuclear power plants, and industrial "parks" producing nitrogen fertilizer, methanol and synthetic diesel fuel are also part of the picture. In part, these projects represent a major industrial reorganization of the United States based on western resources. The Upper Missouri Basin region sits atop the largest chunk.

These dramatic increases in raw material production will depend on their rate of conversion into electricity, fuel, and fabricated metal. In turn, their conversion rate will ultimately depend on water availability. For example, the type of gasification plant being proposed by Panhandle Eastern near Douglas, Wyoming will require about 7.5 million tons of coal per year and will gulp 2.8 million gallons of non-recoverable water, and 21 million gallons of reusable water for its cooling system yearly.[2/] In the Black Hills of South Dakota, Pittsburgh Pacific, a subsidiary of Inland Steel, proposes to stripmine one million tons of taconite iron ore and convert it to iron ore or steel in Rapid City. This project is expected to gulp around 20,000 acrefeet of water from the Madison ground water formation if mainstem Missouri water isn't diverted to augment the scarce water supply in that area. Water is basic to every natural and man-made raw material conversion process into energy. The impact of industrial water use in the Upper Missouri River Basin, upon the established agriculture economy of this region is just beginning to be discussed by the Federal government. This paper is a start towards such an analysis.

WATER SITUATION

Water is a scarce commodity in the Northern Great Plains despite the massive dams all along the Upper Missouri and its tributaries. The average rainfall in the NGP is between 10-14 inches yearly. Cyclical droughts lower river flows on the average of once every ten years and possibly as often as one year in four in the Yellowstone sub-basin of the Upper Missouri. In order to meet energy requirements in the next 30 years, the Bureau of Reclamation states in their Montana/Wyoming Aqueduct study that 2.6 million acrefeet will be needed annually.[3] This amount will lower the Yellowstone River, a major tributary of the Upper Missouri, by one third. Energy companies have already applied for 3.3 million acrefeet.[4] If past practices are followed, this water will be totally consumed in order to protect the watershed from pollution.

The Bureau of Reclamation divides water up in the following manner. The average yearly flow of the Yellowstone is 9.4 million acrefeet; irrigation requires 2.4 million acrefeet; energy development 2.6 million acrefeet. This leaves a healthy surplus on paper. But the Yellowstone, like so many western rivers, does not flow according to statistical averages. During the drought in the sixties, it averaged 4.4 million acrefeet. During a low flow period the Yellowstone River can carry as little as 3.7 million acrefeet.[5] For a good share of at least one year out of ten (possibly as often as one year in four), the river flow is so low that even a careful timing of projected withdrawals will exceed its volume. "Diversions of this scale," the Northern Plains Resource Council argues, "would critically threaten the efficiencies of present pumping and diversion facilities and would eliminate any further development of irrigatable lands."

Since the Yellowstone may not be able to slake the thirst of coal development, the waters from the mainstem Missouri are to augment the water supply in the Yellowstone. The Department of Interior and the Corps of Engineers say that 3 to 5 million acrefeet of water can be withdrawn from the mainstem without any problem.[6] The present average annual flow of the Missouri River at the Oahe Reservoir six miles above Pierre, S.D. is 18,525,000 acrefeet.[7] Since Oahe is the last suggested diversion point, that figure can be considered the total amount of water for all present and potential uses.

WATER SITUATION (Continued)

Every major industrial project will require massive quantities of water. Commitments to energy-related industry in the North Central Plains could seriously over-allocate the Yellowstone River and its tributaries. If water is marketed on purely competitive terms, as appears to be the case, energy companies will outbid existing and potential irrigators and preclude agricultural expansion in the Yellowstone Basin and the mainstem Missouri. This would mean a complete change in the social, cultural, and economic bases in Montana, South Dakota, Wyoming, and Nebraska.

Principal environmental and economic problems include dewatering of stream courses, increasing the cost of water beyond an irrigator's financial capabilities, disruption of aquifers, thermal pollution, destruction of fish and wildlife, disruption of productive farm and range land and air quality degradation. This large scale transfer of water use will seriously alter the established agricultural economy of a region which supplies the U.S. and the world with small grains and livestock.

DEVELOPMENT IN MONTANA

Four new electric generating facilities, two under construction and two under review, are expected to provide 2,100 megawatts of electricity from the Colstrip area of northeastern Montana.[8] All four plants are to be coal fired with evaporative cooling units which will consume about 38,400 acrefeet of water annually. Burlington Northern Railroad (BN) is proposing to construct and operate a diversion of 67,000 acrefeet of water for use in a synthetic fertilizer, methanol, and synthetic diesel facility near Circle, Montana, using coal from a BN mine.[9] Montana was issued 46,000 acrefeet in state permits for industry and 1,250,000 acrefeet have been applied for as of 1974.[10] An acrefoot is the amount of water which would cover an acre of land of water one foot deep. State officials estimate there are 42 billion tons of coal available for strip mining.[11] Montana is extremely concerned with the potential levels of development for energy and the impacts associated with energy conversion and mining operations. Therefore, the state has put a tight clamp on the exportation of its water by challenging federal water marketing in the courts. The state wants to void 658,000 acrefeet of contracts from the federal government to the energy companies. The Montana Moratorium Act of 1974 has eased the time of decision for developments within that state. It allows the Department of Natural Resources and conservation to delay action on any water rights applications over 14,000 acrefeet within the Yellowstone Basin for three years, unless the water is for an energy conversion facility approved under the state Utility Siting Act.

DEVELOPMENT IN MONTANA (Continued)

Montana has also passed The Renewable Resource Development Act which is designed to increase agricultural water use through low interest loans to farmers and ranchers for irrigation. In the 1975 session the Montana State legislature passed a bill placing the burden of proof on any applicant who seeks a permit over 15 cubic feet per second to show that prior rights will not be adversely impacted. Montana's official position is that coal be exported to other parts of the country for conversion purposes.

The Montana Department of Natural Resources finds that an additional 1.6 million acrefeet will be consumed by 2000 to irrigate an additional 600,000 acres.[12] Currently, the Yellowstone Basin has a total of 630,000 acres under irrigation, 20,000 acres have gone into irrigation in the past two years and 40,000 acres are expected to go into irrigation in the next two.[13] The Montana Fish and Wildlife Department has requested 7 million acrefeet be reserved in the river for these purposes.[14] The state would like to receive an option to market a block of water from the Fort Peck Reservoir rather than negotiate every single application with an arrangement allowing Montana up to five years to exercise an option to sell any water from the block set aside, with no payments required until the water is sold.[15]

DEVELOPMENT IN WYOMING

Wyoming state officials currently estimate that something on the order of five new major coal fired electrical generating plants, five coal gasification plants, three coal liquifaction plants, an oil shale conversion complex, and at least three coal slurry pipelines will be in operation by the year 2000.[16] So far six companies, Peabody, Amax, Arco, Carter, Sun Oil and Kerr-McGee have executed contracts for water and are proposing coal conversion facilities.[17]

Basin Electric is proposing and seeking permission from Wyoming to construct a 1,500 megawatt coal powered plant at Laramie Station. Water for this project will probably come from the run off from the North Platte River of which Nebraska officials estimate runs about "three inches deep" on the average.[18] A compact between Nebraska and Wyoming exists over the North Platte and if the water requirements for the Basin Electric project threaten Nebraska water availability, there may be a substantial fight over this. Related developments also include proposed expansion of uranium mining and milling in Fremont county and bauxite development in Albany and Carbon county.

DEVELOPMENT IN WYOMING (Continued)

Since the most extensive development of coal will occur in Wyoming, water will have to be exported from other areas to meet this projected development. As it stands, the entire state coal reserves (1.8 million acres) have been leased out to the energy companies.[19] These companies have also been purchasing water from the Federal government, the state of Wyoming and individual holders of water rights, as well as irrigatable lands, not bearing coal. Texaco has acquired about 38,000 acres of land, 8,000 of which is irrigated: Carter Oil holds 9,000 acres of which 5,000 are irrigatable; and Mobil has 3,000 acres half of which are irrigatable.[20] In the Spring of 1974 the State Legislature decided to put a lid on the water being sold to any enterprise in the state by enacting a Moratorium Act similar to Montana's. However, as an amendment to the Act, Energy Transportation Systems, Inc. was sold 20,000 acrefeet of water from the Madison ground formation, after a substantial lobbying effort which convinced the legislature that they would be using brackish water and that the withdrawal would not affect the water table. However, it was later shown that ETSI is indeed planning to take drinking water in Wyoming and South Dakota. It was also shown that a serious question of the withdrawal at that point of the formation dropping the water table exists. Mobil Oil has applications for 58 deep water wells to tap the Madison Formation on the west side of the Bighorn Mountains. Their annual withdrawal of this water would be over 390,000 acrefeet exceeding the recharge along the Bighorn estimated at about 100,000 acrefeet.[21]

The willingness of the past Wyoming administrations, particularly under Stanley Hathaway, to give these companies whatever they needed can best be described by three situations:

(a) A study of the Powder River, a tributary of the Yellowstone, made by the Harza Engineering Co. for the state estimated that about 102,900 acrefeet of water would be available from that stream. As of June of 1975, 853,365 acrefeet of industrial permits had been issued amounting to about 750 percent over appropriation of the Powder River.

The Tongue, also a tributary of the Yellowstone, according to state records has 96,400 acrefeet available. As of June of 1974, 369,000 acrefeet had been issued in industrial permits mainly to Pacific Power and Light who holds 363,000 acrefeet.[22] This represents a 400 percent over appropriation.

DEVELOPMENT IN WYOMING (Continued)

(b) The Hathaway administration secured a low interest loan from the State Farm Loan Board to construct a 49,000 capacity reservoir. This project was touted to be an example of industry/agriculture cooperation. Carter Oil (Exxon) would buy 25,000 acrefeet a year, paying an amount equal to the principal and interest due on the loan plus one half of the maintenance costs. However, based on the figures developed by Carter's own engineers, the amount of water available to the ranchers would be only 9,500 acrefeet and perhaps as little as 1,500 acrefeet annually during low stream periods. Based on Powder River Stream flow records for 1948-69 there would rarely have been more than 32,000 acrefeet for storage. So Carter Oil got a low interest loan from the State Farm Board and a guaranteed 25,000 acrefeet, leaving ranchers with what little is left over.[23]

(c) In 1962, Carter Oil, a perennial favorite of the Hathaway administration, filed a water right application for 208,000 acrefeet from the Powder River. The State Engineers office is required to issue a permit unless there is sufficient un-appropriated water available. As the law stood until two years ago, construction of a project had to begin within a year of the granting of a permit and must be completed within five years of that date. The intent of the statute was to discourage water rights speculation. Despite the statute, the State Engineer, Floyd Bishop, allowed Carter to hold this filing for more than 13 years without making a start of construction. Although not much importance is given to over allocation in western water law until competing uses face each other in court, if Carter were to exercise this right for 208,000 acrefeet, they could easily overcome the farmer and rancher in court.[24]

The present attitude of the State Government is to encourage additional reservoir construction by passing in 1975 an authorized $22 million dollars in loans for "multi-purpose" reservoirs. Although this is similar to Montana's legislation offering loans for farmers and ranchers, the multipurpose label attached to the funding may be to assure adequate storage capacity for the obvious over appropriation of the Powder River Basin by industrial users.

DEVELOPMENT IN WYOMING (Continued)

Overall water supplies in Wyoming are inadequate for industrial development. Except for the southwestern protion of Wyoming where the Green River (a tributary of the Colorado) could be used for oil shale, areas with large coal reserves have relatively small water supplies. If water from other basins cannot be exported to the coal fields of Wyoming, the development level of coal production in the North Central Plains may be far below that expected bythe proponents of "Project Independence."

DEVELOPMENT IN SOUTH DAKOTA

Although South Dakota does not contain large deposits of coal, the Mainstem Missouri with its massive reservoirs, runs through the state. The augmentation of the streams flowing over the coal fields of Wyoming, will have to rely on diversion from the Missouri in South Dakota. Also, taconite mining in the Black Hills will require water either from the Madison ground Formation or the Mainstem Missouri. And the water proposed to be mined from the Madison formation for coal slurry in neighboring Wyoming may affect the water supply of western South Dakota.

Major energy developments being considered in South Dakota include the following plants along the Missouri River:

(1) A Missouri River Power Plant for Hartland Electric Power District (200 megawatts) is expected to be on line by 1979. It will use flow through water from the Missouri River and coal probably from eastern Wyoming and southwestern North Dakota.[25]

(2) A low BTU coal gasification combined cycle power plant proposed by Northern State Power is also being considered.[26]

(3) Missouri River Hydroelectric plants include Oahe -595 megawatts, Big Bend-468 megawatts, Ft. Randall-320 megawatts, and Gavins Point-100 megawatts. Also the Corps of Engineers are studying proposals for 14 hydroelectric units at 4 dams in South Dakota.[27]

DEVELOPMENT IN SOUTH DAKOTA (Continued)

According to the Project Independence Water for Energy Blueprint, 1,400,000 acrefeet of Mainstem Missouri water will be needed to augment the water supplies in the coal fields of southwestern North Dakota, northeastern Wyoming, and southeastern Montana. Gulf Minerals has an application in for 50,000 acrefeet, and Energy Systems Transportation Inc. has an application in for 100,000 acrefeet from Oahe and 19,000 acrefeet from Shade Hill Dam in South Dakota.[28]

Construction of coal conversion plants in Wyoming will have a significant impact on the water rights in South Dakota. Now that Mainstem Missouri water is earmarked by the Federal Government, transportation of water out of South Dakota will create many problems since the state has no policy established for allowing out-of-state transfers. Removal of significant quantities of water from the agricultural base could play havoc with the state economy. It is expected that South Dakota will have to float bonds to pay for some of the construction of pipeline diversion facilities. If the return from the revenues expected from the sale and transfer of the water from Oahe to Gillette do not match the investment over the expected lifetime of the project (30 years) then South Dakota will be introduced to very serious economic risks. Although South Dakota has to develop a state water plan as required by state law, the Missouri River is number 15 on the list and it is not expected to be completed for another 1 to 5 years.[29] The State Legislature in response to the ETSI proposal in 1975 passed a law prohibiting any withdrawal from any river beyond 10,000 AF in South Dakota without approval of the State Legislature.

Finally, the South Dakota School of Mines has indicated that particulates from coal conversion could significantly reduce rainfall in the North Central plains because they would draw precipitation and take them down wind to be deposited elsewhere in the form of polluted rainfall.[30]

DEVELOPMENT IN NORTH DAKOTA

The development scenarios in North Dakota vary from 42 gasification plants and 31,000 megawatts of electrical generation to 14 gasification plants and 4,920 megawatts.[31] So far, Michigan/Wisconsin Pipeline, a subsidiary of American Natural Gas Co., proposes to construct a coal gasification plant in Mercer County and has received permission from the Federal government for a permit for 17,000 acrefeet;[32] however, the state has not agreed with this. North Dakota has asserted that the Bureau of Reclamation is a holder of a state water permit but has no authority to divert

DEVELOPMENT IN NORTH DAKOTA (Continued)

water already committed primarily for irrigation for industrial use.[33]

The North Dakota Water Conservation Commission has not yet come forth with an overall plan for development of the state's water resources. Farming and ranching groups are now seeking an injunction against the additional issuance of water permits until a comprehensive plan for water development is made by the State Water Commission. However, the Water Commission has stepped back as being the lead agency for receiving industrial applications and has now requested that industrial applicants first obtain a certificate of site compatability from the North Dakota Public Service Commission.[34]

Basin Electric Power Cooperatives is requesting water for an 800-megawatt generating plant at the ANG plant site in Mercer County.[35] People's Gas Company has applied for water to supply four coal gasification plants in Dunn County. The amount is estimated at being 30,000 acrefeet.

North Dakota has undergone a shift from promoting coal development to rejecting it in some cases such as the West River Diversion Project. In 1975, the North Dakota State Legislature voted not to support this project over the objections of the North Dakota State Water Commission. This project was to divert hundreds of thousands of acrefeet of water from Garrison Dam down to the coal fields of southwestern North Dakota.

The general attitude of the State of North Dakota concerning water rights is that the state should be able to sell or refuse to sell as much water as it pleases beyond the jurisdiction of the Federal government.

DEVELOPMENT IN NEBRASKA

Expected major energy development in Nebraska is as follows:

(1) a coal fired plant in Sutherland (2000 megawatts --- 38,000 AF of water),
(2) a pumped storage hydroplant near Lynch (1,000 to 1,600 megawatts),
(3) a coal fired plant at Nebraska City (575 megawatts),
(4) a hydropower unit Kingsley Dam (43 megawatts),
(5) a nuclear plant at Fort Calhoun (1,150 megawatts --- 20,000 AF of water),
(6) a nuclear plant at site of present Cooper Plant (1,000 megawatts),
(7) a coal gasification plant, site unknown, (250 million cubic feet per day).[36]

Nebraska has no statutory authority over the Mainstem Missouri River to market water. The State could gain such authority by altering its Constitution, currently, however, if the Federal government chooses to market water from the Mainstem Missouri, Nebraska has no legal say so in the matter whatsoever.[37] The state water rights on other rivers in the state do show a definite preference for agricultural use. Nebraska is perhaps the only North Central plain State which has utilized its irrigation potential to its fullest. In order for industry to gain a foothold in state water rights, it will have to also purchase large tracts of irrigatible lands with accompanying water rights. This would take a great deal of arable land out of food production, since the water use would be transferred to industry.

Nebraska insists that decisions to market water for industrial purposes be done in Congress not administratively. The state also feels that no assurance is given that the amount charged for water for industrial purposes will be sufficient to reimburse the Basin Account for all revenue lost. Nebraska's final concern is the adequacy of safeguards to insure long range use of water for agriculture and hydroelectric.[38]

INDIAN WATER RIGHTS

Indian water rights are based on the Winters Doctrine construed by the Supreme Court in 1908. The Doctrine holds that the Indian tribes have the right to as much water as is necessary to irrigate the total sum of their irrigable lands and that even though the right may have gone unexercised it carries a priority in the time from the date the reservation was established. The Landmark water case, Arizona v. California, re-affirmed the prior and paramount rights of Indian tribes as well as extending the water use rights of Indians beyond agricultural uses.

Indian water rights are not Federal or public rights. They are private property rights for the beneficial use of Indian tribes. Indian water rights as construed by the Winters Doctrine, and California v. Arizona cases, are not grants to the Indians but are rights held by treaty and aboriginal priority.

In terms of the Federal government's responsibility, it is supposed to act as the trustee of these rights on behalf of the tribes. In other words, because of treaty and moral obligations the Federal government is responsible for helping to determine, adjudicate, protect and develop Indian water rights. However, the Bureau of Reclamation has done everything possible to subordinate Indian Water Rights to narrow large scale industrial and agricultural users.

In June of 1974, the BIA recommended to all tribes that they develop their own water codes. Then the BIA turned around and said that although water codes had been developed, the tribes couldn't submit them and that the situation needed further study. This reversal on the part of the BIA came as a result of the pressure brought on them by the Interior Solicitor's Office, and the Bureau of Reclamation.

The States containing Indian reservations are even more strident in systematically denying Indian water rights in preference to non-Indian uses. Over the past ten years, Indian tribes have rapidly developed sophisticated legal strength and now pose a real threat to water related expansion. The National Water Commission has stated that unless Indian water rights are settled, many energy and agriculture projects will be precluded. Much of this rhetoric from the Commission is to push for a final settlement where Indians will have no real say over the amount of water they are entitled to and how they should use it.

The three affiliated tribes at Fort Berthold in North Dakota are contemplating action to determine and adjudicate their water rights. According to their attorney they will argue that the Missouri is over committed and that honoring present Indian water rights will leave North Dakota short for its own uses.[39]

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INDIAN WATER RIGHTS (Continued)

In Montana, the Northern Cheyenne and Crow Tribes are entering into separate suits to determine and adjudicate their rights. Both tribes are claiming rights from the common boundary of the State of Montana to the headwaters of the Tongue and Bighorn Rivers.40/ The State of Montana is struggling to get the cases argued in a friendlier state court and the Federal government is trying their best to discourage the tribes from venturing on their own by forcing the Northern Cheyenne, for example, to use their economic development funds for litigation.

The Fort Peck Tribe is presently conducting a water resource inventory with the assistance of the Bureau of Indian Affairs. The inventory includes: Indian Water Rights including natural flow and storage; the rights of Indian tribes to market waters they have paramount claim to which are in the Reservoirs along the Missouri River; the current Federal and state laws; international compacts; public land and state land water requirements.41/

The Crow Creek Sioux Tribe, who reside along the eastern shoreline of the Big Bend Reservoir in South Dakota maintain that the Department of Interior has been diminishing their water rights and the authority of the tribal council to comprehensively regulate water within the exterior boundaries of their reservation. The tribe is seeking the Department of Interior to honor the rights of the tribe to issue all water claims within the exterior boundaries of their reservation; to establish and collect water user's fees; to submit all water applications for state perusal; but to have final authority rest with the tribe. Finally, the tribe requests that it be given full membership to the Missouri River Basin Commission. The Crow Creek Tribe also wants to utilize Missouri River water to irrigate 30,000 acres of their land.42/

The tribes in South Dakota have also indicated that they too are planning litigation to exercise their rights on the Missouri.

Arapahoe and Shoshone Tribes of the Wind River reservation in Wyoming are asserting that they cannot obtain a fair and impartial determination of their water rights as long as the Secretary of Interior simultaneously sells large quantities of water to large industrial users. The tribe claims to have 198,542 acres available for irrigation.

The Shoshones and Arapahoes are also maintaining that pending further settlement of the tribes' rights, the Department should neither sell or commit any further water unless they are to be made a party of such contracts, placing the contracts subordinate to their Winters rights entitlements.43/

LEGAL ISSUES

The critical question, "Who controls the water?" has not yet been completely answered. The following court cases pertain to some of the legal ramifications of the water for energy questions.

New Mexico v. U.S. This case was filed in New Mexico state court in the spring of 1975 by the State of New Mexico to force determination and adjudication of Indian water rights in State Court. New Mexico is arguing that the Navajo tribe which has the oldest treaty date be given prior rights over other tribes using common water. This in effect sets up the Navajo's as a water broker and pits one tribe against another.[44]

Mary Aikin v. U.S. This case is parallel to New Mexico v. U.S. in that it arises out of the San Juan River Basin in northwestern New Mexico and southwestern Colorado. The issue again is primarily jurisdictional. Should Federal or State courts adjudicate water disputes? The case involves 1,200 water users and the U.S. government, which claims jurisdiction over the river by virtue of its passage over Federal and Indian lands including a national park, several national monuments and an Indian reservation.

The Supreme Court has ruled on March 24, 1976 that States do have the right to adjudicate waters within the boundaries of their state lines under the McCarran amendment. * The consideration of the court did not take into account the private property rights held in trust for Indian tribes. This is a crucial point in that the federal government argued that Indian rights are federal rights, which negates the sovereignty of treaty rights of Indian tribes under the Winters Doctrine. This case is important because it may serve as a precedent for other cases in the future --- and could become the basis of a state's right battle for water in the west.[45]

United States v. California. This case deals with Federal preemption of State water rights. The Federal District court in California has entered a judgment declaring that the U.S. can without applying to the state of California, appropriate all unappropriated waters necessary for use in any Federal Reclamation project. This case will certainly set a precedent for the rights of states to place Federal water uses under state laws, and will have significant impact on the Upper Missouri Basin states. This decision is certainly being appealed in Federal court.[46]

* 43 U.S.C. § 666, 66 Stat. 560.

LEGAL ISSUES (Continued)

Arizona v. California. Three cases represent the bulk of a 45 year struggle over allocation, use, and jurisdiction over the Colorado River System between Arizona, Nevada, California and the Federal government. The first case, 283 U.S. 423 (1931) arose out of the attempt by Arizona to enjoin the Boulder Canyon Project Act of 1928 which authorized water from the lower Colorado Basin for irrigation and urban expansion in Southern California. The Supreme Court ruled that the Colorado is a navigatible stream and the U.S. government can develop the Colorado system as it sees fit under the commerce clause of the Constitution.[47]

The second case ,298 U.S.588(1936), stemmed from the attempt of Arizona to assert control over the Boulder Canyon Act of 1928 with state laws and state held prior appropriations. Again, the supreme Court ruled that the U.S. government under the comm erce clause of the Constitution is not subject to the control of the state in building projects.[48]

The third case, 373 U.S. 546(1963), stemmed from the question of whether the states had control over the allocation of the Colorado River.

In this case California was seeking a larger allocation despite the uses earmarked for the water by Arizona. Aqain the Supreme Court ruled that the Federal government has the final power to allocate water in the Colorado River. Also, that compacts, and all other elements governing state law which interposed Federal law could be moved aside by Congress; that the tributaries of the Colorado in Arizona are not to be considered in the allocation of Colorado river system; and that the administrative power of the Federal government over the Colorado River lies in the hands of the Secretary of Interior. Finally the Winters Doctrine asserting Indian water rights would be applicable to all present and future uses as well as expanding Indian water rights to include uses other than agriculture. The final outcome was an allocation of the lower Basin account of 7.5 million acrefeet per year divided with California receiving 4.4 million acrefeet per year, Arizona 2.8 million, and Nevada receiving 300,000 AF.[49]

The backdrop of these cases was set by the struggle between the economic forces in California and Arizona. Because California was rapidly utilizing their water through the Boulder Canyon Act of 1928 for irrigation of the imperial valley, Arizona, fearing an over allocation by California,attempted to enjoin the Federal Project unsuccessfully. The spectacular growth of the Imperial Valley's agricultural economy would prove to be the dominant interest behind the decisions rendered by the courts. The agricultural methods of farming the Imperial Valley required massive capital investment to grow food along the vast expanse of what was a semi-arid desert. And so, by centralizing control over the Colorado through the Department of Interior and Congress, the capital investments promoting rapid growth in Southern California were protected.

LEGAL ISSUES (Continued)

Out of the sheer force of massive agricultural and urban expansion came two basic precedents which have served to protect capital investment in water projects and their related growth:

(a) Once a "present beneficial use" precedent is established, no state can interfere with it. In the case of California, it has been using Colorado River water for years to expand municipal and agricultural growth. Any effort to take away this water would cause serious impacts on the state.

(b) Once an interstate commerce project is established no state can interfere with it. For example, if water being used in Imperial Valley from the Colorado were shut off then the food products now supplying the nation would be cut back to the detriment of the nation.

These two precedents will have an enormous implication to energy development in the Upper Missouri Basin. For example, if an energy conversion project were established in a state and was supplying energy to another part of the country it can fall very easily into the two categories of "present beneficial maximum user and interstate commerce project." So if it were proven that this project was seriously affecting the water supply for agriculture no state or entity could interfere with it.

First Iowa Hydroelectric Coop. v. FPC. (328 U.S. 152 (1946)). This case arose out of the attempt by the state of Iowa to force Federal hydroelectric projects on navigatable streams to comply with state laws setting up a situation of duplicate compliance. The Supreme Court ruled that the states do not have veto power through state laws when the commerce clause of the Constitution is involved.50/

EDF v. Morton. Successful litigation of this suit will significantly slow development pressure because the Federal government would have to evaluate all of its existing water commitments. The case centers around three basic issues: (1) the authority of the Federal government to market water for industrial purposes under existing statutes in the Upper Missouri Basin without Congressional changes; (2) the violation of Article X of the Yellowstone Compact which prohibits interstate diversion of water from Montana to the coal fields of Wyoming; (3) the requirement of Environmental Impact Statements on all contracts for industrial water options in the Yellowstone Basin.51/

LEGAL ISSUES (Continued)

Intake Pipeline Co. v. Montana and North Dakota. This case deals with Article X of the Yellowstone Compact. Intake pipeline, a subsidiary of Tenneco is challenging the constitutionality of the Yellowstone Compact in the Federal District court in Billings, as it relates to the prohibition of interstate transfers. Intake wants to move water from Glendive, Montana to Beach, North Dakota. If the Yellowstone Compact is broken, diversions of water from one state to another could greatly expand industrial development.

If the court does uphold the prohibition of interbasin transfers, Tenneco could circumvent Article X by building its plant further west and inside the Yellowstone Basin. The coal then would have to be moved from the company's coal fields in North Dakota across the state lines into Montana.[52]

Intake v. Montana. Intake Water Company has recently won this case to have permits for 80,000 acrefeet from the Yellowstone River for construction of as many as 8 gasification plants. Tenneco had claimed this water under provisions of Montana law which was repealed in 1973 by the state legislature. The District court has ruled that the old law applies.[53]

FEDERAL LAW

"There has been a slow evolution of the Bureau of Reclamation program toward including municipal and industrial (M&I) water supply as project purposes. But each organic reclamation statute has placed specific limitations on supplying M&I water from reclamation projects"54/:

1. The Miscellaneous Supply Act of 1920. This early Act placed veto power over all contracts set out by the Secretary of Interior for purposes other than agriculture in the hands of state approved water users associations. There had to be clear showing that no practical alternative water source existed, that rights of prior appropriators would be protected and that the industrial supply would not be detrimental to irrigation needs. The Library of Congress American Law Division has pointed out that the Department of Interior has repealed this law by implication with no authorizing language in subsequent reclamation acts repealing the 1920 Act.55/

2. "The 1939 Reclamation Project Act. This Act provides for multipurpose sale of water for municipal and miscellaneous uses where authorized, but the Secretary of Interior must make a finding that the value of the project for irrigation is not to be precluded for municipal and industrial uses."56/

3. The Flood Control Act of 1944. Although Congress envisioned multiple and changing uses on the reservoirs authorized in the 1944 Flood Control Act, its designation of dominant interest had the effect of giving preference to uses viewed as contributing to the greatest good of the people of various regions served by the projects, and that authorization to alter the expressed dominant interest intended by Congress had not been delegated, Changes in that preference require new Congressional approval.

The Congress and the Bureau of Reclamation envisioned the continued dominance of agriculture as the economic base of the Missouri River Basin and recommended that reservoirs on the Yellowstone River and the Upper Mainstem Missouri should be primarily for irrigation; and that agricultural dominance in the Upper Missouri Basin was accepted in the reconciliation between the Corps and the Bureau of Reclamation and adopted by Congress through incorporation of the Pick/Sloan Plan as the document in the Act, Congress thereby endorsed and adopted irrigation as the primary use intended of water from Projects in the Upper Missouri Basin.57/

FEDERAL LAW (Continued)

4. The 1958 Water Supply Act. This Act states that storage for municipal and industrial uses may be included in existing or future Reclamation or Corps projects but must be specifically authorized by Congress if the original purposes of the project --- such as irrigation --- would be seriously affected. This is outlined particularly in Title III of the Act.

"This progression of Congressional Acts shows that Congress has approached the whole question of "M&I" water very cautiously. It is clear that the notion of devoting enormous quantities of water, let alone the preponderance of a certain project's, river's, or region's water to energy/industrial uses has never been raised or approved by Congress.

"It is clear that the demand for industrial water is exceeding all prior expectations. But the use of the term "miscellaneous" or "industrial" in the existing reclamation laws obviously did not contemplate massive energy/industrial demands, and we must be sure that these limited authorizations for "M&I" water are not interpreted by the agencies as broad authority for massive industrial water allocations from Federal projects." 58/

RECENT FEDERAL ACTIONS

Industrial Water Marketing Program --- 1967-1972. This program was instituted by Secretary of Interior Stuart Udall and Assistant Secretary for Water and Power Ken Hollum. The Nixon administration subsequently carried it on until the farmers, ranchers, States and Indian tribes affected by this program discovered the magnitude of the sales in 1972. Since then the Department has imposed a moratorium over sales in the Yellowstone Basin until the lawsuit brought against them by the Environmental Defense Fund, irrigationists, and the State of Montana is resolved. This program had no procedures whereby the States, water users' association, and Indian tribes could approve the contracts. The only approval was a special procedure within the Department. The states were never informed through formal procedure as to what the water being sold was going to be used. As a result, 658,000 acrefeet of water was optioned out quietly at a price ranging from 9 to 11 dollars an acrefoot with a 50¢ option to renew. The amount of water optioned from the Yellowtail reservoir may well have exceeded its active storage capacity. Although the Yellowtail reservoir, where most of the sales went on, is clearly authorized for agriculture, no water has been allocated for irrigation from this reservoir since its construction. 59/

RECENT FEDERAL ACTIONS (Continued)

The Ad Hoc Committee on water marketing in the Upper Missouri Basin was formed upon the request of the Corps of Engineers and the Bureau of Reclamation to the Missouri River Basin Commission. The Committee was comprised of representatives from the states of Montana, Wyoming, South Dakota, North Dakota, and Nebraska; the Corps of Engineers, the Bureau of Reclamation and the Missouri River Basin Commission. The purpose of the Committee was to settle upon convincing approaches to market water from the main stem Missouri River for industrial purposes. They also agreed upon setting the price of this water in the range of $3 to $20 an acrefoot. The states were given the first right to market. However, the key problems of how much water does each state have right to, what are the Indian rights to this water, and who has final veto power over industrial water contracts was never resolved. Following this impasse, the Federal government imposed the "Memorandum of Understanding," which effectively repealed the efforts of the ad hoc committee to settle upon a regional approach to industrial water marketing.60/

In February of 1975, the Corps of Engineers and the Department of Interior signed a "memorandum of understanding" which would expedite the sale of main stem Missouri water for industrial use. Hearings were held by Senators Abourezk and Metcalf on this action and it was discovered that the states were never informed of this agreement, that agricultural water is to be "loaned" to industry, and that industrial water use will have preference over hydroelectric qeneration. The first customer for this water is ETSI who wants it for a coal slurry pipeline from Wyoming to Arkansas.61/

The House Interior Committee of the U.S. Congress is currently considering a bill to institutionalize coal slurry pipelines (H.R. 1863). The first major project and prime lobbyist for this bill is being pushed by ETSI* who is proposing the Wyoming/Arkansas slurry line using western coal and water either from the Madison Formation or the Main stem Missouri in South Dakota. This bill also represents the institutionalization of industrial water use in the Upper Missouri by Congress, since ETSI is the first large scale user and costomer for Upper Missouri water.

* ETSI or Energy Transportation Systems Inc. is a wholly owned joint venture between Lehman Brothers Investment firm and Bechtel Engineering and Construction.

WATER DIVERSION SCHEMES 62/

A total of 13 diversion plans has been advanced, 2 for agriculture and 11 for industrial development.

(1) The Agricultural Diversions are Garrison irrigation project in North Dakota and Oahe Irrigation Project in South Dakota. Garrison is under construction. Oahe is in the planning stages but faces formidable legal obstacles and local opposition.

(2) The West River Diversion Project in North Dakota would carry water from Lake Sakakawea behind Garrison Dam on the Missouri across the headwaters of the five tributaries of the Little Missouri, the Knife, the Heart, the Cannonball and the Grand River. Water would be released into these streams which would be damned to provide storage. The total diversion, four million acrefeet according to the North Dakota Water Commission, would support 42 gasification projects and 8,800 megawatts of electrical power generation. In exchange, the farmers and ranchers of this area are promised some water for agricultural use. However, the North Dakota state legislature has voted not to support this project over the objections of the North Dakota State Water Commission.

(3) Water for Taconite in the Black Hills --- The Bureau of Reclamation (which will cooperate with the North Dakota State Water Commission in designing the West River Diversion facilities) has studied moving water to the Sturgis, S.D. area for industrial use. Pittsburgh Pacific Mining of Hibbing, Minnesota has claimed 96 million tons of taconite # iron ore under about 250 acres of National Forest Land in the Black Hills. Pitt-Pac plans to market 1,000,000 tons per year in Rapid City, probably to meet the steel requirements of coal gasification and thermal electrical generation.

(4) Water from North Dakota to Wyoming. The United Plainsmen, an environmental group in North Dakota, has pointed out that the Sturgis area is only a short distance from the coal rich but water poor Powder River Basin in Wyoming. The Bureau of Reclamation has said publically that they have scrapped plans to divert water from North Dakota to Wyoming; however, the Bureau has not been very credible in their dealings with the states so far.

WATER DIVERSION SCHEMES (Continued)

(5) Water from South Dakota to Wyoming. The Black Hills Conservancy Subdistrict, along with the Bureau of Reclamation, has developed a feasibility study to transport about 100,000 acrefeet from the Oahe Reservoir across western South Dakota (between the Cheyenne and Bad Rivers) into the Gillette Wyoming area. 20,000 acrefeet is to be mixed with coal and sent down to Arkansas in slurry form. The first pipeline of this sort is expected to ship 25 million tons of coal a year. Since water is scarce in the Gillette Area, it seems likely that the water not being used by Energy Transportation Systems Inc. (ETSI) could be sold to other energy interests for coal conversion at the mine site.

(6) Water from the Madison Underground Formation. ETSI has secured 20,000 acrefeet of water from the Madison Formation from the state of Wyoming. They plan to drill a high pressure well field in one of the shallower sections of the formation, which is being used for drinking water and stock water for the communities in eastern Wyoming and western South Dakota. There is a serious question as to whether this 20,000 acrefoot withdrawal will exceed the recharge of the formation, thus dropping the entire water table of the Powder and Cheyenne River Basins. Since the Madison Formation is under individual state jurisdiction, it will be up to the courts or Congress via an interstate compact to determine whether or not industrial use of the Madison Formation is beneficial.

(7) Water from Montana to Wyoming. The Yellowstone River Diversion is discussed in great detail in the Bureau of Reclamation's Montana/Wyoming Aqueduct Study. The study projects the construction of a large number of additional reservoirs on the Tongue and Powder, other tributaries of the Yellowstone and the Yellowstone itself; as well as construction of a large number of aqueducts for transporting water from the Boysen and Yellowtail reservoirs, to points of industrial use, mainly around the Gillette Wyoming Area. Three projects are being actively considered: the first one would take water from the Yellowstone River near Miles City, Montana, to Gillette, Wyoming; the second project would divert water from the Big Horn River in Hardin, Montana, to Gillette, Wyoming; and the third project would divert water from the Boysen Reservoir along the Wind River Reservation in Wyoming to the Gillette area.*

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* The diversion from Montana to Wyoming would violate Article X of the Yellowstone Compact, which prohibits the transfer of water from Montana to Wyoming. Montana, Wyoming, and North Dakota are signatory states. However, the transfers of water proposed by the Bureau of Reclamation in the Wyoming/Montana Aqueduct Study do not comply with the formula for water use outlined in the Compact which was signed in 1950. That formula allocates a 60-40 share between Montana

WATER DIVERSION SCHEMES (Continued)

(8) North Platte River in Wyoming to the Powder River* in Wyoming. This project was promoted by the former Secretary of Interior, Stanley Hathaway, while he was Governor of Wyoming. Hathaway attempted to get state funds to build a diversion from the North Platte River near Casper to Gillette. The North Platte is not a large river and the flows might not sustain an industrial diversion without augmentation from another river system, the Green River.

(9) Green River to the North Platte in Wyoming. The augmentation diversin was also promoted by Stanley Hathaway while Governor of Wyoming. The Green River is a tributary of the Colorado and is located in southern Wyoming. This diversion could aggravate salinity problems in the lower Colorado Basin.

(10) Fort Peck to Circle, Montana. This diversion would take water from the Missouri River behind Fort Peck Dam to the Circle, Montana area where Burlington Northern Railroad is planning an industrial complex which would produce nitrogen fertilizer, methanol, and synthetic diesel fuel from low quality lignite coal.

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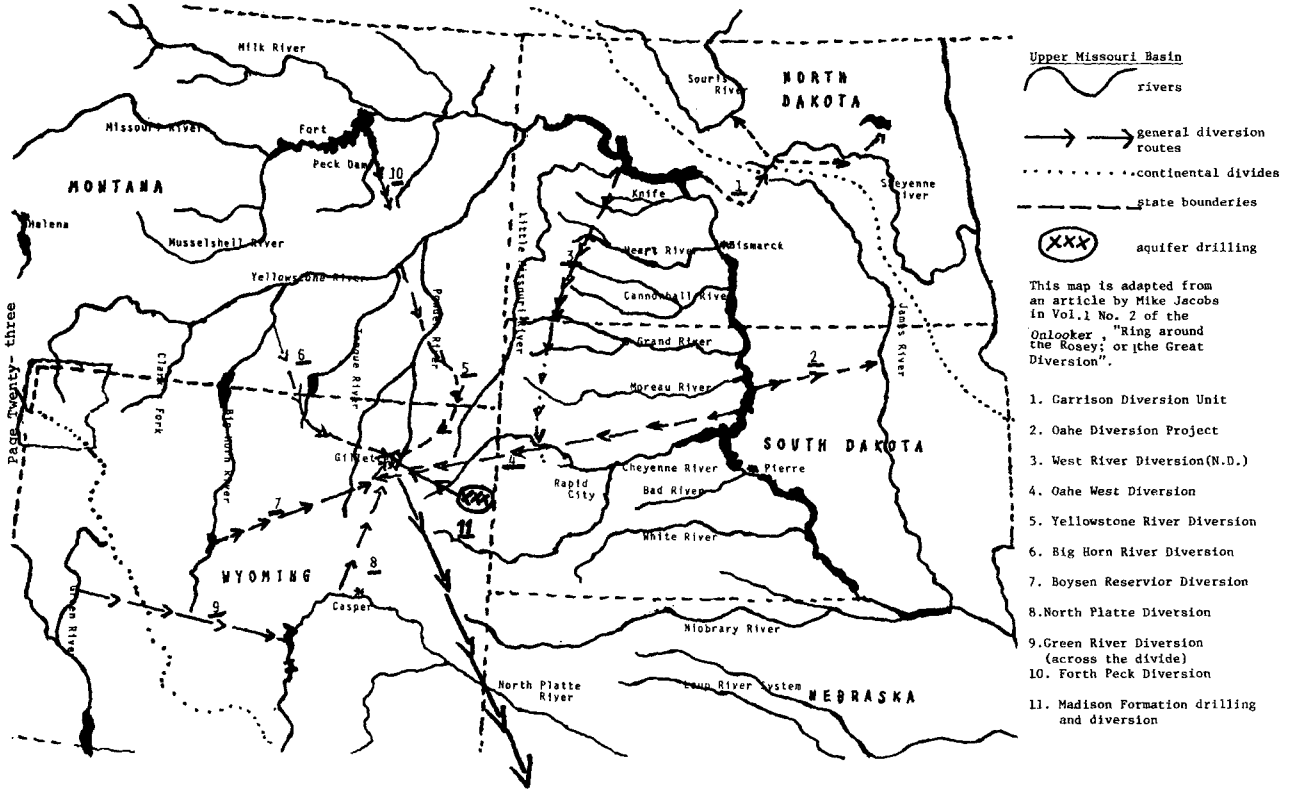
and Wyoming, with Montana getting the larger percentage. North Dakota, although not directly involved, does have a say over the issue of interbasin transfer. In addition, Montana state law forbids any transfer from the state without consent from the state legislature, which so far has not agreed.

* There exists a compact on this stream which gives Wyoming 25% and Nebraska 75% of the share of the North Platte. If over allocations went beyond Wyoming's 25%, then irrigation in western Nebraska could be affected. Thus leading to an interstate legal fight.



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THE NEED FOR ENERGY FACILITY SITES IN THE UNITED STATES: 1975-1985 AND 1985-2000

"The Need for Energy Facility Sites in the United States: 1975- 1985 and 1985-2000" was prepared by the Environmental Policy Institute under contract with the President's Council on Environmental Quality. The Report was prepared by Marc Messing, Director of Facility Siting Analysis, with the assistance of Florence Pappas and Skip Spaulding, Research Assistants. The findings and conclusions of the report do not necessarily reflect either the views or the policies of the Council.

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SUMMARY

The Federal Energy Administration has estimated that "640 new electric generating plants must be in operation by 1985... (including) the equivalent of 200 1000 MW nuclear plants and 150 new 800 MW coal-fired plants," and the President's Energy Facilities Planning and Development Act of 1975 has been introduced in response to the need for siting these facilities.

However, if the FEA estimates are compared to available data regarding utility plans and construction schedules, it can be seen that approximately 55% of the estimated facilities are either already under construction or within two years of construction (and presumably beyond the initial site selection stage); an additional 4% of planned capacity are comprised of units smaller than those which would be regulated under the federal legislation. If either the number of new facilities likely to be sited under existing state power plant siting laws, or the potential for reducing additional capacity demands through more effective energy conservation and utility load management programs, are considered, then the remaining number of new facilities which would be affected by federal power plant siting legislation becomes negligable.

	Additional Capacity (GWe)	Additional Units/Sites
Estimated Additional Generating Capacity Needed	485	644
Additional Generating Capacity Which Would Be Unaffected by Federal Siting Legislation:		
Planned Capacity Under 300 MW of Over 300 MW and Within Two Years of Construction	(288)	(383)
	197 *	261 *
Estimated Capacity Demand of Twelve Largest States With Power Plant Siting Laws	(179)	(240)
	18	21
Generating Capacity Reduction With Conservation and Load Management	(160)	(213)
	-142	-197
Range of Estimated Siting Demands Subject to Federal Siting Legislation	0 - 197	0 - 261

Through 1985 it appears that current construction plans, existing state mechanisms, and a coordinated federal effort to increase energy conservation measures and improve utility load management procedures, can adequately accomodate projected electric energy facility siting needs. Beyond 1985, the additional construction of new generating units on existing sites, and the increased utilization of small, centrally located sites made available by the retirement of older generating units, may essentially stabilize the number of generating sites needed from 1985 through 2,000. In the absence of data regarding current utility land holdings, it is impossible to evaluate the need for additional site acquisition independently of the need for regulatory site approval.

* These figures represent the maximum number of new capacity/units needed. Further reduction of this number by either of the two following categories yield unit numbers from 21 to 43, and consideration of both yields large negative figures.

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INTRODUCTION

In January, 1975, President Ford noted in his State of the Union Address, that approximately "640 new electric generating plants must be in operation by 1985... (including) the equivalent of 200-1000MW nuclear plants and 150 new 800MW coal fired plants."

These estimates were based on forecasts of the Project Independence Report completed by the Federal Energy Administration (FEA) in November 1974, and were subsequently reaffirmed as the basis for the Administration's Energy Facilities Planning and Development Act in the Environmental Impact Statement prepared by FEA in March of 1975. The Project Independence Report was originally accompanied by a Facilities Task Force Report (FEA November, 1974) indicating the methodology and the data base used in establishing energy facility parameters for the parent Report, and the Facilities Siting Bill was originally accompanied by an unpublished paper entitled the "Need for Energy Facility Siting Legislation" (FEA, January, 1975). These four reports represent the best available materials regarding the assumptions, the data base, and the methodology underlying the Administration's projection of energy facility siting needs.

The Energy Facilities Planning and Development Act of 1975 was originally introduced as Title VIII of the President's Omnibus

Energy Act (the Energy Independence Act), and subsequently introduced separately in both Houses of Congress. The legislation mandated the preparation of a National Siting and Facilities Report by the Administrator of FEA within twelve months of enactment (sec. 803), and required the States to prepare Energy Facility Management Programs within one year of the Administrator's Report (Sec. 804). Although the legislation stipulated that nothing within it should allow the federal government to override any final decisions on specific sites selected pursuant to the procedures of the Act, the bill provided a series of Administrative authorities (particularly in Sections 804(i) (1), 804(j) (1), and (807(h)) which have tended to undermine the integrity of this position.

The authorities of the legislation include support facilities for fuel exploration and development; deep-water ports, liquified and petroleum gas terminals, fuel handling and interim storage facilities; fuel processing facilities such as oil refineries; natural gas processing plants, and coal washing facilities; petroleum pipelines, gas pipelines, slurry pipelines, and electric transmission lines; synthetic fuel plants, uranium enrichment plants, solar plants, and assorted other energy related facilities. Nonetheless, the principal quantitative justification for legislation remained the need for new electric generating plants.

Since the introduction of this legislation, coastal zone

facilities have been evaluated by the Congress primarily in the context of the Coastal Zone Management Act; off-shore facilities have been similarly considered in the context of other legislation; transmission lines and pipelines present special regulatory concerns; and all aspects of the nuclear fuel cycle, including uranium enrichment, fabrication, reprocessing, transportation, and the disposal of high-level radioactive wastes, are currently the subject of extensive studies by the Nuclear Regulatory Commission, the National Science Foundation, and other independent bodies. At the same time an internal re-examination (within FEA) of the need for oil refineries has indicated a less extensive problem than originally anticipated in the Project Independence Report, and modest development plans for synthetic fuels during the next decade will clearly minimize the problem of identifying suitable sites through the 1980's. Brief summaries of the need for oil refineries and synthetic fuel facilities are contained in Appendices A and B.

For these reasons, we have focused our attention, in this Report, on the need for electric generating facilities, and new electric generating facilities' sites, through 1985 and the year 2000. Firstly, by comparing the data base and forecast methodology used by FEA in the Project Independence Report, with other recent estimates of both total energy demand and electrical energy demand through 1985 and the year 2000, as well as the potentials for reduced demands and increased efficiencies, we have analyzed FEA's projections for needed new facilities. Secondly, by comparing these estimates of demand for new facilities against current utility plans for new

facilities through 1985, we have estimated the relative demands for the number of new sites necessary to meet projected facility demands. Additionally, considerations for the case from 1985-2000 are discussed. Finally, we have surveyed current State laws and provisions for meeting projected demands on the State level.

PART ONE: ENERGY PROJECTIONS AND THE NEED FOR NEW FACILITIES

Projections of Energy Demand

During the past several years more than a dozen major studies have been undertaken to project the relative growth rates for national energy needs through the years 1985 and 2000. Basing projections on examination of past trends, mathematical extrapolations of historical patterns, econometric projections of supply-demand functions, and probable scenarios regarding the introduction of new technologies, both gradual and/or abrupt changes in national policies and international relations, and programming the projections on the basis of a wide range of economic, social, and technological parameters, the studies generally observe three caveats:

1) "regardless of the actual methodology used, the forecaster's main challenge is to come to grips with the basic underlying forces and factors which may come to bear, in the future, on the pattern which he is attempting to predict." /Report of the Ad Hoc Energy Forecast Working Group, Institute of Electrical and Electronic Engineers, January 1975/

2) "The past 12-18 months (since the 1973 oil embargo) simply represents too short a time period to test the accuracy of conclusions based upon analysis of past growth when applied to new economic and social context..." /Report of member electric corporations of the New York Power Pool, and the Empire State Electric Energy Research Corporation, Pursuant to Article VIII, Section 149b of the Public Service Law, Vol., 1, p.2, 1975/

3) "Certain elements of the forecasting problem are beyond the state-of-the-art in forecasting (economic as well as energy)..." /Project Independence Report, November 1974, p. 418.

As a result, variations in projected demand are significant through 1985, and tend to increase substantially through the year 2000. A survey of major studies released from 1972 through 1974 indicates a range of estimates in projected total energy demand from approximately 93 Quads through 124 Quads in 1985, and 123 to 202 Quads in the year 2000 (See Table 1).[1] Similarly, the projected range of electric energy consumption varies from 2.3 to 4.4 Trillion Killowatt-hours per year (TkWh) in 1985 (7.9 to 15.0 QBtu), and from 3.3 to 11.o TkWh in the year 2000 (11.3 to 37.6 QBtu) (See Table 2). The FEA test-case projections (at $11/barrel oil) of 103 QBtu total energy consumption and 3.6 TkWh (12.3 QBtu) electric energy consumption in the year 1985 are both, as the Report notes, "substantially less than other forecasts"/ FEA op. cit. pp. 26,30/. The project Independence Report considers the general situation beyond 1985, but it does not make quantitative projections. Therefore, for the purpose of considering facility siting needs through the year 2000, we have compared the FEA projection model through the year 1985 with the closely compatible model of the AEC/LMFBR projections, and utilized the AEC/LMFBR projections as consistant approximations of the FEA electric energy case through the year 2,000.* Table 3 (page 8) compares FEA's projections both with the range of projections surveyed by the Institute of Electrical and Electronic Engineers, and with the projections of the AEC/LMFBR model.

*It should be noted here that both the AEC and FEA electric energy projections contained in the IEEE survey estimate annual growth rates of 6.6% through 1985, and the AEC/LMFBR case used in comparison with FEA for projections through 2,000 utilized a 6.1% annual growth rate. This reflects a revision from the earlier AEC estimate of 6.5% annual growth through 2,000 (contained in the IEEE survey), and is more consistant with FEA's modest growth rate estimates and the general trend in virtually all the projections surveyed towards lower electric energy growth rates through the year 2000 than through 1985.

TABLE 1

SURVEY OF PROJECTED TOTAL ENERGY GROWTH RATES: 1973 - 2000

	GROWTH RATE 1973-85	TOTAL ENERGY 1985	GROWTH RATE 1973-2000	TOTAL ENERGY 2000
Chase Manhattan Study	5.0	124		-
Resources for the Future Study			3.5	192
Department of the Interior Study	3.7	118	3.5	192
Stanford Research Institute Study	3.8	119		
Federal Power Commission Forecast	3.6	116	3.7	202
Council on Environmental Quality			1.8	123
Lawrence Livermore Laboratory Study	3.3	112		
Atomic Energy Commission Study	3.7	118	3.6	197
National Academy of Engineering Study	2.9	107	-	
Ford Foundation Study	1.7	93	1.9	126
FEA Project Independence Report	2.6	103	-	

SOURCE: I.E.E.E. (Ad Hoc) Energy Forecast Working Group; Oct 1974-Jan 1975.

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TABLE 2

SURVEY OF PROJECTED ELECTRIC ENERGY CONSUMPTION: 1973-2000

	Growth Rate 1973-1985	Electric Consumption	Growth Rate 1973-2000	Electric Consumption
GMB	7.5%	4.4	-	-
RFF			6.8	10.8
DOI	6.9	4.1	6.0	9.0
SRI	6.4	3.9		
FPC	7.7	4.5	6.8	11.0
CEQ			4.5	6.0
LLL	5.2	3.4		
AEC	6.6	4.0	6.5	10.1
NAE	7.0			
EPP	1.9	2.3	2.2	? ?
FEA	6.6	4.0		
FPC	7.5		6.6	

Source: I.E.E.E., January 1975

TABLE 3

COMPARISON OF FEA ENERGY PROJECTIONS WITH RANGE OF OTHER FORECASTS SURVEYED

	1985		2000	
	total energy	electric energy	total energy	electric energy
High estimates	124 QBtu	15.0 QBtu	202 QBtu	37.6 QBtu
Low estimates	93	7.9	123	11.3
FEA estimates	103	12.3	---	---
AEC/LMFBR	---	12.3	---	30.7

Analysis of Electric Energy Demand Forecasts

When FEA released the Project Independence Report in November, 1974, it presented it as "the most comprehensive energy analysis ever undertaken." It is certainly one of the most complex.

Fundamentally, the Report utilizes a price-elastic supply-demand model to evaluate different production scenarios under present government policies (Business-as-Usual) and alternate policies for increased production (Accelerated Development),* and according to different price levels for world oil. The Report summarizes the basic data used in the following manner:

1) "calculations ... indicating how much production could be achieved for each of the sources of energy under different world oil prices and under (the) two alternative assumptions-- Business-as-Usual and Accelerated Demand,"

2) "Estimates were made of the costs at which key facilities-- refineries, natural gas plants, and electric utilities -- could be built and their leadtimes,"

3) "At the same time that energy production levels, costs and lead times were projected, the demand for each energy product (including electricity) for each region, as a function of price, was developed. In addition to reductions in demand induced by higher prices, the impact of specific conservation measures was also forecast." [2]

Additionally, the Report identifies three key assumptions which underly the 1985 forecast, and a variety of lesser assumptions necessarily permeate the model. The three key assumptions which FEA identifies in the forecast model are as follows:

*In fact, four broad strategies, including a base case, accelerated supply, a conservation strategy, and an emergency preparedness strategy, in addition to a special case regarding the International Energy Program, were all considered; but the production strategies studied are the Business as Usual base case, and Accelerated Supply strategies.

"(1) the rate and economic trends in sectoral growth; (2) the physical availability, economics and technical aspects of future energy supply; and (3) the energy policies in effect which directly shape or constrain the energy sectors."[3]

The Report in turn notes two key parameters in the forecast of domestic economic activity; namely demographic trends and growth in real GNP. The following figures are reproduced from Table I-4 of the Project Independence Report:

TABLE 4
PARAMETERS OF FEA'S ECONOMIC FORECAST FOR 1985

	1973 Actual	1985 Forecast	Average Annual Growth Rate
Population	210 million	236 million	0.96%
GNP (1958 Constant $)	$.84 trillion	$1.28 trillion	3.5%

Notwithstanding the obvious hazards of economic forecasting at this time, forecasts of both total energy consumption and electric energy consumption are sensitive to population variables throughout the models surveyed due to relative high rates of projected per capita energy consumption levels. For example, the FEA model projects increased per capita energy consumption from 360 million Btu per year(in 1973) to 436 million Btu in 1985, with a concommitant increase in electric energy consumption from 8,800 TkWhr/year to just about 17,000 TkWhr/year in 1985 (see table 4). For the year 2000 the AEC/LMFBR model forecasts total energy consumption to rise to 726 million Btu per person, while electric energy consumption increases to more than 32,000 TkWhr (see table 5). The population data used by FEA is based on E-series population data of the Bureau of the Census, and is compatible with the AEC/LMFBR model , but is notably higher than the Council on Environmental Quality (CEQ) projections based on Series F data.

TABLE 5

RATES OF GROWTH AND FACTORS OF INCREASE
FOR FEA ENERGY PROJECTIONS TO 1985

	1973 (Actual)	1985 (Projected)	ANNUAL RATE OF GROWTH (%)	FACTOR OF INCREASE
Population (Millions)	211	236	0.9	1.1
Per Capita Energy Consumption (MBTU)	360	436	1.6	1.2
Total Energy Consumption (QBTU)	76	103	2.6	1.4
Installed Per Capita Generating Capacity (kW)	2.07	3.9	5.4	1.9
Per Capita Electric Energy Consumption (kWhr)	8,763	16,949	5.5	1.9
Total Electric Generating Capacity (Millions of kW)	438	922	6.4	2.1
Total Electric Energy Production (TkWhr)	1.849	4.0	6.6	2.2

Source: I.E.E.E., Jan. 75

TABLE 6

RATES OF GROWTH AND FACTORS OF INCREASE
FOR AEC/LMFBR ENERGY PROJECTIONS TO 2000

	1971 (Actual)	2000 (Projected)	ANNUAL RATE* OF GROWTH (%)	FACTOR* OF INCREASE
Population (Millions)	207[a]	279[a]	0.9	1.35
Per Capita Energy Consumption (MBTU)	333[b]	726[b]	2.7	2.18
Total Energy Consumption (QBTU)	68.969[c]	202.637[c]	3.8	2.93
Installed Per Capita GEnerating Capacity (kW)	1.78[a]	6.72[a]	4.7	3.78
Per Capita Electric Energy Consumption (kWhr)	7,800[a]	32,210[a]	5.0	4.12
Total Electric Generating Capacity (Millions of kW)	367.5[a]	1,880.0[a]	5.8	5.12
Total Electric Energy Production (TkWhr)	1.60[a]	9.01[a]	[illegible]	5.63

---

a Energy Research and Development Administration, WASH 1535, Dec. 1974, Table 2.1-13.

b Computed from note.

c Ibid, Table 2.1-12.

* Figures in columns three and four have been computed directly from data in columns one and two.

The following table compares relative energy consumption levels in the year 2000 according to the AEC/LMFBR projections of per capita consumption, and the different demographic estimates.

TABLE 7
POPULATION PARAMETERS FOR ENERGY PROJECTIONS

	Series E	Series F
population projection	(280 million)	(251 million)
electric energy consumption (32,210 Tkwh/year)	9,019 Qkwhr	8,085 Qkwhr
total energy consumption (726 million Btu/year)	203 QBtu	182 QBtu

Because of the inherent complexity of the FEA projection model, it is difficult to clearly identify the most salient variables in the electric energy projections. However, insofar as the model is essentially compatible with the AEC/LMFBR model, it may be helpful to look at the clearly explicated assumptions there.

The AEC/LMFBR model assumes:

1) "that total energy demand will continue to grow in relation to GNP much the same way it has in the past twenty-five years."

2) "that electrical energy input requirements... (will) continue to grow in relation to GNP in much the same way that it has in the past."

3) "that electricity (will) continue to substitute for other forms of energy in areas of current energy use and that new cases (will) be found for it in the future."

4) "electric utilities (will) continue to add more efficient generation units and, therefore, that the average energy inputs needed to produce a kilowatt hour (will) gradually decline for the total U.S. system." [5]

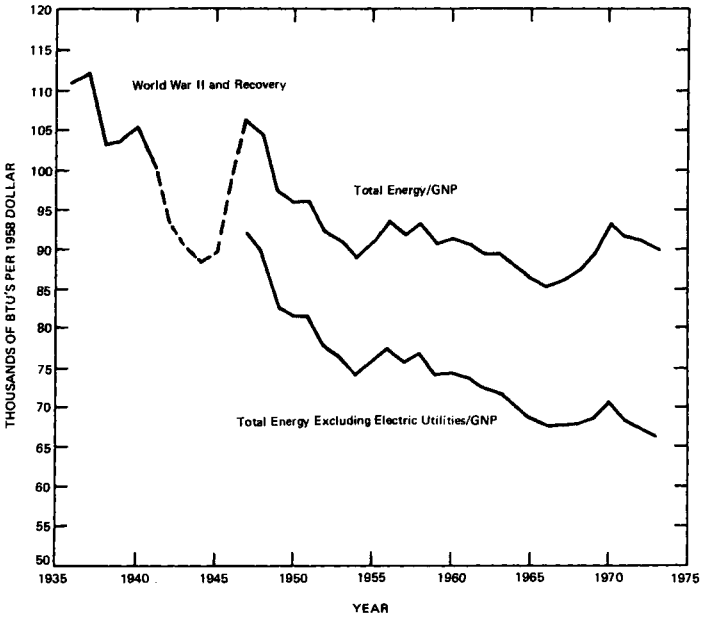
The AEC also notes, as a corollary to 1), that it "implies that the economy will become more efficient in the utilization of

energy, continuing the long term trend." [6]

Of these assumptions, only the third appears to be superceded by a different assumption in the FEA model: that being the price-elasticity of competitive fuels in the FEA model rather than the assumption of continued electric substition in the AEC model. Otherwise the assumptions appear to be consistent with the more recondite nature of the FEA model. The assumptions, assuming they also exist somewhere within the FEA model, require close examination.

First of all, the assumption of a continued (and continuously more efficient) relation between total energy consumption and the Gross National Product raises a series of questions. A casual review of the trend itself suggests 1) that it has been modest (decreasing from 110 thousand Btu/dollar in 1935 to 90 thousand Btu/dollar in 1973), 2) that it has not been without marked variations, 3) that it does not account for the post embargo period, and 4) that the resource consumption of electric utilities has had a dampening effect on the trend towards increased efficiency (see figure 1). Moreover, it should be noted that the period in question, from 1935 through 1973, is one which can be characterized by an abundant availability of low-cost fossil fuels, continued technologic advancements (both conceptually and in commercial applications), and a gradual progression towards the maximum efficiencies of steam-generated electricity. In all likelihood, however, two of these three characteristics no longer apply to the period in which we are living. Fossil fuels are no longer considered to be either abundant or inexpensive, and for more

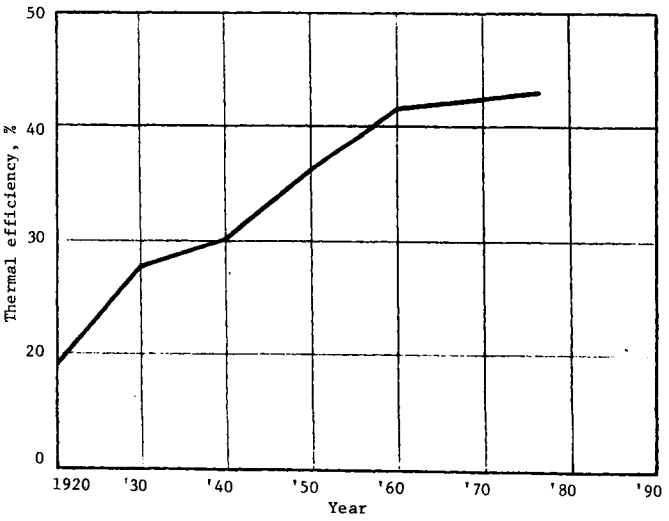
Figure 1



Source: AEC, WASH 1535, DEC 1974

than a decade the efficiencies achieved in steam generated electricity have essentially plateaued (see figure 2). It might also be noted that recent observers have suggested a declining efficiency in energy utilization as the net energy costs of exploration and technological development begin to intrude on our gross energy consumption,[7] while at least one economist has pointed out that "The observed positive correlation between non-human energy and employment means only that energy use and employment are both correlated to some third factors which have been increasing historically, namely total output and total population."[8] Thus, econometric projections based upon these historical correlations may be subject to substantial uncertainties due to changes in underlying parameters.

Figure 2



Thermal efficiency of large steam plants has doubled in 50 years, bringing heat rates within the 10,000 Btu/kWh range.

Source: POWER, June, 1975

Secondly, as we have noted above, the assumption that utilities will continue to add more efficient steam-generating units is subject to two important considerations. While the AEC points out that "dramatic increases in conversion efficiency have been achieved by the electric power industry since its inception (around 1900)",[9] it fails to point out that most of these increases occurred prior to 1960. Since that time, trade-offs between higher boiler temperatures and pressures, and the metallurgical costs of accomodating them, have imposed ceilings on further efficiencies.[10] The addition of new units with higher efficiencies in replacement of older less efficient units may continue to have the gradual effect of increasing the overall efficiency of available equipment, but simultaneously the introduction of an increasing percentage of nuclear reactors will again tend to off-set these gains. Despite the fact that High-temperature Gas Reactors may achieve efficiencies comparable to the finest fossil fueled units (38-40%), the lower efficiencies of more numerous light water reactors (31-34%), will probably tend to keep the national average below 33% in terms of generating efficiencies.

Thirdly, the increased electrification of the total energy budget must necessarily decrease the efficiency of the total energy system. While both the FEA and AEC/LMFBR models, like virtually all of the others surveyed, assume faster rates of electric energy consumption growth than total energy consumption, it is clear from the following table that the penalties in terms of thermal efficiencies are severe. Assuming a net conversion rate of 3,412 Btu/Kwh, and not accounting either for energy losses resulting from trans-

mission of electricity (about 9%), or less efficient generating systems; it is apparent that the thermal energy losses from electric energy generation in the year 2000 will be essentially comparable to the total U.S. energy budget in 1971 (based on the AEC/LMFBR case).

TABLE 8
COMPARISON OF ELECTRIC ENERGY PRODUCTION AND THERMAL ENERGY LOSSES: 1973 - 2000

COMPARISON OF ELECTRIC ENERGY PRODUCTION AND TOTAL U.S. ENERGY PRODUCTION: 1971 - 2000

	1971	percent of Total	2000	percent of Total
Total Energy Budget[a]	68.969	100	202.637	100
Electric Energy Resource Consumption[a] (resource input in QBTU)	17.048	25	100.287	49
Electric Energy Production[b] (resource output in QBTU)	5.868	8.5	38.019	18.7
Energy Lost in Electric Generation[c] (computed on the basis of 3,412 BTU per kWhr, presented in QBTU)	11.180	16.5	62.268	37.5

M. Messing/EPI

a Energy Research and Development Administration Wash 1535, Dec., 1974, Table 2.1-12
b Computed from "a" above
c Computed from data above
note: percent figures represent percent of Total Energy

While the AEC/LMFBR models notes only "that electrical energy input requirements ... (will) continue to grow in relation to GNP in much the same way that it has in the past," and fails to note the implications of this continued pattern, the FEA model overlooks the market value of the thermal energy lost here, and does not consider the effect of its utilization on other elements of its supply demand model. Technical articles in the industry press have recently pointed out that total energy system efficiencies of 55% to 81% are possible, and that the economics of these systems are becoming more attractive under present energy pricing,[11] Moreover, a study of the American Physical Society and the International Federation of Institutes for Advanced Study has recommended a fundamental reconsideration of both the first and second laws of thermodynamics in the context of relative energy efficiencies, rather than absolute energy potentials. As summarized in SCIENCE:

> "The shortcomings of the usual definition of energy efficiency are particularly apparent for tasks in which fossil fuels are used to produce low-temperature heat. Since fossil fuels burn at very high flame temperatures-- up to 4000° F(2210°C)-- the available work produced by fossil fuels is largely wasted when it is used for hot water heating, space heating, or even industrial steam production, since these are relatively low-temperature processes. For such purposes, the fuel could often be better used to raise the temperature of heat pumped in from another source rather than to produce heat directly by burning."[12]

Similarly, although the FEA model incorporates a variable for solar energy development, it is likely that the potential substitution for electric residential and commercial space heating and water heating, has been underestimated for much the same reason: i.e., it's social value as a low-temperature energy source is underestimated in the context of traditional values for relative energy efficiencies.

Finally, it should be noted that the FEA projections involve large degrees of uncertainty not only from the base-case assumptions, but from inherent limitations within the simulation model itself. An example of these limitations is given in the Report Methodology:

> "This list (of variables and values used in the forecast) includes information on the level and distribution of aggregate real output in the economy (GNP), the unemployment rate, the rate of inflation, population, and real personal disposable income. A key assumption in the model is that energy demand levels are conditional upon the values of these variables. For large changes in the relative prices of energy, implying large changes in the quantities of energy inputs demanded, this assumption is unrealistic, and the forecasted macroeconomic and demographic variables must be adjusted to make them consistent with the projected energy environment." [13]

Electric Generating Facility Projections

Notwithstanding problems in the forecast model, FEA's projections of electric generating facility requirements are simple and straightforward. On the assumption that power plant construction in the next decade will be consistant with the Project Independence objectives of phasing out reliance on petroleum imports, increasing domestic coal production, and accelerating nuclear power plant construction, estimates of needed new facilities are made by dividing estimated capacity additions by normalized unit sizes, and factoring in the physical constraints which might inhibit the realization of an optimum plant mix. In other words, it is assumed that typical nuclear power plants will be 1,000 MW units, typical coal facilities will be 800 MW, and typical combustion turbines will be 500 MW. Estimated additions of nuclear capacity are based on optimistic and pessimistic figures for nuclear plant construction, and estimated coal-fired additions are based on compensating for the difference between high and low nuclear estimates. It is assumed that the number of new combustion turbine units added will remain constant regardless of the nuclear/coal-fired mix, and that the contribution of other generating sources will be negligible. Accordingly, FEA summarized the need for new electric generating units as follows: (see page 22)

22.

TABLE 9

FEA PROJECTIONS OF NEEDED ELECTRIC GENERATING FACILITIES*

	Capacity (GWe) 1/ 1973	1985	New Facilities Required in 1985
Nuclear 2/	20	204 - 240	184 - 220
Coal 3/	167	327 - 291	200 155
Combustion Turbines 4/	33	162	260 - 260
			664 - 635

1/ Without measure to reduce the lead times for nuclear plant siting and licensing, the lower estimates for nuclear and higher for coal are more likely. If nuclear plant delays can be reduced, the higher nuclear estimates are more likely.

2/ Typical facilities of 1000 MW size.

3/ Typical facilities of 800 MW size.

4/ Typical facilities of 500 MW size.

Source: FEA, Jan, 1975

This situation can be clarified slightly by comparing the additional capacity needed (rather than total capacity, as above), with the new facility requirements. The following table is based on the above data and considers the high-nuclear scenario as the base case, and the high-coal scenario (in parens), as the alternative. (see page 18).

* for a summary of FEA's total energy facility siting needs, see Appendix C.

TABLE 10

REQUIREMENTS OF ADDITIONAL ELECTRIC GENERATING FACILITIES BASED ON FEA'S PROJECTED NEEDS TO 1985

	Additional Capacity (GWe)	Number of Units
Nuclear	(184) - 220	(184) - 220
Coal	(160) - 124	(200) - 155
Combustion Turbine	(129) - 129	(260) - 260
Other	(12) - 12	- -
Totals	(485) - 485	(644) - 635

From this table it is clear that of the additional 485 GWe capacity anticipated between 1973 and 1985, the facility requirement projections assume that all but 12 GWe will be produced either by coal, nuclear, or combustion turbine units. Furthermore it is implicit that the additions will be in the form of large units essentially comparable to the normalized unit sizes used in the computations. These assumptions are at wide variance with the data available regarding utility plans through 1983.(see Appendix C).

First of all, if Federal Power Commission (FPC) data for Electric Reliability Council (ERC) projections from 1974 through 1983 is examined, it is apparent that more than 1,000 generating units are currently planned by ERC utilities.* Of those units for which plans have

* Current (April, 1974) ERC projections anticipate 485,170 MW additions for the ten year period from 1974 through 1983. Of these additions, units have been specified for approximately 90% of the capacity. Insofar as the 485,170 MW (485 GWe) projections correspond precisely with FEA projections through 1985, and each represents estimates of the next 485 GWe to be added, the figures have been used interchangeably.

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been specified, more than 250 are less than the smallest normalized unit size used in the FEA calculations (500MW); i.e., there are more than 250 units planned between 0 and 500 MW in size. Of the 485 GWe planned, approximately 32 GWe are hydroelectric and pumped storage facilities; and an additional 1100 MW of geothermal are currently planned. Additionally, these figures are still based, for the most part, on pre-embargo data, and more recent estimates continue to forecast reduced load growth for the next decade as a result of higher fuel and electricity prices. In April, 1975, the National Electric Reliability Council revised its own estimate of a year earlier downwards by 10.4%, citing projected reductions in its regional forecasts from 5.2% to 19.6%.[14] At the same time, FPC data through the last half of 1974 continued to indicate a constant rate of growth in the installation of new electric generating equipment, concurrent with a constant rate of decline in electric energy consumption figures. (see Appendix D).

On the whole, therefore, it appears that the FEA projections of needed facilities may be high as the result of high forecast projections, but are unquestionably inflated in regard to the number of new facilities which would come under the authority of federal power plant siting legislation. Of projected capacity additions of 485 GWe, it appears certain that 20 GWe would be in units less than 300 MW in size, 33 GWe would be in hydroelectric and geothermal units, and further load reductions would reduce the need for new facilities further still.

Potential Improvements in Electric Generating Efficiencies

The potential for improving the efficiency of electric energy generation, and thereby reducing the need for additional units without reducing electric energy consumption generally falls into two broad categories: the potential for increasing unit generating efficiencies, and the potential for increasing system efficiencies.

As we have noted above, the potential for continuing to increase the generating efficiencies of individual units, appears to be limited, both by the first law of thermodynamics, and the cost-benefit trade-offs between higher operating temperatures and pressures, and higher metallurgical costs. Although newer, more efficient units may continue to displace older less efficient units, the benefits are unlikely to be dramatic, and will be offset by the lower efficiencies of light-water reactors. Simply by comparing the difference in operating efficiencies between light-water reactors and fossil fueled plants (approximately 6%) with FEA's estimates for high- and low- nuclear production scenarios, it can be seen that under an accelerated nuclear production schedule there would be an efficiency penalty of 6% on approximately 44 GWe of produced power(the amount that would be produced by new coal-fired units if nuclear units did not come on line). In other words, FEA's alternate, low nuclear scenario, would itself reduce the need for new facilities by about 2.6 GWe, or two of the largest nuclear units presently planned.

As also noted above, there is a potential for increased efficiencies in the utilization of total energy systems. The FEA analysis of March, 1975 recognizes this potential in mention of possible "multiple industrial-use siting, but does not discuss it, and the Facilities Task Force similarly mentions the concept without exploring it in detail. The Task Force mention, is, however, somewhat provocative:

> "No consideration is given to private power generation facilities for industrial use. There are quite a number of these (in use) but their individual size is usually much below the 'building block' sizes considered in this study. In some cases, these facilities are tied into the local utility so that sharing or purchasing of the excess power is possible."[15]

Because such facilities would not be included in ERC projections based on utility figures, and because of the large portion of electric power which is consumed by the industrial sector, the increased development of private industrial total energy systems would have a multifold effect of electric power projections. By doubling the efficiency of energy utilization, total energy systems would obviously reduce both the need for new electric generating facilities and the need for fossil (or nuclear) fuels. Additionally, by shifting the obligation of construction to private industry, and by tying in with regional transmission systems, private total energy systems would reduce capital needs of the utilities, and tend to increase the reliability of the systems (due the ability of the systems to tap in with these private sources when necessary. However, the potential savings from total energy systems in the next decade have not been quantified, and are probably limited.

A third possibility in improving individual unit generating efficiencies would be the increased utilization of combined cycle

units, with the potential of increasing the gross efficiency of fossil fueled steam units from about 31% (actual operating efficiency) to 40%. The FEA justification paper recognizes that this would also reduce the number of new sites needed as combustion turbines are coupled with steam turbines, but higher installation costs and the limited availability of oil or natural gas for fuel seem to limit the potential contribution of this technology.

On the other hand, more attention to the increased efficiency of utility systems may offer readily achievable reductions in new equipment needs. In January, 1975, Louis H. Roddis noted, in a speech before the American Public Power Association, that increased utility attention to reliability standards, reserve requirements, and voltage control equipment could have substantial effects on projected facility requirements:

> "Another technical area which I believe requires considerably more industry examination involves the reliability standards that are required in the overall designs of large systems...
>
> "... lowering the generation reserve requirement to be more in consonance with the distribution performance could produce something like a four percent energy reserve reduction...
>
> "Proper outfitting of system voltage controls equipment to allow reductions of a non-harmful nature, could save another four-percent. This eight percent reduction in overall generating reserve requirements by 1985 could produce a saving of as much as 40 million killowatts in capacity and $20 billion in investments." 16

In March, 1975, FEA completed its own evaluation of the possibilities for increasing the productivity of power plants and found additional new possibilities:

> "By 1980, an industrywide reduction in the average forced outage rate of just 1 percentage point could reduce the Nation's installed capacity requirements by up to 6,800 MW and capital requirements by as much as $1.8 billion (1974 dollars). Over this same period, a capacity factor increase of 8 percentage points for nuclear units and several percentage points for 400 MW and larger coal-fueled units would permit an increase in output from these units equivalent to the electric energy produced by burning more than 500,000 barrels of oil per day. At projected costs for oil, coal, and nuclear fuel, this could reduce the utility industry's total fuel costs in 1980 by approximately $3 million per day (1974 dollars)." [17]

At issue here is basically the reliability of large generating units, both nuclear and fossil fueled, and the effects of forced outages in large units on total system requirements and costs. The fact that both availability and capacity factors on an industry-wide basis have been less than expected and declining in recent years is not only contrary to the assumptions in the models discussed earlier, but has had a series of deleterious effects on utility productivity:

> "On average, over the past year or two, the Nation's large nuclear and fossil-fired base-loaded units were forced out of service more than 15 percent of the time, were unavailable for service more than 25 percent of the time, and operated at less than 60 percent capacity factor. Hence, a large fraction of the highest capital cost generating capacity was not in service as much as had been anticipated. This has severely aggravated the financial, siting, licensing, manpower, and other problems afflicting the industry." [18]

Although the Report observed that some large units have obtained very high reliability standards, and that the observed correlation between unit size and forced outage time may be due to the immaturity and individuality of the unit designs, inadequate maintenance procedures, inferior quality of workmanship, or other causative factors unrelated to the inherent size of the units, the effect are manifest in higher reserve margins, higher facility projections, higher capital costs, and, ultimately,

higher electric utility rates.

In June, 1974, the FPC stated that "the trend toward larger generating unit sizes, and the relatively poor availability records of many large units, operate to increase reserve margin requirements over that which is needed when smaller, mature units predominate on a system."[19] As a result, the FPC observed that utility reserve capacities planned for the next decade tended toward "the upper end of the 15 to 25 percent band currently observed."[20] Moreover, it is important to remember that reserve margins are calculated on the basis of necessary reserves over projected maximum peak loads, and therefore projected reserve capacities of 20-25 percent over maximum summer peaks usually result in reserve capacities on the order of 40 percent over winter peak loads. Therefore it is easy to see how the effects of these trends tend to be cumulative. Contrary to the assumptions that increases in unit sizes will necessarily be accompanied by increases in system efficiencies and operating costs, recent experience has indicated that the net efficiencies may be lower and the costs may ultimately be higher.

> "There is little question that of the 20 or 25 percent of plant represented by specific equipment, economies of scale favor the large units. However, cost effectiveness diminishes rapidly if large size dictates custom design and custom construction. In these cases, a consequent increase in the 80 percent of the plant costs represented by field labor and overhead-- most of which are time dependent-- make the total cost of a larger plant comparable to an equivalent number of smaller facilities.
>
> "In fact, the capital cost per kilowatt of installed output has been rising in actual dollars along with plant size."[21]

Although a reduction in unit size might at first be thought to increase the total number of sites required, in this context it can be seen that a reversal in the trend towards larger units might increase the attractiveness of small units incorporated in total energy systems, increase utility system reliability, and reduce the need for a substantial amount of reserve capacity generating facilities.

Finally, it should be noted that other considerations may effect the net efficiencies of generating system over the next decade; considerations such as increased transmission efficiencies (resulting either from higher voltage lines or siting in closer proximity to load centers), the energy costs of pollution control equipment, or increased efficiencies resulting from different management procedures (including such things as coal sorting and washing to allow more efficient uses of higher quality coals.) For our purposes, it appears that the wide range of such variables may ultimately effect either a net increase, or decrease in total system efficiencies over the next decade, but the number of variables is probably larger than the likely magnitude of the effects.

On the basis of the above considerations it is our feeling that the additional generating capacity required through 1985 is likely to be 10 to 25 percent lower than the 485 GWe estimated by FEA, and through the year 2000 a reduction on the order of 25 percent below the AEC/LMFBR estimates appears reasonable.

PART TWO: THE NEED FOR ELECTRIC GENERATING FACILITY SITES

Analysis of Project Independence Estimates for 1985

The President's State of the Union Message of January, 1975 clearly stated the need for 200 major new nuclear power plants, 150 large new coal-fired power plants, 30 new oil refineries, and 20 new synthetic gas facilities on line by 1985, and the "Energy Facilities Planning and Development Act" was introduced to assure the timely siting and construction of the needed facilities: however, neither the Project Independence Report, nor the Energy Independence Act Environmental Statement, nor, in fact, any of the available supporting documents, explicitly address the need for new energy facility sites. The need for new facility sites must be inferred from need for new energy facilities.

If FEA estimates of needed new generating facilities are compared with available industry data regarding construction plans from 1974 through 1983, and adjusted to account for minor variations in plant types and sizes, the estimated number of new generating facility sites needed drops from approximately 640, to less than 150. The following tables do not address the questions of availability of new sites (i.e., whether the new sites needed have been, or will be approved,) but only the number of new sites likely to be needed between 1974 and 1985.

Tables 11, 12, and 13 indicate FEA estimates of projected electric generating facilities needs from November, 1974, January, 1975, and March, 1975, respectively.

Table 11

Electrical Capacity Projections

	Existing Capacity end-1973	1985 Projections (in Gigawatts) BAU $11/BBL.	Demand Management
Total Electricity Capacity	424	922	1002
Growth Rate 1973-1985, %/yr.	--	6.3	7.4
Hydro Capacity	65	100	100
Nuclear Capacity	20	204	240
Coal Capacity	167	327	379
Oil Capacity	78	81	64
Gas Capacity	61	48	48
Combustion Turbine	33	162	171

Source: FEA, Nov. 74, 11-24

Table 12

Electric Generation Plant Requirements

	Capacity (GWe) 1973	1985	New Facilities Required in 1985
Nuclear	20	204-240	184 - 220
Coal	167	327-291	200 155
Combustion Turbine	33	162	260 - 260
		693-693*	664 - 635

Source: FEA, Jan., 1975

* 693GWe totalled from table data

Table 13

Estimated Number of New Facilities Required to Meet Energy Demand Increases over 1972*

	Energy Independence Act (GWe)	Business As Usual (GWe)
Nuclear (1000MW)	184 (184)	184 (184)
Coal Fired (800MW)	204 (163)	138 (110)
Combustion Turbine (500MW)	454 (227)	504 (252)
Hydro (1000MW)	117.5 (118)	117.5 (118)
Oil(800MW)	-21 (-17)	- 3 (- 2)
Natural Gas (800MW)	-16 (-13)	-16 (-13)
Total	922.5 (662)	924.5 (649)

Source: FEA, March, 1975, 2-21

From the data in Tables 11 and 13, it can be seen that the projected electrical energy requirements of the Project Independence Act Business-As-Usual Case (922-924.5 GWe) are those which were targeted in the Energy Independence Act: however, by reorganizing Table 12 to indicate additional new capacity (as well as new facilities), and by comparing this with the breakdown in Table 11, the following table can be constructed:

* The unit sizes have been normalized as indicated; GWe figures have been computed for benefit of comparison

Table 14

Additional New Capacity Needed for 1985

	Additional Capacity GWe	Number of Units
Nuclear (1000MW)	(184)*- 220	(184)*- 220
Coal (800MW)	(160) - 124	(200) - 155
Combustion Turbine (500MW)	(129) - 129	(260) - 260
Other	(12) - 12	- -
	(485) - 485	(644) - 635

The additional capacity shown in Table 14 in fact conforms more closely to the high-coal scenario (in parens) when compared with the BAU $11/BBL projection in Table 11, and it can be seen that the "other" category represents a small decrease in net oil-fired capacity, a substantial decrease in net gas-fired capacity, and an increase of about 35 GWe in hydro- and miscellaneous capacity additions. Therefore, if we assume that the number of generating sites needed most closely conforms to the number of new (additional) generating units needed, we can construct the following first approximation based on the FEA data:

(see page 35)

* Numbers in parens indicate low-nuclear high-coal scenario

Table 15

Additional Generating Unit/Sites Needed

	Additional Capacity GWe	Additional Units/Sites
Nuclear (1000MW)	184	184
Coal (800MW)	160	200
Combustion Turbine (500MW)	129	260
Other	12	-0-
	485	644

Utilizing this base-line data for projected site needs, the estimates can be compared with current utility construction plans as tabulated by the Federal Power Commission from National Electrical Reliability Council reports, with the statutory limitations of the "Energy Facilities Planning Act", and with more recent estimates made by FEA.

First of all, under the definitions of the Act, only electric generating plants (other than hydro-electric) over 300 MW would be affected by this legislation. If one looks at 1974 FPC data, it can be seen that approximately 23 percent of the total number of units planned by utilities are under 300 MW (excluding hydro) and therefore would not come under the authorities of the proposed siting legislation (see Table 16):

Table 16

Planned Electric Generating Units by Size (Excluding Hydro)

	Unit Output (MW)	Number of Units	Percentage of total (No. of units)
000 - 299	20,318	148	23
300 - 499	41,033	104	16
500 - 799	113,836	185	29
800 -1199	70,402	171	26
1200 -2099	49,852	40	6
	395,441	648	100

Source: FPC, April 1, 1974

More significantly, FEA figures indicate the number of new facilities which must be on line by 1985, and the lead-times involved in constructing these facilities, but do not account for the number of units already currently under construction. The FPC compilation of Projected Steam Generating Unit Additions 300MW and Larger for which Construction has Already Begun or is Scheduled to Begin with Two Years, indicates 268 GWe of planned capacity in these categories. Although it might be assumed that specific sites exist for all those plants either under construction or within two years of construction, 161 GWe of the 268 GWe listed is comprised of plants scheduled to be on line by 1979. Therefore, it can safely be assumed that approved sites exist for 161 GWe, and that probable sites exist for 268 GWe of planned capacity. In the case of nuclear plants this does not imply that regulatory approval is necessarily forthcoming for plant operation, or, in the case of fossil fueled plants, that plants will automatically begin

operation without further regulatory delays: but we believe that these figures imply that the initial site selection process has been completed. If the FEA estimates are adjusted to reflect these figures, they would appear as follows:

Table 17

Additional Generating Unit/Sites Needed:

Adjusted for Unit Size and Units Under Construction

	Additional Capacity GWe	Additional Units/ Sites
	485	644
Adjusted for Planned Capacity Under 300 MW		27*
Adjusted for Planned Capacity on line by 1979	161	214*
Adjusted for Planned Capacity Under Construction or within Two Years of Construction and on line 1980-1984	107	142*
	197	261

These estimates, although substantially lower than the initial FEA estimates are subject to additional adjustment. They do not reflect either the number of projected sites in States which currently have accelerated power plant siting laws, or further

---

* Number of units calculated on the basis of the ratio between total GWe demand and estimated number of units (485:644)

or the potential for further load reductions which FEA has projected since the release of these figures. Of the twenty-two states with power plant siting laws (see Table 20), the electric power demand of the twelve states with the largest power demand in 1973 was 163,740 MW-- approximately 37 percent of the national total (438,493 MW). If we assume that the projected percentage of electric power growth for the twenty-two states with power plant siting legislation is no greater than the percentage of 1973 capacity represented by the twelve largest of those states, and if we assume that no additional states pass independent power plant siting legislation, then the number of projected new units covered by these laws would be approximately 240 (644 x 0.37).[22]

At the same time, FEA has recently developed figures which indicate that the total need for installed new generating capacity might be reduced by as much as one-third (160 GWe), with combined load management and energy conservation programs.[23] In October, 1974, FEA Administrator John Sawhill spoke qualitatively about the potential for reduced facility capacity through improved plant performance and management practices:

> "If a plant operates at only 50% of capacity, we must build two plants to get the output of one. Thus we pay the price of higher electric rates, and double the already considerable competition for investment capital, siting, licensing and utilization of scarce resources.
>
> "Poor plant performance is inflationary, wasteful, and unnecessary. It must be eliminated, and this can be accomplished in two ways. There must be improved quality control in the manufacture and design of plants and equipment components. And the utilities must share responsibility by putting quality at the top of their purchasing prerequisites for these goods and services." [24]

In March, FEA had quantified these savings further and reported that:

> "By 1980, an industrywide reduction in the average forced outage rate of just 1 percentage point could reduce the Nation's installed capacity requirements by up to 6,800 MW and capital requirements by as much as $1.8 billion (1974 dollars). Over this same period, a capacity factor increase of 8 percentage points for nuclear units and several percentage points for 400MW and larger coal-fired units would permit an increase in output from these units equivalent to the electric energy produced by burning more than 500,000 barrels of oil per day." [25]

Finally, in June, FEA Administrator Frank Zarb announced that effective load management and related conservation programs could reduce the "use of imported oil for electric power generation by as much as 1.3 million barrels per day and (the) need for new installed capacity by about one-third" over the next decade.[26] Specifically, Mr. Zarb said:

> "While our analysis of all the aspects of load management is not yet complete, our preliminary findings indicate that several specific objectives can realistically be met by 1985:
>
> -- we can improve load factors from the present 62 percent to 69 percent;
>
> -- we can improve capacity factors from the present 49 percent to 57 percent;
>
> -- we can encourage expansion of base load capacity, primarily nuclear and coal capacity, from 45 percent to 55 percent of total generation;
>
> -- we can increase end-use efficiency by about 10 percent through energy conservation actions;
>
> -- we can reduce the use of imported oil for electric power generation by as much as 1.3 million barrels per day." [27]

Moreover, it is important to note that the basis of the reductions and savings are achieved through reduced electric generating capacity expansion rather than reduced electric energy consumption. As Mr. Zarb noted, "Through load management and related

conservation programs, the Nation can attain these objectives at a manageable annual growth rate of about five percent-- plus or minus one half percent-- for electric sales, or kilowatt hour usage, and four percent-- again plus or minus one half percent for peak load demand." [28]

Obviously, if either this potential is met, or if the number of new site selections which might be affected by federal legislation is adjusted to allow for the number of new sites which are likely to be accomodated under expedited state siting laws, then the number of new power plant sites which would be affected by federal power plant siting legislation is negligable. If the estimated additional generating capacity needed is reduced only by the number of planned facilities under 300 MW or over 300 MW and within two years of construction, the capacity and number of units subject to new federal siting authorities would drop to from 485 GWe and 644 units to 197 GWe and 261 units. If this number were to be reduced further, either by the planned capacity additions in states with existing siting laws or by the potential for increased conservation and improved load management procedures, the number of new facilities which might be affected by federal power plant siting legislation might be reduced to zero. Table 18 summarizes these figures:

(see page 41)

Table 18

Summary of Power Plant Siting Needs: 1975 - 1985

	Additional Capacity GWe	Additional Units/Sites
Estimated Additional Generating Capacity Needed 1/	485	644
Additional Generating Capacity Which Would Be Unaffected By Federal Power Plant Siting Legislation:		
Planned Capacity Under 300 MW or Over 300 MW and Within Two Years of Construction 2/	288	383
Estimated Capacity Demand of Twelve Largest States with Power Plant Siting Laws 3/	179	240
Generating Capacity Reduction with Conservation and Load Management Savings 4/	160	213
Range of Estimated Siting Demands Subject to Federal Power Plant Siting Legislation 5/	0 - 197	0 - 261

1/ FEA, November, 1974. See Table 14.

2/ FPC, Summary of Projected Generating Unit Additions by Unit Size for the Period 1974 -1983, Projected Generating Unit Additions and Retirements for the Period 1974 -1983, and Projected Steam Generating Unit Additions 300MW and Larger for which Construction Has Already Begun or is Scheduled to Begin Within Two Years, as reported under FPC Docket R-362, April 1, 1974. See Table 17.

3/ See Table 20.

4/ See note 23.

5/ The range estimated derives a low figure by substracting the figures from lines 2, 3, and 4, (planned capacity additions, estimated demand of twelve largest states, and conservation and load management savings,) from total capacity additions needed. The high figure is derived by substracting only those plants under 300MW or over 300 MW and within two years of construction from the estimated additional capacity needed.

These figures do not address several key factors in power plant siting decisions: they do not address the fact that smaller units (under 300 MW) may imply larger numbers of sites, with an increased potential for utilization of the smaller urban sites made available by retirement of older units; they do not address the fact that existing sites on which plant construction has begun or is scheduled to begin within two years may yet encounter regulatory delays; and they do not address the fact that states with existing power plant siting legislation may nonetheless encounter problems in site selection or approval. Nonetheless, the figures do clearly indicate that the number of generating units needed on line by 1985 and which would be subject to new federal power plant siting legislation, is modest, and that a substantial potential exists for addressing these siting needs either on the state level or through increased conservation and improved load management programs.

Electric Generating Facility Siting Needs Beyond 1985

Beyond the year 1985, the need for new generating sites stabilize rather than continue to increase. In December, 1974, the AEC forecast of nuclear energy supplies through the year 2,000 ranged from 825 - 1,200 GWe, with the most likely case based on the assumption that nuclear energy would account for 72 - 81% of new generating additions through the 80's and 90's, and with the high estimate based on the assumption that nuclear energy would be "about 90% of all additions to generating capacity after 1985."[29] If these projections are compared to a total electric generating capacity of less than 450 GWe in 1973, it can be seen that total capacity additions of 600 - 1,000 GWe are forecast, and as many as 1,200-1,300 new generating sites might be needed. There are, however, several mitigating factors.

First of all, the potential for increased capacity reductions should increase from 1985 through the year 2,000, both as a function of increased reliability in generating units, and as a function of smaller reserve margins. The first point is well-known and has been publicly argued in great detail. Increased reliability would in turn decrease the amount of reserve capacity necessary to insure system reliability. However, there is a potential for further reductions in reserve margin capacities as system reliability improves as a function of increasing numbers of units within the system. A hypothetical statement of this potential is presented in Table 19:

Table 19 [30]

System Reserve Margin as A Function of the Number of Identical Units

Total Number of Identical Units in System	Number of the Total Units Required as Spare Units for Reserve*	Reserve Capacity as a % of Total Capacity
3 to 8	2	67% to 25%
9 to 19	3	33% to 16%
20 to 32	4	20% to 13%
33 to 49	5	15% to 10%

Source: Huettner and Landon

* Based on a forced outage rate of 2% for each individual boiler-turbine-generator unit and a system load loss probability of no more than 0.0004.

Hopefully, therefore, the potential for reducing the need for new installed generating capacity through conservation and improved load management is more likely to be realized beyond 1985 regardless of its effects from 1975 - 1985; and a one-third reduction in installed generating capacity from 1985 - 2,000 would reduce the need (based on AEC's most likely case) from approximately 1200 GWe to 800 GWe (1600 to 1,000 new units). However, these figures include the 485 GWe and 644 units forecast for addition through 1985, and therefore amount to additions beyond 1985 of 315 GWe to 715 GWe and 356 to 956 new units.

Secondly, as FEA noted in the January Paper:

> "Nuclear and coal-fired plants will generally be sited in groups of two or four. Combustion turbine plants of 500 MW capacity will consist of several units occupying a single site. As combustion turbines are coupled in combined cycles with steam turbines, the capacity of these installations will increase, thereby decreasing the number of sites required." [31]

For this reason projected unit additions of 350 to 900 new plants from 1985 through 2,000, may in fact require a much smaller number of new site approvals. This is certainly the case to the extent that large energy centers may be developed, and less likely true to the extent that larger numbers of smaller units might be developed (as mentioned earlier); but it is especially significant if viewed in terms of current utility site holdings and the potential for increased additions to these existing generating sites.

Thirdly, it has been a general practice among utility companies in recent years to increase their inventories of potential sites as a hedge against both rising land prices and more stringent site selection criteria, and to rotate the addition of new units among large generating sites evenly dispersed in relation to projected load centers. In other words, utility companies have tended to acquire large tracts of land which can be developed gradually as load centers grow, and which offset the prohibitive costs of long-distance transmission which would result from the full utilization of sites located far from developing load centers. However, insofar as utility land acquisitions may include a variety of purchase options, and often the right of eminent domain, as well as outright land purchases; and are generally conducted through third party agents, it is virtually impossible to estimate the extent of existing utility land holdings or the potential for increasing the generating capacity of either existing or anticipated sites. In fact, the number of sites that will be needed in the year 2,000 may not be much greater than the number we have now; but the figure is hard to quantify

in the absence of utility land data.

State Facility Siting Projections

Within the past several years approximately twenty states have enacted or consolidated power plant siting laws, for the purpose of expediting power plant siting, and augmenting State land use planning. Although it is still too early to evaluate the effectiveness of the various State laws, it is apparent from a general survey of the contiguous forty-eight states, that power plant siting decisions per se are not considered to present State level problems in most States through the year 1985. In calling the Governor's office of each State, asking for the State agency responsible for power plant siting, and asking whether power plant siting was expected to pose serious problems through 1985, it was found that most States responded negatively. Environmental problems, the availability of fuels (particularly in those states dependent upon oil and natural gas), the availability of water, and problems of capital shortages, all appeared to present more substantial problems than site acquisition and the process of site selection. Although this survey was informal, rather than precise, it is believed that the tabulated responses accurately reflect the priorities of concerns of those State officials who responded. The following table indicates 1973 levels of power consumption, whether or not the State has a power plant siting law, and what siting problems are anticipated through 1985: (see page 33.)

TABLE 20

43.

STATE FACILITY SITING LAWS AND ANTICIPATED SITING PROBLEMS

STATE	1973 Capacity* (Thousands KW)	SITING LAW Y or N	PROBLEMS[1] YN EFWC*
Alabama	11,824	N	N E
Alaska	586		
Arizona	4,819	Y	N F
Arkansas	3,566	Y	N EF
California	31,999	Y	N F W
Colorado	3,384	N	N E W
Connecticut	5,189	Y	N
Delaware	1,455	N	Y
Florida	19,073	Y	Y C
Georgia	9,144	N	?? E WC
Hawaii	1,188		
Idaho	1,656	N	N E
Illinois	23,989	N	N F
Indiana	12,502	N	Y EFW
Iowa	4,107	N	N
Kansas	5,447	N	N F
Kentucky	10,745	Y	N EF
Louisiana	10,358	N	
Maine	1,707	Y	N E
Maryland	6,731	Y	N
Massachusetts	7,776	Y	N E
Michigan	15,962	N	N F C
Minnesota	5,917	Y	N
Mississippi	3,272	N	N
Missouri	10,461	N	N E
Montana	1,881	Y	??
Nebraska	3,033	N	N E
Nevada	3,328	Y	N EFW
New Hampshire	1,146	Y	N
New Jersey	11,300	N	
New Mexico	3,943	Y	N E W
New York	25,960	Y	N E
North Carolina	11,960	N	N E C
North Dakota	1,308	Y	Y E W
Ohio	21,496	Y	
Oklahoma	5,795		F
Oregon	6,091	Y	N F
Pennsylvania	23,725	N	N E W
Rhode Island	360	N	
South Carolina	7,407	Y	??
South Dakota	1,693	N	
Tennessee	12,826	N	N
Texas	33,985	N	N EFW
Utah	780	N	N E *
Vermont	906	Y	Y
Virginia	8,245	N	??
Washington	15,356	Y	N E
West Virginia	12,334	N	N E
Wisconsin	7,664	N	N EF
Wyoming	1,835	Y	N

* Source: Edison Electric Institute, 1974

K E Y

E = Environmental Problems
F = Fuel Shortages - gas & oil
W = Water Availability
C = Capital Shortages
??= Uncertain

* = Siting large concentrations of power in remote areas would involve economic and regional planning problems.

APPENDIX A: THE NEED FOR OIL REFINERIES

Following the publication of the Project Independence Forecasts for energy facilities, including 30 new oil refineries by 1985, the Federal Energy Administration conducted public hearings in December, 1974 to obtain an information base for further government programs.

The information, however, did not support either the preliminary findings that 30 new facilities would be needed, or that the siting of needed refineries would present aggrevated problems for the industry. On the basis of the hearings, the published report, U.S. Petroleum Refining Capacity Overview (FEA, 1975), concluded:

1) that in the context of the Project Independence Report, "the requirements for additional refinery capacity range from slightly less than nothing to 8 million barrels per day. Even assuming that the far ends of the range are not very likely options, a range of at least 1.1 million to 6 million barrels per day remains." (p.3)

2) if it is assumed that an additional capacity of approximately 1.6 million barrels per day of new capacity will be needed to accomodate growth in demand, it would be expected that firm industry committments for an additional 2.3 million barrels per day, and additional industry plans for 4.5 million barrels per day capacity, should be adequate to meet the demand. (p. 5)

3) it was the opinion of industry spokesman who testified that the availability of suitable sites was not a problem, but "the primary problem was the inability of refiners to play due to the lack of a national energy policy." (p. 7)

4) Finally, it was noted that the President's estimate of 30 new refineries was based on a theoretical projection of demand and refining site capacity additions; but that "because refinery construction often takes place adjacent to existing sites, it (could) safely be assumed that at least 20 of these 30 refineries probably have sites secured. This would leave approximately 10 new sites, several of which have been recently secured, to be obtained over the next 10 years." (p. 8)

APPENDIX B: THE NEED FOR SYNTHETIC FUEL FACILITIES

In July, 1974, the Synthetic Gas-Coal Task Force for the Supply Technical Advisory Committee of the Federal Power Commission National Gas Survey, observed that "the coal resources of the United States are sufficient to support a coal-to-synthetic natural gas industry well into the next century," and while various demonstration plants are being tested for different commercial processes, the fundamental technology for coal-gas conversion has been commercially available for more than a generation.

Prior to the oil embargo of 1973, the costs of synthetic fuel conversion were not competitive with petroleum or natural gas prices, but with higher world oil prices and diminishing domestic reserves, it now appears that market competitiveness will be achieved within a couple of years. The Evaluation of Coal Gasification Technology prepared by the Ad Hoc Panel on Coal Gasification Technology of the National Academy of Sciences and National Research Council warned in 1972 that "it would be unrealistic to think (the projected deficits in gas consumption from 1980 - 1990) could be made up entirely with synthetic gas from coal, if for no other reason than lack of capacity to produce the special equipment that would be required for the plants," but the potential for large scale development around the turn of the century remains substantial. All that remains is for price competitiveness, and clarification of goverment energy policies.

In December, 1973, following the President's directive that the Nation should become energy self-sufficient by 1980, the Atomic Energy Commission complete a special report outlining an "aggressive new program... immediately (beginning) construction of full-scale commercial plants using existing technologies for producing synthetic fuels from coal." In January, 1974, the Commerce Department proposed a package of federal programs to reduce the capital risk of synthetic fuel investments through price guarantees and other capital incentives, and in February the White House gave further impetus to the idea of a massive synthetic fuels industry in its proposal to make the U.S. a "net exporter of energy during the 1980's." Despite the fact that the Project Independence Report concluded that "synthetic fuels will not play a major role between now and 1985", the President's Energy Message and FEA's subsequent Environmental Statement reiterated the earlier proposals for ambitious new commercialization programs and subsidies.

In the context of a private, but reportedly thorough, American Gas Association study of suitable sites for gasification facilities, it appears that approximately 175 sites exist with adequate fuel and water availability, and that the siting of 20 facilities should not pose a significant siting problem over the next ten years. Beyond 1985 large scale development is likely to pose more serious water resource conflicts, than site selection problems.

APPENDIX C: PLANNED GENERATING FACILITY ADDITIONS

The following table compares FEA's summary of projected capacity additions (and installed generating capacity in 1985) with FPC estimates based on current utility plans:*

1973 INSTALLED GENERATING CAPACITY (millions of kW)	
Nuclear	20
Coal	167
Combustion Turbine	33
Other**	217

FEA ESTIMATES: Generating Capacity & New Additions		
Nuclear	204 - 240	184 - 220
Coal	327 - 291	200 - 155
Combustion Turbine	162	260
Other**	229	12

FPC ESTIMATES: Generating Capacity & New Additions		
Nuclear	214	194
Coal***	369	202
Combustion Turbine	55	22
Other (specified)	284	67

Source: FPC Docket R-362, April 1, 1974

* Utility projections are, in fact, compiled to 1983. However, insofar as both projections are for installed capacities of 922 GWe, and both represent projections for the types of reactors comprising the next 485 GWe to be added, they have been compared directly.

** This figure has been computed by deducting the figures for the other other units indicated (and cited previously), from Project Independence Blueprint projections for the year 1985.

*** Utility figures are given for fossil fueled units, and have been labeled as coal units here for the purpose of consistancy with FEA assumptions that all future fossil steam plants are to be coal fired.

It should be noted here that more than 16% of the utilities' planned capacity are from units under 500 MW;

	UNIT OUTPUT (MW)	PERCENT OF TOTAL (MW)	NUMBER OF UNITS	PERCENT OF TOTAL (No. of Units)
000 - 299	20318	5	148	23
300 - 499	41033	11	104	16
500 - 799	113,836	29	185	29
800 - 1199	70,402	43	171	26
1200 - 2099	49,852	13	40	6
	395,441	101	648	100

Source: FPC, April 1, 1974

and approximately 14% of planned capacity additions through 1983 consist of hydro-electric or miscellaneous units (other than coal, nuclear, and combustion turbines):

TYPE OF UNIT	PROJECTED MW OUTPUT	PERCENT OF TOTAL
FOSSIL STEAM	202,326	41.7
NUCLEAR STEAM	193,330	38.9
COMBUSTION TURBINE	21,870	4.5
HYDRO-ELECTRIC	13,580	2.8
PUMPED STORAGE	18,261	3.7
GEOTHERMAL	14,021	2.9
MISCELLANEOUS	21,752	4.5
TOTAL:	485,140	99.0

Source: FPC, April 1, 1974

Construction plans for additional new generating facilities by electric reliability council areas, are represented in the following table:

	ECAR	ERCOT	MAAC	MAIN	MARCA	NPCC	SERC	SWPP	WSCC	TOTAL
1974	5	4	6	1	3	7	11	3	6	46
1975	6	3	4	4	2	6	8	3	6	43
1976	6	4	2	4	2	1	13	4	7	43
1977	6	4	4	5	3	3	5	4	4	38
1978	5	2	4	5	2	2	7	6	9	42
1979	8	1	5	3	3	4	9	3	6	42
1980	4	1	3	4		3	8	3	5	31
1981	2	1	5	3		1	4	2	5	23
1982	2	1	3			3	3		4	16
1983	2	3	1	1			1		1	9
TOTAL	46	24	37	30	15	30	69	30	52	333

ECAR - East Central Area Reliability Coordination Agreement
ERCOT - Electric Reliability Council of Texas
MAAC - Mid-Atlantic Area Council
MAIN - Mid-America Interpool Network
MARCA - Mid-Continent Area Reliability Coordination Agreement
NPCC - Northeast Power Coordinating Council
SERC - Southeastern Electric Reliability Council
SWPP - Southwest Power Pool Coordination Council
WSCC - Western Systems Coordinating Council

Finally, it should be noted that neither FEA's estimate, nor our own, takes account of the availability of new sites resulting from the retirement of older facilities or the potential for adding additional units to existing sites.

Appendix C: p. 4

The following table indicates projected facility additions (in Megawatts) for units over 300 MW during the period from 1974 through 1979, and for units listed as being over 300MW and either under construction or within two years of construction in FPC data compiled pursuant to Docket R-362, April 1, 1974.

	ECAR	ERCOT	MAAC	MAIN	MARCA	NPCC	SERC	SWPP	WSCC
1974	5709	2516	4827	540	1837	4315	11685	2650	3665
1975	5434	2135	3165	2557	868	4095	7731	2740	3770
1976	6071	2296	1745	2490	1200	850	10433	2197	3330
1977	4738	3026	3205	3025	1688	1311	5284	2213	2573
1978	5008	2940	2800	3535	761	1420	6721	3459	7159
	26960	12913	15742	12147	6354	111991	41854	13259	19497
1979	5008	750	4575	2198	1631	4200	7324	2220	2930
1980	2138	1150	3098	3760	----	2755	7968	2155	4150
1981	2114	750	5515	3360	----	1150	4450	1630	5670
1982	2330	1150	3048	----	----	3557	3291	----	2610
1983	2114	2250	1160	950	----	----	1191	----	760
	13704	6050	17396	10268	1631	11662	24224	6005	16120
Totals:	40664	18963	33138	22415	7985	23653	66078	19264	35 17

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Table 2-21

ESTIMATED NUMBER[1] OF NEW FACILITIES REQUIRED TO MEET ENERGY DEMAND INCREASES OVER 1972

FACILITY	SCENARIO					
	ENERGY INDEPENDENCE ACT	ACCELERATED SUPPLY	ACCELERATED CONSERVATION	REDUCED SUPPLY	REDUCED CONSERVATION	BUSINESS AS USUAL
Underground Coal Mines (3 million tons/yr mine)	53	83	51	47	6	10
Surface Coal Mines						
- Eastern (1 million tons/yr mine)	155	155	55			
- Western (5 million tons/yr mine)	40	38				
Oil Shale						
- Plants (50,000 bbl/d plant)						
Powerplant Units						
- Coal Fired (800 MW unit)	204	248	197	197	135	139
- Oil Fired (800 MW unit)	(21)[3]	(21)	(21)	3	(21)	(3)
- Natural Gas Fired (800 MW unit)	(16)	(16)	(16)	(16)	(16)	(16)
- HYDRO (Capacity in 1000 MW)	117.5	117.5	117.5	117.5	117.5	117.5
- COMBUSTION ENGINE[2] (500 MW plant)	454	281	337	269	539	504
- NUCLEAR (1000 MW plant)	184	184	184	184	184	184
REFINERIES (100,000 bbl/d)	40	11	25	32	62	62

1 The number of typical facilities has been estimated by dividing the difference in energy production level between 1972 and 1985 by the average size facility. It is not possible to "average" oil and gas wells due to high regional differences. For example, in 1968, Alaska produced 1400 bbl/well/day while Kansas produced 5.6 bbl/well/day. The number of mines shown would be the minimum number. New large mines of the sizes shown would provide the maximum benefit to the operators and miners; however, the average mines opened tend to be smaller than is shown here.

2 This category includes combined-cycle plants for intermediate load requirements.

3 Numbers in parentheses are reductions.

APPENDIX E: ELECTRIC GENERATING FACILITY CONSTRUCTION AND DEMAND

The following two tables are compiled from FPC data regarding trends in electric energy production (consumption) and generating plant construction during the last half of 1974.

ELECTRIC ENERGY PRODUCTION

(Billion kWhr)

	1973	1974	Percent Change
Year ending July 31	1,929	1,970	2.2
Year ending August 31	1,943	1,966	1.2
Year ending September 31	1,952	1,962	0.5
Year ending October 31	1,962	1,960	-0.1
Year ending November 31	1,966	1,961	-0.2

INSTALLED GENERATING CAPACITY

(Thousands of Kw)

	1973	1974	Percent Change
July	443,378	474,143	6.9
August	447,662	480,922	7.4
September	449,454	484,145	7.7
October	451,310	485,733	7.6
November	454,226	486,508	7.1

Federal Power Commission
News Release,
No. 21369, May 6, 1975

APPENDIX F : REASONS FOR DELAY IN POWER PLANT DEVELOPMENT

REASONS FOR DELAY

FEA's Justification Paper for the President's energy facility siting legislation defines the "delays in energy facility site designation and preconstruction approvals (as) the most important problems that must be resolved to achieve the Nation's energy goals."

However, it has been the finding of the two most recent major federal studies on the subject that this is not the case, and recent Congressional hearing records are replete with testimony which similarly contradict FEA's assertions.

In 1973, Commissioner Doub of the AEC reported the results of a Federal Power Commission study on the reasons for delay in nuclear power plants. In the 28 plants reviewed, labor and equipment problems were responsible for most of the delays:

CAUSES	NUMBER OF PLANTS AFFECTED	PLANT/MONTHS OF DELAY
Poor Productivity of Labor	16	84
Late Delivery of Major Equipment	9	68
Change in Regulatory Requirements	8	23
Equipment Component Failure	6	15
Strikes of Construction Labor	5	18
Shortage of Construction Labor	5	18
Legal Challenges	4	9
Strike of Factory Labor		5
Rescheduling of Associated Facilities		12
Weather		9

Source: "Nuclear Powerplant Siting And Licensing," Hearings before Joint Committee on Atomic Energy, 1974.

A more recent analysis of preliminary FPC data indicates a similar situation in the case of all power plants:

CAUSES OF DELAY	NUMBER OF UNITS	MW CAPACITY
Late Delivery of Equipment, Equipment Failure, and Faulty Installation of Equipment	71	25,125
Initial Operation Problems	13	2,446
Rescheduling of Associated Facilities	28	5,432
Problems Related to Construction Labor, Manufacturers, Employees, and Productivity	44	27,600
Prolonged Procedures for State and Local Certification	34	8,718
Prolonged Procedures for Federal Certification	35	29,451
Changes in Regulatory Requirements	28	31,047
Legal Challenges	43	26,295
Fiscal Problems	53	29,846
Other Reasons	71	44,100

Source: FPC, Generation Construction, March 1975

The statistics underscore the point that none of the Federal siting legislation which has been proposed addresses the bona fide problems associated with energy facility siting and development, and the data itself is underscored again by a recent FEA analysis of the reasons for cancelation and delay of nuclear power plants. That study has found that by January, 1974, 69% of the 190 nuclear units planned and on order had been cancelled, postponed, or otherwise rescheduled. Although approximately 50% of those plants rescheduled were delayed for financial reasons, 33% were rescheduled for reasons unrelated to financial considerations, and 18% were rescheduled only for reasons of adjusted load growth.*

* Analysis of Nuclear Power Plant Delays Announced in 1974, Richard H. Williamson, Federal Energy Administration, February, 1975.

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1 Institute of Electrical and Electronics Engineers (I.E.E.E.) (Ad Hoc) Energy Forecast Working Group; January, 1975.

2 Federal Energy Administration, Project Independence Report, November, 1974, pp. 21, 22.

3 Ibid, p. 25.

4 Ibid, p. 25.

5 Proposed Final Environmental Statement on the Liquid Metal Fast Breeder Reactor, Wash-1535, U.S. Atomic Energy Commission, Vol. 4, pp. 11.2-53,55.

6 Ibid.

7 "Energy, Ecology, and Economics," Dr. Howard Odum, 1973.

8 Herman Daly, Electric Power, Employment, Economic Growth, December, 1974.

9 Op. cit., Vol. 1, p. 1-11.

10 Jerry V. Halvorsen, Status Report, Energy Resources and Technology, "Improved Energy Conversion", Atomic Industrial Forum, Inc., January, 1975.

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12 SCIENCE, 23 May, 1975

13 Federal Energy Administration, Project Independence Report, November, 1974, p. A-52.

14 ELECTRICAL WORLD, 21 April, 1975.

15 Federal Energy Administration, Project Independence Blueprint Final Task Force Report - Facilities, November, 1974, p. VII-2.

16 Louis H. Roddis, Jr., Remarks at American Public Power Association Power Supply Planning Committee, Washington, 28 January, 1975.

17 Federal Energy Administration, Draft Environmental Impact Statement - Energy Independence Act of 1975 and Related Tax Proposals, DES 75-2, March, 1975.

18 Ibid.

19 Federal Power Commission News Release, No. 21369, 6 May, 1975.

20 Ibid.

21 Roddis, op. cit.

REFERENCES (Cont.)

22 A list of States with existing power plant siting laws is contained in Table 20. Figures for existing generating capacity by state were derived from the Edison Electric Institute Statistical Yearbook, 1973.

23 Remarks by Frank Zarb before the Load Management Conference, Washington D.C., June 11, 1975

24 Remarks by John Sawhill before the Atomic Industrial Forum, Washington D.C., October 28, 1974

25 FEA, A Report on Improving the Productivity of Electrical Power Plants, March, 1975, p.1

26 Frank Zarb, op. cit.

27 Frank Zarb, ibid.

28 Frank Zarb, ibid

29 AEC, Proposed Final Environmental Statement on the LMFBR, Dec., 1974, p. 2.1-22

30 Huettner, David A., and Landon, John H., "Electric Utilities: Economies and Diseconomies of Scale," Working Paper

31 FEA, "The Need for Energy Facility Legislation", January 1975

CAPITAL COSTS AND ALTERNATIVES TO INCREASED ELECTRIC GENERATING RESERVES

In comparing the costs of large-scale powerplants (800–1200MWe) and small scale units (below 500MWe) it is important to consider the reserve capacities associated with each. Obviously if you add a single large unit to any system, rather than a couple of small units, you stand more of a chance of any shortage if the powerplant fails. That argument is important, but has been compounded by the fact that large powerplants have generally proven less reliable than small powerplants. The electric utility industry has reluctantly admitted this fact (Electrical World, November 1975), but is presently arguing that this is only because the plants are immature, that eventually they will prove as reliable as their smaller counterparts.

In the meantime, this historical data has forced the utilities to plan extra reserve capacity (above maximum peak demands) to compensate for the unreliability of large new plants. As the FPC stated in June 1974, "the trend toward larger generating unit sizes, and the relatively poor availability records of many large units, operate to increase reserve margin requirements over that which is needed when smaller, mature units predominate on a system." As a result, the FPC noted that the utility reserve capacity planned for the next decade tended toward "the upper end of the 15 to 25 percent band currently observed."

If we take FEA's projected capacity figures for 1985, it is easy to calculate the addition capacity involved. With a projected total generating capacity of 922 GWe, if we assume a 25% reserve margin is included, this would involve 738 GWe of base capacity and 184 GWe of reserve: a 15% reserve capacity would leave 801 GWe of base with 121 GWe of reserve. If we assume a cost of $1 billion per GWe (1 GWe=1000MWe) the additional capital cost of the extra 10% reserve capacity would be $63 billion. Projected to the year 2,000 the cost would be approximately $168 billion.

These costs are approximate as they are based on the current costs of nuclear reactors, and while the actual marginal costs of reserve capacity might be lower, the projected costs of nuclear reactors ordered today and coming on line in 1985 may be twice as high. So it is probably a good enough first run estimate.

In addition to this it is important to note two other possibilities for meeting projected (not reduced) electric energy demands with less impact and cost. First of all, the Dow-Midland Energy Industrial Center Study indicated that industrial cogeneration of electricity with industrial steam supply sources, could reduce our energy resource requirements by the equivalent of 680,000 bbl/day by 1985, at a capital savings of $20–50 billion over the next ten years. Furthermore, this would be at current consumption levels, and with the necessary lead times reduced to about two years.

At the same time ERDA has estimated that "if the productivity of LWR's (light water nuclear reactors) were improved from capacity factors of 57% closer to their expected levels of 70%, there would be an equivalent oil savings of 40,000 bbl/day for each percentage improvement." That comes to a possible energy savings of 520,000 bbl/day, and if added to the potential energy savings of industrial cogeneration, indicates of potential energy resources savings equivalent to 1,200,000 bbl/day by 1985 without adding additional central station generating capacity and without any reduction in electrical energy demand. Nor is the development of any new technology involved, although the successful operation of existing nuclear reactors is presumed.

At a minimum I think it possible to conclude that reliable electric energy supplies for the next ten years do not necessarily have to depend on the addition of increased reserve margins; and in fact other alternatives appear more attractive from the standpoint of both capital investment and environmental impact. Obviously, if the potential for energy conservation improvements, many of which have been proven to produce greater employment at less cost than equivalent increases in energy production, are considered, energy production is further reduced, less capital is required, more capital is likely to be made available for investment in other sectors of the economy, and more jobs are likely to be created.

Several good references on this include:

Energy Industrial Center Study, Dow Chemical Company et al., June 1975 under a grant from the National Science Foundation;

Investment Planning in the Energy Sector, Kahn et. al., March 1976, prepared for ERDA at Lawrence Berkeley Laboratory;

"Electricity Consumption and Investment Finance in California", a draft report by W.R.Z. Willey of the Environmental Defense Fund, Berkeley;
"Conservation and Peak Power: Cost and Demand", Goldstein and Rosenfeld, January 1976, Lawrence Berkeley Laboratory;
"Economies and Diseconomies of Scale in Nuclear Turbine Generators", Messing, Environmental Policy Institute, August, 1975;
A Report on Improving the Productivity of Electric Powerplants, FEA, March, 1975.

SUMMARY

A proposal to address the national issue on a large-scale public appeal campaign.

BACKGROUND

The national nuclear debate has been approached by the anti-nuclear side by using emotional "fear" statements to persuade the voters that nuclear energy is not safe. The industry has been countering in a traditional manner quite common to the technically-educated by providing strong "technical" evidence to the same voter. Unfortunately, the voter does not have the technical background to accept our arguments with confidence. While these "technical" cases must continue to be made to the public, there is strong reason to question this mode of operation as being adequate to "win" our case. For this reason, we felt it important to bring the issue forward for examination and present the course of action and possible other courses which might be taken.

PROPOSAL

Form a special office of AIF to specifically deal with the national public nuclear campaign. The effort intended should not be misconstrued as a massive public relations campaign. It must be a nuclear acceptance campaign which will be geared to motivate and persuade the public to observe the positive values of nuclear energy and its safe use, and the alternate consequences if not used; i.e., the loss of jobs which the scarcity of energy would cause; the extreme social unrest which would result and the high cost to the tax payers who still have jobs to support the unemployed; the very real and most serious threat to national security by foreign dominance caused by our basic reliance of foreign middle eastern oil which has no credible line of defense as a reliable source of energy to the United States, Europe, and Japan. All of these dramatic concerns must be emphatically brought to the direct attention of the grass roots voters in a way that they understand and will be concerned toward favoring nuclear energy.

The special campaign group would be specifically selected for their expertise in managing, developing and implementing this effort using advanced political campaign management technology. The office would be dedicated only to this effort and would consist of contracted for outside talent of the type most familiar with running a political campaign. The office would have a definitive life span to terminate after the November 1976 elections unless further state initiatives were evident.

The effort will not supplant the individual state efforts, but will complement them with much harder hitting impact of national events and media use.

CONCLUSION

There is still reasonable time to organize and implement a substantially beneficial effort now to assist the outcome of the California initiative vote on June 8, 1976, as well as those which will be on the November ballot. The effort must have approval to proceed by mid-March to become fully organized by April 1.

This effort must be supported by all segments of the utility industry both manufacturers and users to be effective. This must also be recognized by the non-nuclear use utilities, since any loss of the uranium fuel option will only reflect more heavily upon the already stressed coal developments. Upon concurrence of the need to proceed, the AIF task force to organize the nuclear public appeal campaign will move promptly to formulate and implement such an effort.

Support for nuclear power in California is continuing to erode as the result of the continuing barrage of well-orchestrated fear tactics being deployed by anti-nuclear forces. From November. 1975, to March, 1975, Field Research Corporation's polls showed a ten-percentage-point drop among those people who had

intended to vote against the nuclear initiative. This same anti-nuclear sentiment has spread across the country. Although only California, Oregon, and Colorado have so far qualified to place initiatives on the ballot for June or November, another 9 to 14 states are possible candidates for similar initiatives by this Fall. The California based anti-nuclear group, Project Survival, has identified as many as 20 target states for their anti-nuclear, anti-growth, anti-energy facility activism.

However, California is critical. If its proposal is passed, it will send tremors far beyond California. If the initiative passes, a "domino effect" could reverberate through states with similar pending initiatives. It could deter further Congressional and Executive support for nuclear power. It could influence the world nuclear developments. And, of course, it could cause severe economic dislocations.

The recent public attention given to the four engineers who resigned from industry and the Nuclear Regulatory Commission is evidence of the maximum manipulation of the media by the anti-nuclear forces. There is substantial evidence that the resignations and public statements were carefully planned by the anti-nuclear factions for maximum publicity effect. Press releases, presented with moralistic overtones and religious fervor, dealt with man's inability to be responsible for every imaginable nuclear consequence and exaggerated dangers. The movement sells "fear." It warns of invisible killers and pending catastrophe. It also advocates property destruction and sabotage as in Lovejoy's Nuclear War, a film which has been shown to thousands of environmental and other activist organizations across the country.

The broad-side nuclear attack, which has been so intensified within the last two years, is only the cutting edge of a much broader attack on the life of the entire electric utility and energy industry, perhaps even the very quality of human life. The nuclear controversy cannot be judged in isolation. Already there is heated debate over Western coal development and argument over every conceivable type of drilling, milling, mining, transporting, and method of energy production. The problem with the "antis" is that they will not stop with nuclear—it just happens to be the most tangible target they have chosen for the moment. The success of such tactics can be seen in private, industry polls which further demonstrate the eroding support for nuclear. In February, 1974, 68 percent of the California voters said they would vote against the nuclear proposition. By May, 1975, this had dropped to 55 percent. Today only a third are decidely against it. And while almost another third are undecided, it should be noted that "uncommitted" voters usually side with the emotional issues.

In addition, it is important to recognize that a nuclear ban is only the verbalized goal of the environmental movement. There are latent or non-verbalized objectives that need clarification. For example, a vote against nuclear power to the People's Lobby in California is also a vote against technology, excessive material consumption, economic and energy growth, and many other aspects of the current American life style. Concurrently, it is a vote against big business, bureaucracies, and "bigness" in general. Clearly, the voters of California or any other state do not realize the cosmic implications of their vote. Nuclear is only perceived as the Achilles heel of a system whose goal of sustaining growth and prosperity into the decades ahead is being questioned. Thus, more is at stake than one technology. All sources of energy and many emerging technologies, along with privately-owned industry and a comfortable standard of living, are being debated. They are only selling fear; the energy companies are selling hope.

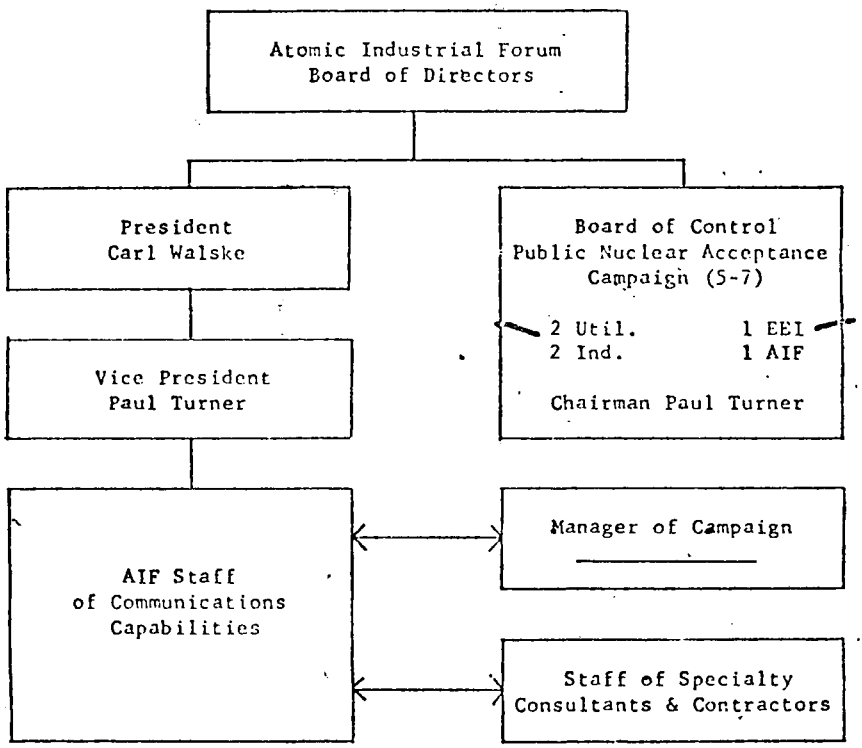
Unlike the anti-nuclear forces who are well-coordinated in a national coalition with a uniform strategy which is adapted to local needs, the pro-nuclear forces are fragmented and sometimes even have contradictory goals and strategies. To help pull this direction together, a strong, unified national campaign is needed—a political campaign, for this is a political issue. This should be a self-contained, short-term effort which lasts only long enough to acquaint people with the real voting issues. Time, money, and people are limited and need to be fully maximized. Just as the anti-nuclear, anti-growth, anti-technology forces have sold fear, the industry needs to find levers with equal emotional intensity—massive unemployment, no growth, poorer living standards, runaway costs, and foreign dominance. For just as the environmentalists use their mushroom-cloud posters to evoke concern, so do these basic economic tenets.

A national effort is necessary because what happens in Connecticut or Maine can effect Arizona or California. The effect of the "free" media on the current California campaign is obvious. Since this needs to be counter-balanced by a

well-coordinated strategy for getting spokesmen in the network news, a national campaign organization which can recruit and manage speakers, acquire free media opportunities, and oversee a unified, coherent national industry case is essential. The attempts to educate the public to the intricacies of nuclear—while an important part of a continuing, large-scale effort—is now insufficient to mobilize and persuade the citizens to cast their votes in favor of nuclear power. This requires an immediate, professionally-managed, political campaign, and a professional campaign manager to look at the problem—developed and defined by research—to build a strategy for its solution. Research defines ways to provide maximum impact with the right issue to the right audience through the correct media. Thus, it is a classical maximization problem which coordinates research with media and other specialty consultants.

The industry does not have the luxury of time. The need for a national unified campaign which maximizes the use of funds, personnel, and time is immediate. This battle, if lost, will not only be a defeat for the electric utility industry, but a defeat for the hopes of many Americans and many people in the emerging nations of the world.

Preliminary Organization Plan
Public Nuclear Acceptance Campaign



Board of Control.—This small group of politically-sensitive people will be responsible for general policy of the program and immediate approval of actions the program manager wishes to take on a quick response time frame. The make-up of the group is required because of the consequences of the actions to be taken which might reflect upon the companies represented. The control board chairman, Mr. Turner, would be responsible for control of cash flow and proper utilization of existing AIF capabilities to the campaign.

Contributions to Americans for Energy Independence

Unions: United Steelworkers of America (J. C. O'Brien)	$500
Utilities—large:	
American Electric Power Service Corp	10, 000
Commonwealth Edison	6, 000
Consolidated Edison of New York	6, 000
Duke Power Co	6, 000
Middle South Services	5, 000
Pacific Gas & Electric	6, 000
Philadelphia Electric	6, 000
Public Service Gas & Electric	6, 000
Southern California Edison	6, 000
Southern Services	5, 000
Wertheim & Co., Inc	1, 500
Electrical manufacturers:	
General Electric	25, 000
Westinghouse	25, 000
Stockbrokers:	
Blyth, Eastman & Dillon	1, 000
Kidder Peabody	2, 000
Kuhn Loeb & Co	5, 000
Merrill, Lynch, Pierce, Fenner & Smith	5, 000
Paine, Webber, Jackson & Curtis	5, 000
Subcontractors:	
Allied Chemical	2, 000
Babcock & Wilcox	5, 000
Bechtel	4, 000
Burns & Roe, Inc	2, 000
Chicago Bridge & Iron	5, 000
Cutler-Hammer	1, 000
General Atomic (Gulf Atomic)	2, 000
Gibbs & Hill	2, 000
Main, Chas. T., Inc	1, 000
Stone & Webster, Inc	2, 000
Utilities—small:	
Baltimore Gas & Electric Co	2, 000
Boston Edison	2, 000
Carolina Power & Light	2, 000
Central Illinois Light	2, 000
Cleveland Electric Illumination Co	2, 000
Detroit Edison	1, 000
Florida Power & Light Co	2, 000
General Public Utilities	2, 000
Iowa Power & Light Co	2, 000
Long Island Lighting Co. (LILCO)	2, 000
New England Electric:	
Granite State Electric Co	80
Massachusetts Electric Co	1, 100
Narragansett Electric Co	820
New York State Electric & Gas Corp	2, 000
Northeast Utilities	4, 000
Portland General Electric Co	2, 000
Puget Sound Powers & Light Co	2, 000
Public Service Indiana	1, 000
Public Service of New Hampshire	500
Southwestern Public Service Co	2, 000
Texas Electric Service	2, 000
Toledo Edison	2, 000
Wisconsin Electric	2, 000
Miscellaneous:	
American Manpower & Aging Advisory Service	350
Heinemann Electric Co	300
Kramer Associates, Inc	250
Small Producers for Energy Independence	6, 500

AN OVERVIEW OF THE CONCLUSIONS

There has been a slight increase in support for nuclear power since the April survey which appears to have been a low point—perhaps caused by the several months of very negative publicity that nuclear power had experienced in the first quarter of this year. However, nuclear power is no more popular now than it was in the surveys of last winter and fall.

Support for alternatives is much the same today as it was in the spring. Opponents of nuclear power plants still cite the many dangers they fear, while proponents find nuclear power the most economical source of badly needed power.

Consumers felt that they could make substantial reductions in their own energy use, if they had incentives to do so. The greatest incentive to do so would simply be a convincing case that a real energy crisis does, in fact, exist.

The survey found that international energy and economic competition provide yet another rationale for nuclear development in the minds of consumers. This stemmed from a feeling that America needs more energy both to insure domestic economic growth and to compete with foreign nations. People also felt American technical leadership in the nucelar field could help make nuclear development safer for everyone.

THE BASIC QUESTION

Support for nuclear power has increased since the spring. While support is up, it has failed to reach the level it achieved in the fall and winter of 1974.

Do you generally favor or oppose building more nuclear power plants?

[In percent]

	Favor	Don't know	Oppose
Summer 1975	53	18	29
Spring 1975	45	21	35
Winter 1974/75	54	16	30
Fall 1974	59	14	27

Considering the relationship between support and opposition and perceptions of danger, it may be that the relative calm of the past few months has helped fear to abate slightly. The spring survey we should remember followed several months of heavy anti-nuclear publicity.

Women continue to be must less favorable to nuclear than men.

WOMEN ONLY

[In percent]

	Favor	Not sure	Oppose
Today	39	27	34
Sping 1975	34	26	40

However, women are now slightly in favor of nuclear where formerly they were in opposition. Among men, the margin of support has increased.

MEN ONLY

[In percent]

	Favor	Not sure	Oppose
Today	63	13	24
Sprng 1975	57	15	29

Blacks, who formerly were opposed to nuclear power by a 37 to 32% margin, now favor it by a 40 to 33% margin.

Gains in support can be seen in every economic grouyp, with the most striking improvement in the $7000–10,000 category. Increases in support are also greater among the less well-educated.

What this all shows is that due to the complexity of the issue, and the fact that most people have very little knowledge of nuclear power, the scales can be tipped easily by unfavorable publicity—a scare story, a dramatic headline.

REASONS FOR SUPPORT AND OPPOSITION

Reasons for positions are virtually identical to those given in the spring survey and suggest no reasons to reconsider any of the analysis presented then.

Why do you favor nuclear power?

[Percent of supporters]

	Summer 1975	Spring 1975
Cheaper, economical	21	19
Need more power, energy crisis	21	16
Need to save resources	9	13
Nuclear is cleaner	8	7
It's safe, reliable	4	5
Just favor it, good	15	20
Energy independence	4	3
Good until solar is ready	1	17
Other/don't know	17	

Why do you oppose nuclear power?

	Percent of opponents
Dangerous, too dangerous	32
Not safe yet	11
Danger of pollution	7
Radioactive waste	5
Radiation in general	4
Explosion	5
Other dangers	10
Total danger	74

THE ALTERNATIVES

This section explores consumer knowledge of and attitudes toward three alternatives to nuclear power: solar energy, coal usage and strict energy conservation.

Americans believe that solar energy can truly provide some kind of solution to energy porblems. This belief rests on both a relatively low estimate of its costs and on optimistic estimates of the availability of solar energy for current use. Americans also feel that coal will play a role in solving the problem, and recognize that we cannot reject both coal usage and nuclear power and still hope to effectively solve our difficulties. Finally, Americans feel they personally could make much greater conservation efforts if they were absolutely convinced that an energy crisis exists.

Three possibile solutions to the energy problem have been proposed that do not involve nuclear power: construction of solar energy facilities, more extensive use of coal, and strict energy conservation. Do you think in the next 25 years each of these can do a lot to solve the energy crisis, something to solve the problem, or very little to solve the problem?

	Percent saying each can do a "lot"
Solar power	54
Coal	31
Strict conservation	36

Thus, coal is rated very low by most respondents. Solar power, which informed opinion seems to think is 50 years in the future, is rated very high.

Breakdowns of these three ratings show:

Better educated and higher income people are more likely to feel that solar power can play a significant role than are the less educated.

Support for coal is much more uniform among educational and income groups.

Better educated, higher income and younger people are all slightly more inclined to feel that strict conservation can play a part in solving the energy crisis.

SOLAR POWER

Over 55% of the people in the survey were unwilling to venture a guess on the costs of a home solar heating unit. Of those who did, $3500 was the average cost.

Do you think such a unit is available for your home right now?

Overall:	*Percent*
Yes	35
Not sure	25
No	40

Younger people are more inclined to believe that solar power units are available. Men are more inclined than women to believe solar is practical, and liberals have more faith in solar than conservatives.

COAL

Previous national Cambridge Reports have showed Americans do not believe it is necessary to relax air pollution standards to resolve current energy problems. On this survey we asked a different question, which shows clearly how much current reaction to the energy problem depends on a lack of belief in the very crisis.

If you were certain an energy crisis existed, would you favor or oppose relaxing controls on air pollution standards so that more coal could be burned?

[In percent]

	Favor	Not sure	Oppose
Overall	51	16	33
Support nuclear	55	14	31
Not sure	47	26	27
Oppose nuclear	44	13	43

Thus, nuclear power opponents are also more inclined to resist relaxing air pollution standards to permit coal burning. There is a clear "anti-energy" coalition in the population that is unwilling to make any concessions to solving the problem.

We can't have it both ways; we either have to burn more coal or we have to build nuclear power plants. People who oppose both are deceiving the public.

[In percent]

	Favor	Not sure	Oppose
Overall	56	18	26
Support nuclear	68	11	21
Not sure	44	38	18
Oppose nuclear	38	18	45

Those who support and oppose nuclear are sharply divided on this question. But it's important to note that over a third of those opposed to nuclear still agree with the statement.

CONSERVATION

A good deal of potential for additional conservation exists.

If you were convinced there *is* an energy crisis would you be willing to curtail your own energy use to help solve the problem?

	Percent
Yes	90
Not sure	5
No	5

Do you think you could cut your energy use by at least one-third?

	Percent
Yes	52
Not sure	19
No	29

The young and the well-to-do fell very strongly that they could cut their energy usage. How would they do it? The results are interesting.

If you can cut by a third: What would you cut in your home to save that much energy? Where specifically would you cut?

	Percent of those who feel they could cut
Cut down on electrical appliances	23
Cut lighting, turn-off lights	15
Lower thermostat in winter	19
Stop air conditioning in the summer	11
Cut down on television time	7
Drive less	6
Other	6
Don t know	13

CREDIBILITY OF SOURCES OF INFORMATION

People rated information sources on a scale from "very trustworthy" to "not trustworthy at all". The results are: (Results are compressed into three categories here.)

[In percent]

	Trustworthy	Unsure	Untrustworthy
Nader	60	21	19
Cronkite	67	17	16
Westinghouse president	32	24	44
Mobil president	17	16	67
A-bomb scientist	61	19	20
Nuclear company	46	22	32
Solar company	56	22	22
University scientist	67	18	15
Corporate scientist	39	25	36

Notable is the great faith Americans place in "science". The nameless scientists both beat Nader. However, a scientist gives up considerable credibility when he goes to work for a corporation.

ENERGY AND THE INTERNATIONAL SITUATION

Some people say that America is being too cautious about nuclear power and that other countires like Japan, France and the Soviet Union are going ahead full speed and will get ahead of us. Others say we should delay nuclear power plant construction no matter what other countries do. Which of these opinions is closer to your opinion?

	Percent
Keep up	60
Don't know	16
Delay construction	24

80% of those in favor of nuclear power also favored keeping up with other countries; 41% of undecideds favored it, and 25% of nuclear opponents favored this course. Older respondents and the well-to-do are most inclined to say "keep up".

Of the 24% who favored a delay we asked,

Some people fear a delay might mean that in 10 or 20 years other countries will have cheaper energy and will thus have economic advantages over us. Would you favor or oppose a delay in nuclear plant construction even if it meant a lower standard of living in the U.S. compared to some foreign countries?

	Percent
Still favor delay	46
Not sure	24
Oppose delay if	31

Thus, a hard-core of 10–15% oppose nuclear power even if foreign countries go ahead anyway and our delay means a lower standard of living. Over half the people in this hard-core are under 35 years of age. The well-to-do and better educated respondents are also more inclined to stick with the "delay" position even when economic hardship is raised as an issue.

Some people argue that if other countries are going to build nuclear power plants anyway, America ought to try to move quickly in order to develop the safest possible designs and to take a leadership role in development. Do you think this is a valid position?

	Percent
Yes	65
Not sure	15
No	20

This position is very strongly endorsed. It represents an excellent argument, particularly if it can be coupled with a "scientific" campaign showing the technology that goes into the nuclear products the U.S. sells.

NUCLEAR AND ECONOMIC GROWTH

We tested the relationship people see between expanded energy supplies and economic progress.

Some people have argued that we can have economic growth here at home—even if we don't increase energy supplies—by conserving and using the energy we have more wisely. Other people say this is unrealistic and that we need to increase energy supplies in order to have further economic growth. Which is closer to your opinion?

[In percent]

	Need energy growth	Do not know	Can simply conserve
Overall	41	14	45
Support nuclear	54	10	36
Do not know	31	28	40
Oppose nuclear	31	12	57

Thus, a fundamental difference exists between nuclear supporters and opponents in terms of the overall future they see for energy growth in our society. Not only are they divided over the safety and the economics of nuclear power, but they are also divided over the need for power in general. The constituencies on both sides are similar to those we saw in the discussion of economic growth in our Winter 1974/75 Cambridge Report.

The pro-conservation position is strongest among the young—with a plurality of those under 35 supporting it—and among the well-to-do and the well educated.

If we don't increase economic growth, some people say there will be increasing unrest in our society because the people at the bottom of the economic ladder will no longer be able to get ahead and will have to literally fight for a larger share of things. Other people say this won't really be a probem because there is plenty

to go around in our society, and all we need to do is distribute it more equally. Do you think growth is essential or do you think we could solve the problem by simply distributing more equally?

[In percent]

	Growth essential	Not sure	Distribute equally
Overall	52	12	36
Age:			
18 to 25	41	9	50
26 to 35	57	10	32
36 to 45	58	10	32
46 to 55	52	13	33
56 to 65	58	14	29
Over 65	49	19	32
Nuclear:			
Supporters	59	11	30
Not sure	46	21	33
Opponents	38	10	51

The young and opponents of nuclear power are the only two groups where pluralities actually believe equal distribution rather than growth is the likely solution to economic problems.

CONCLUSIONS

The Summer 1975 Cambridge Report 4 now being prepared contains major examinations of attitudes toward the energy problems which will complement the analysis here on these proprietary questions.

These questions have shown that faith in solar energy is backed up by relatively low estimations of cost, and highly optimistic estimates on the availability of solar heating for the home.

Furthermore, the analysis shows that if people believe there really is an energy crisis, they will support the increased burning of coal—even if it means relaxing air pollution standards—and they will make greater personal efforts to conserve energy, though the choices of those consumption cuts are unrealistic.

When confronted with the threat of international competition, most Americans feel that we should keep up with foreign countries and even take a leadership role in nuclear development.

On the other hand, the survey indicates that nuclear power opposition is not based solely on the pros and cons of nuclear power. Substantial opposition is related to the whole "anti-growth" syndrome in America. A large number of people feel that America should devote less effort to developing new energy, and more to distributing what we have. This is not the kind of opposition that can be changed by showing the safety aspects of nuclear power. It represents, instead, a fundamental difference of opinion about the future course of American society.

On the side of pure public relations, the survey indicates the tremendous faith most Americans have in science. A believable scientific presentation—that the average person can understand—would do a lot to relieve public doubts about nuclear power.

COMMENTS BY GREGORY A. THOMAS, WASHINGTON REPRESENTATIVE, SIERRA CLUB

The proposal to create an Energy Independence Authority poses in sharp relief the question whether taxpayers or consumers should pay the costs of new domestic energy development. Since it is axiomatic that those who pay will call the tune, the complexion of our energy future, and the concomitant environmental stresses, hang in the balance. Lest it be supposed that these two groups are sufficiently congruent to choose similar futures, the Committee should consider the following:

Accountability for the pivotal choices concerning the pace, the amount, the source and the cost of energy development is at the core of the matter. Comparing the probable behavior of an Energy Independence Authority with the proven behavior of energy consumers, starkly different futures are projected: an Energy Independence Authority would be utterly insulated from economic

accountability, and largely buffered from political accountability as well. A five-member governing board would be appointed by and serve at the pleasure of the President, not as an executive agency of the United States (see Sec. 804(b)), but as an essentially independent quasicorporation (see Sec. 201 (a)). Since its funding, and therefore its activities, would operate largely or entirely off-budget, Congressional oversight would be occasional, haphazard and probably ineffectual.

The guidelines in the bill assure that this entity would not emulate the performance of a private enterpreneur in a competitive energy market. The requirement of Sec. 304(a) that "Financial assistance will be provided in a manner which, to the extent possible, does not enhance unduly the recipient's competitive position", is pure fiction. Federal subsidies will do nothing if not "enhance" a recipient's competitive position and thereby lessen his responsiveness to consumer pressures. There is no disguising that this bill will substitute for free competition and free consumer choices the largely unaccountable administrative decisions of a government corporation.

The type of energy future which consumers would choose in the absence of federal subsidies is distinguished principally by the powerful dynamic for conservation which would be built in, particularly if all the environmental as well as economic costs of new energy development are absorbed by the consumer. Voluntary energy consumption is demonstrably elastic with price.

This difference is considerable. Estimates of the efficacy of conservation to substitute for new energy supplies range from the most recent estimate of the FEA that demand can be reduced as of 1985 by the equivalent of 2.9 million barrels of oil per day (which is almost half of current imports) to those of Denis Hayes for the Worldwatch Institute (under contract to the FEA) which presents a cogent case that *all* our energy needs for the next 25 years could be satisfied out of existing energy waste.

Compulsory taxpayer financing of an Energy Independence Authority will not begin to tap this potential. In fact, the Authority clearly would be structured to promote energy development at the expense of conservation. Note that the purpose of the Authority is to fund projects which would not otherwise "receive sufficient financing upon commercially reasonable terms from other sources to make the project commercially feasible" (Sec. 303(a)). Ironically, energy conservation measures, which are now and will become increasingly cost-effective, are thereby excluded from the coverage of this legislation.

At the same time, the Authority would seek to increase the near-term (at the expense of long-term) supplies of energy, thereby inhibiting conservation efforts. Indeed, this "capital sink" would funnel investment away from conservation measures to developmental projects notwithstanding the widely acknowledged fact that energy conservation will provide a far better return. The FEA has estimated that between 160 billion and 325 billion dollars could be invested in the next 10 years in energy conservation measures which would allow full recovery of the investment within the useful life of any permanent equipment installed. Similarly, the Energy Research and Development Administration, in its recently released National Plan, "Creating Energy Choices For the Future" has determined that conservation is the lowest cost, most immediately available and most environmentally attractive strategy for approaching energy independence.

The same observations are in order with regard to the only renewable resource option at our disposal—solar energy. A recent study by the Jet Propulsion Laboratory at the California Institute of Technology has projected that a $1 billion federal research and development effort between now and 1985 would yield commercial solar cells capable of providing electric power, on any scale, at about 50 cents per peak watt. The long-term potential would be in the range of 10–30 cents per peak watt. These numbers are to be compared with the current cost of nuclear power (taking account of low load factors) in excess of $2 per installed watt today. Again, the Authority, as a lender of last resort, will probably not be available to further such cost-effective, environmentally benign energy systems.

The net result is grossly anomalous. Energy production options which are the most inefficient in the way they use capital (and therefore, cannot attract investment in a competitive market) would be benefited and rewarded by the EIA. Those which offer the greatest promise would be excluded. The anomaly will heighten as the efficiencies decrease with a diminishing resource base and as the investment costs of substitute units of energy escalate. This will not hold for investments in solar or conversvation technologies where each unit of energy captured is independent of the next.

The charter of the EIA calls for a crash program to exploit non-renewable resources without regard for the long-term consequences, in pursuit of a phantom goal of independence from the rest of the world. The Administration and the energy industry are fond of referring to the EIA and similar schemes as an "insurance program". It is somewhat humorous to note, however, that these two promoters cite diametrically opposing "risks" to be insured against. The industry claims that it needs federal loan guarantees to spread the risk that the new energy products will not be able to compete with conventional fuels. This will only happen, of course, if the oil exporting nations *depress* their prices. On the other hand, the federal government claims that it needs the EIA to protect against the risk that these countries may further *escalate* their prices and thereby damage our highly energy dependent economy. In short, the Energy Independence Authority is alleged to be equally justifiable or unjustifiable, depending on your logical preferences, regardless of what the future may hold.

Far more certain than the need for the EIA would be its devastating environmental costs. If we take seriously the energy consumption figures on which Vice-President Rockefeller relies in support of S. 2532, "between now and 1985, our energy needs will grow by 36 percent." In order to also achieve "energy independence" within this period, the level of domestic energy production will have to increase by 70 percent over today's levels. Making the charitable assumption that domestically produced oil and gas will continue to contribute at present levels until 1985, coal, nuclear and hydro sources (which comprises about half of current energy supplies) will have to increase by 140 percent over current levels by 1985. Roughly speaking, that means that for every two coal-fired generating stations in existence today, there will be three more in existence 10 years from now. Similarly, the 56 currently operating nuclear plants would grow to 134 such plants in 1985.

Of course, the actual mix will probably look quite differently. Much of the nuclear capacity, for instance, will probably not materialize, if the currently unfavorable trend with respect to nuclear economics continues. The use of coal will have to take up the slack. At the extreme, this could require an increase in the mining, transportation, and combustion or synthetic conversion of coal of over 7½ times the annual rate. If this translates into 7½ times the current annual insult in terms of land disturbance, water and air pollution, thermal pollution, and associated environment residuals, the diminution in the quality of life in this country would be truly dramatic. While this type of a linear analysis may present the worst case, neither Vice-President Rockefeller nor anyone else has come forward with a clearer picture of the probable environmental costs which would have to be endured. Moreover, at that rate of utilization, even assuming that it did not increase beyond 1985, the seemingly vast reserves of coal in the United States would be utterly exhausted in about the next century and a half.

The value of achieving the objective of energy independence does not compare favorably with this cost. Energy independence by 1985, no matter how vigorous the national effort, is not feasible anyway according to the FEA. Even if it were, alternatives to the EIA approach would be far more attractive. The Congress has already provided for the accumulation of a strategic petroleum reserve over the next 10 years in the recently enacted Energy Policy and Conservation Act of 1975. The Interagency Task Force on Synthetic Fuels Commercialization has indicated that this will be a more cost-effective (and more certain) way to satisfy national security objectives than a synfuels commercialization program which would be stimulated by the pending bill. The comparative merits of conservation measures in achieving energy independence have already been mentioned.

In addition to being unrealistic and expensive, it is not at all clear that energy independence is a worthy goal in the long run. In the first place, it is simply a reversion to the "drain America first" policy which, in large measure, is responsible for the current domestic resource crisis which has given rise to the EIA proposal in the first place. Perhaps more importantly, observers are entitled to wonder if the type of economic interdependence which the world energy market reflects is not overall a significant stabilizing influence. The recycling of petrodollars into the United States at a desperate pace has given the oil exporting countries the kind of stake in our economic well-being that may well, in the end, serve as the greatest deterrent to the imposition of future sanctions against our economy. Moreover, the dependence of this nation upon the rest of the world,

particularly if widely distributed would inhibit the kind of adventurism of which the Vietnam involvement stands as the paradigm example. Finally, the notion that freedom from energy imports will result in the independence of the American economy from the vagaries of the international arena does not bear critical scrutiny. In a resource short-world—and ours is becoming increasingly so—energy is only one of many essential commodities which bind our destiny closely with the fortune of the planet as a whole.

In contrast to the objective of energy independence at any price, I would like to posit an objective more worthy of the efforts of this Committee and the attention of this nation's energy planners. There is a legitimate and essential role to be played by the federal government in easing the transition between our present predicament—characterized by exponential energy growth drawing upon a diminishing resource base—and our most likely future, characterized by a limited energy budget drawing upon renewable resources.

The only long-term energy option of which we can be highly confident is the utilization of sun power in all its manifestations: solar electrification, solar heating and cooling, ocean thermal gradients, wind energy, bioconversion, and even hydro-electric power. Competing sources, which maybe nearly inexhaustible in fact, face an uncertain future. The same problems which have stalled, and may ultimately overwhelm, conventional nuclear power loom even larger in the case of the breeder reactor. It is of course, possible that the safety, waste management and safeguards problems which attend this technology will be solved with time. However, as time goes by (we are now 25 years into the nuclear era), there is less reason for confidence that these problems can be simply "engineered" away. It may be that the development of human institutions with which this technology would be compatible will end up being the critical limiting factor.

The other competitor is the fusion reactor which, despite periodic announcements of technical break-throughs, has yet to sustain a reaction for more than the minutest fraction of a second. It is by no means certain that the device will ever produce a net flow of energy. Significantly, the further development of these technologies will not be advanced by the Energy Independence Authority. Section 304(b) specifically excludes that function. And, irrespective of the eventual fate of these technologies, solar energy will always remain the "fuel" of choice for the future. It is clean, and, in a most relevant sense, it is free.

Characteristic of life in a solar economy will be that the amount of solar energy available for conversion to useful work is constant from one day to the next. Quantitative growth in the usual economic sense will be strictly limited by our technical ingenuity in capturing and converting this energy source. This stands in stark contrast to our current energy situation, based upon stored energy which has been accumulating in the earth for many millions of years. Today, we are essentially living on a savings account. Tomorrow, we shall get by on a fixed annuity. It is this transition and its social and economic ramifications with which federal energy planners should be primarily concerned and it is in this context that the irrationality of the EIA scheme becomes most apparent.

A rational transition strategy would endeavor to moderate rather than stimulate our energy appetite, looking forward to the day when growth will no longer be sustainable. It would attempt to extend as long as possible the period of time during which petrochemical stocks are available, particularly for the most essential and irreplaceable uses such as pharmaceuticals. It would seek to maximize the efficiency with which energy is used in the economy.

Perhaps more than any other concept, a rational transitional strategy must recognize that the demand for and the supply of finite resources occur in different temporal realms. The coal which the EIA would extract and burn at a feverish rate is not uniquely ours to exhaust. The quality of life will always depend to some extent upon the availability of petrochemicals. Finite resources in the face of infinite demand present an ethical question of immense proportions for this generation. The immediate gratification of desires can only be purchased at the expense of future generations whose claim upon the treasures of this planet, which we hold in trust, is the equal of our own.

The EIA would operate cross-grain with this perspective. It would accelerate the ongoing harvest of resources when they should be husbanded carefully. Instead of requiring that we learn to do more with less in terms of our resource base, it would fire the very appetites which we are less able to afford with the

passage of time. In doing so, it would create disincentives to energy conservation; the very strategy which ought to be pursued first and in preference to all developmental approaches.

In contrast to this bill, the Federal government must not be handed a carte blanche to pursue all energy development schemes indiscriminantly on the theory that whatever can be done in a technical sense should be done. Nor should the choice among commercial options be dictated by market forces alone, unless and until all costs of energy production, environmental and economic, present and future, become reflected in the price to the consumer. Rather, the Congress should narrowly circumscribe the types of projects and technologies which would be eligible for Federal assistance to exclude environmentally destructive options. Conservation measures and solar applications should be preferred; nuclear fission technologies and the production of synthetic fuels from oil shale, for instance, should be excluded or delayed until the attendant environmental problems are satisfactorily resolved.

Since coal will, in all likelihood, remain the fuel of chief reliance during the transition to a solar economy, vigorous efforts should be made by the federal government to accelerate the development of technologies which would permit it to be utilized as cleanly as possible. Fluidized bed combustion, low Btu gasification and advanced scrubbing techniques are among the candidates for such attention. Such research and development initiatives (supplemental to those now underway in the Energy Research and Development Administration) are specifically excluded from the bill by Sec. 304(b). This misorientation is further illustrated by Sec. 304(a)(2) of the bill which singles out commercial deployment of nuclear facilities for special attention by the Authority. Yet, the greatest limitation on the potential of nuclear energy to contribute to our energy future is not the need for more capital, but the critical need to address and resolve the elusive environmental problems which continue to plague that fuel cycle.

There is another sound reason for focusing federal participation at the developmental rather than the commercialization phase. If federal subsidies, direct or indirect are required to commercialize an energy source, that is a strong indication that the economy is not yet ready for the introduction of the product. The risk which the federal government is being asked to absorb in the EIA proposition is the risk that a project which cannot now attract capital will produce a fuel which will not be able to compete successfully with conventional sources. This risk, far more than project size, makes these investments unattractive to the energy industry. The uneconomic nature of these projects is also a strong indication that more will be required of the federal government than loan guarantees in order to get these forms of energy into the gas tank, the pipeline, and the light switch. Substantial marketing subsidies are part of the package which Congress is here asked to buy. Yet, notably, not a word concerning the magnitude, duration or administration of these additional subsidies is to be found in the bill or in the Administration's supporting materials.

Finally, some mention of the administrative provisions of this bill is also warranted. Title VI, which seeks to expedite federal administrative proceedings involving energy projects, would quite simply place rapid development ahead of the other essential values which such proceedings are designed to consider: including environmental quality and consumer interests. At best, it would cut months rather than years from the lead time required for an energy project, and would erect at the same time a whole new bureaucracy, requiring delicate and time-consuming judgments by the EIA. Claiming that the national security objectives of the bill require hasty solutions, this bill calls for massive energy projects which require very long periods to bear fruit, while ignoring proximate solutions such as diversification of foreign sources, stockpiling of oil, reserving production from the national petroleum reserves, and, once again energy conservation.

In sum, we fined that the EIA would succeed most in ways which would not be tolerated by our environment while failing entirely to advance the least debatable solutions to the nation's long-term energy dilemma. For these reasons, we urge the Committee to reject this bill.

The CHAIRMAN. Thank you, Mr. Browder.

Our final witness is Mr. Joseph Cury.

STATEMENT OF JOSEPH H. CURY, CONSUMER POWER, JACKSONVILLE FLA.

Mr. CURY. Senator Proxmire, Senator Stevenson, it is an honor to be given the opportunity to speak to you on behalf of the everyday people of this country. The people who in the long run pay for everything one way or another.

I own and operate a grocery store not connected with any chain. I am president of Consumer Power, a group of electricity consumers in Jacksonville who have been fighting construction of a factory which would manufacture floating nuclear plants on Blount Island in Jacksonville. Westinghouse and its offshore power system of Jacksonville is going to profit from this $100 billion boondoggle, who dream of someday building floating nuclear powerplants.

The story I am going to tell you will astound you and the entire nation. It will show how a major corporation will promise anything to get subsidized by a city and State.

Then, when they fail, they turn around and come back to Washington for a Federal bail-out.

To give $100 billion for experimental projects like floating nuclear powerplants is like sending good money after bad.

Our local paper, the "Florida Times," owned by the Seaboard Coastline Railroad, with very, very heavy vested interest in the nuclear power project there, did not want the truth known to the public or anyone else about floating nuclear powerplants.

Numerous out-of-town newspapers and magazines eventually told the story, a true story, to the public.

First came a writer named Dudley Clendenon, from the "Saint Petersburg Times," who broke the story, then the "U.S. News and World Report," the "Rolling Stone" magazine, "Columbia Journalism Review," and many others which you have been furnished, by promising to build a $250 million factory and become our largest employer, our independent authorities, and we are very familiar in Jacksonville with independent authorities, gave them an island valued at $27 million.

They issued $180 million in revenue bonds to give them operating cash and now they are in the process of trying to build them a bridge. This is for offshore power system, for $166 million at taxpayers expense.

Since their arrival at Jacksonville, taxes have almost doubled. Utility rates and bridge tolls have doubled. And the only people who have benefited from this project were people with special interest. We have had the independent authorities in Jacksonville for almost 8 years.

They answer to no one, they come under no budget controls. And this was brought up yesterday.

In my mind, the Energy Independence Authority is another example of a pork barrel project that is being pushed hard by the vested interests who want to make a big profit at the public's expense. This is the granddaddy of all pork barrel projects.

Speaking for the taxpayers, who have already spent years fighting a smaller version of the Energy Independence Authority in Jackson-

ville, I urge you to reject this proposal for this Federal subsidy to big business.

In Jacksonville, offshore power systems convinced the city fathers to buy $2.2 billion worth of floating experiments.

I and a few associates with the help of a city attorney managed to stop this fiasco, which would have in the end have cost the City of Jacksonville the equal of its entire assessed valuation of almost $6 billion.

When Jacksonville refused to be the guinea pig, the original customer, Public Service and Gas of New Jersey, delayed their order for 7 years.

These major corporations risk very little. Then they want the public to risk a lot. They used taxpayers hard-earned dollars. This Independence Authority Bill will be playing right into the hands of mismanaged corporations, such as Lockheed, Westinghouse, Penn Central.

These corporations use State and local officials to obtain taxpayers' money to further subsidize their corporate mistakes. The Florida Cabinet and the Governor learned the hard way.

They have been embarrassed by this project. You have had in your possession documented proof that the Attorney General of Florida is raising serious questions about the floating nuclear project.

Gentlemen, do not mortgage yourselves like we did in Jacksonville and be forced to subsidize these corporations who cannot make it on their own.

The American people cannot afford this luxury, the people need money to buy groceries, not to bail out giant corporations.

Gentlemen, one thing puzzles me.

If I mismanage my business, and I make bad mistakes, I just go broke and lose everything, and I have done this.

And I have got to start from the bottom again, without a subsidy.

A giant corporation that has made very, very bad engineering and economic calculations does not.

They simply come back to Washington and get bailed out.

I will be glad to answer any questions.

Thank you.

[Presentation of Mr. Cury follows:]

STATEMENT OF JOSEPH H. CURY, CONSUMER POWER, JACKSONVILLE, FLA.

Mr. Chairman and Members of the Committee: It is an honor to be given the opportunity to speak to you on behalf of the everyday people of this country. The people who in the long run pay for everything one way or another.

I am president of Consumer Power, a group of electricity consumers in Jacksonville who have been fighting construction of a factory which would manufacture floating nuclear plants on Blount Island in Jacksonville. The factory is being built by a subsidiary of Westinghouse called Offshore Power Systems, better known as OPS.

There are two reasons that our experience with OPS in Jacksonville is relevent to your consideration of legislation to create the Energy Independence Authority. First, the Energy Independence Authority would very likely be used to subsidize the purchase of floating nuclear power plants from OPS in Jacksonville. Presently OPS is in bad shape financially because most of the orders it once had for floating nuclear power plants have been cancelled. The few surviving orders have been delayed for several years. Hence OPS is banking on the Energy Independence Authority to save it from bankruptcy by buying sev-

eral floating nuclear power plants and leasing them back to electric utilities that will not buy them with their own money. My group believes that OPS should not be bailed out by the federal government. If OPS made high risk business decisions that aren't paying off, OPS should suffer the consequences rather than asking the taxpayer for a subsidy. That's the way I run my business and that's the way the free enterprise system is supposed to work.

The second reason that our experience with OPS is relevant to your consideration of the Energy Independence Authority is that OPS would never have been started if the local vested interests in Jacksonville had not seen a chance to use the public's money for private gain. OPS in Jacksonville is a classic porkbarrel project. I have submitted to the Committee for the record articles from *The St. Petersburg Times, U.S. News & World Report, The Rolling Stone, Columbia Journalism Review,* and other publications describing the shady dealings that went on when OPS came to Jacksonville. As you can see from reading these articles, one of the reasons that certain influential local interests supported plans for the OPS factory was that they wanted to use it as a pretext to get a $137 million bridge built near their property.

In my mind, the Energy Independence Authority is another example of a porkbarrel project that is being pushed hard by some vested interests who want to make a big profit at the public's expense. This is the grand-daddy of all porkbarrel projects, and, speaking for taxpayers who have already spent years fighting a smaller version of the Energy Independence Authority in Jacksonville, I urge you to reject the proposal for this federal subsidy to Big Business.

We have already seen local taxes rise and bridge tolls double to help pay for OPS in Jacksonville. Please don't ask us to also pay increased federal taxes to subsidize OPS and hundreds of other boondoggles like it all over the country.

Gentlemen: do not let yourselves get locked in, like we did in Jacksonville and forced to subsidize these corporations who can't make it on their own. The American people can't afford this luxury. The people need money to buy groceries, not to bail out giant corporations.

Thank you.

[From U.S. News & World Report, Sept. 1, 1975]

A City That Reached for Riches and Got Headaches Instead

WHAT BEFELL JACKSONVILLE CAN BE A LESSON FOR OTHER CITIES. JACK MCWETHY, AN ASSOCIATE EDITOR OF THE MAGAZINE, REPORTS FROM THE SCENE

Jacksonville, Fla.—This is the story of what can happen to an American city that rolls out the red carpet for a high-risk industry—and sees its dream of riches end in frustration and controversy.

It was in 1972 that Jacksonville set out to attract a new and exotic company of the nuclear age. City fathers envisioned a day when 10,000 new jobs would be created and cash registers would ring from one end of town to the other.

In pursuit of this goal, lavish—and, some say, questionable—expenditure of millions in city funds was made. Critics claim Jacksonville came close to being plunged into bankruptcy.

The story centers on Offshore Power Systems—known locally as OPS. It is a Westinghouse subsidiary formed to build floating nuclear power plants.

A multibillion-dollar market was forecast for scores of units. They were to be built in Jacksonville, then towed out and anchored off the U.S. coastline to send power hundreds of miles inland.

Now demand for the plants has all but vanished. So have the dreams of quick prosperity for Jacksonville.

"*Like motherhood.*" One local official sums up what happened:

"The chamber of commerce—and these are the people who run this city—just went crazy over this OPS thing. Just about every businessman in town thought he was going to get rich. It became an issue like motherhood and the American flag—you didn't dare say you were against any part of the package our city was offering."

Since Offshore Power Systems arrived three years ago, Jacksonville has:

For all practical purposes, given the firm 850 acres of choice industrial land.

Promised to build a 137-million-dollar bridge to provide access to the Plant's location.

Offered to buy, through the municipal power company, two floating plants at a cost critics insist the city could ill afford—2.2 billion dollars.

Spent more than a million dollars for the purchase of enriched uranium fuel for Jacksonville's two floating power plants, which, it now appears, will never be built.

Launched the construction of a vocational-education center, at a cost of 11 million dollars, that was to train thousands of OPS employees.

Offered to sell 180 million dollars in low-interest, tax-exempt revenue bonds to provide the company with ready cash.

The background.—Offshore Power Systems is dead in the water at the moment. Its one remaining customer has delayed all order five years. What happened to Jacksonville's dream? To go back to the beginning—

In 1972, OPS was scouting for a suitable place to locate. More than 70 coastal cities from Boston to Galveston were hotly bidding to attract the firm. At that time, OPS was a joint venture of Westinghouse and Tenneco. Westinghouse was to provide nuclear expertise and Tenneco—a conglomerate specializing in marine construction and energy systems—was to help with its shipbuilding know-how.

Promising location.—The new joint venture settled on Jacksonville because the city offered an excellent site for the manufacture of floating nuclear plants and was showing what one OPS official described as a "wonderfully cooperative attitude."

Offshore Power officials came to Jacksonville confident that once the company's 300-million-dollar manufacturing facility was in full production, it would employ from 10,000 to 14,000 people. It would be selling power plants for about a half billion dollars each. These were to be floating off the assembly line at a rate of four units a year.

Proponents of the project calculated that OPS and its employees would add nearly 8 million dollars a year to city tax revenues. They also envisioned a 160-million-dollar payroll that would be spent largely in the Jacksonville area.

Civic leaders went all out to smooth the way for the firm. As described by one local attorney:

"When OPS came to Jacksonville, their people just jumped into the government decision-making process. They joined the right clubs, rubbed shoulders with the right businessmen and, after that, this city was theirs."

A site was needed where OPS could assemble the world's first facility for manufacture of the floating nuclear-power plants.

The Jacksonville Port Authority recommended Blount Island—located midstream in the St. Johns River, halfway in the 20-mile stretch between downtown and the Atlantic Ocean.

At first, members of the Port Authority informally offered to give the island to the company outright if it would agree to settle in Jacksonville. Later, in 1973, the Port Authority drew up a contract offering up to 1,000 acres of Blount Island to Offshore Power for $2,000 an acre. The price of other industrial land nearby was running from 5 to 10 times that figure.

No-loss promises.—Written into the agreement were these money-back guarantees:

1. If OPS went broke, the Jacksonville Port Authority promised to refund the purchase price of the island to OPS, plus interest.

2. In addition, if OPS could find another buyer for the real estate suitable to the city, the company would be allowed to recoup out-of-pocket expenses, including site improvement, salaries, subcontracts, advertising and promotion.

To date, says A. P. Zechella, president of Offshore Power Systems, the company has spent 70 million dollars—a portion of which has been paid for by the company's only remaining customer, a New Jersey utility.

The closing date for the land deal was to have been July 1, 1974, more than two years after OPS decided to locate in Jacksonville. There have been postponements, and the final papers were not signed until August 18 of this year.

Because of the delay, Offshore Power was able to partially develop the island without paying any taxes. The company also delayed payment of its dredging and filling bill to the State of Florida. This ranges from less than 1 million dollars to more than 8 million dollars, depending on whose version is accepted—the company's or the State's.

In coming to Jacksonville, OPS officials knew they had a number of major problems to overcome.

For example, if the company was going to employ 10,000 people, there was a big question about just where these workers would come from and how they

would be trained. The answer was a new 11-million-dollar junior college campus—emphasizing industrial vocational training—that is going up near downtown. Impetus for the project was provided by OPS and its need for such a facility.

Floating of bonds.—Another worry was whether Offshore Power would have enough money available to finish its building program.

To make sure there was no shortage of cash, the Jacksonville Port Authority—the same agency that sold Blount Island to Offshore Power—offered to float 180 million dollars in tax-exempt, industrial revenue bonds for OPS. Such bonds could save the company tens of millions of dollars in interest by getting a loan at municipal rather than commercial rates.

Still another concern was that the Blount Island site was somewhat isolated from the rest of Jacksonville. This would pose a major problem in getting the projected 10,000 Offshore Power workers to their jobs every day.

To meet this, the Jacksonville Transportation Authority—the road-building partner of the Port Authority—rearranged the city's bridge-building priorities. It canceled a proposed span that would have eased traffic jams on the already crowded downtown bridges, and began engineering studies of a bridge that would cross the river within yards of Blount Island, providing easy access to the firm's site.

This new bridge is to connect a residential section of Jacksonville on one side of the river with what is today little more than a swamp on the other side. Business leaders hope that development of Blount Island by Offshore Power will transform the sparsely populated north bank of the St. Johns River into a booming industrial area.

The cost of the bridge is estimated at 137 million dollars. To help pay for it, the city in mid-1973 raised tolls on all its downtown crossings from 15 cents to 25 cents. The new bridge will have the highest toll in town—50 cents—and the lowest traffic density.

It was a fourth move related to Offshore Power Systems that critics charge nearly put the city into bankruptcy. If OPS was going to be a success, it would need customers for its floating nuclearpower plants.

The Jacksonville Electric Authority—another of the independent agencies that handle the city's business—decided after nine days of deliberation to submit a letter of intent to buy two floating nuclear plants. This would more than double the city's generating capacity.

The combined generating capacity of the two new units was to be 2,300 megawatts. This is enough to supply roughly a million consumers with electricity. The population of Jacksonville is about 550,000 today, and its generating capacity is 1,600 megawatts, with another 550 megawatts scheduled to come on line in a year.

The total purchase price—including the breakwater needed to protect the floating plants—was to be 2.2 billion dollars. The utility's total assets are worth 515 million dollars.

Subsequent studies made it clear that the city had no need for even one floating power plant.

The 2.2 billion dollars needed to pay for the plants was to be raised by selling municipal utility bonds. This sale would have been more than twice the size of any ever offered by a city in the U.S., according to a New York brokerage firm.

Some opposition.—The drive to push the purchase through without delay was intense and touched off the first real opposition to the city's support of OPS.

One side of the issue was represented by City Councilman Walter Williams, who said: "If we can find some way to buy those generating stations, we ought to do it, even if it costs a little bit more, because those dollars are coming back to this community."

Councilman Frank Hampton took this opposing view: "We should not subsidize a business just because a business is coming to Jacksonville. I'd rather just take the money from the taxpayers and give it to the people."

As debate heated up in the autumn of 1974, a city official described the scene: "The newspapers carried major stories on the company every day and told how these plants would save Jacksonville all kinds of money. Billboards were bought by business leaders and plastered with propaganda. It was an amazing time."

Jacksonville's newspapers, the *Florida Times-Union* and the *Journal*, are wholly owned subsidiaries of the Seaboard Coastline Railroad. The railroad, which

stands to gain considerably from its real estate holdings if OPS proves successful, supported the attempt to buy the two nuclear plants and so did the newspapers, in banner headlines and editorials, day after day.

Railroad holdings.—The Seaboard Coastline owns a vast piece of downtown. It also holds two industrial parks and several other tracts of land—some near the Blount Island area.

At this point, the city's new general counsel, Harry Shorstein, entered the controversy. He reviewed the proposed contract between Offshore Power and the Jacksonville Electric Authority and wrote a 69-page legal opinion laced with sharp criticism of the agreement.

Mr. Shorstein concluded that "reasonable and prudent public officials could not under any interpretation authorize" execution of the contract, and that it would be "an arbitrary and capricious action on the part of the Jacksonville Electric Authority Board and contrary to public interest."

Mr. Shorstein later told *U.S. News & World Report* that, in his view, it would have been just a matter of years before the entire municipally owned utility went bankrupt trying to make payments on the two plants. Offshore Power, he says, could have ended up owning Jacksonville's electric utility.

Offshore President Zechella says that, in retrospect, there was in his mind a "serious question" about whether the Electric Authority could have successfully floated the 2.2-billion-dollar bond issue. This was not the prevailing view at the time, however.

Heated council meeting.—After Mr. Shorstein's legal critique and several stormy sessions of the city council, the Jacksonville Electric Authority was forced to let the letter of intent lapse in the fall of 1974.

In the midst of the controversy, Mr. Shorstein asked the Florida Ethics Commission to consider one of several cases of possible conflict of interest. He requested that the commission rule on the case of Truett Ewton, who was serving as chairman of the Electric Authority and was an outspoken proponent of buying the two power plants.

Mr. Ewton also served as a vice president of Gulf Life Insurance Company, the firm that was selected to provide the group-insurance policy for all OPS employees. The annual premiums from a policy that size could run more than a million dollars a year if Offshore Power ever employed the 10,000 people it once said was possible.

On each of the key agencies of the Jacksonville government—the Transportation Authority, Port Authority and Electric Authority—there were appointed members whose companies were doing business with OPS.

The Ethics Commission refused to rule on any case unless the individuals involved in the possible conflict of interest requested a judgment themselves from the State body. So far as is known, none of the officials has requested such a public ruling.

Prior to withdrawing from the purchase of the two floating power plants, the Jacksonville Electric Authority contracted with the old Atomic Energy Commission in Washington, D.C., for more than 4 million dollars' worth of nuclear fuel. The Electric Authority paid 1.4 million dollars as a down payment. It now appears likely it will lose that down payment unless it can sell the contract to another utility.

Orders canceled.—In the midst of all the city's problems. OPS was having its own. At one time, it had letters of intent to buy from New Jersey's Public Service Electric and Gas (four plants), from Louisiana's Middle South Utility System (two plants), and from Jacksonville Electric Authority (two plants). The future looked bright, with eight orders on the books.

Then came the summer and fall of 1974—the recession was deepening and utilities across the country started canceling orders for all kinds of future generating plants. OPS was hit along with others.

Louisiana's Middle South Utility System let its letter of intent lapse in mid-1974. This was followed in the autumn of 1974 by the Jacksonville controversy and the final lapsing of its letter of intent.

Days after Jacksonville pulled out, the New Jersey utility announced that it was going to delay all its orders by five years. This left Offshore Power with a half-built manufacturing facility on Blount Island and no orders for the immediate future.

Then Tenneco, half of the partnership that put Offshore Power Systems in business in the first place, decided in the early part of 1975 to withdraw from the joint venture.

That leaves Westinghouse as the only backer and Public Service Electric and Gas of New Jersey as the only customer.

Mr. Zechella, OPS president, says he has prospects for other orders. His company, for example, is trying to persuade the Federal Government to buy four floating plants and then lease them to troubled utilities.

Will OPS go out of business? Mr. Zechella says, "No way." Westinghouse is committed for the long haul with OPS, he maintains, and is ready to back the subsidiary into the 1980s, even if no other orders are received.

Work force reduced.—OPS, which was to have started work on the world's first floating nuclear plant this summer, has cut the payroll from 700 to 275.

The welcome OPS got from Jacksonville in 1972 is no longer as warm.

Some of the people who were laid off recently by the company had been drawn from good high-salary jobs in Jacksonville a year ago. Now they have joined the ranks of the unemployed, and there is open bitterness.

The city is continuing to build the vocational education center, and the Transportation Authority is pushing ahead with its 137-million-dollar bridge. The Jacksonville Electric Authority is continuing its search for a buyer for the 1.4 million dollars of nuclear fuel.

Jacksonville's situation was described by one of the top managers of the Electric Authority:

"There was nothing dishonest in the city's dealing with OPS. It was more a situation of a lot of businessmen—and they control this town—thinking they had found the pot of gold at the end of the rainbow.

"If OPS had 50 customers today instead of just one nobody would be questioning all we have done to help this company. As it turned out, there was more risk than we thought. Maybe we've learned a lesson, but I doubt it. A lot of people still think we should have bought those two nuclear plants."

[From the Rolling Stone, Mar. 25, 1976]

TALES OF JACKSONVILLE

(By Joe Klein)

It's a lovely afternoon at Sawgrass, pristine almost. The sun is shining, a light breeze riffles the palm trees. The tennis courts are empty and only a few stragglers mar the golf course. Modern condominium townhouses of award-winning design blend perfectly into the planned landscape. An advertisement for Florida: The Good Life. None of the urban hassles, no winter, no crowds.

Very few people at all, in fact. One townhouse cluster—Bermuda Cove—is completely vacant. It is stunningly white and modern, a naked string of two-story buildings—priced from $65,000 to $90,000 per unit—along a gently curving road. They've been standing there, empty, for at least a year. The rest of Sawgrass isn't doing too well either: it is, in effect, a clustered, modular ghost town.

The saleswoman at the main gate, tanned and blond, is optimistic. Even though the developer recently turned Sawgrass over to the bank, "it wasn't really a bankruptcy," she says. The economy is getting better and soon people will start coming around.

Soon, too, a long tentacle of highway will stretch out from the city of Jacksonville to incorporate Sawgrass. The road will connect with I–295, a freeway around the city, and I–295 will be climaxed by the Dame Point Bridge, a massive span across the St. Johns River which links the populous south side with . . . well, there really isn't all that much on the other side. In fact, most people in town haven't the vaguest idea why anyone would want to spend several hundred million dollars to build a bridge that goes nowhere. But the City Fathers (there are few City Mothers in Jacksonville; it's a man's town) look across the river and see thousands of acres waiting to be developed. Land for more industry, more jobs, more taxes, more residents for Sawgrass. Land that will make Jacksonville the economic jewel of the Southeast, surpassing Atlanta. A pipe dream, perhaps. But it doesn't pay to be pessimistic—pessimism is akin to socialism here.

It's not for nothing that Jacksonville calls itself the Bold New City of the South.

At the outset, it should be noted that this is a story about the presidential campaign in Jacksonville. Having said that, we can proceed:

It began on the morning of January 17th, 1974, with the mail delivery at the Mandarin Supermarket. Joe Cury, the owner of the market, sat in an elevated cubicle near the cash registers which serves as his office, opening the morning bills. And then he screamed, "What is this?" It was the market's electric bill, and it had doubled—from $700 to $1500. Immediately, he called the Jacksonville Electric Authority. The young woman who answered said, in what appeared to be a prepared statement, the increase that Mr. Cury may have noticed in his electric bill was caused by an adjustment necessary because of the high price of oil. Joe wasn't satisfied. He wanted to know the exact price of oil, where it was coming from, how many barrels. . . . The woman didn't know.

For the rest of the morning Joe fumed, talking to his customers and finding that they, too, had received ridiculous electric bills. That afternoon, he jumped into his new black Lincoln Continental and went downtown to the Electric Authority headquarters and started yelling at one of the receptionists. "I want facts," he said.

Joe Cury can seem rather threatening when he is angry. He isn't especially tall, but he is built like a sumo wrestler—thick neck, barrel chest, massive arms. All his clothes look too small. The receptionist went for help.

She came back with a middle manager of mild appearance, and Joe began to yell at him. "Who're you buying this oil from? How much is it a barrel? Lemme see your books . . . I got a right. I'm a citizen, ain't I?"

"We don't have to show you anything," said the middle manager.

Joe was somewhat taken aback by this response. "He actually said that," Joe recalled. "I could have killed the little bastard. But I wasn't about to give up. That's how all this started."

The trip to the Electric Authority had been the first overt political act of Joe Cury's life, but within a couple of months he had formed POWER—People Outraged With Electric Rates—and had filed a class-action suit demanding an open hearing on the rate increase. Soon he was at war with the entire political establishment in Jacksonville.

The entire political establishment in Jacksonville consists of a small group of businessmen who have grown rich together since World War II. At its center is the Florida Publishing Company, a subsidiary of the Seaboard Coast Line Industries, which produces the only two newspapers in town. The primary function of the papers is, apparently, to tell the rest of the community how wonderful Jacksonville and the businessmen are.

Aside from that, the businessmen all belong to the Rotary Club and the Chamber of Commerce's Committee of 100. They eat lunch together at the River Club atop the Prudential Building, play golf together and plan the future. The future, as they see it, is bright. In 25 years, Jacksonville has grown from 300,000 people to 600,000. It is a burgeoning financial and distribution center and has a wonderful deep-water port. The tallest building in Florida—the Independent Life Insurance Company—is located downtown.

Still, the city suffers from a very distinct inferiority complex. It is not as glamorous as Miami or as prosperous as Atlanta. It is cool in winter—sometimes, at night, it even freezes—and the tourists whiz past on their way to the warmer weather, often remembering Jacksonville as the town with the rotten smell (caused by paper mills and chemical factories).

And so, over the last decade, there's been an outbreak of half-crazed macho boosterism. An effort to make Jacksonville so modern, so efficient, so enticing that corporations looking for gold along the Southern Rim can't afford to pass it up. The first real step was taken in 1967, when Jacksonville managed to get its suburbs to agree to become part of the city. The entire government was consolidated at that point, with much of the power going to quasi-public Authorities (electric, port, transportation, downtown development) which would be controlled by, yes, that same small group of businessmen. "This assured," one business leader told me, "that when a corporation came to town it could be welcomed by businessmen, not by bureaucrats waving red tape."

The other effect of the consolidation was that it absolutely prevented blacks in the core city from taking control of the local government which, by most estimates, they would have done by 1970. "Let's face it, the consolidation prevented a black mayor," said a Chamber of Commerce staffer. "And now when businesses come down from the North, they're more likely to choose us than Atlanta, with its black mayor and all the uncertainty that causes."

The payoff came in 1972, when two corporate giants, Westinghouse Electric and Tenneco, announced they were forming a joint venture called Offshore Power Systems to build floating nuclear power plants, and they were considering Jacksonville as the location for their factory. The city went wild. The newspapers played it like the Second Coming: they even bought billboards and two-page ads which read: WESTINGHOUSE TENNECO CAN BRING YOU A BRIGHTER TOMORROW . . . AND A GREATER JACKSONVILLE. WE WANT THEM HERE. The local officials said they'd do everything in their power, and more, to welcome the new industry to town. Even those who thought the idea of *floating* nuclear power plants was a bit bizarre were awed by the scope of Offshore Power Systems: the world's largest assembly line was promised on the banks of the St. Johns River, at least 10,000 new jobs. Atlanta didn't have anthing near as spectacular as that. All Miami had was old people. The unions loved the prospect of all those jobs. The blacks saw a way out of the ghetto. Only the environmentalists had doubts, and they could be counted on one hand. Even Joe Cury didn't oppose it yet.

Joe Cury was born in Allentown, Pennsylvania, and arrived in Jacksonville by pure chance. He was a rough kid, the son of a Syrian steelworker: At age 16, he tried to fake his way into the Marines and almost made it. The next year he joined the Army. He was sent to Germany, where he had a lot of fun and learned how to box. When his hitch was up, Joe decided to try boxing professionally. He was a heavyweight and, he says, won 27 straight fights. "Then my handlers took me to Miami and I was set up in this hotel suite. Miami was *the* place in those days, all kinds of wild broads and things going on. I lost eight straight fights; I was living too high."

Joe went into public relations of a sort. "Budweiser had just come out with its idea of using those horses to promote the beer, and so Ballentine decided to try the same thing. They had a guy called King Ballentine who'd sit in a wagon that was pulled around by horses. My friend—his name was Joe too—was King Ballentine and I helped out. We traveled all over the place. One time we were here in Jacksonville and I'm in this A-rab restaurant and the guy who owns it says if I really want good food, I should go to this picnic they're having. So we decided to take King Ballentine to the picnic and that's where I met my wife."

He was in his mid-20s, time to settle down. He tried opening a hardware store, which didn't do well. He opened a grocery store, which did better. It was located in a well-to-do neighborhood and became known for good meats and huge open-house Christmas parties. He grew older, raised two children, bought a beautiful house near his market; the marriage survived but only after some rocky times. He was restless. When the electric bill arrived that morning, Joe was 45 and life wasn't as exciting as it once had been.

For a while he was swept along by his anger, but gradually he found he was enjoying the political stuff. It was a new challenge. He was becoming *famous* in Jacksonville.

And rightly so. Joe found that the Electric Authority was buying its oil from a company named Ven-Fuel. Ven-Fuel had only one customer: the Jacksonville Electric Authority. The Jacksonville Electric Authority had signed a contract with an escalator clause, and the price just kept rising. It was all very mysterious—no one was really sure who owned Ven-Fuel. Eventually the Federal Energy Administration, the Internal Revenue Service and the Customs Service began to investigate, the city sued Ven-Fuel for overcharging, the company settled for $1.2 million and went out of business. A federal grand jury is still investigating the whole business.

The Ven-Fuel case led Joe to look more closely at the JEA, and the more he looked, the less he liked it. In one instance, the JEA wanted to build a tanker dock, and could have built it on free public land, but chose instead to buy property held by several well-connected local businessmen. The deal was exposed by an enterprising reporter at WJXT-TV, and a grand jury is looking into that too.

There seemed to be no end to the shady dealings. The businessmen who ran the Authorities bought and sold from each other, planned new developments and made money hand over fist, often at the expense of the taxpayers. The ultimate deal was the one the JEA proposed with Offshore Power Systems: it would buy *two* floating nuclear plants for $2.2 billion. Joe Cury had nothing against nuclear power at that point; in fact, he thought it might lower his electric bill.

But because the JEA was involved, the deal was suspicious. He decided to check it out.

Joe Cury almost died twice in 1974. Bad arteries, the doctors said. They took arteries from his legs and put them in his chest. They told him to quit smoking, lose weight and generally cool it. But Joe couldn't cool it—not when the city government was beggaring itself for OPS. What's more, he had begun to do some reading about nuclear energy. He knew the safety systems at a nuclear plant had to be infallible—one mistake and an entire city could go. He knew there had been several near misses. "Those sons of bitches are dangerous," he said. "The insurance companies won't even cover them."

Joe learned that Ralph Nader was intersted in nuclear issues. He contacted Nader's anti-nuke group, Critical Mass, and began receiving material from them. His store took on a distinctly political tinge: there were stacks of *Critical Mass* newspapers at the cash registers and a big bulletin board with clippings about the struggle against OPS. Eventually Joe convinced Nader to come to Jacksonville to speak (the *Jacksonville Journal* characterized Nader as one of the "perfectionists who . . . would certainly never have advised us to fight back after Pearl Harbor because war can conceivably kill you . . ."). Joe was so impressed with Nader that he changed the name of his group from POWER to Consumer Power.

The grocer went out on the local lecture circuit, speaking to anyone who'd listen: the Kiwanis, the Young Republicans, the Southside Businessmen. He spoke about the dangers of nuclear power and all the shady deals the local government was making to help OPS:

The Jacksonville Port Authority (JPA), for all practical purposes, had given OPS 850 acres of choice land on Blount Island in the middle of St. Johns River. The floating nuclear plants would be built there and towed out to sea.

The JPA also gave OPS a money-back guarantee. If the project failed, the Authority would pay the company all expenses incurred in building the factory.

Going still further, the JPA agreed to float a $180-million bond issue to provide OPS with cash.

The Jacksonville Transportation Authority decided to build the Dame Point Bridge—the bridge to nowhere—to provide easier access to Blount Island.

And the Jacksonville Electric Authority would buy the two floating nuclear plants for $2.2 billion.

Why was all this happening? Joe had a ready answer: the businessmen who ran the Authorities also ran their own businesses and stood to make a bundle off OPS. Wesley Paxson, chairman of the Jacksonville Transportation Authority, owned a company that would do all the electrical contracting for OPS. Truett Ewton, their chairman of the JEA, would insure OPS employees through his company, Gulf Life. And there were other conflicts of interest.

But Joe was gaining some curious allies in addition to the handful of environmentalists in town. The local shipyards, not at all convinced there was any such thing as a floating nuclear power plant, thought the real purpose of all the development at Blount Island was a build a new and competitive shipyard, and smiled on the grocer's efforts. But it appeared that Joe didn't need much help because OPS had begun to sink of its own weight.

As the economy turned sour and nuclear safety became a major question, the utility companies that had been interested in floating plants decided they didn't want them after all. Soon OPS had only the orders from Jacksonville and the New Jersey Public Service Electric and Gas Company, which had come up with the idea of floating nuclear power plants in the first place. Then the New Jersey utility "postponed" its orders. And Harry Shorstein, Jacksonville's newly appointed general counsel, began to study the JEA's proposed contract. Shorstein found not only that the city didn't *need* any more power plants, but also that if the JEA signed the contract it would go bankrupt paying for the plants. The Jacksonville City Council decided not to approve the contract.

Tenneco pulled out, leaving Westinghouse sole owner of OPS. Faced with a half-completed factory and no customers, OPS laid off 500 employees, leaving an office staff of 311, and began to lobby in Washington for a federal bailout. But the dream still flickers in Jacksonville: Wesley Paxson, for example, still wants to build the Dame Point Bridge.

Wesley Paxson is a big, open, friendly man who, like so many others, made it on his own in Jacksonville: "In 1957, I started my electrical contracting company with $5000 I had borrowed. Had to hock my house, my kids, everything. But I made it, and so can anyone else who tries."

Not surprisingly, Wesley is a Reagan man. He believes government should leave the free enterprise system alone. Except sometimes, when the government can give the free enterprise system a little nudge. Like the Dame Point Bridge.

"It's difficult for people to understand," Wesley said, frustrated. "They look across the river and see nothing there. I look over there and see jobs, taxes. The kind of growth that can help a community.

"These people who oppose growth are basically socialistic, I think. The same kind of people who want to break up big business and let the employees run the companies and do all this consumer stuff." Wesley paused a moment. "Now some of that is okay, mind you. But you have to draw a line."

But this bridge. Wesley Paxson, don't you own land on the other side that will increase in value if it is built?

"You know where my land is? Ten miles from the bridge."

And don't your friends--including Bryant Skinner, the chairman of the Reagan campaign in Jacksonville—own land there too?

"Well, sure, some of my friends own land there. But Jacksonville is a small town and . . . well, so what? If a business guy puts his money up and takes his chances, why shouldn't he make a profit? Some people just can't see the logic."

In 1975, Joe Cury decided to run for mayor. Then, he said, he realized that he'd have to borrow so much to make the race that he might lose everything, even his market. So he decided to run for city council.

Soon after, he began getting phone calls. First, they offered to buy him out of the race. Then they offered to kill him. Then they offered to arrange an auto accident for his daughter. Then someone smashed in the front of his store. "These weren't kooks," he said. "These were educated, Northern voices on the phone. Like lawyers."

When Joe Cury gets excited, he tends to exaggerate a bit and even his closest friends doubted that Joe's life was in danger. In fact, Joe was close to becoming a complete laughingstock when he received two more phone calls.

The first came from Charles Charles, assistant chief of police in Allentown and an old friend of Joe's. He said the Pennsylvania Crime Commission had made a formal request for Joe's record. "Are you in some trouble down there?" Chief Charles asked.

The next call came from Mrs. Ivy Ogg, a customer at the market and a political supporter. She wanted to know if Joe had ever been a holdup man.

"Who told you that?" Joe asked.

Ivy Ogg said she'd received a phone call from her good friend Bill Staten, the vice-president of OPS. At about the same time, the local media and several politicians received material smearing Joe Cury.

As it happened, Joe did have a criminal record: after he left the Army and before he started boxing. Joe and a friend decided to go to Atlantic City for a bash. They "borrowed" $1200 from the friend's father, who owned a drive-in movie, and took off. The friend's father had them arrested when they got home. They pleaded guilty to a misdemeanor and were fined $100.

When asked by a local TV station how he'd gotten hold of Joe Cury's criminal record, William Staten (who, in addition to being Ivy Ogg's friend, is also a former FBI agent) said the information came to his office in an unmarked envelope. He was later asked to tell the story in greater detail to a grand jury, which is still investigating the incident. Joe Cury narrowly lost the election.

Someone should probably take pains to see that William Staten and all his personal effects are preserved for the enlightenment of future generations. He is a classic figure of mid-century America: the businessman. Not that there is any one quality about him that stands out or that he has any special skill or says anything particularly memorable. He is a lawyer, public relations man, former FBI and IRS man. He is also finance chairman of President Ford's campaign in Florida. He's a nice guy who, like the president, exudes an air of easygoing athleticism.

He is a man without roots. He will go where Westinghouse sends him, sell what Westinghouse asks him to sell, and believe in the product to boot. He believes, for example, in floating nuclear power plants. Thinks they'll be "good for the ecology." He can see in the distant future a day when the Atlantic, Gulf and Pacific coasts will be ringed with floating nuclear reactors a few miles offshore. He doesn't worry about safety. There's a miniature floating nuclear plant

in a tank of water over at the University of Florida, and it works just fine. They've crashed miniature oil tankers into the thing, hurled miniature tidal waves at it and it always comes out okay.

His office. There is a large poster of John Wayne dressed as a cowboy and waving a six-shooter. There is a smaller picture of Roger Staubach dressed as a Dallas Cowboy and waving a football. There are golf trophies and pictures of foursomes. There's a framed letter from the president and pictures of the family. Still, the office is cold and efficient. White and chrome, with black indoor-outdoor carpeting.

He loves his country. He thinks the free enterprise system is great and shouldn't be tampered with. "You know, you might say that $5000 is a lot for a car nowadays. But if it weren't for big companies like Ford and GM, you'd be paying a lot more than that. Big business provides the jobs, pays the taxes, developes the new technologies. . . ."

He thinks President Ford's support will come from average, moderate guys like him. And there are plenty of *them* in Jacksonville. In the past decade or so, the entire south side of the city has been overrun by young Bill Statens. They work for large corporations and live in apartment complexes and tract houses strategically placed along wide, flat boulevards in between the 7-Elevens, the gas stations and steak pubs with salad bars. Bill Staten lives in a grown-up version of that—Deerwood, a private community of expensive homes and recreational facilities.

He loves Jacksonville. It's the friendliest town the company has sent him to. "The business community, of course, has been great. But the city government has been cooperative too, and Mayor Hans Tanzler is just the greatest. They accept you very quickly here. There's no real race problem. The unions are cooperative—I'd say Johnny Bowden of the Building Trades is just about the best union leader in the country."

The more he thought about it, the more ridiculous segregation seemed. It wasn't good for a growing city like Jacksonville. Wild mobs running around town with ax handles was not the sort of image the city needed. What's more, segregation cost money—you had to build two of everything: two high schools, two water fountains, four bathrooms. It was bad business. It was not progressive.

Johnny became a voice of moderation in town and now, in 1976, he still spoke softly and calmly. Just like the man he was supporting for president, Jimmy Carter. Even though he wasn't sure Carter would win, Johnny liked the man's style. It was courtly, it was progressive, it was New South.

Johnny is one of the more prominent Carter supporters in town. Most of the others seem to be on the fringe of the local establishment—young teachers, lawyers, other professionals, blacks. Rational people, people who value quiet and compassion leavened with reason, people who don't like to make waves. Jimmy Carter's wife, speaking to a group of Jacksonville women at an elegant little reception one evening, hit the nail on the head: she said her husband would allow people to "trust the government" once again.

Johnny Sanders, sitting in his office, painted a picture of a Jacksonville where all was harmonious, where government was trusted. "I can go to a Chamber of Commerce meeting," he said, "and sit between William Staten of OPS and John Bowden, the head of the construction unions, and all three of us can get along just fine. I go to the City Council and sit up there with Rodney Hurst, a black man. In fact, Rodney was the leader of the black sit-ins on Ax-Handle Saturday. That's how far we have come."

August 27th, 1960, is still very clear in Rodney Hurst's mind. He remembers walking toward Hemming Park and seeing the rednecks gathering, knowing there would be trouble. He remembers joining his friends at the lunch counter at Grant's, as they'd done at other lunch counters, waiting until it was absolutely clear they wouldn't be served, then getting up to leave. The mob charged as soon as the demonstrators left the store. Grant's employees locked the doors behind them. They were trapped outside. He remembers the Jacksonville police just standing there. He remembers the sound the ax handles made.

Rodney Hurst was a 16-year-old anathema when that happened; now he is 31 and a city councilman. He works for the Prudential Life Insurance Company. White folks like to point to Rodney Hurst as an example of how much the city has changed, a distinction he can live without.

Still, he couldn't resist taking me to lunch at the Jury Room, a private club across from City Hall where, with his the only black face in the room, he trotted out the old rhetoric. "There's only the facade of togetherness here. The black community is only inches away from a major disturbance. Conditions in the ghetto are worse than ever." The words flowed easily; he obviously enjoyed the sound of "community" and "ghetto"—it made him feel like the good old days.

But wasn't he adding to the facade? Wasn't he Racial Harmony Exhibit A?

But sometimes, though, being that was important. Black community support was crucial, for example, in luring Offshore Power Systems to town, and Rodney defended it vigorously. "To hell with ecology," he said. "I care about human ecology. My people need jobs. OPS had jobs; they guaranteed that 23% of their employees would be black."

Still, he wasn't entirely comfortable working the same side of the street as the local power brokers.

"I'll confront them when I have to," he said. And what if they ignored him? "I'll take it to the streets . . . I'll call a press conference."

There have been problems, though. The business with Joe Cury was one of them. "I figured you'd ask about that," he smiled, not offended. "But my lawyers say it's inappropriate to comment about that until the grand jury is done with it."

John Bowden's Building Trades Council represents only about 5000 of the 30,000 trade unionists in Jacksonville, but he is the labor leader the local papers quote because he is part of the team (as opposed to Jim Deaton of the AFL-CIO, who has been known to disagree with the local establishment). Around town, John Bowden is known as "the establishment's Joe Cury" because he's sometimes embarrassingly outspoken.

John is rather diminutive. Like Cury, he's a former boxer and he has a battered nose to show for 210 professional bouts. He originally became involved in construction work to help build his body for the ring, but remained an ironworker when his boxing career faded. He looks very distinguished now, sitting in the electrical workers' union hall. He is wearing a three-piece pin-stripe suit, a gold tie clasp, a gold pocket watch with a gold chain. He is also wearing a gold ring with what appear to be diamond insets, and he's smoking a big fat cigar.

"Did you ever," John Bowden asked, "meet a labor leader who was as popular with the Chamber of Commerce, the contractors and the city government as I am? There isn't a person in this part of the country that doesn't know my name."

John Bowden hews to the party line in Jacksonville and then some:

"I've been so successful because I've taken a realistic approach to the labor situation. No strikes. No work stoppages. We want to see this community grow."

"The environmentalists are a dangerous group. The Audubon Society will bring this country to its knees."

"Ralph Nader is someone we could probably do without. They say there's a fine line between a genius and a nut and he's right on it."

"OPS will be a great thing for Jacksonville."

His man for president is Henry "Scoop" Jackson. When Jackson came to town, Bowden arranged a big labor rally and gave him some good advice. "Hold it to about 15 minutes, Senator," he said. "They might get a little bored after that." Scoop was a big success and John Bowden takes some credit for it: "I think we lit a fire under him."

John Bowden thinks Jackson will do well in the primary, but is worried that much of the rank and file would vote for Wallace. "You see, these rank and file guys don't take the time to understand what's going on in the world, so they can be led on easily."

A cool, breezy day in January. For the first time, Offshore Power Systems has invited the community leaders of Jacksonville to inspect its Blount Island site and have some lunch. OPS is to announce the beginning of construction on a giant crane for the world's largest assembly line. It is uncertain why OPS is doing this, since there still aren't any immediate orders for floating nuclear power plants, but the suspicion is that the company wants to prove there's still life in the corpse after a year of inactivity.

So the civic leaders come. About 200 or 300 of them crowd into an absolutely vacant building on desolate Blount Island. John Bowden is there, as are Johnny Sanders, Rodney Hurst, Wesley Paxson and, of course, Bill Staten. The room is filled with prosperous-looking men (there are two women, not counting waitresses) in patent-leather shoes discussing mergers, interest rates and golf. An impressive show of force on the part of the establishment.

In addition to "consolidating" its suburbs into the core city, it appears Jacksonville has consolidated its various warring factions—business, labor, blacks, reformed good ol' boys. Representatives of four of the five active presidential campaigns—Ford, Reagan, Jackson, Carter—are present.

But where are the Wallace people?

It's certainly curious. Everyone in town seems to agree that Wallace will sweep Jacksonville in the primary, as he did last time. But none of the organized factions seem to support him; in fact, they disdain him. He represents everything that Jacksonville has been striving to overcome. He is Old South. He has more support from elected officials in Boston than he does in Jacksonville.

After a buffet lunch, the civic leaders gather around to listen to speeches. Mayor Tanzler says a prayer, thanking God for OPS. Then he says, "There are those who have criticized this community's welcoming of OPS. There are those who chose to believe that OPS was a mirage. But I'm here to say that if any other company wants to make the same kind of commitment to Jacksonville, I'll be out front shining their shoes, strewing rose petals in their path and kissing them on both cheeks. . . ."

An hour later, the building is locked and completely empty again.

The gun on the counter of Joe Cury's little office looked like a toy, but it was very real. Joe took the day's receipts and put them into a brown paper bag along with the gun. He was ready to go home.

"By the way, Joe," I asked. "Who are you supporting for president?"

"Who am I supporting for president?"

"Yeah."

"I'm voting for George Wallace," he said, laughing. "I want to shake those bastards up."

[From the Columbia Journal Review]

BOOSTERS IN THE NEWSROOM: THE JACKSONVILLE CASE

(By Sean Devereux)

The American business man is generous to a fault, but one thing he does demand of all teachers and lecturers and journalists: if we're going to pay them our good money, they've got to help us by selling efficiency and whooping it up for rational prosperity!

(Excerpt from George S. Babbitt's address at the dinner of the Zenith Real Estate Board, in Sinclair Lewis's *Babbitt*)

Jacksonville, Florida (population: 570,000) has long enjoyed the reputation of being a city in which trains don't hit cars, cars hit trains. This bit of local color dates back to 1897, when Florida magnate Henry Flagler, vexed at being accused by Jacksonville's *Florida Times-Union* of falsifying records of railroad land holdings to dodge taxes, silenced the paper by buying up its parent company, the Florida Publishing Company. Abruptly, trains and railroad men could do no wrong—at least not in Jacksonville. Control of Florida Publico, as the firm is informally called, and thus of the *Times-Union*, has remained in the hands of railroad men ever since. The present owner is Seaboard Coast Line Industries, one of Florida's largest companies, which also controls the merged Atlantic Coast Line and Seaboard Railroads, as well as the Louisville and Nashville Railroad. Workers in Florida Publico's photoengraving shop recall that black in the fifties they had to airbrush the words "Atlantic Coast Line" from the sides of boxcars in train-wreck photographs on the rare occasions such photographs were run. As late as 1973 a *Times-Union* police reporter who covered an accident involving a Seaboard Coast Line train had to telephone SCL's assistant public-relations director and read the story to him for approval before the city editor would accept it.

As the city's only morning paper, the *Times-Union* has a hefty circulation (148,000) and no real competition. Florida Publico bought up its sole local rival, the afternoon *Jacksonville Journal* (circulation: 60,400) back in 1959.

Jacksonville is also the city which, in 1972, was selected by the Westinghouse Electric Corporation and Tenneco, Inc., to be the home of a major new industry—the construction of floating nuclear power plants, designed to be moored in the ocean to generate power for coastal cities in the U.S. and elsewhere. And thereby hangs a tale.

Only a parking lot separates the Seaboard building from the newspapers' office buildings in downtown Jacksonville. It took half a year, however, for the power plant to move from the conference room of the Seaboard building to the pages of Jacksonville's two dailies.

The Seaboard Coast Line Railroad Company was the prime mover in inducing Offshore Power Systems, the joint Westinghouse-Tenneco venture, to locate in Jacksonville. In July 1971, E. H. "Bud" Whittaker, SCL's manager of industrial development, met members of Westinghouse's special projects division in Tampa. They were looking for a deep-water harbor site from which they could launch floating nuclear plants, which would then be towed to permanent sites. Whittaker was confident that in Jacksonville they would find the site they were looking for. Three Westinghouse men arrived in late August.

From the start, secrecy was the policy—a Westinghouse policy that Jacksonville's public leaders, including Florida Publico board members and newspaper executives, enthusiastically adopted. Thus, on August 26, when Whittaker's assistant Jim White introduced the site scouts to Bob Peace, the managing director of the Jacksonville Port Authority, he followed their instructions and identified them simply as representatives of "a reliable company." Only after Peace consented to keep the information a secret did the Westinghouse men identify their employer and describe their plans for a multimillion-dollar plant.

Shortly after this meeting, Virgil Fox, executive director of the Jacksonville Area Chamber of Commerce's Committee of 100, the chamber's industrial development task force, was let in on the secret. Then, Fox recalled in a recent interview, "because of the size of this project and because of the necessity to get the full support of the city," he and Peace decided "to confidentially alert a number of key people about this project." The number was rather large. "The mayor, the president of the city council, the chairman of The Committee of 100, the president of Florida Junior College, several large key industrial employers, and the governor were alerted," Fox said.

Florida Publico's publisher, Robert Feagin, and executive editor John Walters were also let in on the secret. "Both Bob and John are in The Committee of 100," Whittaker points out. "They knew about the project from the beginning." So, too, did the overwhelming majority of Florida Publico's then thirteen-man board of directors, eleven of whom were members of the chamber's Committee of 100.

So, too, did at least one Florida Publico reporter—*Times-Union* business editor George Wachendorf. "You knew George could keep a secret, if George gave you his word," explains Ross Legrand, an assistant manager of industrial development for SCL. Virgil Fox, another admirer of Wachendorf's ability to keep a news story to himself, added in an interview: "Once in a great while we [staff members of The Committee of 100] level with the media. George and I discussed Westinghouse-Tenneco. I didn't discuss it with regular reporters. I had confidence in George. George knew all along."

Publisher Feagin, asked to comment on the newspapers' six-months' silence on a story that the *Times-Union* was later to call its "Story of the Year," replied that "a premature announcement here might have tipped our hand to Portsmouth [Virginia, which Westinghouse-Tenneco was also considering as a site in the fall of 1971]. We have to be very careful of giving aid and comfort to the enemy—not enemy, really, but aid and comfort to another community." Virgil Fox, meanwhile, defends the news blackout on the ground that "publicity muddies the waters. A community will go crazy if people think a big plant is coming there. Most of the time a company will look at several dozen locations. Westinghouse looked at over fifty—fifteen or so in Florida. The corporations are good citizens. They don't want a whole lot of towns getting excited over nothing."

While Jacksonville's two dailies obligingly withheld the OPS story, two Portsmouth, Virginia newspapers—the *Ledger-Star* and *The Virginian-Pilot*—

broke it. An October 8, 1971 article in *The Virginia-Pilot*, for example, quoted a local source as saying that Portsmouth was being considered as a possible OPS site and that "Jacksonville, Florida, is making a strong pitch for the [OPS] plant and that Savannah, Georgia, is interested."

THE TRAP

Seaboard Coast Line Railroad, the prime mover in bringing Offshore Power Systems to Jacksonville, was kept out of the story that Florida Publico reporters told. George Wachendorf—then the *Times-Union* business editor, now in business for himself—does not hesitate to explain why he did not mention the railroad in his stories. "The railroad owns the paper, you know. Some of my sources were SCI people. I was protecting my sources. I learned to stay off the railroad as much as possible."

Wachendorf described one object lesson. One day he thought he would write an article about railroad freight rates. He discussed the idea with his editors. His discussions left him with the understanding that Seaboard could not profit by such a public examination: if his analysis determined that Seaboard's freight rates were high, readers would conclude that Seaboard was greedy; if they were low, readers would conclude that the story had been published to plug Seaboard. "It's the typical trap you get into on the *Times-Union*," said Wachendorf.

The Portsmouth papers scooped Jacksonville's by a full five months. (In a speech delivered in 1973, Virgil Fox said of the Virginia coverage: "This was of considerable annoyance to the Westinghouse-Tenneco people." He added: "They were highly complimentary of us and our news media for the discretion that we had used in dealing with them. Our news media deserved this compliment. In spite of the fact that most of them knew about this project, they respected our request to remain silent. They were great!") Florida Publico's news managers did not release the story until March 9, 1972; GIANT INDUSTRY BID IS BARED, the *Times-Union* stated in banner headline. Two and a half months later, the decision was made. On May 25, D. C. Burnham, chairman of the board of the Westinghouse Electric Corporation, and N. W. Freeman, chairman of the board of Tenneco, Inc., flew to Jacksonville to announce publicly that the $200-million OPS plant was definitely coming to Jacksonville. When the two board chairmen emerged from the Robert Meyer Hotel, where they had been guests of honor at a banquet sponsored by the Jacksonville Area Chamber of Commerce, they saw copies of the *Jacksonville Journal* headlining their announcement already in the racks. "Thirty to forty seconds after our news conference announcing it!" marveled Tenneco chairman Freeman. "This is the fastest action I have ever seen by a newspaper." Jacksonville's two dailies could move very fast, when they chose to.

During the intervening two and a half months, Florida Publico's all-out support for a project that promised to bring jobs and money to Jacksonville led to a burst of boosterism that might have come straight from the pages of *Babbitt*. From the time the publishing firm's two dailies began selling Jacksonville on OPS (and selling Westinghouse-Tenneco on Jacksonville) until Westinghouse-Tenneco made its decision, the newspapers repeatedly suppressed news outright; they repeatedly kept arguments advanced by critics of the project out the headlines and buried them so deep that only the most dogged reader could unearth them; and they resorted to a counterpunch technique: blasting the opponent's position before stating it.

Before citing specific instances, it might be well to look into one mystery: why did Florida Publico executives break the story when they did? Publisher Feagin's explanation is that until March 9 the project "was purely speculative." In an interview, he said he could not recall, though, what early-March developments made it any less speculative. Virgil Fox of The Committee of 100 and Whittaker and Legrand of the SCI agree that the story was broken on March 9 for only one reason; the Florida House Committee on Finance and Taxation was due to consider a tax-bill amendment, introduced by a Jacksonville legislator, that would exempt installations costing more than $1 million from paying sales tax on heavy equipment. As Fox explained in an interview, "It was too tough getting a tax break for an anonymous company. It [the OPS story] would have been kept under wraps even longer, somewhat longer, if it hadn't been for the tax problem."

There is considerable evidence to support this view. In his front-page March 9 story in the *Times-Union*, for example, business editor Wachendorf warned readers that in order to make sure the giant industry came to Jacksonville, the business community would have to provide "a favorable climate." He then dropped a heavy hint, describing Florida's sales tax on heavy equipment as "a possible barrier to the plant's location here." Virginia levied no such tax, he noted. On March 10 the *Journal* published an editorial which asserted that failure to give the OPS project a tax break "could prove to be the deciding factor that would rob us of this magnificent opportunity, the type of industrial enterprise that few cities would dare dream of possessing." News on March 11 that the house committee had voted down the tax-law amendment bill did nothing to still the clamor on this issue in Florida Publico's papers. Between March 9 and March 15, the two newspapers ran, between them, eight news stories and two editorials describing the Florida tax law as a critical factor in the choice between Jacksonville and Portsmouth. (An editorial in the *Palm Beach Post*, after calling attention to "the current semihysteria being whipped up in Jacksonville," suggested that if the citizens of that city were so afraid that OPS would go away to Virginia if the project were not given a tax break, they might consider amending their local country property-tax schedule to take up the slack. This alternative was not voiced in the Florida Publico papers.)

THE HORSE RACE

At a Jacksonville press conference held on March 23, William Staten, a manager in Westinghouse's special projects division, said: "We hope this [plant] is to be located in Jacksonville. But the choice of sites is still a horse race. It could be Jacksonville or it could be Portsmouth." *Journal* copy editors turned Staten's statement into a headline: "Westinghouse: Plant Between Jacksonville and Portsmouth." And the horse-race theme was written tightly into the drama which Florida Publico's papers would construct for their readers for the next two months.

How genuine was the race?

In a free-lance, how-to-bring-a-whopping-industry-to-your-home-town article, which appeared in a business publication in 1973, George Wachendorf wrote:

Basic Strategy—The original announcement from OPS said that Jacksonville was one of two sites being considered for the plant. . . . The writer personally feels that Jacksonville was the prime choice right from the beginning, but the element of competition no doubt did much in intensifying the Jacksonville community effort for OPS. . . .

Apparently, Westinghouse-Tenneco held up Portsmouth as a threat, not a novel way of wringing concessions from city fathers—and Florida Publico executives, editors, and reporters accepted their version as gospel.

Ross Legrand of the railroad says now that there never was any real suspense: "They [Westinghouse-Tenneco] were only interested in Portsmouth if it fell dead in Jacksonville." Virgil Fox and J. J. Daniel agree. Daniel, chairman of the executive committee of a large Florida real estate firm and a prominent member of Florida Publico's board of directors and of the chamber of commerce, recalls being told by A. P. Zechella, then the manager of Westinghouse's special projects division and now president of Offshore Power Systems, that Portsmouth was a distant second choice, a back-up only if plans went radically awry in Jacksonville. "Portsmouth did not want them [Westinghouse-Tenneco] there," Daniel recalls, although he does not recall the reason. "The papers here let them know they were wanted."

Fox supplies a reason. Early on, he was told that the concentration of industry in the Portsmouth area—including Tenneco's shipyards there, the country's largest—posed a labor problem for a project that would eventually require a work force of 14,000. One of the first men in Jacksonville to know about the project Fox adds that he never regarded Portsmouth as a serious threat to Jacksonville's chances for the prize industry.

The impression created by Florida Publico coverage of the OPS story was that the people of Portsmouth were also caught up in the suspense and excitement of this multimillion-dollar horse race. They weren't. During the eleven-week selling campaign in which the *Times-Union* and the *Journal* bombarded their readers with 146 Westinghouse-Tenneco stories, including sixteen editorials on the project, *The Virginian-Pilot* and the *Ledger-Star*, covering both

Portsmouth and Newport News, published between them seven stories and one editorial on the project. *Single* stories published in the *Times-Union* occupied more column-inches than *all* of the Westinghouse-Tenneco news and editorial copy printed by both Virginia papers.

Before the OPS project could come into being, a number of hurdles related to the factory site would have to be cleared. The site Westinghouse-Tenneco wanted, because it offered access to the Atlantic Ocean, was on Blount Island, an island in the St. Johns River midway between Jacksonville and the ocean. At the island's center lay a 250-acre saltwater marsh or estuarine bayou known as Back River, in memory of a river which had long since ceased to flow. (While dredging a ship's channel in the 1950's, the U.S. Army Corps of Engineers had used Blount Island as a spoil site; deposited spoil stopped Back River's mouth.)

The first (very low) hurdle, approval by the city council of dredge-and-fill operations on Blount Island, was surmounted on May 4, when, after a five-hour public hearing, the council voted unanimously to approve. Members had made up their minds on the matter before the hearing was held; weeks before the hearing took place, the council had allowed its name to appear on a forty-foot-high billboard which bore the message: "Westinghouse-Tenneco, The Kind of Neighbor We All Want." The idea for such signs, which proliferated throughout Jacksonville, had come from the chamber of commerce's Committee of 100.

Following up on another Committee of 100 idea, on May 5 both Florida Publico papers ran a two-page, three-color ad which read "Westinghouse-Tenneco can bring you a brighter tomorrow . . . and a Greater Jacksonville . . . WE WANT THEM HERE," and which was signed by "*The Florida Times-Union* and the *Jacksonville Journal*."

The second (higher hurdle, certification by the state's pollution-control board, was overcome on May 22. The third hurdle was cleared the next day when Governor Reubin Askew and the cabinet, in their role as Trustees of the Internal Improvement Fund, voted to permit dredging and filling on Blount Island. TIIF executive director Joel Kuperberg and his staff had recommended that the trustees should delay their decision. "The trustees cannot adequately protect the public in the light of the information we now have available to us." Kuperberg said a week before the vote. "I feel very, very nervous about having this thing finally being decided next Tuesday." The *Times-Union* paraphrased Kuperberg's strong remarks and then buried them twenty-one column inches deep in a story headlined City Delegation Presents its Case to Cabinet for a-Plant Fabricator. The *Orlando Sentinel*, like other non-Jacksonville newspapers, viewed the TIIF director's remarks as being sufficiently newsworthy to justify a separate story, which it headlined a-Plant Pressure Charged.

DIVERSIONS AND "BALANCING ACTS": THE DREDGE-AND-FILL ISSUE

From the start, Florida Publico's editors and reporters billed the OPS plant as an ecologist's dream. Sustaining this image required great delicacy in the treatment of certain topics—for example, the proposed location of the giant plant (Blount Island's Back River marsh, noted for its wildlife). In Wachendorf's lead-off story on March 9, the proposed location is not mentioned either in the headline or the lead sentence or in the caption under the five-column artist's rendering of the future plant on the *Times-Union* front page. The island—but not the marsh—is finally mentioned thirteen inches deep in the story after a jump to page 5.

That afternoon's *Journal* said that there were *two* "Major Islands In The News." The *Journal*, like the next day's *Times-Union*, reported a plan, complete with a map, for building a recreational park on Quarantine Island, across the river from Blount Island. Congressman Charles Bennet told the *Times-Union:* "I envision picnic spots, boat launching ramps, a swimming pool, baseball diamonds, soccer fields, and perhaps even an outdoor amphitheater for concerts and plays. Tropical plantings and lights could make the area a real beauty spot for our city."

Quarantine Island? A check in the Florida Publico clipping morgue establishes that it had not been worthy of either newspaper's attention prior to March 9 and would never again make it into print after March 10. The stories quoted officials who said that the park could become a reality only *if* the state donated the island to the city, *if* an upcoming bond issue were used to pay for

the park, and *if* Congress provided matching funds. None of these steps was taken, and the island was forgotten. But the maps and the long sidebar stories did associate the OPS project with the prospect of water's-edge fun and games for all.

For weeks, Florida Publico reporters stressed the environmental cleanliness of the OPS project. For weeks, they neglected to mention the need for extensive dredging and filling of the marsh and wildlife areas of Blount Island. Executive editor John Walters, like publisher Feagin, a member of the knowledgeable Committee of 100, ignored the gap in the story. George Wachendorf did nothing to plug the gap, either.

The first clear statement that Back River would have to be filled appeared in Florida Publico's papers on April 13—more than a month after the first OPS coverage—and then only because a UPI wire story from Tallahassee, carried by many other newspapers in the state, prompted the company's editors to divulge this news, in their fashion.

The news out of Tallahassee was that two state environmental officials had said that "the tidal bayou known as Back River, which must be filled in for the [OPS] plant, is 'biologically valuable.'" *Times-Union* reporter Tom Longhurst reported this story in a balanced article headlined Value of Back River Bayou Debated in Governor's Office. He also prepared a sidebar on the request by five Jacksonville conservation groups for a cost/benefit study of the OPS project. His contributions were buried in the women's section, on page 46. At the *Journal*, editors tinkered with the wire service story throughout the day. In the first edition, they headlined the story Biological Value of Bayou Claimed and placed it on the front page of the local section; in its final city edition the headline was changed to read Askew 'Supports' Factory Location. Between editions, a new lead—about Governor Askew's "qualified support" for the location—had been inserted, and the paragraph reporting the environmentalists' position was moved from the second paragraph to the sixth.

Not content with deftly obscuring the news that the cost of the OPS project was to be the Back River bayou, the editors of the *Journal* took care to put it "in perspective." Thus, the rewrite of the UPI story ran under another story which bore a larger headline: Tidal Silt Said Rapidly Filling Back River. Written by Joe Caldwell, who had covered the port authority since its founding in 1966, the article began:

Caldwell had had to do no digging to come up with his story. Several days before his article appeared, the Jacksonville Port Authority had provided him with a copy of a report made, on behalf of the JPA, by Dr. B. A. Christensen, an expert in coastal and oceanographic engineering. Caldwell does not recall when he was handed the report, which bears the date "March 1972," nor can he say why his superiors chose that particular afternoon to review it. In any event, his article served the usual purpose: the transcendent environmental goodness of the OPS project was preserved—Back River was "dying" anyway; by filling it, the Corps of Engineers would merely be speeding up its inevitable demise. Thereafter, Florida Publico reporters found themselves unable to write the words "Back River" without following them with "dying anyway" or "the dying cul-de-sac."

Officials in Tallahassee and biologists throughout the state were upset by the Christensen report—and by the uses to which Jacksonville's newspapers could be relied upon to put it. Kuperberg of the TIIF called the dying cul-de-sac thesis "absolute humbug." Kenneth Relyea, a professor of biology at Jacksonville University, said "It all depends on what you mean by 'dead.' When a body of water gradually fills in and becomes a marsh, then a swamp, then a hardwood hammock, then a forest, when was it 'dead'? But Back River will be dead in every sense of the word when they pour concrete and build a plant over it." (Such comments by this local and articulate expert on the subject did not find their way into print in Jacksonville.) Robert Routa—chief of survey and management of tidelands for the state's department of natural resources, and a marine biologist—felt that laymen were being misled and asked Christensen to clarify his statement. In a letter to Routa—a copy of which Routa made available to UPI and which came over the wire to Jacksonville on May 2—Christensen wrote, in part: "The word 'dead' does not refer to the biological system (or ecosystem) but *strictly* to the river as a physical hydraulic system."

Christensen's report had made a splash on April 13, when it had provided the perfect buffering for the "bad news" from Tallahassee that Back River

would have to be filled; his qualifying statement was ignored on May 2 by the *Journal*, then was positioned on page 5 of the second section of the following day's *Times-Union*, nearly three column-feet deep in a story that disputes Back River's biological worth. Christensen's qualification had come too late; both papers continued their litany of "dying anyway."

Any reporter who had bothered to look into the *Times-Union's* "salt marshes" file in a large cabinet in the exact center of that paper's newsroom could have found a very different view of Back River. The reporter might also have drawn some conclusions about why in 1972, the year of the OPS project, the Jacksonville Port Authority had asked a hydraulic engineer to assess Back River, whereas previously it had asked biologists to study the bayou. In 1969, the JPA had commissioned Robert Routa, of the department of natural resources, to study Blount Island. In a report that started out by asserting that "salt marshes are among the most biologically productive areas on earth," Routa had written of Back River. "This bayou is exceptionally productive for marine life and should be preserved intact. A buffer zone should be left between it and industrial development." In 1970, the JPA had turned to Kenneth Relyea, at the local university. Relyea's report, submitted to the JPA on February 20, 1970, ended on an unequivocal note: "I can state that . . . spoiling of the proposed areas [which included Back River] would be an ecological disaster equal to any such disaster that has occurred in North America. . . ." Neither report was judged newsworthy by Florida Publico's editors at the time of its release; neither was used to give background and balance to the Christensen-report story.

On May 2, a 10:20 a.m. dispatch from UPI in Tallahassee took the *Times-Union* and *Journal* newsrooms by surprise. The story, written by Tallahassee Bureau Chief Barbara Frye, began:

A new biological study turns thumbs down on location of a multimillion-dollar Westinghouse-Tenneco plant on Blount Island in Duval County, State Natural Resources Director Randolph Hodges reported today.

". . . This proposed project will result in the irreversible commitment of a large area of productive marsh habitat and will have massive adverse effects on the marine biological resources of Northeast Florida," according to the six-page report signed by Robert A. Routa, Chief of Survey and Management for Tidelands.

"An alternate site should be found for this industrial plant and Back River should be conserved so that it can continue to function as an important part of the St. Johns estuary," it concluded. . . .

Routa recalled that previous studies found the St. Johns River to be "probably the most important single feature affecting the shrimp population of the northeast coast of Florida." He said Back River is heavily utilized by these shrimp on their migration in and out of the . . . river.

Reporters at work in the newsrooms near the wire service machines on the morning of May 2 recall that city editors judged the story too hot for them to handle. Routa was, after all, the senior staff biologist of the agency responsible for all of Florida's natural resources. The story quickly ascended the chain of command to the office of executive editor John Walters.

"We don't want this," Walters told a reporter. "Let's hold this until we get something to balance it."

Walters called *Times-Union* reporter Jim Ward to his office. Normally the story would have been assigned to *Journal* reporter Joe Caldwell, since the story broke on *Journal* time; but Walters decided that the *Journal*, two hours away from its first edition deadline, could go to press without the news from Tallahassee. (The *Times-Union*, incidentally, has been known to replate its final editions to make room for such late-breaking stories as the Boy Scouts of America's bestowal of its Silver Buffalo Award on Prime F. Osborn III, vice president of Seaboard Coast Line Industries and president of the Louisville and Nashville line, at a scouts' conference in California.) Walters trusted Ward, who occasionally refers to himself as "the sacred cow reporter." "I know what those people up there want," Ward once told a fellow reporter, with a lift of his eyes toward the fifth-floor offices inhabited by Feagin and other Florida Publico executives, "and I bive it to them."

Ward's regular beat was city news—United Fund dinners, trophy-presentation dinners, meetings of the local historical society, the North Florida spelling bee (sponsored by Florida Publico), and Robert Feagin's recent resignation

from his post as president of the chamber of commerce because of his publishing company responsibilities. As of March 1972, he had never seen Back River.

As Ward recalls, Walters told him to go the JPA office where Peace would give him a report which he would find useful. Ward says he left Walters' office with the clear impression that his assignment was to counter the bad news conveyed by Barbara Frye's UPI wire story with whatever helpful news he could extract from the report Peace would hand him. Walter's reasoning, Ward says, was: Barbara Frye is the wife of Earl Frye, director of the Florida Game and Fresh Water Fish Commission; members of this commission had worked together with biologists of the Department of Natural Resources in preparing the report which Routa had signed. Her husband "had somehow gotten to her"; she was, therefore, "not objective"—this despite her thirty years as a UPI correspondent.

It was about 2:30 P.M. when Ward rushed out of the Florida Publico building; he had until 10:00 P.M. to produce a "balanced" rewrite.

The report Peace handed Ward was the biological appraisal section of an "industrial land market study" of Blount Island, whch the JPA commissioned in October 1971, shortly after it, SCI, and the chamber of commerce had begun their negotiations with Westinghouse-Tenneco. The firm hired for the job was the Battelle Memorial Institute, of Columbus, Ohio, which specializes in doing research on industrial development. The biological appraisal section was done by Frederick C. Tone, a biologist on the staff of Battelle-Duxbury, in Duxbury, Massachusetts.

"I was lost," Ward recalls. "The report wasn't finished. There were all those bird and fish names and all these scientific formulas that I didn't understand. But I got it [the information he needed] from the summary. The summary pretty well had it all there."

Ward zeroed in on the last lines of Tone's report—which sounded strikingly similar to the recently-published "dying-anyway" Christensen report, which Christensen had just clarified. Tone had written:

"Although nearly two-thirds of Back River is quite unproductive in its present heavily silted state, based on existing data, the remaining portion near the mouth is still making important contributions to the Blount Island environment. Yet when compared to apparent productivity in Nichols and Browns Creeks and when it is realized that it is rapidly silting in and will soon die from an environmental standpoint. Back River's contribution to the Blount Island region is considered to be important only on a short term and limited scale. Any additional conclusions will require supplemental data."

This allowed Ward to start off his rewrite (the first thirty-six column inches of which are devoted to Tone's report and a rehash of the Christensen report) as follows:

"An in-depth ecological survey of the Back River shows the silted and dying inlet on the Jacksonville Port Authority's Blount Island is productively interior to other marshlands in Northeast Florida and only of short-term and limited environmental importance."

The "balance" requested by Walters is hard to find in that lead sentence or in the story's headline (Back River Ecological Worth is Held Limited) or, indeed, in any aspect of the story.

Both the introduction and summary of Tone's report contained a number of important qualifications. Tone notes, for example, that the JPA had requested "a rapid survey"; that "all collected data are a result of a three-day sampling period in January 1972"; that in January "many species are off-shore and not in their marsh-dependent stage." Ward buried these qualifications 200 lines deep in his story. He buried Christensen's clarification—which called Ward's whole lead into question—280 lines deep in his account. He buried Routa findings—*the* news in the UPI story, which he had been asked to "balance"—293 lines deep.

More important, while Ward emphasizes that Tone's report "is marked contrast to" Routa's, he nowhere mentions that Tone was the *first* and *only* biologist whose research might be said to justify the filling of Back River—no doubt because he had not read the Relvea and Routa reports in the newsroom file. (Nor, indeed, had Ward read this new Routa report; all the direct quotes from it that appear in his rewrite were taken from Frye's account). One man's three-day study of a marsh, made at a time when its marine life was least in evidence, is balanced against three studies made by Florida biologists over ex-

tended periods of time—and the Massachusetts biologist's report, commissioned as part of an industrial land market study, is found to outweigh them all.

Ward made his deadline. Walters, pleased with the rewrite, sent the reporter a special note of thanks. In the envelope, Ward recalls, was a check for $125 from publisher Feagin. He, too, was pleased.

There were further expressions of company appreciation for a job well done. In the June 1972 issue of *Intercom*, Florida Publico's in-house newsletter, Bruce Manning, the managing editor of the *Times-Union*, wrote:

"Jim Ward's outstanding job of putting together an elaborate story on the Battelle ecological report on Blount Island was recognized as a standpoint performance in the best professional tradition of speed and completeness."

Two weeks after his high-speed rewrite, Ward was assigned to a story that took him to Blount Island. Turning to another reporter, he asked: "Where is Back River out here, anyway? I helped kill all those poor little shrimp and I've never even seen the place."

Ward's story was outstanding in one respect: it spelled out, for the first time since Florida Publico's coverage of the OPS project began, the number of acres on and around Blount Island that would have to be dredged (550 acres) and filled (800 acres of marshland and fringe). The figures were cited in the UPI story; apparently, no Jacksonville reporter had extracted these figures from the local port authority, which had filed the dredge-and-fill permit. Ward's citing of them marked not only their first appearance in Florida Publico's two dailies, but also, with the exception of one *Journal* reference, the only time during this period that a Florida Publico reporter would get the number of acres involved in the massive dredge-and-fill operation straight: 1,350 acres. Thereafter, when the two papers referred to dredging and filling required for the project, the figure mentioned was almost invariably 250 acres. "Interesting oversight, wasn't it?" remarked George Wachendorf, whose reporting repeatedly set the loss of marshland at 250 acres, when this discrepancy was later called to his attention. "As fas as I'm concerned, OPS was so good for Jacksonville that if someone had told me they needed even ten per cent of all the marsh in the country, I wouldn't have cared." His explanation for any inaccuracies involving the marshes was, "I'm not an environmentalist."

THE MISSING OTHER SIDE

The argument for encouraging OPS to settle in Jacksonville was strong. As Florida Publico's papers incessantly reminded their readers, it would mean 8,000 or 10,000 or 14,000 jobs and a $100 million payroll each year. But reasonable citizens raised reasonable objections to the way the project was being pushed through. The *Times-Union* and *Journal* either refused to cover such people or counter-punched them into oblivion.

Crutis Lovelace was one local critic of the project whose treatment by Florida Publico's editors may stand as an example of that afforded other Jacksonville critics. Lovelace was president of the Citizens' Committee of 100 (no kin of the chamber of commerce's Committee of 100), a group "dedicated to the preservation of our natural resources. Florida's greatest asset." He was not a rabid conservationist. Almost immediately upon learning the nature of the OPS project, five other Jacksonville conservation groups had voted to oppose the project until a cost/benefits ratio study had been made. Lovelace's group refused either to oppose or approve the project, despite strong pressure from conservationists and members of the chamber of commerce alike, until April 23, when it, too, formally opposed the project pending a cost/benefits study. Lovelace repeatedly hand-delivered letters and press releases, which raised questions about the project, to both newspapers.

In a recent interview, published Feagin and executive editor Walters were asked about their failure to give Lovelace and other conservationists a chance to be heard. Both men spoke at the same time. Feagin spoke strongly, saying that in the interest of a balanced presentation of the Westinghouse-Tenneco news the *Times-Union* and *Journal* had solicited the views of environmentalists and other researchers who questioned the project, and that Lovelace, as spokesman for the body of North Florida environmentalists, had been given equal time by the newspapers. "We explained his position time after time," Feagin recalled.

Walter's recollection differed. The editor acknowledged that Lovelace's questions and findings had been ignored by the papers, justifying his decision to do

so on the ground that "he had been around talking about the environment for a long time. Oh, ten years. By this time he was making wild claims simply for notoriety's sake. He had begun to sound repetitious."

Walter's memory is the more accurate. During the first two and a half months of Westinghouse-Tenneco coverage, Lovelace was mentioned by name only once, thirty-six column inches deep on a *Times-Union* back page.

While men and women who had doubts about the project were treated as nonpersons or put down in print before they could speak for themselves, those who wholeheartedly approved of the OPS project loomed large in Florida Publico news. Thus, for example, in two and a half months of photographic coverage both newspapers between them ran a total of *one* photograph of an opponent of the project: a picture of Frank Flook, a member of the Florida Wildlife Federation and of the local chapter of Zero Population Growth, appeared on a back page of the *Journal*. During that period, the *Times-Union* ran dozens of photographs of supporters, from Florida's Governor Askew to Westinghouse's A. P. Zechella. But the paper never showed the face of a critic.

EPILOGUE

On May 25, 1972, the day OPS announced its decision to come to Jacksonville, Mayor Hans Tanzler declared, "I believe this is Jacksonville's finest hour," thereby providing the headline for the evening paper. "The plant," he went on to say, "will literally transform our lives."

"I don't want to say that the newspapers prostituted themselves," comments Seaboard Coast Line executive Ross Legrand. (His choice of words was not prompted by the interviewer.) "What I would say is that they were serving the public interest."

The interviewer suggested that it might be healthy for a newspaper to maintain some skepticism or at least some show-me objectivity in the face of a development as vast as the OPS project.

"That's not the way our newspapers here work," Legrand replied. "Our papers work to promote growth."

Florida Publico board member J. J. Daniel defends the two papers' coverage of the Ops project on similar grounds. Asked why editors had not been urged to provide more balanced coverage. Daniel replied. "I don't think the newspapers should have been critical or skeptical. . . . Both Westinghouse and Tenneco are so reputable. The paper chose to support it." Asked whether he thought the support the two papers gave the project throughout their pages should have been confined to their editorial pages, Daniel replied: "How many people do you think read the editorial page? What do you think the percentage is of people who read the news pages versus those who read the editorial page? Seventy-thirty? Do you think it is that high? Our papers let them know they were wanted."

Asked whether Florida Publico's all-out support for the OPS project was related to the fact that Seaboard Coast Line Industries stood to gain increased railroad business from the project, Daniel replied, "If I believed that the railroad was telling the papers what to write, I would quit the board tomorrow." He did acknowledge that the railroad had exerted influence in the past. "When I first became a member of the board [in 1968]," Daniel said, "I went to see [Robert] Millar [Feagin's predecessor as publisher] and asked him about the newspaper and the railroad. He told me that certain taboos and prohibitions had grown up over the years. 'This is pretty much the way we run things,' he told me." Not any more, Daniel recalls informing Millar. Daniel says that if the railroad still receives special attention in the *Times-Union* and *Journal* newsrooms, it is only because "the change in attitude has not settled down to that level."

In a May 1972 interview which appeared in the *St. Petersburg Times*, but which readers of Florida Publico papers were spared, Joel Kuperberg of the THF remarked: "The Westinghouse-Tenneco plant may be the best thing that ever happened. If it's a good project it should stand up under examination. It would appear that they [Jacksonville's newspapers and civic leaders] didn't want it examined."

Responding to this statement, George Wachendorf, who wrote more Westinghouse-Tenneco copy than any other Jacksonville journalist, said in a recent interview: "Nothing stands on its own two feet. You are operating in an unreal

world if you think so. You have to sell anything. I am hesitant to think that saying something once or in measured terms gets across to anyone. My job was to make them aware. If I could help it, everyone was going to know about it, even the shoeshine boys. . . . In my mind, the son of a bitch was a winner. My major worry was that people wouldn't realize how good this thing was. That is why I pressed the point. I did for Westinghouse-Tenneco what a good public-relations firm would have done. Maybe I got carried away." (Throughout 1972 Wachendorf moonlighted as a one-man public relations firm, preparing annual reports and investment brochures for several Jacksonville firms. At least three of his clients enjoyed favorable attention in his *Times-Union* financial affairs column. In March 1973, he was given the choice of remaining as business news editor with a raise and giving up his work in public relations, or leaving the paper. He left to become president of Wachendorf Associates, a firm specializing in corporate communications and investor relations.)

Former *Times-Union* reported Tom Hoey, now director of public relations for the Jacksonville Port Authority, adds: "In retrospect, it appears that it was a selling job. If you are for a thing, if you have decided that it is good for the community, then you should sell it, I guess. We were not told to write anything false, but to stick to the helpful facts. Everything we said was true, but we left some of it out. We didn't seek stories, we took handouts [from OPS, the JPA, and the chamber of commerce]. Anything negative, Dick [Stalder, *Times-Union* city editor] turned his head.

"OPS was very helpful. They sold the paper a bill of goods and they sold us. Obviously it was in their interest to play down any of the problems, problems that are now cropping up. It wasn't Westinghouse's job to point out the problems."

Exactly.

Among the problems that have cropped up: Back River has been filled in, but orders for floating nuclear plants have dried up. In the fall of 1973, OPS had orders for four such plants from the Public Service Gas and Electric Company of New Jersey, the utility which had developed the concept of floating nuclear plants, and letters of intent for the purchase of four more: two for Louisiana's Middle South Utility System, two for the Jacksonville Electric Authority. (Swept up in the local effort to boost OPS, the JPA offered to sponsor up to $180 million in tax-exempt industrial revenue bonds for Ops, a gesture of support that could save the company millions of dollars in interest by providing it with a loan at municipal rather than commercial rates. Officials of both the JFA and the JPA stood to profit from the success of the Ops venture Truett Ewton, the chairman of the JFA, was also vice president for Gulf Life Insurance, the company awarded the group insurance for OPS employees, while Thompson S. Baker, chief officer of Florida Rock Industries and a member of the JPA's board of directors as well as of Florida Publico's, was awarded a $4-million contract to supply OPS with materials.)

Then came the recession, and inflation—and, in Jacksonville, a new general counsel for the city. Middle South Utility System let its letter of intent lapse in December 1973. The following summer, Jacksonville's new general counsel, Harry Shorstein, reviewed the proposed contract between Ops and the Jea and concluded a scathing analysis of its terms by writing that its execution would be "contrary to the public interest." The purchase price for the two plants came to $2.2 billion; the JEA, whose total assets are valued at $515 million, proposed to raise this sum by floating a bond issue. Shorstein, who described the proposed $2.2-billion bond issue as "the largest amount of tax-exempt debt ever offered for sale to finance any project in the history of the United States," pointed out that making payments for the two floating nuclear plants could quickly bankrupt the Jea, costing the people of Jacksonville their municipally owned utility system and about $25 million a year in revenues which the Jea normally paid into the city's general fund. In September 1974 the Jea allowed its letter of intent with OPS to expire. A few days later, PSE&G of New Jersey postponed all of its orders for five years—its first plant is now scheduled to be delivered in 1984—because of lower forecasts for energy demand and higher interest rates on loans.

On February 1, 1975, Tenneco dropped out of its partnership with Westinghouse. By the summer of 1975, OPS was trying to persuade the federal government to buy four floating nuclear plants, which it could then lease to utilities along the Gulf and Atlantic coasts. Westinghouse is now lobbying hard for

President Ford's Energy Independence Authority bill, which would set up a $100-billion corporation ($25 billion of equity, $75 billion of debt) to assist private sector energy projects. Whether the country at large needs floating nuclear plants remains an open question. A study just completed by the environment-conscious Scientists Institute for Public Information, for example, finds that rising construction costs will make the production of electricity at nuclear power plants, earth-based and seaborne, economically impractical within ten years: nuclear power will cost more than coal-based power.

Ops officials, meanwhile, say that they are committed to the offshore venture and that Westinghouse will back it even if no federal funds are forthcoming. But today there are no 8,000 or 10,000 or 14,000 jobs for Jacksonville workers out on Blount Island. Ops, which was to have begun work on the world's first floating plant last summer, has cut its work force from 700 to "305 office-oriented people." The huge assembly plant will now be built piecemeal, an OPS spokesman says, each section being completed in time for next process in the manufacture of a floating nuclear power plant.

It would have been asking too much of any newspaper to foresee the difficulties that presently beset OPS. But it would not have been asking too much of Jacksonville's two dailies to have reported the pros and cons in the beginning, before the community's decision was made—to have behaved, in short, like newspapers rather than like publishing arms of the chamber of commerce.

The CHAIRMAN. Well, thank you. I thank all of you gentlemen very much for your presentations.

That was quite a story. I see it was featured, as you say in U.S. News and World Report. I have a copy of the article here.

Mr. SIMPSON. Mr. Chairman, I am John W. Simpson of the Westinghouse Electric Corp.

Could I make a brief statement?

The CHAIRMAN. You certainly may.

Mr. SIMPSON. I was very involved in the founding of the Offshore Power Systems Co., which is a wholly owned subsidiary of the Westinghouse Electric Corp. The project is a very viable project, technically and economically. It is in trouble neither technically nor economically.

We are asking for no bailout from anyone. We have firm contracts for four floating nuclear plants of 1,150 megawatts each with the Public Services Electrical and Gas Co. of New Jersey. This will furnish power to New Jersey cheaper than any other possible source.

If the Federal Government, in its wisdom, wishes to buy plants, it is their option to do so. We believe that there would be some merit in having these plants, because in the event of a power shortage in any area, they could be moved to that area.

Such orders are by no means necessary for the financial viability of the project. In the long run, that project will become increasingly viable, furnish power increasingly cheaper to the utilities who have suitable sites.

Public services delayed its order 5 years through no fault of ours, only due to the fact of the lack of energy in the United States bringing down the economy and resulting in low growth in load in the State of New Jersey.

I think that is all I have to say.

There is no bailout. There is no financial problem. We are proceeding.

Next, with respect to Mr. Patrick Codell, who is a consultant of Westinghouse furnishing public opinion information. There is a proposition, known as proposition 15, before the people of California,

the initiative to be voted on on June 8. It is our opinion, mine as an individual, the atomic industrial forum's and a great deal of industry, that the people of California simply do not understand what they are voting for.

A recent opinion poll showed that of those people who stated that they would vote in favor of proposition 15, approximately 50 percent thought they were voting, when asked, for nuclear power instead of against it. Twenty five percent of the people who said they would vote in favor of proposition 15 admitted to the poller they didn't know which way they were voting, they were just voting.

Under those circumstances, backed up by industry's and the people's constitutional rights to defend themselves and to discuss legislation, backed up by the superior and supreme court of California and the Supreme Court of the United States, we in industry are exercising our constitutional right to advise the people of California the facts surrounding proposition 15 and urging them to vote "no" on proposition 15.

Thank you, sir.

The CHAIRMAN. I want to get into that maybe later, gentlemen. I think maybe we could devote an hour or two to that, but I think we better stick on this legislation for the time being. Perhaps at the end we may have time to discuss this particular problem further. I have some questions with respect to that.

Let me first ask Mr. Cameron—and, Mr. Simpson, you might want to comment, too. You both made a good case for Federal assistance to finance long leadtime capital intensive energy facilities, for example, fuel enrichment, reprocessing operations which you mentioned, Mr. Simpson.

Federal assistance should go to projects which offer the best hope of achieving energy independence, the most innovative technology, the most efficient production methods. Frankly, I am not convinced that this Energy Independence Authority would to this.

The range of projects which can be assisted is very broad, would include anything, and I quote, "essential to the production or use of nuclear power." It appears that EIA could finance any nuclear plant on the production line today under that broad language, and I am just wondering whether or not this can be justified.

For instance, the language of the bill provides the authority shall not provide financial assistance to a project which would otherwise qualify for financial assistance if in the judgment of the board of directors such project involves technology which is in the research and development phase or project application doesn't display satisfactory levels of efficiency, management levels, or other factors. That is about the only safeguard.

The charge has been made, and it is a charge that concerns me very much, that this could go into inefficient technologies simply because the pressure would be there to build atomic plants or to provide for a plant that might permit you to liquefy or gasify coal. The cost would be high, and the commercial prospects would not be very promising.

What is your answer to that?

Mr. CAMERON. I would only answer with respect to synthetic fuels, Mr. Chairman. I might defer to Mr. Simpson to discuss the nuclear question.

Insofar as synthetic fuels are concerned, I frankly am much more optimistic about the results that would come out of the legislation passed by the Senate and now being considered by the House, H.R. 12112. That legislation has been the subject last fall of exhaustive hearings. It has gone through a perfecting process in order to make sure that there are not wasteful uses of the loan guarantee authorities that will be granted under it.

If, indeed, there is passed in the future an Energy Independence Authority, the administration has said that the program would be folded into the EIA. But I believe that synthetic fuels can best get under way now under the aegis of H.R. 12112, with government risk-sharing with industry.

The CHAIRMAN. That bill in the House, as I understand, provides for $2 billion in loan guarantees.

Now, this is a $100 billion bill. It sounds as if, in view of the fact that synthetic fuels would be a major part of this operation, the $100 billion may be too much. It may be extravagant.

Mr. CAMERON. I have not seen any breakdown of how the $100 billion might be used, but, frankly, the original bill considered before the House and passed by the Senate was a $6 billion loan guarantee, which would have covered the development of about 350,000 barrels per day of synthetic fuels.

The CHAIRMAN. Is it your contention that what would happen is that the process, for example, of liquefying coal or of making oil shale commercial, that that plant would come onstream and then you would work out the bugs, work down the costs, and you would be able to get the costs down from what might now be projected at $15 or $20 a barrel down to the $6 or $7 or $8 that we are aiming toward?

Or do you think that all it would do would produce fuel at this very high cost?

Mr. CAMERON. No; I think that the costs of oil from oil shale, oil from coal and gas from coal, probably initially will be in the range of those figures that I mentioned, anywhere from $12 to $25 a barrel, covering the full range.

Now, we are talking about 1976 dollars. If we go ahead and build this initial suite of plants, we are going to learn a lot. Those plants that might be built at a 50,000-barrel-per-day capacity—after we learn to operate them better—probably will be increased in capacity to 60,000 or 70,000 barrels a day. In real terms, we will reduce those costs.

The CHAIRMAN. I think what I hear you saying is that we will build a plant or series of plants to produce at this $15 or $12 to $25 cost, and we will learn in that process what is wrong with that plant. Then we have to build another plant to produce at the lower cost.

Is that right?

Mr. CAMERON. No; an industrial plant is not like a 1976 Chevrolet, which is always a 1976 Chevrolet. When you build a 1976 industrial plant, every time you bring it down for maintenance, you put it back together better than it was before.

So we expect to see improvements in the economics of those initial plants, because you will incorporate the new things you learn.

But the important aspect of this whole concept is to be prepared to build better plants the second time around, to expand the industry with a more mature technology and more experienced manpower.

The CHAIRMAN. Can you give us any hard evidence that this is likely to lead to a lower cost fuel that would be competitive with oil?

Mr. CAMERON. Every experience we have had in the past, from building oil refineries to airplanes, we have always been able to increase efficiencies and reduce real costs.

The CHAIRMAN. Provide us documentation for the record.

Mr. Simpson, let me sharpen the question. It's been charged that this bill is a bailout for the nuclear power industry.

That the costs to the nuclear power industry have been much, much higher than they thought they would go, and that they are inefficient and that the Federal Government will pick up financing for large projects that have failed to make it on the private market, because they are not economical.

What is your response to that?

Mr. SIMPSON. Well, I think that is not a correct statement of the facts, because I think that this bill would only provide money for plants in the event that a utility had decided that the cheapest way to produce power was with a nuclear plant.

The CHAIRMAN. Yesterday, Vice President Rockefeller testified that most of the money might go, and he was justifying $100 billion, might go to nuclear powerplants, that we have to increase the number, so we will be producing 30 percent of our power within 10 years or 27 percent, a very large proportion with nuclear plants.

Now, it seems to me that if you are looking at it that way, then you aren't going to get the cost down to a competitive level, are you?

Mr. SIMPSON. Nuclear plants produce power much cheaper than an oil-fired plant, substantially cheaper than Eastern coal, marginally cheaper, but cheaper than Western coal without scrubbers.

Now, in the area where you have a need for the power, the utility, for whatever reason of the past, no longer has the bond rating where they can borrow the money or, for example, they have to have 2 times interest coverage in order to borrow any more money and they do not earn that much. They can't sell common stock, because they are selling it at 60 to 70 percent of the book value, and any dilution simply makes the stock worth less with a series that only converges at a zero price for the stock. Then if the people in the utility, think nuclear is the cheapest, it seems reasonable that some assistance in borrowing money for that area that would not otherwise be provided, would be reasonable.

I would think only in the event that a great many utilities found themselves in a position they simply couldn't borrow money and couldn't sell stock, that you would use this bill to build nuclear plants.

A nuclear plant is a very viable financial deal on its own to be built by any company that itself is financially capable.

The problem is not the nuclear plant isn't an attractive financial venture, it is that utilities in some cases might not be able to borrow money for anything, even to buy coal.

Now, the other part is on the solidification. To me the solidification of nuclear waste is a very special situation. There is no market for this radioactive waste. The waste by law must be turned over to the Federal Government. It must be buried in a solid form.

If you are sending it to the Federal Government for storage, it is not a normal commercial venture and there is no good way to determine a fair price.

So it seems reasonable that the government would be involved in the financing of a solidification process. It has no other useful industrial use, except solidifying the waste to turn it over to the government to bury.

There are a number of special cases like this where I think that it might well be that this act could come in.

The CHAIRMAN. Mr. Browder—I beg your pardon.

Mr. SIMPSON. When you are talking about the—I believe, it was Mr. Cameron, who said that the price would come down, I don't think he meant to say that it would be lower than other forms of energy, but that any given plant would have lower costs later than it did at the start; is that correct?

Mr. CAMERON. Right.

The CHAIRMAN. I presume it would have a lower price, but if it is not going to come down into a range where it would be competitive, where it would be able—this authority only lasts 10 years, only 7 years when they make commitments. If they can't get it down in that period, then what happens?

Does the Federal Government have to operate or subsidize it with some kind of price support program or price differential, price subsidy?

Mr. SIMPSON. I personally don't believe it is possible in this period of time to get it down, because starting today, by 1983, 1985, we will be lucky to be through the second phase on these things that take so long to build.

I think you also have to take into consideration the cost of the coal that goes into it, which is the key place you start.

But you are going to need synthetic gas and synthetic oil for those uses for which we have no substitutes, regardless of whether it is less expensive, because in the not-too-distant future we are simply not going to have enough natural gas and natural petroleum liquids to go around.

Then we are going to need these even if they are not economically competitive.

The CHAIRMAN. Mr. Browder, on the first page of your statement and throughout your delivery, you claim the EIA would develop our lowest grade, most remote and most costly resources, all at the highest price and highest rate of consumption.

Well, the bill requires the EIA to finance those projects which would contribute to energy independence.

It would have a clear directive to get the most effiicient, most promising energy sources for development and financing.

Why do you think they would be this perverse?

Mr. BROWDER. Well, sir, all that is required is a look at the Administration's existing policy, a look at those industries and those companies that are lined up to get the subsidies.

I don't think you can look at the bill as if it were being proposed in the absence of anything else that is happening.

You can look at the Administration's policy, oh, as far back as Secretary Dent's tenure as, Secretary of Commerce, when he was proposing the list of plants that had to be subsidized.

Then just take a look at Mr. Cameron's very presence here and interest in this. I think it is quite clear which systems and which fuels are lining up, which ones are doing lobbying in favor of the legislation.

Today, the Science and Technology Committee on the House side is having more hearings on the synthetic fuel subsidy legislation. The Environmental Defense Fund is representing us and most of the others——

The CHAIRMAN. The fundamental point Mr. Simpson made that I think makes a lot of sense, we just need more fuel. The cost may be higher, but we need more energy.

Mr. BROWDER. We agree with that very much.

The CHAIRMAN. If we are going to avoid a situation where we are importing more than half of our energy and, therefore, are very dependent and very vulnerable and subject to international blackmail——

Mr. BROWDER. We agree with that very much, sir.

But this program is not designed to produce more fuel.

The CHAIRMAN. It is bound to, isn't it.

Mr. BROWDER. No, sir, it is designed to subsidize hardware construction, not fuel production.

At more than a billion——

The CHAIRMAN. That additional hardware would produce some fuel.

If, for example, let me give you an example. Supposing if we had 30 percent, maybe you can't get that high, but 25 or 30 percent of our electricity supplied by atomic plants in 1985. Why wouldn't that reduce the shortage we now have and create a situation where we have gone at least part way toward solving this problem?

Mr. BROWDER. I think you would have to take a look at what the alternatives were and the number and kinds of resources and amount of money that could be invested to achieve that same degree of energy production, whether it was through nuclear power or coal or a combined cycle——

The CHAIRMAN. Very good.

This is exactly what the GAO just testified to. They said they wanted to require that before these investments are made that there would be an analysis to determine whether this is the most efficient way of saving or getting a barrel of oil, whether the conversion method would be the best, solar energy, whatever it is, require that test.

Mr. BROWDER. The administration has already made its analysis. It hired Mr. Cameron to tell the administration that his process was the most efficient.

So we think the administration has gone through the process of making its agenda for those fuels and systems that deserve to be subsidized.

The CHAIRMAN. Are you saying they would ignore the law?

Mr. BROWDER. Yes, sir; absolutely. They would continue their same Orwellian use of language that they have in regard to energy production for the last several years.

The CHAIRMAN. Then what can you do? On the assumption that you said Senator Jackson had the same position, if you have President Jackson or President Ford or some other Democratic President, who would support the Jackson position on energy he is enormously influential——

Mr. BROWDER. Not everyone supports his position.

The CHAIRMAN. That is true. But it seems to me your position is one of just saying there is nothing we can do about it.

Mr. BROWDER. No, sir; there are a number of things we can do to produce energy in the country. But one of those things has to be to take a look at how direct Federal investment and how Federal spending indirectly influence private capital and influence which fuels and which systems we encourage.

To encourage the construction of billion-dollar facilities to produce 50,000 barrel a day energy systems would, in our opinion, and the opinion of a lot of other people, not give you enough energy for your money.

The administration's own synthetic fuel task force told the President, and you can have these documents, they are accessible to you just as much as to Mr. Cameron, that the synthetic fuel commercialization program would in no way contribute to U.S. energy independence.

The CHAIRMAN. You say you share our objective to achieve energy independence. How would you do it?

Mr. BROWDER. First I would get an honest definition of independence, and decide what level of imports we could achieve through diversification of our sources.

The CHAIRMAN. All right. I don't think that is unrealistic. The Vice President, in supporting his position, argued that importing 30 percent of our energy needs by 1985, would be progress toward independence.

Do you accept that?

Mr. BROWDER. Yes, sir.

Second——

The CHAIRMAN. How would you get there?

Mr. BROWDER. To the 30 percent?

The CHAIRMAN. That's right.

Mr. BROWDER. Sir, I would rather, because I feel more comfortable, talk about domestic fuel production, because those are the issues that our organization works on.

The CHAIRMAN. All right.

Mr. BROWDER. From the coal and oil and synthetic fuels work and energy facilities siting and electric power demand work that our people do, we believe that it is possible to stimulate coal production in a much more efficient way than the administration is now doing.

To the degree that government has to bias toward one segment of the industry or another, we believe the biases are going in just the wrong way now.

The CHAIRMAN. Specifically what would you have us do? How would we amend this legislation to achieve this goal?

Mr. BROWDER. I would throw out this legislation, sir.

The CHAIRMAN. Then what legislation do we need, if any?

Mr. BROWDER. I think the first thing you would have to recognize is the country is broken into diverse regions that have diverse sources of energy and uses of that energy once it comes to them.

It is difficult to create an efficient, uniform nationally applied energy production system when you are talking about regional fuel consumption.

I would like to give you a very specific example. Eighty percent of our current national coal production comes from east of the Mississippi River.

Fifty five of our coal resources in this country measured by British thermal units, which is the way we burn it, instead of measured by tons, is east of the Mississippi River.

There is more than 80 billion tons of coal that is low sulfur east of the Mississippi River.

Most of the demand for expanded coal consumption is in the industrial sector of this country east of the Mississippi River.

Yet the administration and those elements of the coal industry that have enough capital to be mobile enough to make the move are wanting to take advantage of cheap Federal leases on the public lands in the West and shift our coal production, in effect develop a new coal industry out there where we would take, in the West, low quality coal. It is only low sulfur sitting in the ground.

If it has fewer British thermal units, by the time you burn enough coal to achieve the same unit of energy production, you have burned more sulfur.

The CHAIRMAN. How would you achieve the purpose of making the—converting coal to the purposes now served by oil if we don't follow some kind of a synthetic fuel operation?

Mr. BROWDER. Well, there is a considerable difference between the economics, including the geographic economics, of synthetic fuel production and production of coal for use under boilers, for direct production of electricity.

And the first thing that we would do would be to look at those Federal programs that are biasing toward inefficient fuels, 7,000 Btu coal instead of 12,000 Btu coal, and stop the biases.

It just doesn't make sense to take coal from Wyoming to West Virginia, but that is the basis of the administration's coal production program. For synthetic fuels, sir, I want to tell you, because this is very important, we do not oppose the production of synthetic fuels.

There will undoubtedly come a time when synthetic fuels will be necessary and we will have to inject them into our economy.

But if you subsidize the commercial development of synthetic fuels before there is a market for the fuels, you are going to bias the region of the country that produces those fuels.

From our point of view, the Midwestern coals, Illinois and Ohio, that region, would be the natural basis for synthetic fuel production when the economy can genuinely use synthetic fuels.

The CHAIRMAN. May I ask you, Mr. Browder, if you, perhaps for the record, because this might take some thought on your part, I

mean a little more thought on your part, for the record if you could give us your proposal as to how we might be able to translate this legislation or get new legislation, legislation you think you would work, that would enable this administration or an administration with a similar viewpoint, to achieve this big stimulus of the coal industry, would give us the kind of energy production we need?

Mr. BROWDER. Could I make a last short point?

The CHAIRMAN. Yes, sir.

Mr. BROWDER. The difference between a 15 percent and a 25 percent reserve margin in capital construction for electric power companies over the next 10 years would come to capital investment of $63 billion.

The range of financial opportunities both for saving and investment in taking an objective look at the need for utility construction, the relationship between reserve margins to utility financing, the relationship between investment in large central station facilities and increased unreliability that results from that, as compared to diverse and smaller facilities where you have less outage risk, these kinds of analyses can show that there is such a range, within a level influenceable by policy, but that does not require Federal subsidy, such a range of options for investment in the utility industry that we would think at least that a hard analysis of utility financing should precede any kind of legislation that just says, "okay, the utilities say they need X amount of capital, let's make sure they get it." Because the electric utility industry takes more capital for plant property and equipment per dollar of sales than any industry in the country.

To the degree that we invest in electric power as opposed to less capital-intensive ways of achieving the same energy purposes, all we are doing is shifting money out of other sectors of the economy into that electric power plant, property and equipment without regard to the productivity of the utility.

The CHAIRMAN. Let me ask you, Mr. Cameron, I think Mr. Browder has made quite a strong case here. This is legislation that would provide for $100 billion for in effect subsidizing below the market rate, so you could come on with synthetic fuels, among other things, and atomic energy in a bigger way.

He argues, and I think the argument is a very logical one, that the market for all its weaknesses does have great strength only going where the most efficient operation is and selecting the most efficient and discriminating against the inefficient, incompetent.

The government doesn't do that. The government will do the opposite. It will come in and subsidize that which the market won't take. That is what this bill asks the government to do.

What is your answer?

Mr. CAMERON. I would be opposed to any continuing subsidy of any energy source, including synthetic fuels.

The CHAIRMAN. That is what the bill does.

It subsidizes in the sense——

Mr. CAMERON. To the extent that the bill does that, I am opposed to it.

The CHAIRMAN. Then you are opposed to the bill because what the bill does is provide that these investments will go into those areas that would provide more fuel, but where the private market will not finance them.

I asked Governor Rockefeller specifically, I said supposing the private market would only finance a particular project at a 12 percent rate because of the risk involved; would you come in at 8 or 9 percent?

He said yes, that is what the legislation, in his view, would do.

He is the principal architect of the legislation. That is a subsidy.

Mr. CAMERON. Of course, I might differ in the way that I would administer whatever government program might come out of the Congress.

First of all, I don't think any energy source should be subsidized because that causes wasteful use of that energy source.

The CHAIRMAN. Isn't that the whole thing this bill does? What does this bill have in it aside from a subsidy?

Mr. CAMERON. Second: I would hope that we would establish a competitive market for energy in this country so that by the normal processes of attrition, we will find out which energy sources are most economical.

If, for instance, after we have established what synthetic fuels' costs really are, if they cannot compete in a free market, I would say that they have been determined not to be feasible at that particular moment.

Now, what we really are doing, I think, in even considering Federal participation in the financing of new energy sources is tooling up for the latter part of the century. I agree with Mr. Browder and others who say we are not going to produce many barrels of oil or cubic feet of gas during the next 10 years. But what we will do is get ourselves prepared to make the best choices of energy supply when we really have to have more domestic sources.

And that, I believe, is an appropriate role for Government—to share the risk with industry; not pay for it; not take all the risks—but to share the extraordinary risks of bringing these expensive new fuel sources into practice.

I would like to make one clarification. Mr. Browder suggested that I have some proprietary interest in the technologies that are being proposed here. I have absolutely none. This is a misinterpretation on his part.

I believe all available technological approaches that are ready to go to commercial operation at the present time should be encouraged. I do not believe that ideas in the R. & D. stage should be pushed into a commercial application before they are ready.

But we have in the synthetic fuels area numerous technologies that have been practiced over the past 20 years, in Europe, South Africa, and elsewhere, that we should learn how to use and learn where they fit in our own energy economy.

The CHAIRMAN. Now, I would like to get to Mr. Cury and Mr. Simpson on the Jacksonville matter, because I think this is fascinating.

I notice in the Jacksonville story, first Mr. Simpson, I notice that the U.S. News and World Report, which is a highly reputable publication, says that since Offshore Power Systems arrived 3 years ago, Jacksonville has done the following: for all practical purposes, given the firm 850 acres of choice industrial land; promised to build a

$137 million bridge to provide access to the plant's location; offered to buy through the municipal power company two floating plants at a cost critics insist the city can ill afford, $2.2 billion.

Spend more than $1 million for the purchase of enriched uranium fuel for Jacksonville's two floating powerplants, which now appear will never be built. Launch construction of a vocational rehabilitation center at a cost of $11 million to train thousands of OPS employees. Offer to sell $180 million in low-interest, tax-exempt revenue bonds to provide the company with ready cash.

In view of all of this, and in view of the fact that the article further said that since 1974, the Offshore Power Systems has had four of its eight orders canceled and the other four delayed for 5 years, went on to say that OPS' president was now trying to persuade the Federal Government to buy four floating plants and lease them to troubled utilities.

A letter received from Westinghouse—and I have it right here—dated April 12, "Dear Senator Proxmire," a letter I received yesterday, backed up this point. It described OPS as an excellent candidate for EIA financing, an excellent example of a company looking for a Federal bailout.

Mr. SIMPSON. No, sir, it is not. I don't know why the State of Florida decided to build a bridge. I am not in the bridge-building business or traffic business.

Westinghouse did attempt, as we always attempt to sell our products, to sell not only to Jacksonville Electric Authority, but to Florida Power and Light, Middle South Utilities and the Southern Companies floating nuclear plants.

The city of Jacksonville, Jacksonville Electric Authority, at one point intended to buy those plants and for their own reasons went ahead and bought some uranium. That is a perfectly reasonable thing for them to have done if they had intended to go ahead with the plant.

We have had the plant delayed, as I have explained, because of the low load growth on the public service electric and gas utility system. There was help in training people, almost every State of the Union has a facility or organization that helps train industrial employees to bring industry into their area. They offered it; we accepted it, we used it when we came in.

I do not believe there has been any $180 million bond issue. They said they offered to do it. This is something that they do normally. I do not believe that has yet been done and it may never be done.

Let's see. The other thing was, yes, Westinghouse does believe it would be in the United States' interest to buy two of these plants. That is not a bailout. The fact that we would like to sell two or four plants to the United States, if the United——

The CHAIRMAN. Why do you have to sell to the U.S. Government? Why can't you simply operate these, if they are efficient?

Mr. SIMPSON. We don't operate them, sir. We build them.

The CHAIRMAN. Why can't they be operated?

Mr. SIMPSON. We have no customer.

The CHAIRMAN. That is because the market won't pick it up. You have to go to the Federal Government with a $100 billion project.

Mr. SIMPSON. Sir, it is not a bailout; the fact that we have a product we believe is desirable for the United States to buy.

The CHAIRMAN. Why do you build this if you have no customers?

Mr. SIMPSON. We have four—we have a customer for four plants, and we have a perfectly viable operation.

The CHAIRMAN. I thought you said you had no customer for this particular offshore plant.

Mr. SIMPSON. We don't build them until we have orders for them, sir. We have orders for four. We are building four.

If the United States would like to buy any, we will be glad to sell them to them. The United States would only do this, if they believe at the present time it was undetermined as to what the load growth in an area would be, like Florida, Georgia, Alabama, Mississippi, and none of the utilities felt that they could go ahead; the Government might decide that it would be in the interest of energy assurance for the future to buy the plants and then resell them to whichever of these utilities at the time need them.

If the United States doesn't believe this is a good thing, they don't have to buy them. We will continue, and we will still have a good business.

The CHAIRMAN. Now, may I ask Mr. Cury to comment.

Mr. CURY. I differ quite a bit with a lot of statements Mr. Simpson said.

Number one, I would like to make a little statement here. I think it is well established that without very, very large Federal subsidies, Westinghouse cannot sustain OPS without resorting to a kind of atomic socialism. They came to Jacksonville. They jumped into the government process, they joined the right clubs, they rubbed shoulders, and anybody that opposed them felt the wrath of Westinghouse Corp.

I am a small independent grocer with a very small store. My wife and family. The Westinghouse Corp.—and I say this for the record—harassed, threatened, and right now it is in front of a Federal grand jury, where the vice president of Westinghouse or Offshore Power is being charged with extortion to do bodily harm through the mails.

I would like to make another statement on the bonds that he said they have already accepted; the port authority that doesn't answer to any one passed a resolution to issue the bonds for OPS, tax-exempt bonds. It so happens that members of the port authority were promised contracts from Offshore Power Systems, members of the Jacksonville Electric Authority, the man who is no longer there that was going to buy the nuclear plants, Mr. Weinard, he is under two grand jury investigations and has left Jacksonville.

The bridge is not $137 million. It is being pushed, and it is $160 million.

But I would like to make one statement. The main man that came to this town, Mr. Staten—and I am very involved in this Offshore Power thing—he just so happens to be President Ford's chief fund raiser for the State of Florida. And I would like that to go into the record.

I don't know Mr. Simpson. But they came to this town and paid no taxes. They deceived, they deceptively marketed their merchandise.

They couldn't give anybody a straight answer, and anybody that opposed them, and a very small group in the beginning, holy hell broke loose.

They sent out smear letters on me. They run background checks on myself. They have done things that are unbelievable in the history of the United States.

Mr. SIMPSON. And I don't believe them.

The CHAIRMAN. Who ran the background checks?

Mr. CURY. Mr. Staten admitted it to a television station. He had a file on me. He is the executive vice president. He admitted on public television, CBS, they had all these documents. In fact, he called people in the community. He spread false propaganda about me.

If he was so worried that this unit was so good and he had customers, what was he worried about a little grocer? I went and bought shares in Westinghouse, Public Service and the company he mentioned, Middle South Utilities. There is a letter here I wrote to Mr. Kirby, chairman of the board.

I got a letter back and found out he is an amateur magician. He did not give me an answer. I say, does Jacksonville have any money invested in Jacksonville?

He referred me to Mr. Zachelda. I turned around and found out that Public Service and Gas dreamed up this idea; it was written up in New Yorker Magazine that Public Service and Gas has put all the money in this project.

They have not proved to me as a stockholder that they have any money in it. In other words, if Jacksonville—and let me mention Florida Power and Light, and I would like to bring this up, 4 of the directors and major stockholders of Westinghouse control 23 percent of Florida Power and Light.

I do a little homework, too. Mr. Simpson wasn't aware of it. I am a grocer, but I do a little bit on the side.

The CHAIRMAN. There is one other point before you ask Mr. Simpson to answer and perhaps conclude, that I realize the situation at Jacksonville must be red hot on this issue, the town is divided on it. We all know the enormous influence the newspapers have.

Among other things the "U.S. News and World Report" reported that Jacksonville's newspapers, the "Florida Times," "Union," and "Journal," are wholly-owned subsidiaries of the Seaboard Coast Line Railroad, a railroad which stands to gain considerably from its real estate holdings, if OPS proves successful, supported the attempts to buy nuclear plants and so did the newspapers in banner headlines and editorials day-after-day.

Mr. SIMPSON. They might even own or have some coal, if Jacksonville doesn't buy these plants, so they are going to make out either way.

The CHAIRMAN. Would you like to make further response?

Mr. SIMPSON. Yes, I just think it is a misuse of a forum to discuss the Energy Independence Authority to make statements of the sort that this gentleman has made in a direct attack, which he is prepared for, and it is clear that I wouldn't know all the facts about what somebody said to him or anybody else in Jacksonville. I am from Pittsburgh.

I did have the responsibility at one time for this plant. I have not had responsibility for this plant for the last 18 months, and I just would have no way to counter all the details.

Basically we have a viable commercial operation, and the things that went wrong in the City of Jacksonville, if the Jacksonville Electric Authority did something wrong or the Florida Power and Light did something wrong, that is somebody else's problem. We went in there with a perfectly straightforward business proposition before the OPEC embargo, when electric utilities were buying plants, because they believed in the growth of 7 or 8 percent a year, instead of 2 years negative growth.

Obviously, with a 2-year negative growth, our market didn't turn out to be as good as we thought. We had no plants cancelled.

We had some letters of intent that were not firmed up.

That is perfectly reasonable. I think that most of the statements the gentleman has made simply are not factual.

The CHAIRMAN. All right, sir.

Well, I think that is a perfectly proper criticism that you weren't prepared. I will tell you what I would like to do. If you would like to make a detailed response to Mr. Cury for the record within the next week or so, so that you would have an opportunity to consult with people in Florida, who are on the spot and familiar with it, I will be happy to disclose that, release that to the press or handle it in any way you feel would be helpful, because you are correct in that, the purpose of this forum is not to decide anything for Jacksonville.

I think it is a matter of concern, but the purpose of this forum, of course, is to see whether or not we should pass this legislation or modify it, or amend it.

I think all of you gentlemen have contributed to our understanding.

Mr. SIMPSON. History will show——

The CHAIRMAN. I would like to have you, Mr. Simpson, for the record, supply us with whatever you would like to.

Mr. SIMPSON. I will, sir, and history will show that floating nuclear plants are the cheapest, most environmentally acceptable way of producing electric power that this country has any possibility of achieving in the next 20 years.

The CHAIRMAN. Thank you, gentlemen, very much.

We appreciate your testimony.

The committee will stand in recess until 10 o'clock tomorrow morning, when we have a number of witnesses who will appear.

[Whereupon, at 12:45 p.m., the hearing was adjourned, to be reconvened at 10 a.m., on Wednesday, April 13, 1976.]

[The following letter from Offshore Power Systems was ordered inserted in the record at this point:]

OFFSHORE POWER SYSTEMS,
Jacksonville, Fla., April 26, 1976.

Hon. WILLIAM PROXMIRE,
U.S. Senate, Dirksen Senate Office Building,
Washington, D.C.

DEAR SENATOR PROXMIRE: At the hearing in Washington, D.C. on Tuesday, April 13, 1976, before your Committee on Banking, Housing and Urban Affairs in regard to S-2532, Energy Independence Authority, John W. Simpson appeared

as Chairman of the Atomic Industrial Forum. At that hearing Joseph H. Cury of Jacksonville, Florida, representing Consumer Power, also testified.

During the hearing, a number of statements were made in regard to Offshore Power Systems, a Westinghouse venture, as well as the City of Jacksonville. Since Mr. Simpson is an Officer-Director of Westinghouse, you agreed to hold the record open so that Mr. Simpson would have an opportunity to consult with Offshore Power Systems and make a response for the record. As President of Offshore Power Systems and at the reguest of Mr. Simpson, I would like to offer the attachment to this letter for inclusion in the record.

Very truly yours,

A. P. ZECHELLA,
President.

Attachment.

OFFSHORE POWER SYSTEMS RESPONSE TO ALLEGATIONS

The following responses to subjects raised at the hearing and the headings used in the responses are for the purpose of categorization only.

Allegation.—Westinghouse cannot sustain OPS without federal subsidies.

Following conversations between Mr. Robert Kirby, Chairman of Westinghouse, and Mr. Frank Zarb, Administrator of the Federal Energy Administration, in March of 1975 regarding the potential shortages of electrical generating capacity in the United States in the early 1980's, OPS proposed that the FEA purchase four FNP's for subsequent resale or lease to the electric utility industry for start of operation in the time period 1982 to 1986.

This proposal was made on the basis that the load growth uncertainties and financial dilemmas of the utility industry had caused the deferral of planned generation to such an extent that there was a real possibility of a shortage of generation capacity by the early to mid 1980's. This shortfall was one that was considered a serious threat to the National economy by Westinghouse and some parts of the Federal Government including sections of the FEA.

Historical records show that economic growth was always accompanied by sustained increases in electricity use. The start of the economic recovery then envisioned for the 1975–1976 time period and continued growth into the late 1970's and early 1980's would require electrical capacity not planned or delayed. The economic risk of not having sufficient electrical capacity to support and sustain the recovery and growth are so great as to be unacceptable. The OPS proposal presented a program by which over 4400 MW of nuclear generation as FNP's could be started and scheduled for operation as early as 1982 without having a designated utility or site. The federal funds used for this program would be recovered in total through the resale or lease of these plants to operating utilities.

This FEA program was never envisioned as a bail out for OPS in that OPS had planned and has continued in business to sell these plants to the utility industry. It was conceived out of a real concern for the future of this country and presented as a method to partially alleviate a future electricity shortage and move the nation more rapidly towards its goal of energy independence. Whether or not there is federal action on this proposal OPS is now and will remain an economically viable undertaking with the four units now under firm contract with Public Service Electric and Gas. No bail out is necessary or requested.

Allegation.—Public Service Electric & Gas Company delayed their orders for seven years and has put all the money in the project.

On September 3, 1974, due to a reevaluation of their overall construction program resulting from reduced load growth projections, Public Service Electric & Gas Company requested that the delivery dates for the four Floating Nuclear Plants under contract with OPS be rescheduled. The delivery of the first FNP was rescheduled from July 1979 to July 1984 and the remaining three units rescheduled to July 1986, July 1989 and July 1991, respectively. These revised shipment schedules were accommodated through contract negotiations.

At no time since the original letter of intent from Public Service Electric & Gas to Westinghouse in February 1972 has PSE&G owned or controlled Offshore Power Systems. Until January 1, 1975, Offshore Power Systems was a joint venture of Westinghouse and Tenneco. Effective as of that date the interest

of Tenneco in OPS was retired and Westinghouse became the sole owner of OPS.

Public Service has by no means put up all of the money for OPS. Westinghouse has had and will continue to have a substantial investment in OPS.

Allegation.—OPS deceptively marketed their product to the Jacksonville Electric Authority and the Authority spent a million dollars for nuclear fuel.

The Jacksonville Electric Authority recognized since early in the 1970's that the City of Jacksonville was growing at such a rate that the Authority would eventually need to consider nuclear power to satisfy the needs of the City. It was with this in mind that the Authority authorized and received from Black and Veetch, consulting engineers, an in-depth report on the new generation recommendation for the JEA system. This report, finished in early 1972, concluded that the JEA system should consider only the addition of nuclear power after 1982. This recommendation was made mainly upon economic considerations and this was in a time period when oil, our only source of energy for our existing power plants, was cheap and plentiful.

Since the Black and Veetch report, the JEA staff has been actively investigating the various nuclear plant concepts. This investigation has included trips to various nuclear plants in operation or under construction, visits and conversations with utilities already in the nuclear generation era, as well as discussion with vendors of nuclear plant equipment including Offshore Power Systems.

In September, 1973 Offshore Power Systems submitted to the Jacksonville Electric Authority a proposal for the purchase of two FNP's by the JEA for operation in 1982 and 1984. The proposal was based upon the standard FNP and the contract terms and conditions then being used by OPS in negotiations with other utilities. Following a review of the proposal by the JEA and its staff, a conditional letter of intent was issued by the JEA to OPS. This letter was valid for a period of 120 days and required that four specific conditions be satisfied prior to JEA entering into a contract with OPS. These conditions included:

1. JEA's identification of a suitable site for FNP's.
2. JEA's economic evaluation showing that the FNP was its preferred generation choice.
3. JEA obtaining power sales agreements or joint venture agreements with other utilities for the FNP's.
4. JEA obtaining a satisfactory method of financing the plants.

The original proposal was for two FNP's at a price of $345 million each or a total of $690 million and not $2.2 billion. During the course of discussions and negotiations with the JEA staff towards the satisfaction of these conditions, JEA requested that OPS submit a proposal to manage the total project including the design and construction of all necessary and related site structures such as the protective breakwater and buried cable from the FNP's to shore. At the request of and in conjunction with the JEA staff and consultants, OPS proceeded to develop preliminary site structures and facility designs and cost estimates. As required by the JEA financial consultants and bond specialists, it was necessary to estimate the completed cost of the total project including escalation and interest costs. The initial cost estimate for the two FNP's, site structures and facilities and project management was $981 million. The addition of other JEA costs, contingencies, escalation estimates and interest costs resulted in a total completed estimated cost of $1,960 million. As required by JEA bond indentures, a debt service reserve account had to be established. This reserve account was set at $200 million. The JEA's financial consultant reported the project was feasible and financeable.

Failure to satisfactorily resolve the conditions of the letter of intent resulted in several mutual extensions of the letter through the spring and summer of 1974. During this time period, the Energy Research and Development Administration informed the utility industry that all contracting for enriching services for nuclear fuel to be used in plants for operation by 1982 had to be contracted for by June, 1974. As the OPS negotiations were not complete but were progressing, the JEA committed to the enriching services necessary for the first core of the first plant which required the down payment of approximately $1 million to ERDA which was subsequently refunded.

All of the negotiations between OPS and the JEA were conducted in an open manner. All negotiation meetings were attended by members of the JEA staff

and representatives of the City's Office of the General Counsel. In addition, many of the other briefing sessions were held before the Authority itself as well as the City Council. Many of these briefing sessions were attended by and reported on by the local newspapers, TV and radio stations.

In spite of continued negotiations, a satisfactory contractual arrangement between JEA and OPS was not reached over the summer of 1974. The letter of intent was terminated on September 8, 1974 by OPS which was a right under the terms of the letter. The $1 million down payment made by JEA to ERDA for fuel enriching services has been refunded in full.

Allegation.—Jacksonville gave OPS 850 acres of choice industrial land.

The Jacksonville Port Authority sold Offshore Power Systems 880 acres of land on Blount Island for $2,000 per acre, or $1,760,000. This land had been for sale for many years.

Of the acreage, 525 acres was in marsh or wet lands. In order to make the Blount Island land suitable for its purposes, OPS spent $10 million in site preparation which included dredging and filling. In addition, in return for taking the 525 acres of marsh and wet lands, OPS purchased 1,007 acres of marsh and wet lands in Duval County and deeded this property—at no cost—to the City of Jacksonville. This land is so deeded that it will remain in its natural state in perpetuity. Further, OPS paid $800,000 to the State of Florida for sovereign material taken out of the St. Johns River and placed on Blount Island by the U.S. Army Corps of Engineers as part of the harbor deepening project. (It should be noted that it was the first time in the history of the State that a charge was made by the State of Florida for material dredged from a Corps of Engineers project.) This means that an acre of usable land or water on Blount Island actually cost OPS over $14,000 an acre, including the $2,000 per acre paid the Port Authority.

U.S. News and World Report stated that the price of other industrial land nearby was running 5–10 times the $2,000 figure. The fact is that in mid-1973 and after land values had been raised due to OPS coming to Jacksonville, OPS purchased 325 acres of primarily upland property on the mainland—including about a mile of deep water river frontage—right across from Blount Island, for a total price of $1,225,000, or approximately $3,677 per acre.

Because OPS delayed the exercise of the option on the land one year it did not pay taxes on the property for that period—however, it paid the Port Authority $125,000 for the year's extension. Had the raw property at that time been on the tax books, it would have had to be appraised at over $7 million in order to have cost $125,000 in property taxes.

Allegation.—Jacksonville is trying to build a bridge for OPS.

A bridge in the area in question has been projected on the Florida Highway Department maps as far back as 1960, twelve years before OPS came to Jacksonville.

The allegation doesn't mention that already in the area the bridge would serve are: Imeson Industrial Park with huge regional Sears catalogue center; St. Regis Paper Co.; the Jacksonville Port Authority's present facilities on Blount Island; the Anheuser-Busch plant; the airport; the zoo; the Bacardi plant; and Highlands and several other subdivisions. Furthermore, studies have shown the bridge to be viable without any reference to revenues projected to be generated by traffic to the OPS facility.

Allegation.—Since the arrival of OPS, utility rates, tolls and taxes have gone up.

WATER AND SEWER RATES

The City of Jacksonville began a comprehensive water and sewer program with a bonded indebtedness in excess of $100 million. In an effort to finance this program, the following rate changes were made beginning in 1969—three years prior to the arrival of OPS:

Date effective	Water (cubic feet)	Wastewater (cubic feet)
Prior to 1969	$6/3,600/quarter	No charge.
Jan. 1, 1969	$3/1,200/mo	$3.50 flat rate/mo.
Feb. 1, 1973	$3/800/mo	$4/800/mo.
October 1975	$3.50/300/mo	$6/300/mo.
March 1976	$3.50/500/mo	$6/500/mo.

ELECTRIC RATES

The increase in electric rates in Jacksonville results from skyrocketing fuel oil costs. The generating capacity of the Electric Authority is 100% oil fired. The fuel oil adjustment charge is tied directly to the increased cost of oil.

	1,000 kWh base rate	1,000 kWh fuel adjusted charge
Oct. 1, 1973	$18.38	$1.57
Oct. 15, 1973	18.38	7.94
Jan. 16, 1974	18.38	20.00

Taxes in Jacksonville have been reduced every year since 1969.

Year	County rate	City/county rate
1967	$28.04	$40.74
1968	25.93	31.93
1969	25.41	31.41
1970	24.22	29.72
1971	24.16	29.66
1972	23.05	27.05
1973	21.71	22.89
1974	18.08	19.30
1975	17.82	19.04

BRIDGE TOLLS

The Jacksonville Transportation Authority increased the bridge tolls from 15¢ to 25¢ effective September 1973, with a provision that maintained the 15¢ rate for commuters through the use of ticket books (40 tickets for $6.00).

According to the JTA, this action was taken "to increase JTA revenues sufficiently to provide the bonding capacity necessary to improve and expand the expressway system."

Allegation.—Offshore Power Systems has paid no taxes.

OPS has, to date, paid $292,000 in Florida State Sales Tax, $86,000 in Property (real and personal) Tax and $4,000 in Occupational Tax. The Blount Island property, purchased in August 1975, is now being appraised by Duval County and taxes will be payable in November of this year.

Allegation.—Jacksonville is building a vocational center for OPS.

When Florida Junior College President Dr. Ben Wygal came to Jacksonville seven years ago—long before OPS—he started exploring ways to pull the various downtown facilities already operated by the Florida Junior College into one center.

Nearly six years ago he started working with Mayor Hans Tanzler and the FJC Board Chairman and others to get urban renewal land in the downtown area. Partly prompted by the arrival of OPS, a decision was made to go ahead with a full Junior College Campus rather than a center in the downtown area. This campus now under construction is not solely a vocational center, nor is it dependent upon the future of OPS. There are more than 3,000 students now in the downtown area at other facilities in various junior college programs; easily enough to warrant the campus if it opened today. The facility, when opened, will serve the entire community.

Allegation.—The Jacksonville Port Authority issued $180 million in revenue bonds to give OPS operating revenue.

No bonds for the OPS facility have ever been issued by the Jacksonville Port Authority. In 1973 the Authority authorized the issuance, should OPS so request, of up to $180 million in industrial revenue bonds to finance port-related facilities and pollution control facilities which would be sold or leased to OPS and used as part of the OPS facility. This authorization was continued in October 1975.

The bonds will not be issued until the request of OPS and the authorization will be reviewed on a year-to-year basis by the Authority. The agreement be-

tween OPS and JPA provides that the issue may not exceed the costs of the financed facilities and the interest must qualify as tax exempt under Federal and Florida laws. The bonds are to be payable solely from the revenue derived from the sale, operation or lease and do not constitute an indebtedness or pledge of the general credit of the Port Authority. In addition to the leases, rentals or installments required to pay principal and interest and redemption premiums on the bonds, OPS would pay all taxes, governmental charges, utility charges, etc., and would have full responsibility for expense, operation, repair and maintenance of the facilities.

JPA is authorized to issue industrial revenue bonds under the "Florida Industrial Development Financing Act", Chapter 69-104, Laws of Florida, General Acts of 1969, as amended, and has done so a number of times throughout the years as have other agencies in the State of Florida in order to finance various types of industrial development. In fact, industrial development financing is a method of financing long recognized throughout the United States and its tax exempt status is provided for in the 1954 Internal Revenue Code and IRS Regulations.

Allegation.—The local newspapers supported OPS.

This allegation is best answered by one local newspaper's editorial dated December 28, 1975.

"We supported the OPS project wholeheartedly. We supported it openly, honestly, truthfully. We still support it.

"Our support is based on the honest conviction, based on the fact available, that the project would be good for the community of Jacksonville.

"Success has a thousand fathers, to paraphrase the saying, while failure is an orphan.

"The initial promise has not yet materialized. The financial crunch and the energy crisis put the plant orders from New Jersey, upon which the start of project was predicated, on the back burner.

"It is by no means dead. The orders have not been cancelled. They have been delayed. The future is uncertain.

"We hope the potential is realized. It will have a host of benefits for the community, including a way out of the poverty trap for many who are unemployed or underemployed.

"The community in 1972 was united in a way seldom seen in Jacksonville in its desire to have OPS locate here. The support cut across social and economic lines. The effort was a community effort.

"We don't apologize for being part of that effort."

Allegation.—The Attorney General of Florida is raising serious questions about the Floating Nuclear Project.

Robert L. Shevin is Attorney General of the State of Florida and, along with the Governor and his Cabinet, is a Member of the Board of Trustees of the Internal Improvement Trust Fund of the State of Florida. Mr. Shevin, on January 18, 1976, requested that OPS appear before those Trustees at their January 20th meeting. At that meeting he expressed satisfaction with the answers received from OPS.

On May 23, 1972, upon the grant of the Florida Dredge and Fill Permit required to do the necessary work on Blount Island, the Trustees by resolution provided that if the land to be conveyed to OPS from the Jacksonville Port Authority for the facility was not used to construct "a manufacturing plant to produce platform-mounted nuclear plants" then it was to be reconveyed to the Port Authority. Because the United States Nuclear Regulatory Commission, in its "Final Environmental Impact Statement Related to the Manufacture of Floating Nuclear Plants" issued in October of 1975 referenced alternative uses for that land, Mr. Shevin felt that there might be a use contemplated by OPS that was inconsistent with the permit restrictions. In addition, Mr. Shevin wanted an update on the status of the project. Accordingly, at the January 20, 1976 meeting of the Trustees, both the Jacksonville Port Authority and OPS appeared and assured the Trustees that the condition was being complied with. It was pointed out by OPS that the alternative use discussion in the NRC's Environmental Impact Statement was required by the National Environmental Policy Act as well as by a series of Federal Court cases and was required regardless of whether or not the agency involved (here the NRC) or the owner had the power to implement the alternatives. It was also pointed out that OPS correspondence that was part of the Impact Statement specifically called the

requirement of the Board of Trustees to the attention of the Nuclear Regulatory Commission. In fact, agencies of the State of Florida including the Trustees had expressly commented on the proposed Impact Statement when issued in proposed form in July of 1974 and those comments did not relate to the alternative use section. At the January 20th meeting and in accordance with the Attorney General's request, the Trustees were also given a status report on the OPS project. At the end of the OPS presentation by Messrs. Staten and Campbell, Attorney General Shevin said:

"I would just like to thank Mr. Staten and Mr. Campbell and the Chairman of the Port Authority for being with us today and for answering these questions. And I hope that everything moves as well and on schedule as possible. Again it's not 12,000 jobs but it's a substantial number of jobs and I would hope that you'll get more orders and can employ a lot more people so we are talking about an ongoing industry."

OPS knows of no further questions by the Attorney General of Florida.

Lastly, Mr. Cury charged at the hearing that he had been threatened and subjected to various forms of personal harassment. As we understand it, this matter is currently under the jurisdiction of and is being investigated by a Federal grand jury. We would like to propose that the matter stand in abeyance until the grand jury is heard from.

ENERGY INDEPENDENCE AUTHORITY ACT OF 1975

WEDNESDAY, APRIL 14, 1976

U.S. SENATE,
COMMITTEE ON BANKING, HOUSING, AND URBAN AFFAIRS,
Washington, D.C.

The committee met at 10:05 a.m. in room 5302, Dirksen Senate Office Building, Senator William Proxmire (chairman of the committee) presiding.

Present: Senators Proxmire and Sparkman.

The CHAIRMAN. The committee will come to order.

This is the last day we have scheduled for hearings on S. 2532, the administration's Energy Independence Authority.

We are delighted with the quality of witnesses we have scheduled for these hearings and I apologize to witnesses for the fact that we have asked them to prepare their statements with such little advance notice. That's the reason, I presume, that some of the witnesses haven't been able to file statements with us. I hope that they have been able to bring some prepared statements because it's a great convenience for the committee and also, of course, to the press if they can have prepared statements available.

Mr. Parsky, we have your statement. I would appreciate it if you could limit it as much as possible. We have six witnesses today. We are anxious to hear them all and I have a number of questions for all of you, so if you can abbreviate your statement it will be printed in full in the record.

STATEMENT OF GERALD L. PARSKY, ASSISTANT SECRETARY OF THE TREASURY FOR INTERNATIONAL AFFAIRS; ACCOMPANIED BY PETER BORRE, FEA; AND BRUCE PASTERNACK, FEA

Mr. PARSKY. Thank you, Mr. Chairman. I will do my best to abbreviate it as much as possible.

It's certainly a pleasure for me to be here to discuss the President's proposal for an Energy Independence Authority. This initiative should be seen as part of the President's comprehensive energy policy—a policy that is aimed at removing our country's excessive dependence on others for our energy.

To achieve these objectives we cannot rely on Government alone. We must, in large part, depend on our private sector for the large capital investment necessary to develop energy supplies. The task of mobilizing the needed private capital would be very challenging under the best of circumstances. However, the Government has com-

pounded the difficulties through its regulation and control of the energy industry; and for a variety of reasons, the private sector is having difficulty financing certain types of important energy projects. Most of these difficulties could be overcome through timely and innovative regulatory actions and through removal of other impediments to the development of oil, coal, and gas and the growth of nuclear power.

The fact that we must face, however, is that these needed regulatory actions and policy decisions will be too slow in evolving. The President has determined that we can't wait and, accordingly, has proposed the EIA in order to insure the timely development of important sectors of our energy industry. If EIA is viewed as a substitute for taking the needed regulatory reforms or if it is seen as a substitute for the private sector, its purpose will have been defeated and it will be counter-productive. If, however, it serves as a temporary bridge to the time when regulatory impediments are removed and evolves as a supplement to the private sector, then it can play an important role in bringing a sensible energy policy to this country.

In my testimony today, I will concentrate on the financial considerations which led to the EIA proposal and some of the more important consequences of EIA operations. I know that you have heard from the Vice President as well as Frank Zarb and they have outlined a number of our energy policy considerations. My testimony focuses on the expected capital requirements of our energy industry, the reasons why many important energy projects may not be financed by the private sector, and the capital market impacts of EIA.

A number of studies have been made concerning the capital requirements of the energy industry. In most cases these studies have analyzed the requirements based on several assumed scenarios, and the resulting estimates of the overall levels of capital requirements for the energy sector for 1975–85 produced by these studies range from about $480 billion to about $680 billion in 1975 dollars. A $580 billion figure would seem reasonable to us.

In order to assess the relative size of this figure, it should be compared with estimated business spending on new plant and equipment of roughly $2,000 trillion in 1975 dollars over the 1975–85 period. When viewed in this light, the $580 billion energy investment figure would constitute roughly 30 percent of estimated business fixed investment over the period, which would be well within the range of historical experience. Over the 1965–74 period, for example, energy investments as a percentage of total business fixed investment averaged 29 percent and ranged from 24 percent to 33 percent.

Despite the fact that capital needs for energy are not out of proportion to historical trends, an important concern is the extent to which private investors will be willing to finance the necessary investment in energy.

We believe that the capital market will have the capacity to provide this level of funding to the energy industry. However, given the current uncertainties and regulatory climate, we do not believe that all of the necessary funds will actually flow to the energy sector in the needed amounts. Energy projects will have to compete with projects from other sectors; and the capital will normally flow to the

most economically attractive projects—that is, where it can be most profitably employed in terms of private market criteria. Most of the needed conventional energy sector investments would be able to attract the necessary financing from private sources without Federal financial assistance such as that contemplated by EIA. There are, however, some types of projects which, for various reasons, are less likely to be able to attract funds from the private markets during the next 10 years without some form of Government assistance. It's for this very reason that the President decided to propose EIA. To more fully appreciate the need for EIA, I would like to look briefly at some of the reasons why the private sector may not finance such projects.

There is no single all pervasive reason why certain types of energy development projects are not being financed in the private markets. In most cases where Federal assistance may be required, there is a combination of factors which create uncertainty in the minds of potential investors and prevent them from committing funds without some form of Federal participation. The most important of these reasons are the following:

(1) Some energy projects included in our national energy program are marginal and, in some cases, not economic at current market prices. For example, synthetic fuel plants are at best only marginally economic at current prices; and because of uncertainty over future world oil prices and Government regulation most synthetic fuel projects are not attractive to private investors. Federal financial assistance will be needed if we are to accelerate the commercialization of synfuels and other promising emerging energy technologies.

(2) We have failed to take needed regulatory action which is necessary to improve the financial viability of certain segments of our energy industry and to provide requisite assurances to potential investors. As a prime example of this regulatory neglect, I would cite the inadequate rate increases granted to electric utilities by State commissions which have resulted in straining the financial condition of these utilities and in the deferral or cancellation of large amounts of new generating capacity. Almost half of the energy sector's projected capital requirements in the 1975–85 period are in the electric utility sector. Electric utilities are faced with the need to raise more capital than the oil companies over this period, but will have less than half the revenue base of these companies. While recent regulatory actions have resulted in some improvement in the financial situation of electric utilities, these companies can be expected to face future financial difficulties unless additional action is taken to provide for adequate rates and for a stronger cash flow. Without innovative regulatory actions such as including construction work-in-progress in the rate base, we may continue to have periods during which the financial condition of the electric utilities retards the undertaking of needed investment.

In the natural gas industry, if private financing is to be arranged for certain needed major projects, deregulation of new gas prices and still other types of innovative regulatory actions may be needed. These include approval of "all events full cost of service" tariffs which pass some of a project's risk to gas consumers and, possibly,

consumer surcharges, which could be used to help finance exploration and development of new gas supplies.

Lastly, decontrol of crude oil prices would substantially improve the ability of the petroleum industry to finance energy projects and would also provide needed incentives for conservation and for the development of new supplies. As you know, we are phasing such controls out over a 40-month period. The President has made it clear that we should do whatever we can to assure decontrol takes place as rapidly as possible.

(3) Some energy projects have special risks which the private market may not be willing to bear without innovative regulatory devices and/or some form of Government assistance. In discussing synthetic fuels I provided examples of that, those involving commercialization of technologies untested in the private market are the principal illustration.

The basic long run solution is to move forward as rapidly as possible with policy changes and regulatory reforms which will strengthen the ability of private firms to attract needed capital. For example, decontrol of energy prices would materially assist in financing of energy projects by improving cash flow and providing needed incentives to marginal projects. In the tax area, there are a number of measures which the President has proposed which would facilitate capital formation in general or would improve in particular the financial strength of the electric utilities industry. We also need to encourage the private sector to adopt innovative approaches to arranging the financing of needed major energy projects.

These kinds of actions must be taken. The problem, however, is that many of these will take time, and we simply can't wait. As the President has repeatedly emphasized our dependence is growing and we must do whatever we can to reverse this trend. Therefore, the President has proposed the Energy Independence Authority as a temporary measure which will assist the energy sector over the next 10 years in drawing capital to needed energy projects which might not otherwise obtain financing from the private capital markets.

As we evaluate the EIA, I think it is important to focus on precisely what EIA is designed to do and, as importantly, what it will not do. EIA is not intended to provide Government assistance to all energy projects and it is not meant to substitute the Government for the private sector, which will continue to provide the bulk of the funds for our energy development. It is a supplement to the private market and aimed essentially at some of the critical bottlenecks in the energy finance field which may not be overcome in a reasonable time period by the private sector without Federal assistance.

In the text of my statement, Mr. Chairman, I go into the description of exactly how the EIA will work. I think that's been provided for you so I will pass through that rapidly.

The EIA will be a Federal undertaking of large scope and magnitude and result in substantial Federal involvement in financing certain types of energy projects. Some would argue that the Federal Government should not be so involved. I would agree if I felt that the needed regulatory changes would take place in a timely fashion.

However, we have not seen evidence that this will happen and because of the overriding national importance of meeting our energy policy objectives in a timely manner, some Federal involvement is necessary. In 1973, we saw what could happen to us because of our heavy reliance on foreign energy sources. That experience, coupled with the continuing control that others exert over the price of oil, has resulted in a determination to reduce our reliance on insecure supplies which create an unacceptable danger to our economic prosperity and our national security. In order for this goal to be achieved we must increase domestic energy supplies, diversify sources of imports, create strategic stockpiles, and reduce the excessive demand for energy. EIA will provide critical assistance in meeting these objectives.

However, the EIA legislation should not be considered as a substitute for the needed regulatory and energy policy actions which, over the long run, are essential to achieving our energy objectives. This is not the intention of the EIA proposal, and we must do everything we can to assure that it will not happen.

Briefly, Mr. Chairman, I would like to turn to an assessment of the impact that EIA assistance will have on our capital markets. In providing financial assistance to the energy sector through the EIA, we believe that every effort should be made to minimize the cost of the EIA program to the general taxpayer, and to maximize the efficiency of this program. Minimizing the level of financial support requires flexibility in the forms of support that can be provided. In addition, the exact form of the most appropriate financial assistance will vary from situation to situation depending on the technology, the regulatory environment, the nature of the companies involved, and competitive market considerations. Accordingly, we believe that it is desirable to allow EIA to have a broad range of methods for providing financial assistance.

Even with such flexibility, concern has been expressed about the impact of EIA on the capital markets. I believe that we must face the fact that there may be considerable market impact. The central question is whether the urgent need for energy development outweighs any adverse capital market impact. Any type of Federal financial assistance which results in projects which would not have otherwise been undertaken will lead to some redirection of resources within the capital markets. This is as true for EIA as for any other Government program. If EIA is to be effective in helping to solve our energy dependence problems, the EIA will have to divert capital from other areas of our economy into the energy sector. Moreover, because the financial incentives provided by EIA will have little or no effect on the overall supply of capital, EIA loans or loan guarantees will increase the demand for capital and tend to raise both private and Government borrowing costs. This is also true of other Government lending and loan guarantee programs. There is nothing unique about the EIA program in this respect.

In this regard, the net annual flow of funds in the U.S. credit markets is expected to be about $239 billion in fiscal year 1976. Of this amount, $137 billion, or 57 percent, will be required to finance the Federal budget deficit and net borrowings for off-budget Federal programs, leaving only $102 billion to finance the private sector.

Further total Government borrowings this fiscal year will have an even greater impact on the long-term securities markets. The funding of the EIA would add to the already large Government presence in the capital markets and have an important impact on both the overall allocation of credit and the financing costs of both Government and private borrowers.

We must, however, remember that some redirection of capital flows is the intended effect of EIA and an inevitable consequence if we are to assure priority to energy development. Furthermore, the EIA assistance will be spread over a relatively long time period. The EIA would provide an average of $10 billion per year in the late seventies through the mid-1980's, with the largest part of such assistance likely to be provided in the period from 1980 to 1986 when the overall economy will have grown by 25 to 30 percent. This would represent roughly 13 percent of the projected yearly energy investments of $70 to $80 billion and roughly one-third of the external finance raised for energy sector investments during that period.

The precise nature of EIA's impact on interest rates and the allocation of capital is impossible to predict with any certainty. The aggregate size and the precise mix of the demand for capital will be influenced by the size of Federal deficits, Government fiscal and monetary policy, the rate of inflation, the strength of and duration of our economic recovery, and the financing needs of the private sector and of State and local governments. Any one of these factors could have a substantially greater effect on capital markets than EIA activity.

In addition, the bill contains a number of provisions designed to minimize the impact of EIA operations on the capital markets.

First: Section 303 of the bill requires the EIA to seek the maximum amount of financing from non-EIA sources in connection with any project which EIA undertakes.

Second: Section 306 requires the concurrence of the Secretary of the Treasury as to the timing and substantial terms and conditions of each security issue backed by the Federal Government. This provision is, in my view, an absolutely essential part of the EIA proposal in that it not only helps minimize the impact on the capital markets but reduces the effects of EIA activities on Government borrowing costs.

Third: Section 314 of the proposed legislation contemplates an advisory panel which would review the effects of EIA financial activities on the functioning of the capital markets, including the effects on the volume and distribution of capital flows to and within the energy development sector of the economy. Such a panel could keep continual watch on the effect of EIA activities on our capital markets and insure that the impact was minimized.

Fourth: Section 801 of the proposed legislation gives the members of the Energy Resources Council an opportunity to comment on any financial assistance granted by EIA. This would give the Secretary of the Treasury and other members of the ERC concerned with the financial implications of the program an opportunity to give their advice on the capital market impacts of EIA assistance to any given project.

In conclusion, Mr. Chairman, it is clear that EIA operations will impact on our capital markets. It is also clear that EIA will result in the reallocation of capital toward the energy industry; however, the proposed legislation contains a number of provisions to minimize adverse market effects. Furthermore, inherent in the EIA proposal is the belief that some reallocation or diversion of capital is needed if we are going to achieve our energy goals. Also central to the proposal is the belief that EIA is not a substitute for market solutions and regulatory reform but a temporary supplement to the private market. It is with these two objectives in mind that we are calling for the creation of EIA.

[Complete statement follows:]

STATEMENT OF GERALD L. PARSKY, ASSISTANT SECRETARY OF THE TREASURY

Mr. Chairman and Members of the Committee: I am pleased to be here today to discuss the President's proposal for an Energy Independence Authority (EIA). This initiative should be seen as part of the President's comprehensive energy policy—a policy that is aimed at removing our country's excessive dependence on others for our energy. Specifically, the President has set as our goals:

In the near-term, 1975–77, halt our growing import dependence by reducing oil imports by 2 million barrels per day (MMB/D) before the end of 1977.

In the mid-term, 1975–85, attain energy independence by achieving invulnerability to oil import disruption; this means a 1985 import range of 3–5 MMB/D, replaceable by stored supply and emergency measures.

In the long-term, beyond 1985, mobilize U.S. technology and resources to supply a significant share of the Free World's energy needs.

To achieve these objectives we cannot rely on government alone. We must, in large part, depend on our private sector for the large capital investment necessary to develop energy supplies. The task of mobilizing the needed private capital would be very challenging under the best of circumstances. However, the government has compounded the difficulties through its regulation and control of the energy industry; and for a variety of reasons, the private sector is having difficulty financing certain types of important energy projects. Most of these difficulties could be overcome through timely and innovative regulatory actions and through removal of other impediments to the development of oil, coal and gas and the growth of nuclear power.

The fact that we must face, however, is that that these needed regulatory actions and policy decisions will be too slow in evolving. The President has determined that we can't wait and, accordingly, has proposed the EIA in order to ensure the timely development of important sectors of our energy industry. If EIA is viewed as a substitute for taking the needed regulatory reforms, or if it is seen as a substitute for the private sector, its purpose will have been defeated and it will be counterproductive. If, however, it serves as a temporary bridge to the time when regulatory impediments are removed and evolves as a supplement to the private sector, then it can play an important role in bringing a sensible energy policy to this country.

In my testimony today, I will concentrate on the financial considerations which led to the EIA proposal and some of the more important consequences of EIA operations. In particular, I would like to discuss with you (1) the expected capital requirements of our energy industry, (2) the reasons why many important energy projects may not be financed by the private sector, and (3) the capital market impacts of EIA.

ENERGY INDUSTRY CAPITAL REQUIREMENTS

A number of studies have been made concerning the capital requirements of the energy industry. In most cases these studies have analyzed the requirements based on several assumed scenarios, and the resulting estimates of the overall levels of capital requirements for the energy sector for 1975–85 produced by these studies range from about $480 billion to about $680 billion in 1975 dollars. A $580 billion figure would seem reasonable to us.

In order to assess the relative size of this figure, it should be compared with estimated business spending on new plant and equipment of roughly $2,000 trillion in 1975 dollars over the 1975–85 period. When viewed in this light, the $580 billion energy investment figure would constitute roughly 30 percent of estimated business fixed investment over the period, which would be well within the range of historical experience. Over the 1965–74 period, for example, energy investments as a percentage of total business fixed investment averaged 29% and ranged from 24% to 33%.

Despite the fact that capital needs for energy are not out of proportion to historical trends, an important concern is the extent to which private investors will be willing to finance the necessary investment in energy. Historically, the energy sector financed a relatively small percentage of its investment from funds raised externally. For example, it is estimated that during the early 1960's about 25% of fossil fuel investment was financed externally while the investor owned electric utilities financed about 35% of their capital needs this way.

However, over the past decade the energy sector and business in general has tended to rely more and more on external financing, especially debt. During the late 60's and earlq 70's the fossil fuel industry financed roughly 30–40% of its requirements externally; and the level of external financing for investor owned utilities ranged from 50–70%. The result has been that the energy sector has taken an increasing share of total funds supplied by the private capital market. Over the 1961–65 period the energy industry's share of the total amount of funds raised by business in U.S. capital markets averaged 18 percent. The energy sector's share rose to 21 percent for the 1966–70 period and then to 28 percent in 1975, a year when other capital market demands were depressed. Estimates for the 1975–85 period suggest the U.S. capital market will provide some $1.1 trillion (in 1975 dollars) to the business sector and that the energy industry will require on average 25% of these funds.

We believe that the capital market will have the capacity to provide this level of funding to the energy industry. However, given the current uncertainties and regulatory climate, we do not believe that all of the necessary funds will actually flow to the energy sector in the needed amounts. Energy projects will have to compete with projects from other sectors; and the capital will normally flow to the most economically attractive projects—that is, where it can be most profitably employed in terms of private market criteria. Most of the needed conventional energy sector investments would be able to attract the necessary financing from private sources without Federal financial assistance such as that contemplated by EIA. There are, however, some types of projects which, for various reasons, are less likely to be able to attract funds from the private markets during the next 10 years without some form of government assistance. It's for this very reason that the President decided to propose EIA. To more fully appreciate the need for EIA, I would like to look briefly at some of the reasons why the private sector may not finance such projects.

REASONS WHY THE PRIVATE MARKET MAY NOT FINANCE CERTAIN TYPES OF ENERGY PROJECTS

There is no single all pervasive reason why certain types of energy development projects are not being financed in the private markets. In most cases where Federal assistance may be required, there is a combination of factors which create uncertainty in the minds of potential investors and prevent them from committing funds without some form of Federal participation. The most important of these reasons are the following:

(1) *Some energy projects included in our national energy program are marginal and, in some cases, not economic at current market prices.*—For example, synthetic fuel plants are at best only marginally economic at current prices; and because of uncertainty over future world oil prices and government regulation, most synthetic fuel projects are not attractive to private investors. Federal financial assistance will be needed if we are to accelerate the commercialization of synfuels and other promising emerging energy technologies.

(2) *We have failed to take needed regulatory action which is necessary to improve the financial viability of certain segments of our energy industry and to provide requisite assurances to potential investors.*—As a prime example of this regulatory neglect, I would cite the inadequate rate increases granted to

electric utilities by state commissions which have resulted in straining the financial condition of these utilities and in the deferral or cancellation of large amounts of new generating capacity. Almost half of the energy sector's projected capital requirements in the 1975–85 period are in the electric utility sector. Electric utilities are faced with the need to raise more capital than the oil companies over this period, but will have less than half the revenue base of these companies. While recent regulatory actions have resulted in some improvement in the financial situation of electric utilities, these companies can be expected to face future financial difficulties unless additional action is taken to provide for adequate rates and for a stronger cash flow. Without innovative regulatory actions such as including construction work-in-progress in the rate base, we may continue to have periods during which the financial condition of the electric utilities retards the undertaking of needed investment.

In the natural gas industry, if private financing is to be arranged for certain needed major projects, deregulation of new gas prices and still other types of innovative regulatory actions may be needed. These include approval of "all events full cost of service" tariffs which pass some of a project's risk to gas consumers and, possibly, consumer surcharges, which could be used to help finance exploration and development of new gas supplies.

Lastly, decontrol of crude oil prices would substantially improve the ability of the petroleum industry to finance energy projects and would also provide needed incentives for conservation and for the development of new supplies. As you know we are phasing such controls out over a 40 month period. The President has made it clear that we should do whatever we can to assure decontrol takes place as rapidly as possible. We must all make sure that the 40 month program will be fully implemented so that we can once and for all do away with that set of government regulations which encourages wasteful consumption of oil and discourages needed investment that will result in additional supplies.

(3) *Some energy projects have special risks which the private market may not be willing to bear without innovative regulatory devices and/or some form of government assistance.*—Examples of these types of projects are those involving the commercialization of technologies untested in the private market. The technological risk is often compounded by regulatory uncertainty, and private investors may not be willing to bear these risks without Federal assistance. In many cases, these special risks are compounded by long construction lead times which also make investors reluctant to commit funds. Synthetic fuel plants, for exemple, have a lead time of at least five years; and the typical nuclear power plant has a 10 year lead time.

BASIC FEDERAL GOVERNMENT AND REGULATORY ACTIONS TO ASSURE ADEQUATE ENERGY INVESTMENTS

The basic long run soution is to move forward as rapidly as possible with policy changes and regulatory reforms which will strengthen the ability of private firms to attract needed capital. For example, decontrol of energy prices would materially assist in financing of energy projects by improving cash flow and providing needed incentives to marginal projects. In the tax area, there are a number of measures which the President has proposed which would facilitate capital formation in general or would improve in particular the financial strength of the electric utilities industry. We also need to encourage the private sector to adopt innovative approaches to arranging the financing of needed major energy projects.

These kinds of actions must be taken. The problem, however, is that many of these will take time, and we simply can't wait. As the President has repeatedly emphasized our dependence is growing and we must do whatever we can now to reverse this trend. Therefore, the President has proposed the Energy Independence Authority as a temporary measure which will assist the energy sector over the next 10 years in drawing capital to needed energy projects which might not otherwise obtain financing from the private capital markets.

THE SCOPE OF THE EIA

As we evaluate the EIA, I think it is important to focus on precisely what EIA is designed to do and, as importantly, what it will not do. EIA is not intended to provide government assistance to all energy projects and it is not

meant to substitute the government for the private sector, which will continue to provide the bulk of the funds for our energy development. It is a supplement to the private market and aimed essentially at some of the critical bottlenecks in the energy finance field which may not be overcome in a reasonable time period by the private sector without Federal assistance.

The Energy Independence Authority is designed to provide up to $100 billion of finacial assistance to energy projects which:

(1) Will contribute significantly to energy independence, and

(2) Would not otherwise be undertaken by the private sector without governmental financial assistance.

The EIA would have a limited life of ten (10) years (subject to a single three-year Presidential extension). The financial outlays and commitments of the EIA are intended to be recovered by the government and will be used in conjunction with private sector financing to the maximum possible extent. The legislation requires EIA to use loans and loan guarantees to the maximum extent practical; but EIA is also permitted to provide guarantees of price, purchase and leaseback facilities, and purchase convertible and equity securities. Grants in aid could be excluded. The projects that could be supported by the EIA range across the full spectrum of the energy field and include emerging energy technologies, energy supply infrastructure, major conventional energy projects and emerging energy conservation technologies.

In addition, through the EIA legislation, the Federal Energy Administration would be empowered to certify projects as being of critical importance to achieving national energy goals. The EIA would establish new procedures for coordinating and expediting Federal regulatory proceedings that affect energy projects and require sound and expedited regulatory responses from regulatory Commissions having authority over EIA-financed utility projects.

The Energy Independence Authority will be, in short, a Federal undertaking of large scope and magnitude and result in substantial Federal involvement in financing certain types of energy projects. Some would argue that the Federal Government should not be so involved. I would agree if I felt that the needed regulatory changes would take place in a timely fashion. However, we have not seen evidence that this will happen and because of the overriding national importance of meeting our energy policy objectives in a timely manner, some Federal involvement is necessary. In 1973, we saw what could happen to us because of our heavy reliance on foreign energy sources. That experience, coupled with the continuing control that others exert over the price of oil, has resulted in a determination to reduce our reliance on insecure supplies which create an unacceptable danger to our economic prosperity and our national security. In order for this goal to be achieved, we must increase domestic energy supplies, diversify sources of imports, create strategic stockpiles, and reduce the excessive demand for energy. EIA will provide critical assistance in meeting these objectives.

However, the EIA legislation should not be considered as a substitute for the needed regulatory and energy policy actions which, over the long run, are essential to achieving our energy objectives. This is not the intention of the EIA proposal, and we must do everything we can to assure that it will not happen. In this regard, I think that the Committee should pay special attention to those provisions of the proposed legislation which are intended to encourage and facilitate needed regulatory reform. Specifically, Section 304(c) of the Act requires, as a condition of assistance to a regulated utility, sound and expedited regulatory response from state regulatory commissions. For example, the legislation requires that the relevant regulatory commission agree with the EIA and the regulated firm to a rate covenant that assures adequate earnings to protect EIA's investment. In addition, Title VI of the legislation provides a procedure to expedite Federal regulatory decisions with respect to energy projects. By reducing the time needed for regulatory action, the legislation would help remove some of the regulatory uncertainty which prevents private capital from flowing to many energy projects.

IMPACT ON THE CAPITAL MARKETS

I would now like to turn to an assessment of the impact that EIA assistance will have on our capital markets. In providing financial assistance to the energy sector through the EIA, we believe that every effort should be made to mini-

mize the cost of the EIA program to the general taxpayer, and to maximize the efficiency of this program. Minimizing the level of financial support requires flexibility in the forms of support that can be provided. In addition, the exact form of the most appropriate financial assistance will vary from situation to situation depending on the technology, the regulatory environment, the nature of the companies involved, and competitive market considerations. Accordingly, we believe that it is desirable to allow EIA to have a broad range of methods for providing financial assistance.

Even with such flexibility, concern has been expressed about the impact of EIA on the capital markets. I believe that we must face the fact that there may be considerable market impact. The central question is whether the urgent need for energy development outweighs any adverse capital market impact. Any type of Federal financial assistance which results in projects which would not have otherwise been undertaken will lead to some redirection of resources within the capital markets. This is as true for EIA as for any other government program. If EIA is to be effective in helping to solve our energy dependence problems, the EIA will have to divert capital from other areas of our economy into the energy sector. Moreover, because the financial incentives provided by EIA will have little or no effect on the overall supply of capital, EIA loans or loan guarantees will increase the demand for capital and tend to raise both private and government borrowing costs. This is also true of other government lending and loan guarantee programs. There is nothing unique about the EIA program in this respect.

In this regard, the net annual flow of funds in the U.S. credit markets is expected to be about $239 billion in fiscal year 1976. Of this amount, $137 billion, or 57 percent, will be required to finance the federal budget deficit and net borrowings for off-budget federal programs, leaving only $102 billion to finance the private sector. Further, total government borrowings this fiscal year will have an even greater impact on the long-term securities markets. We expect that such borrowing will absorb 82 percent of funds available in the long-term securities market. The funding of the EIA would add to the already large government presence in the capital markets and have an important impact on both the overall allocation of credit and the financing costs of both government and private borrowers.

We must, however, remember that some redirection of capital flows is the intended effect of EIA and an inevitable consequence if we are to assure priority to energy development. Furthermore, the EIA assistance will be spread over a relatively long time period. The EIA would provide an average of $10 billion per year in the late seventies through the mid 1980's, with the largest part of such assistance likely to be provided in the period from 1980–1986 when the overall economy will have grown by 25–30%. This would represent roughly 13% of the projected yearly energy investments of $70–$80 billion and roughly one-third of the external finance raised for energy sector investments during that period.

The precise nature of EIA's impact on interest rates and the allocation of capital is impossible to predict with any certainty. The aggregate size and the precise mix of the demand for capital will be influenced by the size of federal deficits, government fiscal and monetary policy, the rate of inflation, the strength of and duration of our economic recovery, the financing needs of the private sector and of state and local governments. Any one of these factors could have a substantial greater effect on capital markets than EIA activity.

In addition, the bill contains a number of provisions designed to minimize the impact of EIA operations on the capital markets. First, Section 303 of the bill requires the EIA to seek the maximum amount of financing from non-EIA sources in connection with any project which EIA undertakes. Second, Section 306 requires the concurrence of the Secretary of the Treasury as to the timing and substantial terms and conditions of each security issue backed by the Federal Government. This provision is, in my view, an absolutely essential part of the EIA proposal in that it not only helps minimize the impact on the capital markets but reduces the effects of EIA activities on government borrowing costs. Third, Section 314 of the proposed legislation contemplates an advisory panel which would review the effects of EIA financial activities on the functioning of the capital markets, including the effects on the volume and distribution of capital flows to and within the energy development sector of the economy.

Such a panel could keep continual watch on the effect of EIA activities on our capital markets and ensure that the impact was minimized. Fourth, Section 801 of the proposed legislation gives the members of the Energy Resources Council an opportunity to comment on any financial assistance granted by EIA. This would give the Secretary of the Treasury and other members of the ERC concerned with the financial implications of the program an opportunity to give their advice on the capital market impacts of EIA assistance to any given project.

COST OF THE EIA PROGRAM TO THE TAXPAYER

The fact that EIA is designed to provide assistance to projects which are too risky for the private sector to undertake has led many to conclude that EIA will lose billions of dollars for the U.S. taxpayers. This will not be the case. The mere fact that a project involves risks greater than those which the private sector is willing to assume does not mean that the project will necessarily lose money. Many inherently sound projects are not financed by the private sector because of regulatory delays and uncertainty, or the long lead times of certain energy projects. EIA assistance in such cases does not mean that EIA would be financing a "losing project." In structuring this authority, we have tried to provide safeguards so that there will be no cost to the taxpayer from EIA operations. As you know, EIA designed to be self liquidating. The loans it makes are expected to be repaid, appropriate guarantee fees will be charged, and EIA is expected to pay a return to the Treasury on its equity capital.

It is, of course, possible that EIA might sustain losses—particularly in its programs to encourage new energy technologies. However, the legislation has built-in special provisions to limit certain types of riskier financial assistance. Specifically, Section 308 provides that high risk loans, direct investments, product price guarantees or other direct financial assistance may not be provided if reserves established to meet contingent liabilities created in connection with such assistance exceed the sum of EIA's paid-in capital, earned surplus and gains on disposition of property. In such a case, the maximum loss to the taxpayer would be the initial equity contribution, unless Congress provided further equity capital.

CONCLUSION

In conclusion, it is clear that EIA operations will impact on our capital markets. It is also clear that EIA will result in the reallocation of capital toward the energy industry. However, the proposed legislation contains a number of provisions to minimize adverse market effects. Furthermore, inherent in the EIA proposal is the belief that some reallocation or diversion of capital is needed if we are going to achieve our energy goals. Also central to the proposal is the belief that EIA is not a substitute for market solutions and regulatory reform but a temporary supplement to the private market. It is with these two objectives in mind that we are calling for the creation of EIA.

The CHAIRMAN. Thank you, Mr. Parsky.

Mr. Parsky, I have great reservations about this proposal. It's an enormous amount of money, $100 billion. It's all offbudget. You haven't justified that, incidentally, in your statement. It's supposed to fund projects that the private market won't touch and while the President has been preaching deregulation and getting government off our backs, he now says we should get the Federal Government deeply involved in the energy business, deeply involved to the extent of $100 billion. Last fall President Ford and Secretary Simon were for a long time adamant in their opposition to a loan guarantee to New York, our largest city, a city of 7½ million people, which has been going for 400 years and will be for another 400 years.

Now you are before us, Mr. Parsky, speaking for the administration, saying you want Federal loan guarantees and other financing running into $1 billion a month up to $10 billion for a single project, and all that for risky energy ventures which the private market won't touch, just as it wouldn't touch New York City bonds.

It seems to me there's an element of inconsistency here. The New York City situation requires that loans not be made until there's a reasonable prospect of repayment as the way we protect the Federal Government's financial interest in up to $2.3 billion of loans that may be made to New York City. Now this $100 billion, almost 30 or 40 times larger, contains no requirement that there be a reasonable prospect of repayment of the loans or other financial assistance.

While you say in your statement that the EIA's outlays are intended to be recovered, I see little in the legislation to insure that that happens. It seems to me you should be vitally concerned about the question of repayment because the Treasury will be saddled with a responsibility of liquidating EIA's affairs at the end of 7 years or you can make commitments up to 7 years and it can run for another 3.

Mr. PARSKY. That's right.

The CHAIRMAN. Should the bill require a reasonable prospect of repayment?

Mr. PARSKY. Well, if I might, Mr. Chairman, I would make a few comments. The question of whether the EIA would be treated on-budget or off-budget—the basic rationale for treating it off-budget—stems from the basic expectation that although some of the investments will be in risky or high risk ventures and will result in losses, in the aggregate all of the financial resources committed are expected to be recovered.

The CHAIRMAN. Let's stop right there for a minute. We, unfortunately, do not have a capital budget. We should have it. We don't have it. We treat virtually all—with very few exceptions—of our credit programs as budgeted programs. This is true in housing. This is true with the Eximbank and it's true throughout our operation. I can't for the life of me see how we can make an exception of a program which is not a repayable loan program. It's also an equity investment program. It's also a price support program.

Mr. PARSKY. The equity aspect would be part of the budget as would any of the financial losses or gains that would be incurred by the Authority. I provided you with a rationale. I meant to add on top of that rationale, that any legislative measures you would see fit to provide for assurance of repayment, we would support. We do expect that in fact these investments will be, as I said—these financial resources will be recovered.

The CHAIRMAN. Let me just interrupt to say that the equity investment in the Authority will be part of the budget, but the equity investment that the Authority makes will not be necessarily.

Mr. PARSKY. That's right. The equity of the Authority would be and any additional equity requests would be, but the equity commitments which would be of a very limited nature made by the Authority would not be. That's right.

The CHAIRMAN. And the price support commitments would not be either, and of course you can lose. I would think if they can come into effect it would mean an expenditure.

Mr. PARSKY. That's correct. But if I might, Mr. Chairman, I'd also mention that we too have concerns about the Energy Independence Authority. These concerns were expressed directly as part of the interagency process. I think that the determination and I think the thrust of my statement was that the priority that is attached

to achieving a comprehensive energy policy is such that a normal and continual reluctance to involve the Federal Government and the private sector is in this instance overweighed. It's a temporary authority. We must make sure that it stays temporary and it is not seen as a substitute for the private sector, but I would share with you concerns, and I think we should undertake any safeguards, but we made a determination that in fact the needed energy will not come onstream in the time frame we are talking about and it's for that reason that the President has recommended this.

The CHAIRMAN. How about the question as to whether or not the bill should require a reasonable prospect of repayment before you make any financial commitment?

Mr. PARSKY. As far as we're concerned, we anticipated that the bill was aimed toward sound lending and prudent equity investment. If some characterization were suggested along those lines, I don't think we would have any objection to it.

The CHAIRMAN. I have reluctance about this because we passed a Lockheed loan guarantee that was hotly contested and although we expected it to be administered rather strictly it's been extended 4 times. The Secretary has made it clear he will never extend the loan to New York City. He discriminates in that case. We have here something that would be the equivalent of a Lockheed loan guarantee every week for the next 7 years, 400 back-to-back Lockheed loan guarantees. It's $100 billion. That's an enormous amount of involvement in the private sector that this bill would require.

Mr. PARSKY. Mr. Chairman, we have no objection to including in the bill a condition that there be reasonable prospect of repayment.

The CHAIRMAN. Well, let's look at some of the types of financial assistance which the EIA is authorized to provide. You say it's desirable for the Authority to have flexibility, that is, to have a broad range of methods for providing financial assistance. Some of these methods raise substantial questions about the prospects of repayment. Take price guarantees. This means the Federal Government will agree to subsidize the difference between the market price and a higher cost of production when the facilities come on-line and for a certain period of time.

What if the price remains above the market level? Will the Federal Government ever get repaid? Will we even have any legal right to require repayment? We don't require repayment on agriculture subsidies and this seems to be quite similar.

Mr. PARSKY. With respect to price guarantees, there is both the risk that there would be a loss and a possibility that money would be made, depending on where the price will go.

The CHAIRMAN. You're betting against the market. The market would get into it if they thought there was that kind of a prospect, wouldn't they?

Mr. PARSKY. That's at this point in time, but there's no way to predict exactly where the market will go over a period of time.

The CHAIRMAN. And the bill also allows, as I said, the Authority to purchase equity securities. How will the government be assured of getting its mouey out of this within a set period of time or will they not be able to assure that?

Mr. PARSKY. Well, first of all, it's contemplated that equity participation would be of a limited nature. Second, we would attempt to do that in a way that would——

The CHAIRMAN. Why shouldn't the bill expressly indicate how limited it should be? Would you object to that?

Mr. PARSKY. Well, we would like to have the bill provide as much flexibility as possible. As I said, we are cautious in our willingness to allow substantial equity participation, but we would urge that maximum flexibility be provided.

A general caveat to the effect that this should be of a limited nature, as opposed to attaching a certain percentage or a certain amount, I don't think would be objectionable, because we share those concerns.

The CHAIRMAN. Why not confine the equity to, say, participating debentures or something like that? Senator Stevenson raised the excellent point in earlier hearings on this bill that the government ought to participate in the earnings in some of these areas and the earnings might be substantial. Couldn't you achieve that by requiring that any equity would have to be participating so that the government would be protected? You wouldn't subordinate that equity which is what happens to equity all the time of course.

Mr. PARSKY. Mr. Chairman, that's certainly a possibility. As I indicated, I think that we should give the Authority as much flexibility as possible, putting in the proper kinds of safeguards. If the Congress in enacting this legislation wants to ensure that the equity aspect of it was of a limited nature without giving a specific percentage or a specific dollar amount, and wanted to make sure that earnings in fact were generated and couch those into the bill, I don't think we would have any objection.

The CHAIRMAN. The bill also allows the EIA to form a subsidiary and construct a major facility without even having a buyer lined up and go into a $10 billion project because it looks like the technology ought to be developed. But what if it builds the thing and nobody will buy it? Should the bill require that the buyer be lined up or should there be some kind of commitment?

Mr. PARSKY. In discussing this possibility we always contemplated that this would be in a very limited way. I wouldn't object to any caveat being attached along those lines.

The CHAIRMAN. Now you say in your statement that some energy projects are risky because they have long construction lead times, 10 years in the case of a nuclear power plant, and most of the financing would be done in the period from 1980 to 1986.

Now doesn't this mean that a lot of the projects won't even be finished, much less repaid, when the Authority expires?

Mr. PARSKY. Yes, that's correct.

The CHAIRMAN. Wouldn't that mean that the Treasury would therefore have to, in effect, own a big piece of nuclear powerplants, for instance?

Mr. PARSKY. There could be a period of time that that would be the case, yes.

The CHAIRMAN. Mr. Parsky, in dealing with the New York City problem, the Committee has been looking down the line at the problems the city will be facing when the Federal loan program expires,

and it's a very grim situation, at least in my view. It seems to me that no one has been looking down the line of what we would be faced with when the $100 billion Energy Independence Authority expires 10 years from now. It seems to me that the Federal Government would be left holding a bagful of costly, obsolete white elephants perhaps in 1986. Since the bag will fall in the Treasury's lap, I believe you should be giving more thought to what is involved in this legislation in that way.

Mr. PARSKY. Mr. Chairman, we have given a great deal of thought to it and, as I indicated to you, we are concerned about having EIA move in a direction or evolve in a direction that was not intended. I think I have tried to express as precisely as I can that intent. We have looked down the road and we are objective and our purpose is to in fact use the EIA as a means of removing those impediments to the process that will allow these aspects of the energy industry to continue to function and continue to grow.

I draw a distinction—and perhaps I should have mentioned this before—but I do draw a distinction between the EIA and the New York City situation. In the New York City situation, we were repeatedly reluctant to provide New York City with a guarantee or a form of assistance until we had some degree of assurance that the city would in fact begin to get its own house in order, would begin to reduce its expenditures and would begin to move toward a balanced budget. The situation with respect to the energy industry, Mr. Chairman, I believe is quite a bit different.

The CHAIRMAN. I don't want to resurrect New York City all over again, but when they came to the Federal Government they had already made enormous cuts. They had already cut 20,000 or 30,000 people off the payroll. They had already frozen their payroll for 3 years. They had already put in place the Financial Emergency Control Board which had been extremely emphatic in holding down expenditures. They had already made their city about the highest taxed city in the country. They had already made a lot of big sacrifices.

I agree with you that the President was successful in securing additional concessions that were valuable. This seems to me to go to the heart of this thing.

You estimate the capital needs for the energy sector for 1975 to 1985 at $580 billion. Do you intend that the $100 billion in Federal assistance proposed in this bill will be in addition to that $580 billion or a substitute for part of the $100 billion or make the $580 billion possible?

Mr. PARSKY. The latter, Mr. Chairman. I would make the $580 billion possible.

The CHAIRMAN. Well, the studies that we have, the only documented studies, indicate that the $580 billion, or in current dollars somewhat more than that, would be available from the private sector. A recent Bankers Trust study, for example, concluded the private capital markets would be adequate to meet the financing needs of the energy industries even though their estimate of the capital needed to achieve energy independence by 1985 was $900 billion and even allowing for current dollars being more, that's somewhat higher than yours.

A study by Bosworth and Dusenberry made the same conclusion. They concluded that the capital markets would be adequate without additional Federal assistance.

Now you agree that the private markets will make the capacity to do this and yet you say you don't believe that all the necessary funds will actually flow to the energy sector. It appears your real point is that the funds won't go to the most risky ventures without Federal assistance. Are you saying that we need an EIA primarily to channel capital to risky energy projects and perhaps away from more secure energy investments?

Mr. PARSKY. The word "risky" is often a dangerous word to use because it suggests that it's going to be totally uneconomic and that the result will be a loss. That's not what it means to suggest in my mind. I think there are sectors of the energy industry that will not be able to generate the needed capital over this period of time and those would include the nuclear area: it would include certain emerging technologies. The thrust of the EIA would be in that direction.

I think that with respect to oil and gas over that period of time, it's probably true that in fact the private market without Federal assistance would be able to generate the needed funds.

What I was trying to indicate that I felt is that although the capacity exists in the private market as a whole, I don't think that in certain areas of the energy sector that those markets will supply the needed funds without some diversion and this Authority would bring about that diversion.

The CHAIRMAN. Dr. Barry Commoner argues that by departing from the private market which will finance the most efficient and productive investments that what you're doing is bringing on the more expensive and costly technologies and that the effect is going to not only divert capital but result in higher energy costs.

Mr. PARSKY. Well, Mr. Chairman, I think that we have to recognize that we are running out of cheaper energy and the question that we have to face is whether or not we are willing to maintain or slightly reduce our dependence or increase our dependence or whether we really want to be in a position of being invulnerable to a cutoff in supply: and the conclusion that we have reached is in fact we are going to have to pay a little more in order to achieve that level of independence.

The CHAIRMAN. Senator Sparkman.

Senator SPARKMAN. Mr. Chairman, I find myself somewhat lost in trying to go through all of these billions that are involved in this presentation and yet it is an interesting proposal.

Let me ask you—this is the President's proposal, isn't it?

Mr. PARSKY. Yes; it is.

Senator SPARKMAN. Is this his Manhattan project for the production of energy?

Mr. PARSKY. Senator, I haven't heard the President refer to it that way. I don't view EIA as our whole energy policy. I view it as an important aspect of it and the President attaches that kind of importance to it. It's a limited authority to do a limited job. We shouldn't try to change the thrust of it, for if we do, I think that we would be moving in a direction that would be counterproductive.

Senator Sparkman. This is not in any sense a nationalization of the energy program, is it?

Mr. PARSKY. No, Senator, it should be viewed as exactly the opposite. If it becomes such or if it's changed from the proposal that the President has put forward to be that, then we would object to it.

Senator SPARKMAN. I may say to you that I have long recognized the problem with which we are faced over the next good many years with reference to energy. As a matter of fact, about a year ago I wrote the President a letter and at that time there was a great deal of discussion among the people and in the news media with reference to how our energy resources compared with those in other countries of the world, what our dependence might be on it, and we fussed back and forth in the Senate on an energy bill you may remember, trying to get effective legislation. I wrote the President a little letter reminding him or recalling to him that back when we were getting ready for World War II there was set up what was known as the Manhattan project. I remember I was in the House of Representatives at that time and was on the Military Affairs Committee of the House and I remember Senator McKeller, who was chairman of the Senate Appropriations Committee, came over and testified to our committee and he made this request to us—he was asking for an authorization of $2 billion and in those days that was a lot of money.

Mr. PARSKY. It still is.

Senator SPARKMAN. He said, "Now I just request this, that you not ask me to tell you what this is for." So that was quite a request. But, he said, "I want to assure you that what we propose to do will probably determine who wins the war if we get into it." This is just before we entered it, just before Pearl Harbor, maybe several months, but we all saw a war coming. Well, he says, "Germany and the United States are both working on the same thing." He didn't tell us what it was, which we found out later was the breaking of the atom—the smashing of the atom, but he said—and as you know, they were pursuing two different methods. The Germans were working on it and theirs was the heavy water process and he said, "We are both working on it and the one that solves it first will win the war."

Well, we took him at his word and there was set up the Manhattan project and you remember that that money was used for the purpose of building at Oak Ridge, Tenn., the nuclear plant that we had there. So he may have been right in what he said. I don't know. But anyhow, I recalled that to the attention of the President and I said I'm disturbed about this energy resource problem with which we are confronted and what's going to happen to us. Back at that time we were talking about becoming self-dependent by 1984 or some such year as that, and I suggested to him that we had a great supply of energy in the earth, under the earth, and that what we needed, in my opinion, was a tremendously stepped up production of oil, going after our coal, the production of other sources of energy, and I told him I thought that some such program as that ought to be done.

He assured me that they were working on the program that he thought would provide the energy that we needed and it seems to me that this bill goes very far in that direction. I must admit that the amount of money involved does rather scare me, but it may be neces-

sary and I don't think we can take any chances. I'm glad at least it's being explored and I hope we can find some solution to our multiple problems with reference to adequate energy supplies.

Mr. PARSKY. Well, Senator, I can only comment by saying that the amount of money that's needed in the sector as a whole is very large. We have not viewed the EIA as the only answer, as I indicated. It shouldn't be seen as the long-term answer. The long-term answer really lies with our private sector and with improving the climate for investment. This is a temporary measure. We need to keep it temporary and we need to at the same time insure that the necessary changes are made in the environment to stimulate private sector action.

Senator SPARKMAN. That's all, Mr. Chairman. Thank you very much for your statement.

Mr. PARSKY. Thank you.

The CHAIRMAN. I might point out that this is not a research bill. There's not a nickel in here for research and as a matter of fact, as I understand the language here, you are only permitted to fund projects in which the research—it says no research is permitted.

Mr. PARSKY. That's correct.

The CHAIRMAN. We have already provided last year something like $2.6 billion for research in this area, and this year a 30 percent increase to well over $3 billion, $3.3 billion I think it is. So this is something separate. This is for established technology.

Mr. PARSKY. That's right. It's designed to attack a different problem, Mr. Chairman.

The CHAIRMAN. Now I note that you say that EIA could finance all manner of energy supply projects, including major conventional projects, but on the conservation side it could finance only new technologies. Yesterday, Mr. Canfield from GAO made a very, very good presentation and I recommend that you review what he said because it was one of the best presentations that we have had.

He testified that the gain in energy saved from using conservation technology exceeded those to be gotten in the supply side and I got the distinct impression—I got it from Vice President Rockefeller when he testified and from Mr. Zarb—that they are almost totally ignoring the conservation savings. As a matter of fact, they estimated the savings would only be a reduction in the rate of increase of about 5 percent and the other testimony contradicts that pretty emphatically and I would hope that if we do enact this bill that you would think very strongly about financing not only new technologies—and I think we ought to modify it to authorize you to do so—but financing established technologies so that we can save money in conservation.

Incidentally, Mr. Canfield suggested that we establish what this bill doesn't do, a benefit-cost system, so that you would evaluate every project on the amount of number of barrels that that project would save for the dollar cost, and he said on that basis we would find that we could do a lot more in conservation than we would probably in production.

Mr. PARSKY. Well, Mr. Chairman, I would only say that the concern is, again, that we not substitute EIA for what the private sector would do without EIA. That's the reason we have been cautious in

terms of the Authority and the kinds of programs that we would undertake. But we are certainly committed to in fact increasing our conservation at the same time that we are bringing on supplies and this suggestion about a cost-benefit approach is certainly acceptable.

The CHAIRMAN. I just have one final question. Usually, especially when the Treasury comes up, particularly a Treasury Department headed by Mr. Simon, he's very careful about the amount that's requested and he fights tooth and toenail I'm sure to make sure that amounts are held down to only what is necessary and he will fight over $1 million and certainly over $100 billion. Here you come up with a $100 billion request and I haven't seen a line indicating why it has to be $100 billion instead of $80 billion or $50 billion or $20 billion or $200 billion. There's no justification as to why $100 billion, which Senator Sparkman has said, is a size that would frighten all of us—why that much money is needed. Why do you settle on that? I know Vice President Rockefeller, who's the author of this, thinks big, but that's awfully big.

Mr. PARSKY. Mr. Chairman, let me assure you that Mr. Simon and others in the Treasury fought tooth and nail on this issue as well as others.

The CHAIRMAN. And he fought on the right side, I think, even though he lost.

Mr. PARSKY. But I would say we feel it is reasonable in comparison to the total amount of energy investment that's needed over this period—approximately 20 percent. We have broken it down approximately a third to a little bit more than a third to emerging technologies, approximately a quarter would be allocated to nuclear, some to oil and gas displacement, some to the regulatory side, and by categorizing that the reasonable amount——

The CHAIRMAN. How much for conservation?

Mr. PARSKY. I don't have a specific breakdown in amount. I can get it if you like.

The CHAIRMAN. Well, roughly? You must have had some notion; 10 percent, 5 percent?

Mr. PARSKY. I'd say about 10 to 12 percent.

The CHAIRMAN. That's pretty pitiful, don't you think, in view of the prospects of it?

Mr. PARSKY. The question you have to ask is does the conservation area in fact call for this kind of supplemental Federal involvement? It's not that we aren't committed to conservation. The question we have to ask of any one particular area of the energy sector—is that one that would not otherwise be developed without Federal assistance?

The CHAIRMAN. It sounds like maybe the best investments will be made without Federal intervention.

Mr. PARSKY. That could be, Mr. Chairman.

The CHAIRMAN. On that note, thank you very much, and thank you seriously for a very fine presentation and for an extremely well organized paper.

Our next witnesses will be John Harper, Business Roundtable, Pittsburgh, Pa.; and Peter Peterson, chairman of the board, Lehman Brothers, New York.

STATEMENT OF JOHN D. HARPER, CHAIRMAN, EXECUTIVE COMMITTEE, ALUMINUM CO. OF AMERICA

Mr. HARPER. Senator, my name is John D. Harper.

The CHAIRMAN. I'm sorry to interrupt once again and I apologize because you have been a patient listener, but we do have Mr. Nader following you and then Robert Nathan and Professor Weidenbaum, so we would appreciate it if you could abbreviate your remarks and make them as concise as possible.

Mr. HARPER. I will abbreviate it very much, sir.

I am a director of theAluminum Co. of America and chairman of the executive committee of the company. I was formerly chairman of the board and chief executive officer of Alcoa and have served the company for nearly 50 years and I want you to know that we at Alcoa appreciate the opportunity to give you these comments on the proposed Energy Independence Authority and I should point out that I am appearing for Alcoa not for the Business Roundtable.

The company endorses the concept of the Federal Government providing loans and loan guarantees to industry for key, highrisk energy projects, which industry could not finance otherwise. We feel strongly, however, that such projects should be developed and operated entirely by the private sector.

While Federal financial assistance is needed to stimulate private development of new energy sources and technologies, equally important is the need for Congress to deregulate the sale of natural gas at the wellhead. That will allow higher prices and provide an incentive for exploration and production and, thus, increase natural gas supply. It is essential also that Congress deregulate, as rapidly as possible, the price of oil to establish an incentive for developing new sources, including the Outer Continental Shelf, and for increasing secondary and tertiary recovery.

U.S. industry is going all out to live with the new energy reality. That means searching for tolerable ways to pay the price of higher cost conventional energy. It means converting to alternate fuel where possible. It means developing new energy sources—and the technology to use them. And, it means tough conservation efforts. Hundreds of millions of dollars are being spent by industry in coming to grips with today's and we hope tomorrow's energy constraints.

Despite this substantial effort by the private sector, the overall energy dilemma is not getting resolved. The whole situation seems hopelessly bogged down in regulatory problems, institutional and environmental barriers and policy uncertainties.

To understand the energy situation in the aluminum industry, you should know that smelting—or the actual metalmaking process—accounts for over 60 percent of our total energy requirement. Less than 40 percent is used in mining, refining and fabricating operations.

So, the largest base for reducing energy per unit of production is in smelting. In the past three decades, the energy for smelting aluminum by the Hall process has been reduced from 12 kilowatt hours a pound to an average of 8 kilowatt hours, with today's most efficient smelters requiring about 6 kilowatt hours per pound of metal produced. It is not economically feasible to convert the older Hall pot-

lines to the newest technology. But their energy efficiency is continuously increased through better operating methods.

That's because the aluminum industry is highly competitive—and all aluminum companies compete vigorously in reducing energy costs.

The U.S. aluminum industry's energy profile is unique. For example, Alcoa, whose profile is characteristic of the industry's, generates 50 percent of its own electric power requirement in company-owned plants and purchases the remainder from public and private power developments. By contrast, industry as a whole generates only 16 percent of its power. Of Alcoa's total power requirement, 43 percent comes from hydroelectric plants; 40 percent is generated from coal. Only 17 percent comes from gas, oil, and nuclear plants.

We began in 1972 to convert all facilities possible in nonsmelting operations to use alternate fuels. Since then, we have spent about $12 million to convert from natural gas to oil. We do this because we see little, if any, interstate gas available to industry after 1979, except for critical process uses which are not convertible to alternate fuels.

We anticipate heavy constraints on the use of oil after 1990, so we are developing ways to use more coal. Increased use of coal and coal-derived fuels are high priority projects in our industry laboratories. We need the benefit of coal gasification and liquifaction, as well as more nuclear power.

But the capital requirements for these projects are huge—and the benefits may be far in the future.

Thus, the aluminum industry is counting heavily on its extensive conservation effort to make the best use of the fuels that will be available over the next few years.

Some of Alcoa's initial success was due to timely results of ongoing research. A new Alcoa smelting process just coming on-stream will reduce by 30 percent the electric power used in that process compared with today's most efficient potlines. However, it will take years and tremendous capital investments before this, or any other smelting technology, will replace the existing Hall process.

Alcoa developed a new flash calcination process for use in refining alumina and now has it installed at all of our refineries. It will save the company about 30 percent of the energy we were using in calcining.

We have over 100 energy-related projects underway—right now—in our research laboratories.

We've also conserved energy through equipment and process modifications—improved efficiency in production methods—utilization of waste heat for several applications—installation of exact controls on equipment—and tough plant housekeeping rules to eliminate energy waste.

We've not been concerned only with Alcoa conservation. The industry, through meetings with the FEA and Department of Commerce, set 10 percent less energy per pound of production as an energy reduction goal for 1980. The base year is 1972. The aluminum industry already has made 50 percent of its goal. The next 50 percent will be the toughest, but we expect to make the goal.

In the next 4 years we have to save more to meet the remaining one-half of our commitment. We expect to manage with major equip-

ment and process changes, application of innovative technology, and construction of new facilities of superior design.

These solutions have a particular characteristic in common: they cost money, a lot of money. And capital is short in the aluminum industry, as in many other industries, today. Capital formation is a very serious concern to us.

The Federal Government could be especially helpful in moving the entire aluminum industry more rapidly and surely to an even higher level of energy efficiency. There are energysaving opportunities common to all aluminum companies.

We need the capability of replacing the use of natural gas and oil with coal-derived fuels through liquefaction and gasification processes. The Federal Government is needed to back development of this high-risk technology and to help the private sector establish commercial scale operations.

It becomes obvious from this description of Alcoa's, as well as the aluminum industry's, energy situation that the private sector cannot possibly accomplish on its own all that needs to be done to improve the Nations overall posture. A cooperative effort with Government is essential to speed development of key energy projects.

Private industry is best equipped to handle many of the energy projects that are needed. But for those that represent an unusually major undertaking, involving high-risk capital, some form of help will be necessary from the Federal Government. That help should be provided only in the form that financing today is provided routinely in the private sector by banks, insurance companies, and other sources of capital.

Therefore, it is vital that we act now, as a nation, to turn the flow of U.S. dollars away from insecure foreign suppliers of oil to the many U.S. projects that are vital to achieving energy independence.

Thank you for the opportunity to comment at these hearings. I will be happy to answer any questions you have regarding my testimony.

The CHAIRMAN. Thank you very, very much, Mr. Harper.

[Complete statement follows:]

STATEMENT OF JOHN D. HARPER, CHAIRMAN OF THE EXECUTIVE COMMITTEE, ALUMINUM CO. OF AMERICA

My name is John D. Harper. I am a director of Aluminum Company of America and chairman of the executive committee. I was formerly chairman of the board and chief executive officer of Alcoa and have served the company for nearly 50 years. We, at Alcoa, appreciate the opportunity to offer our comment on the proposed Energy Independence Authority.

Aluminum Company of America endorses the concept of the Federal Government providing loans and loan guarantees to industry for key, high-risk energy projects, which industry could not finance otherwise. We feel strongly, however, that such projects should be developed and operated entirely by the private sector.

While Federal financial assistance is needed to stimulate private development of new energy sources and technologies, equally important is the need for Congress to deregulate the sale of natural gas at the wellhead. That will allow higher prices and provide an incentive for exploration and production and, thus, increase natural gas supply It is essential also that Congress deregulate, as rapidly as possible, the price of oil to establish an incentive for developing new sources, including the Outer Continental Shelf, and for increasing secondary and tertiary recovery.

U.S. industry is going all out to live with the new energy reality. That means searching for tolerable ways to pay the price of higher cost conventional energy. It means converting to alternate fuel where possible. It means developing new energy sources—and the technology to use them. And, it means tough conservation efforts. Hundreds of millions of dollars are being spent by industry in coming to grips with today's, and we hope tomorrow's, energy constraints.

Despite this substantial effort by the private sector, the overall energy dilemma is not getting resolved. The whole situation seems hopelessly bogged down in regulatory problems, institutional and environmental barriers and policy uncertainties.

To understand the energy situation in the aluminum industry, you should know that smelting—or the actual metalworking process—accounts for over 60 percent of our total energy requirement. Less than 40 percent is used in mining, refining and fabricating operations.

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Based on the aluminum industry's own assessment of fuel supplies, we have been altering our energy profile at Alcoa.

We began in 1972 to convert all facilities possible in non-smelting operations to use alternate fuels. Since then, we have spent about $12 million to convert from natural gas to oil. We see little, if any, interstate gas available to industry after 1979, except for critical process uses which are not convertible to alternate fuels.

We anticipate heavy constraints on the use of oil after 1990, so we are developing ways to use more coal. Increased use of coal and coal-derived fuels are high priority projects in our industry laboratories. We need the benefit of coal gasification and liquefaction, as well as more nuclear power.

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The aluminum industry already has made 50 percent of its goal. The next 50 percent will be the toughest . . . but we expect to make the goal.

In the next four years we have to save more . . . to meet the remaining one-half of our commitment. We expect to manage, with major equipment and process changes . . . application of innovative technology . . . construction of new facilities of superior design.

These solutions have a particular characteristic in common: they cost money. A lot of money. And capital is short in the aluminum industry—as in many other industries—today. Capital formation is a very serious concern to us.

The Federal Government could be especially helpful in moving the entire aluminum industry more rapidly and surely to an even higher level of energy efficiency. There are energy-saving opportunities common to all aluminum companies. For example:

Recovery of heat from the Hall Cell.

Saving energy in the baking of anodes in ring furnaces.

Improvement of efficiency of melting furnaces. And, development of heat recuperation for preheating combustion air and materials to be melted and for space heating.

Development of technology for burning coal in aluminum melting furnaces.

In the heat-treating operations, we need heat recuperation for preheating combustion air and space heating and for substitution of oil for natural gas and propane in thin-wall radiant tube furnaces.

We need the capability of replacing the use of natural gas and oil with coal-derived fuels through liquefaction and gasification processes. The Federal Government is needed to back development of this high-risk technology and to help the private sector establish commercial scale operations.

It becomes obvious from this description of Alcoa's, as well as the aluminum industry's, energy situation that the private sector cannot possibly accomplish on its own all that needs to be done to improve the nation's overall posture. A cooperative effort with government is essential to speed development of key energy projects.

Private industry is best equipped to handle many of the energy projects that are needed. But for those that represent an unusually major undertaking, involving high-risk capital, some form of help will be necessary from the Federal Government. That help should be provided only in the form that financing today is provided routinely in the private sector by banks, insurance companies and other sources of capital.

So long as capital is short, and near-term constraints on energy supply can be managed, industry will continue to gamble on the future availability of oil as it is unable to take the big step, on its own, to initiate any of the badly needed high-risk energy ventures.

Therefore, it is vital that we act now, as a nation, to turn the flow of U.S. dollars away from insecure foreign suppliers of oil to the many U.S. projects that are vital to achieving energy independence.

Thank you for the opportunity to comment at these hearings. I will be happy to answer any questions you have regarding my testimony.

STATEMENT OF PETER G. PETERSON, CHAIRMAN OF THE BOARD, LEHMAN BROTHERS INC., NEW YORK

Mr. PETERSON. Thank you, Mr. Chairman, I will speak informally and in a summary way on this subject.

In thinking about this problem and talking to people around the United States about it, I am impressed with what we used to say in Nebraska about the problems that are this difficult, that we feel ambivalent, as we used to say, about these problems.

On the one hand, we say that growing dependence on insecure sources is completely unacceptable and yet, we seem to go around accepting it. We say that extraordinary measures are needed to reduce the vulnerability, but when it comes to taking concrete steps we seem to find reasons not to take them.

Therefore, it seems to me the first question that you must face is whether you really believe the problem is serious enough to do some things that none of us would do under other circumstances.

I guess I have decided that the alternatives, namely not having enough energy, whether it's high cost or low cost, are that serious. This problem has achieved a certain Vietnam quality in which all of the alternatives are bad and they seem to be getting worse. So, the sooner we get at it, the better.

So I start out with the premise that something unusual needs to be done. But in deciding what ought to be done, it seems to me that we have to face the fact that the public's suspicions that now exist on this energy problem are in a sense at the heart of the political problem with regard to what could be done about it.

I think the suspicions on the energy problem on both sides of the political spectrum approach paranoia and, in this Bicentennial year of 1976 in which I think some of the feelings are a little less generous than our forefathers, I think it's going to be particularly difficult to arrive at constructive, sensible solutions.

As I talk around the country to people about the Energy Independence Authority and what's implied, as I talk to people who approach the problem from the political left, here are the kinds of comments, or I should say allegations that I get: "The oil companies engaged in one giant rip-off in the fall of 1973 with its very high prices. These companies—again I must emphasize these are allegations—were part of a conspiracy to create an artificial shortage. Now what's being proposed as, in effect, a second giant rip-off." We all know the oil companies are not folk heroes in American life at the present time. Thus, it is easy to say that if one goes ahead with a program of this kind, many will suspect they will have achieved the millennium of high rewards and zero risks in which heads they win and tails the consumer loses.

Oddly enough, if you approach this problem from the political right, I hear across America equal concerns. Some say to me that "this is simply the first step to an energy equivalent of the Post Office and, in addition to that, you're taking enormous amounts of capital that are badly needed for other purposes that are more sensible, more commercially feasible, and it just aggravates the capital shortage problem." They go on to say, "there's no way this Authority will go out of existence in 1985 because it's predicated upon the premise of energy independence by 1985 which is not going to happen." With the natural Parkinsonian tendency of bureaucracies it probably wouldn't have happened anyway but it's not going to happen in this case. So this is simply the first step toward a kind of government control and operation of the energy business.

This is aggravated by the fact that people have predicted specific growth rates in synthetic fuels over the next 10 years. Many sober analysts of this field tell me they are not likely to be attained and, therefore, having set up the goals and not attaining them, it is argued that this will then be used as a reason to federalize this effort.

So I would suggest an obvious point to you, Mr. Chairman, that given the profundity and I think the extensiveness of the suspicions on both sides of the political spectrum, one has to pay unusual atten-

tion in coming up with the right legislation to a good answer to the process by which projects are selected. Safeguards are also unusually important or we are likely to once again do nothing because we are paralyzed by our mutual suspicions.

In my comments today, I'd like to focus essentially on new energy sources, principally in the synthetic energy field. Our need it seems to me is not simply for a certain amount of energy by a certain amount of time, but a symbolic need to demonstrate to OPEC and the rest of the world that we have the potential, the capacity to produce in large volume additional energy if we need it.

Now if we agree on that, I guess the first question is: Will the private sector invest in these kinds of new energy projects of a synthetic nature? I think I will say it pretty strong. In my judgment, I think they absolutely will not. Let's look at how these synthetic energy projects would look from the standpoint of a typical company assessing these projects.

Obviously, a first question that has to be raised is how many dollars are you talking about? I have looked at a variety of these projects and we are clearly in the megabuck category where the typical project here is somewhere between $500 million and $1 billion for a number of these new synthetic energy projects. Remember, the old cliche about the pig and the egg-laying hen discussing their relative contribution to the food problems of the world. I believe it was the pig that indicated to the hen that to the hen it was only a contribution but to the pig it was his whole existence.

Now I think what you're going to find is that as companies start looking at numbers of this magnitude, particularly with the kind of economic and political risks you're talking about, sensible business people are going to decide that the risks are simply unacceptable, particularly when we consider the magnitude of the capital investment we are talking about.

Now let's look beyond the capital investment to the product costs, which I have tried to do, and if you want to ask more questions about this later we can get into it, but any prudent businessman is going to look at alternative costs and alternative investments of other energy projects. After all, oil is pretty much oil, whether you make it synthetically or not. If you take other available investments in oil, for example, let's go across the spectrum all the way from Mideast oil to let's say advanced recovery methods in the United States, and go Mideast, North Sea, off-shore, domestic oil, regular and then advanced recovery methods. In the case of the Mideast we are probably looking at oil that with production costs fully amortized, including investment of $4,000 to $7,500 a barrel and prices of $5, $5.50, $6, $7, and $8. If you go off-shore, you hear investment numbers like $3,000 to $4,000 a barrel and production costs like $5 to $6. If you talk about domestic oil, you hear investment numbers all the way from a few thousand dollars a barrel to $12,000 a barrel and prices of $5 to $10 and if you talk about advanced recovery methods, the numbers range to something above $10. Against these kinds of investments and selling prices, we see estimates on the synthetic energy projects that involve investments per barrel between $12,000 and $25,000, and selling prices from $13 to $26 a barrel—clearly much higher.

The point is, that you have got three very large negatives there facing anybody looking at these new synthetic energy projects—huge investments in relation to their book value and net worth (often single synthetic projects exceed a single company's entire book value—it would threaten their whole existence), extremely high cost, a factor of up to 100 to 1 over alternatives, and an ambiguous and unpredictable regulatory environment that adds additional risks. So I don't think it's an overstatement to say that if one argues he needs these new synthetic energy sources, it's close to zero probability that they will happen relying on the market system.

Thus, while I am generally an advocate of the market system, I think the circumstances here are remarkably unusual. In the first place, normally the market gives you some time to adjust, but October 1973 was so traumatic that the mechanism simply has not had time to work. Second, you're dealing with an eminently nonmarket phenomenon in the cartel: and third, you're dealing in an area here where, as I mentioned earlier, the political forces in this country are extremely important and they just add a whole new magnitude of risk to any project.

Therefore, I think it's easy in this situation to sloganize and become ideologues and both sides of the political spectrum will probably do that. But when I consider the alternative which is not only having low cost energy but not having energy at all, I think it is literally nonacceptable.

Therefore, I would want to commend the President and, of course, the Vice President for presenting to the country an alternative instead of a good deal of meaningless rhetoric that says on the one hand we can't stand for this cartel, we have got to do something, but we end up liking every kind of energy except the ones that we have.

Now before getting to the development of new energy sources, I think there are some things that greatly supplement this activity. I commend what you've done on strategic storage reserves because by any cost effective measures that I have seen, it's eminently more cost effective and timely way of reducing the cost of embargos than new synthetic energy source programs.

Conservation I think deserves even more emphasis than it's gotten. In addition to proposals that I'm sure you will have heard about, investment in conservation technology, for example, I would remind you that more effort on conservation has some very great advantages. It's much, much quicker than some of the things that we have been talking about on the synthetic energy. It's much, much cheaper. You save investments in the many billions of dollars and, of course, our consumers save the money for other purposes and we save the precious resource with less environmental impact. So I reluctantly conclude that it's going to be necessary, given the threat that this problem poses to our security, to move even further in the direction of mandatory standards on various kinds of new buildings and equipment, et cetera, as we have had to do on automobiles.

But beyond new buildings, I think I would throw into the hopper consideration of looking at what we are doing with existing buildings where we are obviously wasting enormous amounts of energy. As I go around the country I still find many buildings relatively overheated, overlighted, and overcooled. I am told by people that pre-

sumably know the American political system that the political baggage of this country is too heavy to sustain mandatory conservation standards. I'm not really at all sure about this. I have a feeling that if the American people really understood the gravity of this problem, and there was real burden sharing in which everybody sacrificed something, that it is time that we do explore some alternatives here that apply to all of us with regard to conservation on lighting, heating, cooling temperature standards in all commercial buildings. When I look at the alternatives and the cost and the time and the need to show the world we are serious, I think the time is here when we are going to have to consider additional conservation measures.

Now with regard to the Energy Independence Authority and synthetic energy sources, there are a few issues I will articulate. The first is how much money should be put into this and, of course, the next question is to do what? As to how much money, I will simply use the "motherhood" appeal and say "as little as possible" and I'd like to indicate why.

I think it's very important that we do not put too many billions of dollars into these extremely high-cost energy sources. It would be an irony indeed if we put capital that's badly needed in other segments of our economy into very high-cost energy only to discover that our foreign friends who in a more perfect world should be sharing in these costs got the advantages of this investment without the cost. So I think it's very important that we try to think in terms of minimizing this investment rather than in terms of any fixed number.

If the purpose of this synthetic activity is to pick out a very limited number of promising commercial projects in a few promising fields and move them to a sufficient commercial scale that it means something—that it's credible in terms of whether a given method will work on a large scale and credible in terms of production costs—I would guess you're talking about some number like 10 to 20 of these picked from a variety of these fields such as coal gasification, coal liquefaction, geothermal, etcetera. If these projects are half a billion to a billion dollars apiece, you're talking somewhere in the area of $10 to $15 billion to do this.

Now it is widely suggested that the best approach to this problem is to rely on guaranteed loans. My view on that is I would only do that if I absolutely had to. My reasons are as follows: I think to the extent possible we should put faith in the workings and the discipline of the market system. We should continue to keep some risks in these projects because I think risk is an incentive to succeed and incentive not to fail. I know it's possible on guaranteed loans to write provisions like "you can't get credit elsewhere." I think provisions like these, while they may in some cases be necessary, are going to turn out to be a bit self-fulfilling. What I mean by that is as long as lenders know that if they wait around they can get government backed credit, there are very few people I know who aren't going to prefer that route.

On the subject of loans, too, I would suggest another caution. In some of the material I have read about this program, there seems to be an implication that the losses would be minimal. Let me suggest to you that it's possible that there's an inherent contradiction in this

assumption. What I mean by that is the following: If somebody says the EIA should not be authorized to subsidize operations that will prevent losses, whatever that means, this is inconsistent it seems to me with the authority to provide price guarantees. If the aid is going to be restricted to commercially feasible projects, whatever that means, by definition, the Federal assistance would often not be necessary. Some of the rhetoric on guaranteed loans seem to suggest that the real issue is the availability of capital; somehow, if you have the money it doesn't really matter too much whether it's commercially feasible.

I would argue that what most businessmen are going to be concerned about is whether they can sell enough of this product at a sufficient price to make a profit and the question of loans can sometimes be self-defeating because they increase the leverage and increase the risk.

So generally speaking, I would not like to see guaranteed loans be the first option. I would much prefer a competitive bidding process of some sort where the Federal Government would say they will buy so much oil from a certain kind of process at such and such a time over such and such a period. It also seems to me that it would be preferable to give the Government some kind of a put or a buy-out price as part of that where if, for example, we discover the costs are much higher or the technical problems are much more serious or the price of oil falls happily to some number like $5 or something, that the Government has a right to buy its way out on an agreed basis.

It seems to me that the advantages of trying to work towards some kind of contracts where the Government takes out a certain quantity at a certain price is it makes the process of handing out contracts more competitive. And I think it's a process that's more likely to be accepted by the public, given the suspicions I mentioned earlier. It makes it somewhat more objective rather than subjective and it does keep some risks in this process.

An important issue I think you're going to have to face is what do you do if the project fails? I think we should assume there will be failures and I think it's important that we face what we do in the event there are. What do we mean by a failure? Well, perhaps the costs are so high as to be prohibitive or the technical aspects don't work. I think it's important that we devote some time to who buys out who; what happens to the technology. I think it's going to be a much more complex problem than simply saying the technology belongs to everybody because my experience is that technology that belongs to everybody generally belongs to nobody. So we have to think through what happens in that event.

Another issue is who does this work? Should it be ERDA? Should it be FEA? Should it be a new organization? My exeperience generally, Mr. Chairman, with technical organizations such as ERDA is that typically they are not particularly good at commercialization. Their mentality, their disciplines are different. The FEA it seems to me is a regulatory organization. So while it may be desirable to establish a new organization, I think we are going to have to devote a lot of time to how this effort is coordinated because the line between research and technology and commercialization is a very fuzzy one.

I think another issue, quickly, is the issue of congressional control over this process. I would hope you would conclude that project-by-project control is inappropriate. I think it would become a massive bureaucratic and political football game and simply delay the process endlessly.

But I think it is important that you consider what kind of safeguards you want; what is the process by which projects are chosen and how are they audited? It seems to me at the very least you're entitled to is an audit, a report by some independent board or authority that you have had a significant role in appointing that tells you how the projects have been chosen and how they are doing, which now brings one, I think, to the awkward question these days of should it be on-budget or off-budget.

I think it's self-delusion, which is obviously a product which is not in short supply anywhere, to argue that simply because something is an investment it isn't a drain or simply because we haven't yet lost money, we aren't going to lose money. I think it's important to give a sense of realism to this highly ambivalent subject that there be some way that annually we establish, as we would do in industry, some kind of reserve for the losses.

The CHAIRMAN. Does that mean it ought to be in the budget or not?

Mr. PETERSON. On balance, I don't think it has to be in the budget, but I think annually you should get an audit on the status of at least certain major projects in that period of time. If the risk/reward ratio has changed significantly, it should be charged off annually. In other words, Mr. Chairman, I don't think the fact that a project isn't yet a certain loss should preclude us from facing the likely reality.

Now a final thought with regard to the process. This suggestion may sound a bit temporizing and evading the issue, but I do think some of these questions I have raised, and others I haven't had time to get into, are extraordinarily difficult questions if you're going to get the kind of safeguards that I believe you're going to want.

I would wonder whether it would be presumptuous of me to suggest that beyond this hearing process, as valuable as it is, the difficulty in defining how these projects are going to be selected, monitored, etcetera, is such that you might not want to consider appointing very quickly in a matter of days or a week or something, a group of independent, credible, experienced people, if that isn't a contradiction in terms these days, and suggest that this group do some really intensive work to try to come up with specific proposals for your consideration on how to manage this unbelievably complex question of the process of making these very big project decisions on synthetic energy.

I haven't asked any of the following people whether they would be available. I'm simply suggesting that there are some people in the country who do have some credibility with various sides of the political spectrum who, if they could be attracted to work on this, might cut through what might be endless political bickering on this subject. I'm thinking of men who may have less credibility than they may have had when I was here in Washington, but there are men like Mr. Sawhill, Mr. Ruckelshaus, Charlie Shultz, like the GAO, like Harold Brown at Cal Tech, like Mike Blumenthal at Bendix, like Lane Kirk-

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land at AFL–CIO, men who are not in the energy industry, who have a certain credibility, who I think might be helpful in trying to think through how to get this enormously important effort organized.

Thank you. I'm sorry to have taken so long.

The CHAIRMAN. Well, thank you. Thank both of you gentlemen for your testimony.

Mr. Harper, I understand that you intended to appear today as a representative of the Business Roundtable. In fact, your contacts with the committee were made entirely through the Roundtable. They requested that you appear and now I see your statement says "chairman of the executive committee of Alcoa," and you expressly told us at the beginning of your statement that you did not represent the Roundtable. Is that because they oppose this legislation or take no position on it or what's the reason?

Mr. HARPER. Well, Senator, the Roundtable, as such, does not take positions. We try to encourage members to take positions and I'm taking the position for Alcoa. I'm taking it as a member of the Roundtable, but I'm speaking for a specific company and that's what we ask people to do because we think that's the way we can be effective and meaningful. I'm sorry that there was a misunderstanding about my appearance because I intended that it be for Alcoa all along.

The CHAIRMAN. But you say the Business Roundtable does not take a position on this legislation?

Mr. HARPER. No, we do not.

The CHAIRMAN. All right. Now you indicated that Alcoa—and Alcoa is a very large company—what are your total assets?

Mr. HARPER. Our total assets are about $2.5 billion.

The CHAIRMAN. As one of the largest companies in the country, it would be unable to develop some of these technologies without Federal assistance, because I take it the risk would be too large. Obviously, you're in a position to borrow substantial sums on your own credit. You could borrow $\$1/2$ billion or $1 billion for a project if in the judgment of your experts it was something that would prove out. Is that correct?

Mr. HARPER. Well, I would question that because our debt is already high, and this industry, like many others, has been steadily going upward in debt for the last several years and I think we would be limited in some of these projects both because of risk but also because of our inability to really finance a tremendously big project.

In addition, we are having to put all of our available resources to trying to modernize and trying to improve our conservation efforts and trying to increase our capacity, and I think that we are close to the limit of our resources. So I think that it would be extremely difficult, if not impossible, for us to finance a large coal gasification project, for example.

The CHAIRMAN. Well, can you give me 2 or 3 instances of the kind of projects that you envision this would finance? How much would they cost and the arrangements that you think would be appropriate for the Federal Government, the kind of loan that you would need or the kind of interest rate that you would have to have in order to move ahead?

Mr. HARPER. Well, Senator, I would say that the sort of project that we would be thinking of is a project such as a coal gassification or coal liquefaction, and let's suppose that we look at coal gasification. This is experimental and I would say that initially a project could be done for not too many millions of dollars, but this would be an initial project and I'm thinking we are talking several hundreds of millions of dollars to build a project that's a meaningful size. I think, in addition to the liquefaction, we are talking about gasification of coal underground. Here again, to do a major project you're talking several hundreds of millions of dollars today for that.

The CHAIRMAN. Would you think it would be feasible to adopt the very interesting proposal that Mr. Peterson has made, that instead of getting a guaranteed loan from the government when you make a proposal of this kind on the notion that they have, that you would be an efficient, competent firm to engage in this kind of coal gasification and that you would bid with others so that the government would be safeguarded in seeing that they did get the best cost break they could get?

Mr. HARPER. I would think that would be possible, provided some safeguards were made.

The CHAIRMAN. Such as?

Mr. HARPER. Such as having the bidders qualify technically so you would not just have someone bid who is not qualified to do the project. I think if proper qualifications were set up, and I'm sure Mr. Peterson intended that, I think it's perfectly feasible.

The CHAIRMAN. Well, on that kind of basis then, you would envision that on the coal gasification, for example, Alcoa and 2 or 3 similar companies might make a proposal to the Federal Government—and I would presume on the basis of what Mr. Peterson has told us—and correct me if I'm wrong—that this would be one that would be funded for the purposes of seeing whether coal gasification would in fact work out, whether you can work out the bugs, whether its something that could be efficient, and you could come on with reasonable low cost energy; is that right?

Mr. HARPER. That's right.

The CHAIRMAN. And that would be satisfactory with you if you would simply bid in competition with others to see if you would be the one that would be funded?

Mr. HARPER. Well, I think we would expect that because I would think that this should be done on a competitive basis certainly.

The CHAIRMAN. And at a particular price? In other words, you would come on with a coal gasification that might be $500 million and somebody else might come on with similar terms for less; then also, more important than that—and I missed this point and I have just been corrected by the staff—the price per barrel of oil, for example, or oil equivalent?

Mr. HARPER. Well, Mr. Chairman, I think that that's what a lot of the project has to do with, to see if it is feasible to produce liquified fuel, synthetic fuels from coal, at a price that we can live with. I think that a lot of work has to be done before a figure can be set, but this is really what the game is all about I think.

The CHAIRMAN. Well, as I understand, Mr. Peterson indicated—and I want to come right in, Mr. Peterson,—you weren't talking about front-end assistance; you were talking about something like the assurance to the company that they would come on, they could expect to get a market price that would make it possible for them to go ahead and do it; is that right?

Mr. PETERSON. Yes. Let me just elaborate a moment on this. I think what I intended to say, Mr. Chairman, was that wherever that approach is feasible, I personally prefer it to just starting out with a guaranteed loan. Now I think what you would find out—Mr. Harper, maybe you would agree and maybe you wouldn't—is that in actual practice, whether a company would be willing and what conditions it would set on prices, for example, would depend somewhat on the degree of the technical risk, for example.

Mr. HARPER. That's right.

Mr. PETERSON. Now if you move towards technologies that are reasonably well proved, my guess would be that you could get companies to state prices with appropriate cost escalators. As you move to the other end of the spectrum where there are very large technical questions, I think then you're going to probably have to go to some other approach, some kind of guarantee in the event of failure in which there's something paid for the technology. All I'm suggesting is that rather than starting out with the premise that this has to be a government loan activity, I'd like to get some competition and some discipline into this process and only use other methods when it's been demonstrated that they had to be used.

Mr. HARPER. Mr. Chairman, I know that Mr. Peterson said this is difficult, but I said that I felt that this should only be done where other means of financing could not be obtained and I recognize the difficulties in really spelling that out and making it work that way, but to the extent it's possible, I think it should be confined to that, to the very risky things that you can't——

The CHAIRMAN. That goes back to the Small Business Administration. What happens is that the SBA won't make the loan unless you get a turndown from the bank, and the lending bank says, "Sure, I'll tell them that I won't make you the loan." It doesn't mean very much.

Mr. HARPER. I recognize that, but I would hope there would be some way found so that this is done for the very risky things that can't be handled through any normal commercial channels.

The CHAIRMAN. Mr. Peterson, you're a marvelous witness. You're one of the bright lights of the country I think in so many ways. I say that before I tell you that I think that you have taken advantage of the committee by not submitting a statement. You're the only witness who didn't. I know you're a very busy man. I know you work many hours. But your testimony has been immensely valuable to us but it is a handicap not to have a statement we can go over and analyze and consider and the staff can have a chance to study. It improves the hearings substantially if that can be done.

So I would hope—I know it's a burden on you and you don't get paid for this—none of you gentlemen do. You volunteer your time and it's very valuable time, but in the future I would hope you would provide for us an outline at least.

Mr. Peterson, I think you may have saved the Government about $90 billion this morning, if I understand what you told us, so I think it was a morning well spent. You tell us instead of a $100 operation, you think we ought to consider something like $10 or $15 billion. Is that right?

Mr. PETERSON. Well, let me comment on two aspects of that. In the first place, savings should be put in quotes in the same way losses are put in quotes and commercially feasible is put in quotes.

The CHAIRMAN. Like when your wife doesn't buy a hat she comes in and saves $10?

Mr. PETERSON. By definition, if you accept my premise that people aren't going to submit bids unless they think there's a reasonable opportunity to make a profit, there's no free lunch here. Somebody is going to have to end up paying the price for that high-cost energy and that will be the Government. I'm simply suggesting that the discipline of that kind of bidding with some risk in it is a more acceptable way of doing it than going the loan guarantee route. But over the long period, it's still obviously going to cost money because you're going to have to pay for that energy.

Second, remember that I'm talking about one part of this program. I'm talking about the new energy sources that are related to synthetic fuels. In spite of your overly generous comments, I don't claim to be anything approaching a renaissance man in this field. I know that there are other aspects to the program. But I think what I am saying is that for the new energy synthetic fuels aspect of the program I don't think an amount much more than $10 to $15 billion would be necessary as the first step at least. I think you're going to want to watch this program very, very carefully in any event, and I would lean toward the competitive bidding price approach to the maximum extent that it's possible.

The CHAIRMAN. Well, it's important that we don't put in too much money. You did say $10 to $15 billion. Now you say that would be with the synthetic fuels area. All right. Now tell us what you think this overall program, if you can—is $100 billion then about right? Is it too much? We have to make a judgment on that. I know it's awfully hard to do it, but you have probably given this more attention than most members of this committee are going to give it, so we would like your advice. What would you do if you were a member of the committee?

Mr. PETERSON. Mr. Chairman, you're the only man I know who's more modest than I am so I doubt very much that that's a true statement. I haven't really studied carefully the other aspects of the program. I guess what I'm saying is this, when you have a departure that is this profound from the market, enterprise approach to problems which generally I believe in, when you have a kind of public suspicion that I think exists about this energy industry and where this program might lead and fears that cover the entire spectrum of loss of confidence in U.S. institutions, I think an approach that might be characterized as step by step, a certain amount of gradualism, a certain amount of constant review may be quite appropriate. I don't say this in criticism of the program because I commend the Vice President for forcing us to do something unusual.

I think it's more important to do something and to get started and to do it in a hurry than it is to try to agree in advance whether that number is $10 billion or $150 billion. You've got to think of this problem, Mr. Chairman, in a 10-year time frame and you will have plenty of time over the next year or two or three to be deciding how big that ultimate number should be.

The CHAIRMAN. Well, we have to pass a bill and the bill says $100 billion. Now shall we just leave that in the bill?

Mr. PETERSON. You have demonstrated the quality of independent thought on other occasions and I'm sure that you can fill in some other number and simply say that we will review what the size of that should be after a year's experience. I frankly would be satisfied to get this program launched to compromise over the size of the number, to be sure you had appropriate safeguards and a tough review and audit program rather than to have to decide today what that ultimate number is now.

The CHAIRMAN. Does that mean that you think we could start off with a $10 or $15 billion proposal and then look at it after a year and see if it needs more?

Mr. PETERSON. I think this kind of number is probably in the ball park for the synthetic portion. I don't know how large it should be for the other programs. I don't know that much about them, but I am a supporter of this synthetic energy program. I don't feel that there's any compelling argument that suggests that you have to specify today that the number need be $100 billion.

I guess if you push me to the wall on that, which you're probably doing, I would——

The CHAIRMAN. I'm trying.

Mr. PETERSON. I would argue that given the major departures here from precedent, given the political suspicions that exist on all points in the spectrum, it might be prudent to start out with a number that's substantially smaller than that.

The CHAIRMAN. Senator Sparkman?

Senator SPARKMAN. I think you've done a very good job. I don't have any questions.

The CHAIRMAN. I would like to ask just a couple more.

Senator SPARKMAN. I do want to ask a question of Mr. Harper with reference to gasification of coal. You mentioned that and apparently you view it as a very fine potential. Do you have any projects in operation?

Mr. HARPER. We have a project proposed right now which we are trying to get accepted, Senator, and we put an awful lot of research into it and we think we have some excellent technology and with some assistance it can be developed to where it's commercially practical.

Senator SPARKMAN. This thing has been discussed over a good many years. Have there been any successful trials?

Mr. HARPER. Senator, there have been some successful trials technically, including one back in Alabama that I remember a good many years ago, Alabama Power Co. did it.

Senator SPARKMAN. Way back in 1930 or 1940?

Mr. HARPER. That's right. Alabama Power Co.

Senator SPARKMAN. Dr. Milton Theiss. I remember when he used to talk about it way back in the 1930's I think it was.

Mr. HARPER. That's right. That was practical technically. It was not economic at that time. There are some changes. There are some improved technologies which we think will improve it. There's been a lot of work since then of various sorts, but no one has really put a project together that has proved out to be economically feasible. We think that it is practical to do that at this time. It's going to take some help and it's going to take a lot of effort and a lot of money.

Senator SPARKMAN. Well, thank you.

The CHAIRMAN. Mr. Peterson, I thought the most powerful part of your argument was your calling to our attention the enormous uncertainty in this industry. You point out that in some Mideastern countries it's 14 cents a barrel and in other areas it's $4 to $5 and elsewhere it's $10, and it's bringing out some of these would be at a higher level. This is the peculiar reason why the risk is so enormous that it paralyzes the kind of action that you would otherwise get. That complicated by the fact that we have price regulations which are very uncertain and hard to know therefore what's going to happen to the price in the future.

Do you think that perhaps the first and more important step is to deal forthrightly with the regulation of the price level or price control?

Mr. PETERSON. I'm going to reveal my essential conventionalism on this subject by suggesting that I would have preferred that we be in a position today where we relied more on market than we are now relying because I think it's far better to have as much of the capital in this country allocated according to objective market disciplines and not according to some governmental view of what is better than something else, but we are not dealing in a perfect world. The Congress in its wisdom has decided that they aren't going to move toward—at least very quickly, toward more decontrol. The utility rate regulation practices as they exist in the real world I think are unforunate in that we simply aren't pushing in the direction of forcing these prices to operate their will on the market. I think, Mr. Chairman, sooner or later we are going to have to do something about moving more toward markets and decontrol and more toward getting rid of these regulations that I think greatly add to the uncertainty. But as I say, it's an imperfect world and if we wait around for 5 to 10 years for that to happen we will be sitting in this room in 1984 asking ourselves have we determined what shale oil would cost? Have we determined what coal gassification and coal liquefaction would cost? You had a great Senator who this building I believe is named after, Senator Dirksen, and I happened to be from Illinois at the time. A question came up where he had indicated a certain amount of willingness to adjust his views and he said, "Mr. Peterson, you may wonder whether I'm a man of principle," and he said, "I want you to know that I'm a man of high principle and my first principle is flexibility."

I guess what I'm saying is if I had my choice I would prefer that market force play a more important role, but that isn't the world we're living in and if we wait around for that perfect world to exist—the Vice President is absolutely right—we will be sitting around here 5

or 10 years from now where private industry won't take the risk, and the OPEC will be looking at this country and deciding it doesn't have alternatives and we won't know whether we do or do not have alternatives, and at what cost, and given the gravity of this problem, I guess I'm a flexible enough person that I suggest we get on with it.

The CHAIRMAN. All right. I have one final question. It relates to your position that this shouldn't be in the budget. You made a very strong argument that we ought to acknowledge the fact that there are going to be losses and I think I couldn't agree with you more, and I think it's important that we face that forthrightly. You also said we ought to audit it and watch it closely. The only way we can do this is in the budget. We need that discipline in the Congress. There is no other way. If we simply authorize this legislation, Congress is so busy and has so many other things to do—members of Congress do—that we simply will walk off and that will be, if not the end of it. it will be rare if we look at it and then only a few Senators or Congressmen will.

Mr. PETERSON. Let me give an analogy that Mr. Harper has probably had more experience in than I have had—it is not at all uncommon in industry, Mr. Chairman, for companies to have major development projects where the technical or the economic or the market prognosis changes as time goes on. The typical procedure there is while you may capitalize that investment and therefore not run it through your operations statement, at least annually, the auditors and the controller looks at these projects and if the prognosis has changed so the original assumptions no longer seem valid—and I predict that's going to happen in this program—you write off against that year's budget whatever those losses should be. I think something of that type will force us annually to look at what's going on with this program. I'm sorry to be so hardnosed about this because I'm not negative about this program at all. I think we should do it. I would not accept any rhetoric, if you're getting it, that somehow all these projects are going to be "commercially feasible." If they were commercially feasible, the market system and the private system would already be financing many of them—except perhaps for the very largest ones—and therefore you're going to have to use nonmarket mechanisms in order to get these programs to operate. So I would guess you are going to have some losses. So why not face the losses as you go on? That will give us some indication of what it's costing us.

The CHAIRMAN. Well, we are facing the losses after the losses are incurred. The only way it seems to me we can have a constructive attitude is to make reasonable assumptions and face the fact that you're going to perhaps lose a large part of your loans and therefore appropriate the whole thing and put it into the budget and have it take its chances with everything else and compete with our other priorities for our limited resources.

Mr. PETERSON. Mr. Chairman, frankly, I have two problems with that, one conceptual and one political and pragmatic, but more frankly not ones that I feel terribly deeply about. Conceptually, I guess if we're going to single out this investment program, then there are lots of questions raised about how the U.S. Government budget is set up that are of an investment nature.

The CHAIRMAN. I don't want to single it out. Everything else is put in the budget.

Mr. PETERSON. Well, you have a lot of off-budget items.

The CHAIRMAN. Very little now, just a few that are left. REA and others, Ex-Im Bank is back in the budget and almost all the big housing programs are back in the budget. These are all loan programs, repayable with interest. This is something that, as you say, we will have a lot of losses. It would be very inconsistent not to put this in the budget.

Mr. PETERSON. You have a second problem. Let's assume you agree to put in $10 or $15 billion in synthetic fuels and some other number of billions in some kind of utility project, nuclear or otherwise. This could amount to $20, $30, $40 billion of investment. I would guess that given the political realities of the country at that time anybody that proposed that kind of an item being added to the budget we'd probably find once again it would be a reason for not doing anything. I think this problem is simply too serious not to get ahead with it.

The CHAIRMAN. It's too serious not to face it. You can make that argument on all of our programs. You can say we shouldn't appropriate, that it discourages national defense to have to put it in the budget and appropriate it. You could say it discourages environmental policies because we have to appropriate money for that. It would just seem so logical if we're going to make resources available through the Federal Government they ought to all stand up and be counted.

Thank both of you gentlemen very, very much.

Senator SPARKMAN. Mr. Chairman, I'd like to ask Mr. Peterson one question. He mentioned shale a few minutes ago. I believe that's the first time I've heard that mentioned this morning.

Mr. CHAIRMAN. Well, other witnesses in prior hearings have discussed that.

Senator SPARKMAN. I just wanted to ask him this question. What progress are we making in shale?

Mr. PETERSON. Well, let me take shale as an example because I think what's happened to shale is what's going to happen to all these other synthetic energy projects. A couple of highly enterprising companies decided to make substantial investments in terms of buying rights to some shale land, as I remember it, John. Standard of Indiana was one and Gulf I believe was another. If you will go back to those projects, Senator Sparkman, and see what has actually happened to them, what I think you will find is that very little has happened to them. Let me explain briefly why.

In the case of shale, you're probably looking at costs now of somewhere between $12 and $15 thousand of capital per barrel of oil. This compares to numbers domestically like a third or half of that number. The per barrel cost that I have recently looked at would probably be around $15, somewhere between $13 and $20. Now if you were sitting there in a company, and let's multiply these numbers out, if you wanted only 50,000 barrels a day and as you know that isn't very much, at $12 or $15 thousand a barrel, that company is looking at a $600 to $750 million investment.

Now going with that project at a unit cost of oil that is 2 to 3 times what it would cost if it put its money elsewhere and a total invest-

ment that's much larger, and all kinds of regulatory and environmental questions as to whether indeed they were going to be permitted to complete the project on schedule—it is precisely that kind of synthetic oil project, in my judgment that a prudent management and a prudent board of directors is simply going to say the risk/reward ratio is inappropriate; we are not going to go ahead with this project. And I personally would be very surprised if many companies are going to dump a half billion dollars or three-quarters of a billion dollars into this sea of uncertainty.

Mr. HARPER. If I could add one word about it, I believe the experimental shale projects that were, two of the, underway have been shut down also for this same reason.

Senator SPARKMAN. I remember one time talking to Dixie Lee Ray at the time she was up for the position in the State Department. She came by my office and she said that the process of getting oil out of shale was simply, from an environmental standpoint, impossible, because when you take the product and put it through the process what's left over is greater in mass than what you started with.

Mr. PETERSON. Mr. Chairman, I think one of the reasons we'd better have a couple of projects is to find out. I mean, I can't imagine anybody in industry going into a huge business without trying it, I mean commercializing it. If you don't, you're going to have all these questions, some of them myths and some of them real. Frankly, you're going to end up with some problems you didn't anticipate, some that are worse than you thought they were, but I don't know any way of finding out what they actually are except by doing one or two of each of these.

Mr. HARPER. There are also some possible payoffs from shale some day in that associated with shale is a material known as Davisonite which is a good source of aluminum bearing ores. It can't be done unless shale is developed because it's entirely too expensive, but if shale could ever be developed where it's practical and economical, this gives us a domestic source of aluminum bearing ores which we don't have at the present time.

Mr. PETERSON. I have the number, Mr. Chairman. I asked that it be looked up. To give you an idea of why you may consider this a redundancy, but why a nervous, timid businessman might look at some of these projects with more than usual concern. I am told that the current investment per barrel in the Mideast is $300. I am told that domestically it runs anywhere from a few thousand up to 12 and it probably averages 7 to 8. Off the Gulf of Mexico, it's probably 3,500, and roughly in the same ball park in Alaska. High Btu gas somewhere between $10,000 and $20,000. Coal liquefaction, somewhere between $15,000 and $25,000.

Now, Senator Sparkman, in the ordinary course of business, when you're deciding to go into a venture, you look at your competition. You look at your alternative sources.

I don't think it's within my experience as a businessman that you have a 100 to 1 or 50 to 1 ratio and that risk is just unacceptable.

Senator SPARKMAN. Thank you very much.

The CHAIRMAN. Thanks again very, very much.

Our next witness is Ralph Nader.

STATEMENT OF RALPH NADER, CORPORATE ACCOUNTABILITY RESEARCH GROUP, WASHINGTON, D.C., ACCOMPANIED BY GARRY DELOSS

The CHAIRMAN. Our next witness is Ralph Nader. We have your statement.

Mr. NADER. It is a concise statement that should take about 10 minutes.

The CHAIRMAN. Go right ahead.

Mr. NADER. Thank you very much. With me this morning is Garry DeLoss, who has been working on energy aspects of public policy.

Thank you for the opportunity to comment on the proposed Energy Independence Authority, which is really a misnomer. It should be called the "Energy Cartel Subsidy Act." As Chairman Proxmire noted on Monday, the EIA sounds suspiciously like the Lockheed guarantee multiplied manyfold.

There is, as I discern, two purposes for this proposal, both of which are not reflected in the deficient testimony supporting it. One purpose is to make a concise Rorschach test of Mr. Rockefeller's political economy. For future historians, this bill has so many provisions illustrating so many disagreeable consequences that proceeded from his career as Governor in New York State.

The second purpose is to soften up Congress by later retracting this monstrous $100 billion boondoggle; the proponents of this bill are trying to get a piece of that action either by developing further support for the $6 billion synthetic fuels loan guarantee bill, or, as is more likely, to develop a massive bailout for the Atomic Energy Industry. If you look at this bill carefully, and it is delightful reading, from either a satiric or serious point of view, you will see that it has the following impacts. Its foolish conceptually; it reflects unbridled corporate greed, is establishing a massive corporate welfare system, replete with contempt for the taxpayer, contempt for the economic health, and well-being of the consumer. It supports, in effect, an objective that might be called the annual bank guaranteed profit bill.

It tries to avoid the NEPA Act. It succeeds in avoiding the Freedom of Information Act. It succeeds in avoiding all of the Federal laws relating to public contracts and public works, and it succeeds in developing a system of unfair competition for those businesses who believe in taking the risk along with the profits in an enterprise system. It also manages to avoid congressional accountability and manages to bypass, in some interesting respects, regulatory processes at the Federal and State level. That is not a bad grab bag for the Rockefeller forces. It may also be called a bill which will generate a severe imbalance in the kind of energy policy this country should pursue.

Let me try to decomplicate the deliberate overcomplication of this energy problem so as to, in Mr. Rockefeller's view, facilitate Government support of those kinds of energy resources, real or potential, which can be exclusively possessed in a high capital-intensive manner by a few giant energy corporations with guaranteed profits from Washington. Let me make this assertion as clear and simple as I can.

We do not need to add another Btu in supply for our economy to the end of this century.

In the next 25 years, even assuming doubling economic growth if we pursue an energy-sufficient policy that is equivalent, by the year 2000, of what Sweden and West Germany has attained and will attain by the year 1990, we need no additional supply annually beyond what is now being used.

Now I really should complete my testimony on that point, to make the point. But I will continue anyway.

In short, energy efficiency is the way to go. It gives us a 25-year breathing period, at the very least, in all areas of our economy, reduces inflation, saves a good deal of capital which can be allocated to other parts of the economy that legitimately need it; reduces the further monopolization in our country; reduces pollution, because if you burn less you are going to have less pollution; increases the efficiency of the economy which will reflect itself in foreign trade advantages as well.

I suppose the thrust of this bill is to further the process which the Congress is trying to stop, that is, the process of nationalizing the American taxpayer indirectly through Washington on behalf of the giant corporate state.

There is no better example of that than Mr. Zarb's testimony. He put it all in a few pages. And Mr. Rockefeller's testimony. And it is done with an offensiveness to our Federal system and to our system of checks and balances that I find utterly deplorable.

After Watergate, after the abuses of the executive branch, after the corporate-executive collusions that we have seen ranging from bribes and payoffs, and coverups, to subsidies, we are now asked to embark on a further minimum 10-year program with consequences in terms of defaults and payments extending well beyond 10 years, to bypass Congress, to close off access to the citizenry, and to engage an energy authority which has about as much insulation from the public accountability as any institution of quasi-government that has ever been conceived, including the New York Port Authority.

This proposal has much in common with the Lockheed bailout. While much of the discussion of the EIA proposal has focused on its use to subsidize development of a synthetic fuel industry, it is also designed to bailout the nuclear power vendors and their electric utility customers who are in trouble due to mismanagement reminiscent of the Lockheed quality of management, although its consequences are much more serious in terms of radioactive disaster.

Thus, the nuclear manufacturers have repeatedly understated the problems involved in developing safety, reliability, and economic nuclear power, and electric utility managers have unskeptically accepted such findings; for example, for many years Westinghouse used cutrate uranium supply long-term contracts to sweeten the deal when selling nuclear reactors to a utility. Then in 1975, Westinghouse breached the uranium supply contracts due to the uranium price increases, which it had not allowed for.

Electric utility managers have had their own managerial excesses. They have a long history of sloppy operation of nuclear powerplants, and they have persistently overstated the need for nuclear power by

overstating future demand for electricity through their rate policies and other corporate practices.

Today, reduced electricity demand and burgeoning capital and uranium costs have caused utility management to postpone or cancel dozens of nuclear plants.

Now the nuclear vendors and some of their electric utility people want the Federal Government to bail them out by creating EIA to finance expanded uranium enrichment facilities, nuclear fuel reprocessing plants, and the purchase of nuclear powerplants.

In short, the EIA proposal is an admission by the Ford administration and the nuclear industry that nuclear power cannot compete economically with alternative energy sources.

The nuclear power bailout has been highlighted by remarks of both President Ford and Vice President Rockefeller. In a September 29, 1975, speech to a national convention of construction unions, President Ford, announcing the proposed EIA, said: "* * * we need dramatic action to produce * * * floating nuclear powerplants on barges * * * and vast energy parks throughout America."

At an energy policy conference October 2d, Vice President Rockefeller noted that 70 percent of the nuclear powerplants projected for construction have been canceled due to capital problems. He then suggested that EIA might construct nuclear powerplants and make lease-purchase agreements with electric utilities.

An important part of the White House proposal is to condition EIA financial assistance for powerplant construction on binding agreements with State regulatory commissions that they will increase electric utility rates to insure "adequate earnings to protect EIA's investment."

Now, how much thought do you think President Ford gave to that statement? I don't think he gave anything. I think that was taken from a mimeographed procedure. He has repeatedly refused to meet a single time with distinguished scientific and technical energy critics of nuclear power. We have wanted to sit down with him and give him at least 1 hour of the other side of the nuclear power scene compared to all the hours he has been exposed to the promoters of nuclear power.

I think it is incumbent on all Presidents to at least try to understand what speechwriters put in their mouths. And this statement stands as one of the most stupid statements by any President in dealing with a subject of such grave responsibility of health in the United States of America, or the economic wisdom of any proposed energy policy.

The Federal "carrot" of initial Federal financing of projects costing hundreds of millions of dollars would be used to induce the desired State cooperation. In the end, of course, the local ratepayers would be paying for the federally constructed nuclear powerplants. In this respect, the EIA is a back-door route to Federal preemption of State control of electric utility rates so that ratepayers are forced to finance uneconomical nuclear powerplants.

The fact that President Ford announced the EIA plan before an audience of construction union officials was, of course, not accidental. He is repeating the practice perfected by Vice President Rockefeller

as Governor of New York, where massive public spending on construction projects was used to gain the political support of the construction lobby—banks, contractors, steel companies, cement companies, other suppliers, and the construction unions.

In his speech to the union leaders, President Ford even found virtue in the diseconomy of nuclear powerplant construction by stressing to his job-counting audience that "400,000 man-years of labor are required to construct plants and manufacture equipment for 50 nuclear powerplants. This represents 650,000 man-years of labor in the time frame required."

Of course, he chose to ignore the judgment of detached specialists that a greater number of jobs better distributed geographically, would be created. Retrofitting buildings, for example, as the American Institute of Architects showed, can produce more jobs and save more electricity at lower capital costs than nuclear power could contribute over the next 20 years.

By the way, Senator Proxmire, I would like to submit for the record an article that appeared in the Washington Star on September 21, 1975, by William Rangel, called, "How Rockefeller's Midas Touch Trick Went Sour." The subtitle is, "Do we want to set up a $100 billion energy agency along the lines of a device to help get New York City in such a pickle?"

Also, I'd like to include in the record an article from the Wall Street Journal about the $100 billion white elephant where the Wall Street Journal writer took this proposal to task a number of months ago (see p. 377).

The proposal for creation of EIA to increase Federal subsidies to the nuclear power industry is consistent with the Ford administration's general policy of favoring tax and subsidy programs which divert scarce capital to energy producers as the primary answer to our energy needs. Energy conservation or efficiency receives lip service; but when the White House Office of Management and Budget cuts the ERDA and FEA energy conservation budgets, the Ford administration's real policy of footdragging on energy conservation is revealed.

Again and again, Senator Proxmire, the staff in the FEA and ERDA who have been working on conservation have been disillusioned. In FEA there is a rapid turnover and I understand Roger Sant is about to resign. And while he will give the usual public reasons, privately he is very disappointed at the lack of support he has been getting both from the White House and from his superiors in the Federal Energy Administration. They have lost some very good people that were working in energy conservation, who have come to Washington to try to do their best, and are undercut by proposals such as this; and then leave.

It is interesting to note in the generally very good GAO testimony, Mr. Canfield noted that this not only doesn't emphasize energy conservation, this proposal, but it hampers it by the way the bill is written.

As an analysis by the Congressional Office of Technology Assessment concluded, ERDA's energy conservation plans are "timid and underfunded, despite strong congressional encouragement," and "the

lack of an aggressive conservation program is also reflected in ERDA's budget requests, which allocate less than 2 percent of its total budget for conservation."

Why is conservation looked on in reality with hostility, although the lip service is always there by the Exxons and the Rockefellers?

Because, first of all, it reduces sales for oil companies. It reduces sales for electric companies. Because you don't buy what you don't need.

Second, it doesn't develop this massive capital-intensiveness that increases the sales and the political-economic power of giant corporations.

There is a great way to whipsaw government when a few giant corporations have got control of the energy future and supply in this country. You can devise tremendous leverage in Washington whether it deals with more tax preferences, more support overseas for plundering or any other policies that the oil companies have been supporting, and seek to continue to support.

The fact is that the EIA proposal is a symptom of an emerging struggle over allocation of capital between energy production and energy efficiency improvements. Energy-efficient improvements are likely to be made outside the major area of—dominated by the energy monopoly. They are going to be made, for example, by small business retrofitting of existing buildings, and homes and office buildings, by architectural engineering firms building new efficient buildings, by and industry and commerce, that now purchase electric and home fuel, doing so under efficient building modifications.

So there is this struggle that is going on. The energy industry and its proxy in the White House is resisting serious energy-saving policies because lost sales of energy will be lost profits. Proponents of energy conservation programs, on the other hand, are resisting the further diversion of capital to energy production by EIA because they know that there is a finite amount of capital available. Hence, to the extent that EIA preempts available capital for use in energy production, it will reduce the capital that could be used for energy efficiency improvements.

Another possible consequence of EIA's diversion of scarce capital to energy production rather than energy conservation is an increased need for imported oil. This could occur because generally more energy can be produced by investing a dollar in energy efficiency improvements which save energy than can be produced by investing the same dollar in conventional energy production. This is only not premised on a very comprehensive energy conservation approach, but it is premised on the premium off-the-top whether you do it by putting unproductive dollars in unproductive energy production or productive dollars in productive energy efficiency.

If capital is diverted to the less capital-efficient option of energy production, the loss in capital efficiency must be made up by either importing more oil, or by diverting more capital into energy production, unless we really go all the way on energy efficiency.

One outstanding example of the superiority of investment in energy efficiency over investments in energy production has been provided by Ohio State University's program of retrofitting existing campus buildings to use energy more efficiently. Ohio State has cut electricity

use as much as 63 percent and natural gas use as much as 78 percent by such building modifications as reducing ventilation rates during building occupancy, conversion of constant volume ventilation systems to variable volume systems, shutting down air handling systems when building space is unoccupied, removal of excess lights, and adjustments in cooling system controls.

In the six buildings modified and monitored thus far, the university has cut electricity use by an average of 36 percent and natural gas use by an average of 61 percent. The $210,000 investment in modifying the buildings was repaid in less than 8 months and the university is now netting $340,000 per year on its investment. This deals with only six buildings, and they are extending this policy to other buildings on campus. That can occur all over the country in many buildings whether on campus or off campus. It gives you an illustration of the spectacular gains that can reduce this pressure to rip up more land and spill more oil, and produce more dangerous nuclear powerplants.

Another example of how capital could be invested in energy efficiency to produce more energy than an equivalent investment in conventional energy production was described in a 1975 study by Dow Co. of cogeneration of industrial steam and electricity on factory sites. The Dow study estimated that electricity could be produced with half the energy and at half the capital cost if produced through cogeneration by industry.

In fact, Senator Proxmire, one of the reasons for the ridiculously low prices at which the electric utilities sell electricity to large industries, requiring a small homeowner, in effect, to cross-subsidize, is that they are fearful if they charged these industries the price they should be charged, that the industries will produce their own electricity.

For a variety of reasons, some of which I have alluded to in recent testimony before the Senate Commerce Committee, the Ohio State success in retrofitting commercial-type buildings to save energy has not been widely replicated. Similarly, there are institutional and financial barriers to the widespread adoption of industrial cogeneration of electricity and steam despite the Dow study's prediction of a 20 percent rate of return on investments in cogeneration facilities. That is a fair return, but it is not as much as what industry likes to have on its type of return, particularly when you include the Federal subsidy component.

The Ford administration should be proposing policies that divert capital into energy efficiency improvements such as those just described. By proposing a policy which would divert capital into energy production rather than energy efficiency, the Ford administration is supporting a policy of "less bang for a buck." The EIA would serve the vested interests of the energy producers but the national interest—along with less pollution, less inflation, more jobs and superior consumer and foreign trade value—would be better served by encouraging a more economically efficient allocation of resources to energy efficiency improvements.

Let there be no mistake about the purpose of tendering this bill in this session of Congress. It is not to get this bill through. This

bill doesn't have a chance to get through. It is to, in effect, wean some Members of Congress into going part of the way, and to get that process underway of dramatic inefficiency: a Federal subsidy and guaranteed loans.

The history of off-budget institutions, the administrative problems, the problems of such provisions in the bill, as this one, I would like to refer to just briefly—and it deserves, one might say, a little humor—page 13 of the bill says, "Financial assistance will be provided in a manner which, to the extent possible, does not enhance unduly the recipient's competitive position."

You will note, Senator Proxmire, that on page 15 and in the definition of "agency," it clearly excludes this authority from the Freedom of Information Act, and near the end of the bill, where it talks about the environmental impact statement, you will see that, such as on page 43, you will see that there are grave doubts whether the environmental impact statement law has any application to some of those decisions.

In conclusion, I would like to note that if you would like further submissions to support these points and make up the record more fully, we would be very happy to submit information.

I hope that this doesn't divert the Senate's energy from a much more important bill, S. 2932 and its amendments, which is supported by Senators Hollings and Kennedy, to really embark on a tough energy efficiency program for the Nation.

It is interesting to note that some of these same people who are bringing you S. 2532, that little old $100 billion Energy Independence Authority, which is another "layer of bureaucracy," those are the same people who came to Congress to oppose the $15 million a year nonregulatory, nonsubsidizing, consumer advocacy bill to represent the interest of consumers on such matters of energy.

Thank you.

[Mr. Nader's prepared statement and the newspaper articles referred to earlier follow:]

STATEMENT OF RALPH NADER

Mr. Chairman. Thank you for the opportunity to comment on the proposed Energy Independence Authority, which is a misnomer. It should be called the "Energy Cartel Subsidy Act." As the Chairman noted on Monday, the EIA sounds suspiciously like the Lockheed Loan guarantee multiplied manyfold.

Indeed, this proposal has more in common with the Lockheed bailout than the Chairman may have noted. While much of the discussion of the EIA proposal has focused on its use to subsidize development of a synthetic fuels industry, it is also designed to bail out the nuclear power vendors and their electric utility customers, which are in trouble due to mismanagement reminiscent of the Lockheed quality of management. The nuclear manufacturers have repeatedly understated the problems involved in developing safe, reliable, and economic nuclear power and electric utility managers have unskeptically accepted such claims. For example, for many years Westinghouse used cut rate uranium supply contracts to sweeten the deal when selling nuclear reactors to the electric utilities. Then, in 1975, Westinghouse breached its uranium supply contracts due to uranium price increases which it had not allowed for.

Electric utility managers have had their own managerial excesses. They have a long history of sloppy operation of nuclear power plants and they have persistently overstated the need for nuclear power by overstating future demand for electricity. Today reduced electricity demand and burgeoning capital and uranium costs have caused utility management to postpone and cancel dozens of nuclear plants. Now the nuclear vendors and some of their electric utility

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customers want the federal government to bail them out by creating EIA to finance expanded uranium enrichment facilities, nuclear fuel reprocessing plants, and the purchase of nuclear power plants. In short, the EIA proposal is an admission by the Ford Administration and the nuclear industry that nuclear power cannot compete economically with alternative energy sources.

The nuclear power bailout motive of the EIA subsidy has been highlighted by remarks of both President Ford and Vice President Rockefeller. In a September 29, 1975, speech to a national convention of construction unions, President Ford, announcing the proposed EIA, said ". . . we need dramatic action to produce . . . floating nuclear power plants on barges . . . and vast energy parks throughout America."

At an energy policy conference on October 2, Vice President Rockefeller noted that 70 per cent of the nuclear power plants projected for construction have been cancelled due to capital problems. He then suggested that EIA might construct nuclear power plants and make lease-purchase agreements with electric utilities.

An important part of the White House proposal is to condition EIA financial assistance for power plant construction on binding agreements with state regulatory commissions that they will increase electric utility rates to ensure "adequate earnings to protect EIA's investment." The federal "carrot" of initial federal financing of projects costing hundreds of millions of dollars would be used to induce the desired state cooperation. In the end, of course, the local ratepayers would be paying for the federally constructed nuclear power plants. In this respect, the EIA is a back-door route to federal preemption of state control of electric utility rates so that ratepayers are forced to finance uneconomical nuclear power plants.

The fact that President Ford announced the EIA plan before an audience of construction union officials was, of course, not accidental. He is repeating the practice perfected by Vice President Rockefeller as governor of New York, where massive public spending on construction projects was used to gain the political support of the construction lobby—banks, contractors, steel companies, cement companies, other suppliers, of the construction industry.

In his speech to the union leaders, President Ford even found virtue in the diseconomy of nuclear power plant construction by stressing to his job-counting audience that "four hundred thousand man-years of labor are required to construct plants and manufacture equipment for 50 nuclear power plants. This represents 650,000 man-years of labor in the time frame required." Of course, he chose to ignore the judgment of detached specialists that a greater number of jobs would be created by spending an equal amount of money to promote energy conservation and small-scale, decentralized energy systems which drain away less capital from other sectors of the economy.

The proposal for creation of EIA to increase federal subsidies to the nuclear power industry is consistent with the Ford Administration's general policy of favoring tax and subsidy programs which divert scarce capital to energy producers as the primary answer to our energy needs. Energy conservation receives lip service, but when the White House Office of Management and Budget cuts the ERDA and FEA energy conservation budgets, the Ford Administration's real policy of footdragging on energy conservation is revealed. As an analysis by the congressional Office of Technology Assessment concluded, ERDA's energy conservation plans are "timid and underfunded, despite strong congressional encouragement" and "the lack of an aggressive conservation program is also reflected in ERDA's budget requests, which allocate less than two percent of its total budget for conservation."

The fact is that the EIA proposal is a symptom of an emerging struggle over allocation of capital between energy production and energy efficiency improvements. The energy industry (and its proxy in the White House) is resisting serious energy saving policies because lost sales of energy will be lost profits. Proponents of energy conservation programs are resisting the further diversion of capital to energy production by EIA because they know that there is a finite amount of capital available. Hence, to the extent that EIA preempts available capital for use in energy production, it will reduce the capital that could be used for energy efficiency improvements.

Another possible consequence of EIA's diversion of scarce capital into energy production rather than energy conservation is an increased need for imported oil. This could occur because generally more energy can be "produced" by

investing a dollar in energy efficiency improvements which save energy than can be produced by investing the same dollar in conventional energy production. If capital is diverted to the less capital efficient option of energy production, the loss in capital efficiency must be made up by either importing more oil or by diverting more capital into energy production.

One outstanding example of the superiority of investment in energy efficiency over investments in energy production has been provided by Ohio State University's program of retrofitting existing campus buildings to use energy more efficiently. Ohio State has cut electricity use as much as 63 percent and natural gas use as much as 78 percent by such building modifications as reducing ventilation rates during building occupancy, conversion of constant volume ventilization systems to variable volume systems, shutting down air handling systems when building space is unoccupied, removal of excess lights, and adjustments in cooling system controls. In the six buildings modified and monitored thus far, the University has cut electricity use by an average of 36 percent and natural gas use by an average of 61 percent. The $210,000 investment in modifying the buildings was repaid in less than eight months and the University is now netting $340,000 per year on its investment.

Another example of how capital could be invested in energy efficiency to "produce" more energy than an equivalent investment in conventional energy production was descsribed in a 1975 study by Dow Chemical Company of cogeneration of industrial steam and electricity on factory sites. The Dow study estimated that electricity could be produced with half the energy and at half the capital cost is produced through cogeneration by industry.

For a variety of reasons, some of which I have alluded to in recent testimony before the Senate Commerce Committee, the Ohio State success in retrofitting commercial type buildings to save energy has not been widely replicated. Similarly, there are institutional and financial barriers to the widespread adoption of industrial cogeneration of electricity and steam despite the Dow study's prediction of a 20 percent rate of return on investment in cogeneration facilities.

The Ford Administration should be proposing policies that divert capital into energy efficiency improvements such as those just described. By proposing a policy which would divert capital into energy production rather than energy efficiency, the Ford Administration is supporting a policy of less bang for the buck. The EIA would serve the vested interests of the energy producers but the national interest (along with less pollution, less inflation, more jobs and superior consumer and foreign trade value) would be better served by encouraging a more economically efficient allocation of resources to energy efficiency improvements.

Thank you.

[From the Wall Street Journal, Sept. 30, 1976]

Mr. Ford's $100 Billion Elephant

(By Dennis Farney)

Washington—"We don't seem to have a goal. FDR came in with a goal, but we don't seem to have one."

So mused a politically conservative friend and adviser to President Ford one day recently. To win reelection, he continued, the President will have to offer the voters something more than repeated vetoes of congressional programs. "Something more than a WIN button." Something positive, forward-looking.

Then, rather surprisingly for a Republican conservative, he concluded: "I think we need a 10-point program."

As it happens, the Ford White House contains a man who has spent a lifetime enthusiastically developing just such programs. That man is Nelson Rockefeller. And even as the Ford adviser spoke, Vice President Rockefeller was putting the finishing touches on perhaps his boldest, most controversial creation yet: a plan to channel $100 billion into energy projects over the next decade.

Last week, to the consternation of practically every one of the President's economic advisers, Gerald Ford endorsed the Rockefeller plan. The story of

how, and why, Mr. Rockefeller prevailed offers an intriguing look at the impact of personality and political considerations upon decision-making at the White House.

A SIMPLE EXPLANATION?

Almost to a man, Ford administration economists are baffled that the conservative Mr. Ford opted for the scheme, with its inherent bureaucracy, expense and federal intervention in the capital marketplace. But perhaps, as the conversation with the President's friend suggests, the explanation is simple:

The President and some of his more politically oriented advisers had come to feel the need for some sort of "positive" program for 1976. Nelson Rockefeller had such a program—and the singleminded determination to bull it through.

And bull it through he did. Time and time again, during more than three months of infighting, opponents like Economic Adviser Alan Greenspan, Treasury Secretary William Simon and Budget Chief James Lynn thought they had succeeded in throttling the ambitious scheme. Time and time again it revived to confront them anew, like some great weed that could not be contained.

Mr. Rockefeller was simply impervious to criticism. "Mr. Vice President, there is not one redeeming feature in your plan," a member of the Economic Policy Board snapped during one point in the debate. "Glad to have you aboard," Nelson Rockefeller replied genially.

The long debate highlighted a profound difference in outlook and philosophy within the Ford administration. The critics of the plan are cautious men, pessimistic about the ability of government to shape events, and opposed on principle to government intervention. To them, big plans are always bad plans.

But Nelson Rockefeller, that inveterate optimist and problem-solver, is something else again. "He gets emotionally involved in very big stuff—he feels like he's creating something," complains an opponent in the recent debate. "His life-long weakness is that he gets overly enthusiastic about solving the world's problems.

"When I see something like this, I think 'If it's that big, it can't be any good,' but when he sees it, he thinks 'If it's that big, it's got to be good.' "

Indeed, the Rockefeller plan is all of a piece, in its sweep and its financial structure with the Urban Development Corp. Mr. Rockefeller spawned as governor of New York. The fact that the UDC has come periously close to financial collapse apparently didn't inhibit the Vice President in the slightest. His feeling about the UDC, says an associate, is that if he had remained in Albany to watch over it, it wouldn't be in the shape it's in.

Mr. Rockefeller began thinking about the plan after President Ford assigned him to start collecting ideas for a Ford domestic program next year. He plunged into his task with his characteristic airy self-assurance.

One day, during a discussion of some now-obscure aspect of domestic policy, a staffer warned Mr. Rockefeller that Treasury Secretary Simon would never go for the idea under consideration. "Who is Simon?" Mr. Rockefeller replied lightheartedly. Then he answered his own question:

"Just a bond-seller."

Out of staff meetings and numerous working dinners at the Rockefeller residence here, the proposed agency took shape. It would operate much like the Depression-era Reconstruction Finance Corp. By guaranteeing loans and making loans of its own, it would try to steer $100 billion into a variety of projects.

Those projects, by definition, would be high-risk projects, either too far-out or too huge to attract sufficient capital on their own merits. Mr. Rockefeller's proposed Energy Independence Authority would try to launch synthetic fuel plants using technological processes now in the research stage, for example. It would promote "energy parks"—clusters of nuclear power plants or of conventional utilities. To get construction moving, it would even build some major facilities itself—nuclear power plants, for example—then try to lease or sell them back to private industry.

To launch the EIA the Treasury would buy almost $25 billion in the public corporation's stock, the purchases spread out over the first four or five years of the corporation's life. After 10 years, the EIA would go out of business. Then, in theory, the Treasury would devote the next decade after that recovering the taxpayers' investments.

Would taxpayers get all their money back? It's doubtful. Some of EIA's high-risk loans might well prove bad and some of its high-risk projects might well become white elephants. To offset these losses, the EIA would have to make profits on its other investment.

As the plan took shape, the Vice President began trying to sell it to top administration policymakers in a series of meetings. And soon administration men were taking sides—mostly the anti-Rockefeller side.

Unequivocally against the scheme were Messrs. Greenspan, Simon and Lynn, as well as Economic Adviser Paul McAvoy, top aides in the Federal Energy Office and an energy adviser on the Domestic Council staff.

Philosophically, the opponents objected to the very idea of government meddling in the marketplace. They feared it would merely subsidize many investments that are going to be made in any event. They argued that it would hurt other sectors of the economy by diverting capital away from them and noted that it would create yet another bureaucracy in an administration that supposedly is trying to shrink the bureaucracy.

More equivocal were Federal Reserve Chairman Arthur Burns, Economic Adviser L. William Seidman and Commerce Secretary Rogers Morton, who had deep reservations but could see some arguments for the idea. "From a pure economic basis it's very hard to defend," Mr. Morton said recently, but national security requires steps to achieve energy "independence."

Energy Chief Frank Zarb was an enigma to the end, seeming to oppose the scheme on some occasions, seeming to support it on others. White House Chief of Staff Donald Rumsfield functioned as a broker between the competing factions.

Of course, the only man whose opinion really counted was President Ford. And according to one participant in the debate, the President accepted the Rockefeller idea, in principle, months ago.

BREAKING A STALEMATE?

This seems highly ironic for a President who ceaselessly champions free enterprise and has repeatedly denied hard-pressed New York City the very kind of loan guarantees he now advocates for some of the most powerful corporations in America. But White House men say Mr. Ford is convinced that a new effort is needed to break the energy policy stalemate with Congress. Moreover, he's impressed by arguments that the plan would create jobs and help sustain the economic recovery in future years.

The President announced his decision in a meeting with the Vice President and top administration policymakers almost two weeks ago. Even then, a participant recalls critics of the plan made a last-ditch effort to change Mr. Ford's mind. While the President listened patiently, they ran "two or three times" more.

In the end, those and other arguments against the idea may yet prevail. The plan already has generated strong opposition in Congress, with conservatives opposing it on fiscal grounds and liberals denouncing it as a give-away to big business. Even the businessmen it supposedly would benefit are divided on its merits. In a telling admission, a top White House official concedes privately that the idea probably will go nowhere in Congress.

It's possible that the controversial idea could become a political minus for Mr. Ford next year. But that's conjecture, and Mr. Ford is a stubborn man who doesn't change his mind easily. He now has a program, a "positive" program, and chances are you'll be hearing a lot about it from him in the months ahead.

[From the Washington Star, Sept. 21, 1975]

How Rockefeller's Midas-Touch Trick Went Sour

(By William Ringle)

In Nelson A. Rockefeller's baggage when he came to Washington was a formula for his equivalent of the philosopher's stone and the universal solvent rolled into one.

Like the philosopher's stone, this wonder-working device seemed to turn baser substances (in Rockefeller's case, paper bonds) into gold, or at least money.

Like the universal solvent, it seemed to dissolve obstacles—especially public debt, the need for more taxes, troublesome legislators, recalcitrant voters, reluctant union bosses and political liabilities.

This magic device was called the public authority.

Almost any time Rockefeller had a major money problem in New York—how to provide university or mental hospital buildings, housing for those of low and middle incomes, or commuter railroad cars—he created a public authority.

Last spring, the public authority turned out to have still another, political, advantage: If it goes belly up, it does so after the creator is long gone and it gives big trouble to his opposition.

In April one of Rockefeller's pet authorities, the Urban Development Corporation, became the first major public agency in New York State ever to declare itself unable to meet its debts. "The Impossible Happens: UDC Goes Broke," said a *New York Times* headline. By that time Rockefeller was comfortably ensconced far away in Washington. His Democratic successor, Gov. Hugh Carey, who by then had scarcely had time to learn the way to his office, was forced to pick up the pieces.

Republicans in New York have yet another bonus in prospect. The UDC was bailed out, to the tune of a half billion dollars, but only temporarily (until Nov. 1, 1976): The odds are that Carey next year again will be forced into the time-consuming, distracting and embarrassing business of cleaning up another UDC mess.

In addition, New York State's Housing Finance Agency, still another Rockefeller public authority (it is the agency that markets bonds for public authorities) which needs to borrow $100 million a month just to tread water, served notice on the state just last week that it has no reliable source of funds in sight.

Yet, with the smoke from UDC still on the horizon and the HFA troubles looming, Vice President Rockefeller—whose sense of timing in the past has been less than exquisite—has peen pushing for the same general kind of answer to the nation's energy problems: a public authority that would float bonds and raise up to $100 billion.

Rockefeller's idea was to create a "new government corporation" that would:

Guarantee loans for private industry, or

Raise money by selling its own government-guaranteed bonds and then make direct loans to industry.

"Theoretically," explained *The Wall Street Journal*, which first revealed the scheme, "Washington would be able to steer great quantities of private money into vital areas without tying up great quantities of public money."

Because this is almost exactly the language Rockefeller used in promoting his authorities in New York State, it may be worthwhile to look at how and why these developed and what has happened to them.

The public authority—sometimes called the "public benefit corporation"—in its pristine form is simply a means of letting the users of public projects pay for them.

For example, an authority might be set up to build and operate an expressway or a bridge. To raise the money, it would sell bonds. Over the years, to pay off the bonds with interest, and to pay for operating the road or bridge, it would charge tolls. The project successfully financed by an authority would literally pay for itself—be "self liquidating," in the government lingo.

The authority classically is used to do a job that has an extra dimension or is not in the state's usual line of work. For example, an authority might operate power plants to generate and sell electricity in partnership with a foreign government. Or it might provide a facility that transcends ordinary political boundaries (such as building and operating a sports stadium to serve two conunties, or a farmer's market serving a vast region of many cities and counties; or a seaport or airport serving a wide region).

The members of an authority, often three to six in number, operate as a kind of free-wheeling board of directors. They combine the flexibility and independence of a private business with the power of government.

In any narrative of Rockefeller's enchantment with public authorities, two men loom large. One is his former all-purpose brain truster, William J. Ronan. The other is John N. Mitchell, once one of the nation's leading municipal bond lawyers who was later to become President Nixon's attorney general.

In the early 1950s, Ronan, then dean of the New York University Graduate School of Public Administration and Social Science, directed a state commission's pioneering study of public authorities. It is still somewhat of a collector's item among students of government. In 720 pages it described the uses and abuses of public authorities.

They operate—in secret, if they wish—outside the conventional controls by elected officials.

And they can, by selling bonds, run up debt without the approval of the voters or the legislature. This is perhaps the most important aspect of the authority because many state governments are forbidden by their constitutions to go into debt (that is, to borrow by selling bonds or notes) without obtaining the voters' approval. The public authority is a way around that obstacle.

(A few may recall that Rockefeller became governor in 1958 after taking the hide off his predecessor for runing up an $879 million debt, all approved by the voters. Fifteen years later, when Rockefeller left office, the state debt was listed as $11 billion, with only $3 billion of it approved by the voters. The rest had been run up by public authorities.)

Ronan's study also noted that the debt acquired by authorities is not subject to those early-warning systems, state or municipal debt ceilings. A public authorty's debt is its own obligation and is not lumped in with total state debt. ". . . Many public authorities in New York have been created to avoid debt limits," said the Ronan-directed study.

Despite the authorities' freedom from state restrictions, Ronan's study conjectured that if an authority could not meet the payments on its bonds and went broke, the state's taxpayers would have a tacit obligation to pay its debts. This, he said in 1956, could be a "moral obligation." (Prophetic words: That is exactly what happened after the UDC declared insolvency in April.)

Rockefeller laid the foundation for public authority financing in 1960 with the Housing Finance Agency. By then, Ronan, the old maestro of the public authority, was Rockefeller's administrative alter ego. And Mitchell generally gets credit for drafting the HFA legislation, of which more will be said later.

Gradually, authorities proliferated. In 1962, confronted with the need for hundreds of millions, perhaps billions, to enlarge the state university, Rockefeller created the State University Construction Fund.

Then, there was the Mental Hygiene Facilities Improvement Fund to erect buildings at mental hospitals (in those days a big part of every state's budget). Both sold their bonds through the HFA.

The UDC came along in 1968, after voters had defeated two low-income housing bond issues. By then even the legislature was balky. An angry Rockefeller—who had hoped to get the "revolutionary" legislation enacted to counter black hostility after the assassination of Martin Luther King Jr.—threatened to withhold patronage and veto bills the legislative rebels were interested in. The UDC bill passed.

Rockefeller's authorities had a twist. The projects they financed did not exactly pay for themselves—they were not "self-liquidating," although he continues to insist they were.

What Rockefeller did was to spin off some conventional state responsibilities, such as the construction of college buildings or mental hospitals, and give the job to a public authority.

Since these kinds of structures did not themselves generate any new revenues, as a new toll road or a bridge would, he then earmarked students' fees and mental hygiene patients' fees to pay off the bonds.

Because such fees previously had been going into the state's general funds, this mean the slack would have to be taken up by tax revenues. So, the bonds indirectly were being repaid by the taxpayers, even though the debt technically had been shifted from the state's books to the authorities'.

Besides the bookkeeping sleight of hand, the authority device provided a number of advantages.

One, whether he intended it or not, was political. Rockefeller was then running for president and trumpeting "pay as you go." The authority gimmick enabled him to go around the nation and claim that he was doubling the size of the state university or adding $300 million in mental hospital space without adding to the state's debt and without raising taxes. This claim, a legal truth

but a practical misrepresentation, made Rockefeller seem like some kind of administrative miracle worker, an aura that he retains in some quarters today.

Another was that authorities enabled Rockefeller to avoid the cumbersome, time-consuming process of government—the approval by legislators, whom Rockefeller does not hold in high esteem at any level, and the voters, who were demonstrably against more public housing and might have resisted the badly needed state university expansion. The authorities enabled Rockefeller to exercise his considerable "papa-knows-best" instincts.

Finally, the authorities had the benefit of postponing, if only for a while, the need to raise taxes.

It was not long after Rockefeller's first venture into public authorities that his tactics began to draw fire.

As early as 1963, two corporations that rated state bonds—Dun & Bradstreet and Moody's Bond Survey—were warning of the consequences. ". . . The state, in a shower of politically oriented slogans, is resorting to borrowing through special agencies and is increasingly earmarking revenues for this new debt," said D&B. "A continuation of these policies could eventually affect the state's credit standing . . ."

After several years, D&B and Moody's, followed by Standard & Poor's, lowered New York's triple-A credit rating a notch.

Instead of acting to curb Rockefeller, the piant legislature turned on the bond-rating companies with threats to outlaw them.

The dour state comptroller, Arthur Levitt, repeatedly lambasted Rockefeller's "backdoor financing" "fiscal legerdemain" and "phantom debt."

Robert Morgenthau, the Kennedy-picked Democrat who ran against Rockefeller in 1962, articulated the case against the authorities. But he proved such an insipid campaigner that no one listened. Besides, his criticism, like Levitt's, was discounted as coming from a Democrat.

The fledging Conservative party, made up largely of apostate Republicans, also had the authority issue pinned down in 1962, but its strident across-the-board objections to any government spending all but downed it out.

Mitchell played a major role in making the authority bonds more palatable to bond buyers. Since the bonds were issued by public authorities alone—mainly the UDC or HFA—they did not have the "full faith and credit" of the state behind them.

Obtaining that would require the approval of the voters, which Rockefeller, after his setbacks, was reluctant to seek.

Mitchell is given credit for language in the HFA law acknowledging the "moral obligation" of the state to make good on bonds should an authority collapse. Other states adopted the same language.

Theoretically, this would reduce the risk so that buyers would accept them at a lower interest rate. However, since the collapse of UDC and New York City's latest insolvency, that hope is somewhat beside the point. New York's "moral obligation" is indeed being called upon—to the tune of $285 million of the taxpayers' money for UDC bonds, to date.

The other money to meet UDC's debts was borrowed last spring from such places as a state fund that pays claims when there's no insurance after an accident, from the state employes' retirement system and from a consortium of savings banks. Thus, it is possible that the taxpayers will have to reimburse them and may end up paying the entire half billion. Yet the UDC was to have been a device, like Rockefeller's proposal for a federal energy agency, to avoid "tying up great quantities of public money."

How did New York State get in such a pickle?

One reason was that the legislature was not only tractable, but found the hazards of authority borrowing, although simple in concept, beyond its narrow attention span.

Many others contributed to the mess. They include: A subservient State Budget Division; a trusting and adulatory press (with the exception of the *New York Times*, which spoke out early and often against the backdoor borrowing); a neutralized band of liberals who didn't question the means so long as they approved of the ends; and trade unionists who savored the good jobs that the subsequent construction generated.

Rockefeller's new federal proposal—for an Energy Resources Financing Corporation—seems to be getting more scrutiny than he was accustomed to in Albany.

Alan Greenspan, chairman of the Council of Economic Advires, blasted draft proposals because of the "virtually unconstrained" scope of the corporation's operations. The corporation itself could get into almost any aspect of the energy business, or could bankroll others.

The corporation could avoid dealing with those persnickety bond buyers who were such a nuisance in Albany. The draft legislation would permit it to sell bonds to trusts and fiduciaries that are under federal control.

That means that money going into the Social Security "trust fund" or other retirement money could be "invested" in ERFCO. And if ERFCO performed in the manner of UDC or HFA, pension money would be lost and the United States would have to step in and make up the difference.

With his new corporation, Rockefeller wouldn't have to resort to John Mitchell-inspired suggestions of "moral obligation" in order to make the bonds attractive. The bill say they'd be backed by the "full faith and credit" of the United States.

The CHAIRMAN. Thank you, Mr. Nader, for a devastating presentation.

I think that your catalog of problems that this bill presents is most helpful. The Freedom of Information Act exemption, the exemption in the Federal public contracts, apparently an exemption from the National Environmental Policy Act not in the budget. no appropriation for, or congressional review, and others; you rely very heavily on conservation. And you indicate your hope for the Kennedy-Hollings bill, which I think seems to be a very good bill.

But how realistic is it, really, to rely this heavily on conservation?

Mr. NADER. It is very realistic because you are relying on——

The CHAIRMAN. I am talking about the political problem.

Mr. NADER. Yes; I think it is for several reasons.

One is, we are talking of changing human behavior. We are talking of changing architectural standards. We are talking of changing energy efficiency in automobiles. We are talking of changing industrial processes.

The CHAIRMAN. Let me just start off with the architectural standards.

We pased a bill out of the Senate. It's over in the House now. That would require conservation in insulating homes, and so forth, so that the cost of—the energy cost of heating would be reduced. We are having a terrible time in the House over that, and indications are that we probably won't be able to get it through.

In all fairness to the administration, they are supporting that, and they are supporting it vigorously. And they are pleading with the Members of the House to adopt it. But this is a matter that is very hard. No matter where you turn here, you step on the toes of people who are deeply interested; in this case, the homebuilders and the architects.

Mr. DELOSS. Let me make a point about that. It is true that the administration deserves credit for a change for supporting a program, a regulatory program, to require energy efficiency because that is what is what it is, a nonfiscal approach.

But that program won't take effect for at least 5 years when you analyze the timetable in the bill, and the really important thing for the next decade is to do something about existing buildings; that legislation only applies to new construction.

Now, the bill that we have testified on before the Senate Commerce Committee, S. 2932, does focus on existing buildings and existing manufacturing plants. And that is the kind of area where we need activity to have some effect in the next couple of years.

The CHAIRMAN. I couldn't agree with you more. But if a much milder bill with that long timetable is having such a very difficult time, what prospect do we have that we can get legislation of the kind that you support?

Mr. DELOSS. Well, the fact is that S. 2932, because it is not a mandatory regulation bill, because it is something of an incentive type of legislation and involves a form of loan guarantee and interest subsidies, might not run into that kind of resistance.

The big point is that the Administration did come in and testify against that kind of legislation which we think would have the kind of short- and medium-range impact that they have been talking about when they talk about the need to reduce oil imports.

The CHAIRMAN. I agree, but we may have a veto. The arguments have been, and, frankly, I am not well enough informed to know how fair this argument is. The argument has been that the Democrats aren't very far from the Republicans here.

Senator Jackson, who has been a leader in the energy area, has made proposals very similar to Vice President Rockefeller's proposal. So the problem of getting a substantial majority of Congress for the kind of energy conservation program which you think is logical and I think it is too——

Mr. DELOSS. We are aware of this problem, Senator, and we are hosting a conference right here on Capitol Hill May 20 and 21st to educate Congress and the public and the media. It is a conferecne entitled, "Public Policies to Promote Energy Efficiency." And I will be glad to send you all the material relating to that conference.

We are going to invite everybody and we are having a number of experts from all over the country. We will be able to inform Congressmen and their staff members on the potential in this area and there will be an extended discussion specifically on the public policy initiatives.

The CHAIRMAN. I congratulate you on that. I think it is very constructive kind of action.

Mr. NADER. Senator, let me just say, first of all, I think the political reality of getting the energy efficiency bill through is much greater than the political reality of getting this bill through.

Second, you don't find any verbal opposition to energy efficiency compared to any other program. They just don't want to push it, but they are really very reluctant to oppose it verbally because it basically is accountable for efficiencies on the part of intermediate consumers and final consumers of electricity and fuel. That holds true for insurance companies, banks, industry, as well as the ultimate consumer.

I think the Congress has been so diverted by these foolish proposals that are coming up from the executive branch for the last 3 years, all this corporate subsidy gimmickry and all these pricing shenanigans that Congress has not had an oportunity to build up national support for an energy-efficient policy.

Now that some of the pricing problems have gotten shunted to the side for some 40 months. you can concentrate on building up a constituency for energy efficiency. And I say that it is there all over the country, and it is also there in some areas of industry who are advocating the sale of equipment that permits energy to be consumed more efficiently.

So you have got a business lobby that can potentially be coordinated to support your efforts.

The CHAIRMAN. Well, I won't write off this bill as having no chance. We have had support from the AFL/CIO. We have had the support of many big industrial firms which is, as you pointed out, would gain—then gain greatly.

Alcoa came in and testified this morning. So I think there is some possibility that this might pass the House and Senate, and I wouldn't write it off. It has the formidable support of the Administration, particularly the Vice President.

Would you deny this bill would increase supply? You see, the main logic they have, it would seem to me, is that although this may underwrite inefficient processes, it will bring on a greater supply then we have now.

For example, Vice President Rockefeller said that one of the things this bill would permit would be the construction of a pipeline through Canada; a gas pipeline that would pick up both Alaskan and Canadian gas and bring it to the Middle West.

He argues that it would be very, very hard to expect individual corporations to do that without some kind of government support because the cost would be so great.

That would increase the supply of natural gas. Why won't that be helpful in your energy situation?

Mr. NADER. First of all, that assumes that there isn't available private capital to build the pipeline. And I don't think they can substantiate that assumption. After all, you know the oil companies were ready to build pipelines on their own from Alaska. When Alaskan price of oil in this country was at $3.50 a barrel. It is now up to $12 a barrel. That is a lot of incentive.

The CHAIRMAN. It is an incentive, but as Mr. Peterson argued—and I wish you would answer this because I think this was the stronger argument. We have heard the difficulty for these firms is there is such an enormous differentiation in cost. In the Middle East, the cost of oil is a small fraction of what it is offshore there, or offshore in Alaska or Mexico, and these new synthetics coming on that might increase the supply, the cost is even higher.

So the risk for them going into these areas is so immense, and the amount of money involved is so great that they can't do it without government assistance.

Mr. NADER. I must disagree because the oil companies already took that risk before the 1973 embargo: to exploit and sell Alaskan oil at $3.50 or $4 a barrel. And it is now selling for more than 3 times that. And while some of their costs have gone up, clearly you have got a lot of leeway there.

They were willing before '73 to drill and produce and transmit Alaskan oil at a price less than one third of what it is selling now.

The CHAIRMAN. But you have the hard, cold facts that they have not developed these other alternatives. They haven't built—there is no indication they are going to build the Canadian pipeline. There is no indication they are going to come on with a gasification or liquifaction plant in a big way for coal. There is no progress in the shale area; none of these areas.

Mr. NADER. You have to ask yourself: At what price supply? That is, the capital that comes out of the EIA is so unproductive per Btu that pretty soon you ask yourself: are all kinds of other alternatives more cheap? Solar, right now, starts to become very attractive for generating electricity.

With this kind of massive price cost, this EIA, they are hoisting themselves by their own petard. On one hand it is going to take enormous capital per Btu-produced and only this government program can guarantee to backstop it.

Then that raises the question: "Well, now, what other alternatives suddenly become very economically attractive since the ceiling price for the synthetics has gone so high?"

I think you are going to see within 1 year. Senator, the detailed plans for solar-generated electricity that can be built, starting now, that is competitive with those alternatives.

Mr. DELOSS. Senator, in regards to the high risk contrasted with the rate of return, where Mr. Peterson talked about $15,000 per barrel of capital required for, let's say, oil shale development, now, I think I understand what he is talking about. There is $15,000 investment per barrel per day of production. Well, you produce 365 barrels a year then. That means that that $15,000 divided by 365 barrels is $41 development cost per barrel on an annualized basis.

Now, they are going to get, a few years from now even under price controls, the price of oil is going to rise, let's say it went to $14, $14 is one-third of $41, so they get a 33 percent rate of return.

The CHAIRMAN. What they are talking about is $300 of capital investment in the Middle East compared to about $3500 in the Gulf of Mexico.

Mr. DELOSS. But they don't have that option anymore. They aren't able to invest in the Middle East today. They don't have any low-priced options anymore. They only have high-priced options.

The CHAIRMAN. I do have other questions. Unfortunately, time is running by. We have two other witnesses who are patiently waiting.

Let me just ask one question; because you hit this so hard, I know how strongly you feel it, and I agree with you.

You argue in your statement that this bill would be a baliout of nuclear power industry in the electric facilities. EIA would be authorized to construct nuclear power facilities and to purchase and lease back facilities.

You contend that 70 percent of nuclear plants projected for construction have been cancelled due to capital problems. Where do you get your figures?

Mr. NADER. You mean 77 percent?

The CHAIRMAN. Yes.

Mr. NADER. Those are just constantly repeated in the New York Times and Wall Street Journal. I am sure they come from the Atomic Industrial Forum or the Edison Electric Institute.

Mr. DeLoss. The 70 percent figure in the testimony was taken from Vice President Rockefeller's address to an energy conference last October, but there are more exact tabulations of postponements and cancellations, and so on, available from a number of sources, including the NRC and ERDA. and the industry itself. And we can supply any number of those for the record.

The CHAIRMAN. Well, the Vice President testified that most of the money, in this bill would go into nuclear plants. That is what he told us. That was his testimony.

Now, if most of the nuclear plants on the drawing boards are being cancelled, who is going to buy the facilities after EIA builds them?

Mr. DeLoss. Well, there is a real irony going on here. As Mr. Simpson said yesterday, the problem is that the market for nuclear powerplants is gone and the reason the market is gone is because of the price elasticity in the area of electricity consumption.

Now, that is what this administration was preaching last year about energy pricing in which they were fighting oil-price controls and gas-price controls. They wanted the prices to go up so price elasticity would decrease consumption. That was part of their argument.

Now, where it has worked most successfully is in the area of electric consumption. And yet here comes the administration, jumping in and saying, "Horrors? Price elasticity has worked here. Electric consumers have used less electricity due to the increased price.

"Now there is no market for nuclear powerplants. We have got to do something. We have got to jump in with a subsidy." That is what is going on here. They are trying to have it both ways. They are saying they want price elasticity; they want consumers to respond to prices by using less. But when they do, they want to pump in and bail out an industry where the market has slumped.

The CHAIRMAN. If the EIA and the bill is primarily nuclear facilities, will those facilities then end up in the hands of the Government because they are too inefficient? Now, because the bill is written to guarantee that the ratepayers will subsidize these utilities eventually, it begins with the taxpayer subsidizing, then the State regulatory commission is required to adjust rates, so the ratepayers end up paying for these things.

Believe me. the industry is not going to end up holding the bag.

Mr. NADER. The devices for the government to buy them and lease them back to the utilities.

Mr. DeLoss. I might point out that I just found out yesterday from talking to somebody who attended a briefing on the Energy Independent Authority by Mr. Zausner of FEA—who may still be here in the audience—that in addition to the description that is in this testimony of the way the EIA would condition these lease-purchase agreements on cooperation by the State regulatory agency to provide rates high enough to finance the purchase by the utility, on the lease-purchase agreement, that in addition to that, the interpretation of this listener at the briefing that I heard about, was that the Regulatory Commission would have to go further and provide enough gravy in the rates so the next time that utility wanted to buy a nuclear powerplant, it would be able to buy it out of its income

from the rates and it won't have to come back to the EIA for another lease-purchase agreement.

In other words, there is gravy on top of gravy here. This is really a loaded set of conditions that they want to attach so that you are not only preempting the State regulatory role here, but you really are kind of forcing the purchase of nuclear powerplants that the market does not particularly need.

Mr. NADER. Senator, it will encourage bidding for unproductive, or excessive risk, as I interpret prices. In section 3020, page 10 of the bill, it says the authority authorized and empowered in its sole discretion, and upon such terms and conditions as it may determine to provide financial assistance.

Just another illustration of how much is closed off from the accountability to the taxpayer and the consumer.

I do want, in 1 minute to summarize the reasons for the conservation alternative. The claim is that high risk energy production options require Government aid. That is the claim that is made by the proponents here.

The lowest risk investment are investments in energy efficiency by making buildings and industry more efficient; for example, that is the lowest risk. Furthermore, investments in energy efficiency provide the quickest return on investment. There is a much shorter leadtime, than in the case, say, of atomic power, which, quite apart from its terrible safety problems, requires 10 years or more for construction—and other experimental technologies, who knows, maybe 20 or 40 years. I really find it abominable, and very, very revealing, how little attention is paid to solar energy in this bill.

There are explicit references to supporting nuclear power but there is just—oh, yo ureally have to strain to see whether there would be a possible interpretation for solar energy in this area.

The great future energy source for the planet Earth is here today in some applications and coming much more rapidly even without Government aid. That is how compelling it is.

Now, that is the tipoff right there.

The CHAIRMAN. Gentlemen, thank you very, very much.

As I have said, devastating testimony. We very much appreciate it.

Our final witnesses are a panel of Robert Nathan, Washington, D.C., and Professor Murray L. Weidenbaum.

Gentlemen, I apologize to both of you. You are mighty patient.

I understand, Mr. Weidenbaum, you have to leave. So you go right ahead, sir. You understand that the problem is time. The entire statement will be printed in full in the record.

STATEMENT OF PROFESSOR MURRAY L. WEIDENBAUM, DIRECTOR, CENTER FOR THE STUDY OF AMERICAN BUSINESS, WASHINGTON UNIVERSITY, ST. LOUIS, MO.

Mr. WEIDENBAUM. Thank you very much. I have submitted a 38-page analysis, which I do hope you will include.

The CHAIRMAN. It will be printed in full in the record (see p. 397).

Mr. WEIDENBAUM. Let me summarize my statement very briefly.

The case against the EIA is compelling on economic, financial, and administrative grounds.

First of all, there is no case for a Federal subsidy for energy development, in the first place. The energy industry has shown it is fully capable of raising large sums of capital for commercial energy projects. The energy industry has a strong financial structure. Its profits are now just about average for manufacturing companies.

The demand for energy is not static; it is not declining. Every forecast shows it is rising. The reason that private development of new energy sources isn't forthcoming is it doesn't pay, the way Congress has geared public policy, for new private energy investment in new energy sources because of price controls and regulatory policies.

My paper boils down to the simple point that if you would let the market work, if you would eliminate the price controls on existing fuel sources, as the price of existing energy sources rises, the cost of new energy sources will become competitive. There won't be a need for a Government subsidy.

Now, certainly an increase in energy prices is painful. Any price increase is painful. But the way to deal with inflation isn't to contain a specific price. That is a classic way to create a shortage. As the former Chairman of the Joint Economic Committee well knows, there are many ways that Congress can fight inflation. And sitting on energy prices usually isn't one of them.

As Ralph Nadar pointed out—oh, I am almost uncomfortable agreeing with him so much on this subject, and no doubt vice versa—we have dampened down the demand for energy because of the sharp price increases that have occurred.

Now, when you look at the bill, I think the most compelling reason for oposing the EIA bill is just to read it. It is a fascinating document.

First of all, it would put Government into private business, into owning energy facilities and into producing and selling energy on the market to consumers. That is what it says in the bill. I go into detail on that.

If there is any concern about a lack of credit for energy, I suggest that a Government credit program doesn't create more funds. It rearranges the use of funds. What the Congress needs to consider is initiatives to stimulate a greater flow of private savings in the first place.

Clearly, EIA is a budget subterfuge. Yes, it might conceivably generate offsetting revenues but don't let that fool you. And I am sure it won't. There are plenty of agencies in the budget that generate revenues. Just because a Federal agency will generate offsetting receipts, that is no reason for keeping it out of the budget, because by that standard, the IRS ought to be an off-budget agency. It generates far more revenues than it costs the Treasury.

And in terms of the administrative problems, people don't recall sufficiently the circumstances under which the Reconstruction Finance Corporation—the previous large Government credit program for business—was terminated, full of scandal.

Well, what does this thing try to do? It sets up so many restrictions to avoid the RFC-kind of problem that it's unworkable. In my statement I just list 11 different restrictions. I won't repeat them now.

For a prospective energy project to jump those 11 hurdles, either it is impossible or even if they do it, it will take so long that that 1985 target date for energy independence still won't be achieved, even if they spent the $100 billion.

I just implore the Members of the Congress to read the bill; to look at the details. Really, the unworkable details are piled on top of each other in setting up this new Government program. But there is one thing that needs to be emphasized, that is, the regulatory barriers to domestic energy production.

There have been a number of studies which I cite in my full statement saying that one of the major impediments to new domestic energy production in the United States is the great uncertainty resulting from the environmental legislation. Even if those cases where finally the project passes the environmental regulatory hurdle, there is still such great uncertainty as to when the project will finally meet all of the requirements, all of the litigation which is predictable.

You can set up the most pollution-free energy program, and I predict the previous witness, or his friends, will set up a suit to oppose it. And if they lose, they will set up another suit. And if they lose, they will set up still another suit. If anything, they have increased the portion of the national income going to the legal profession. But that is another point.

To summarize, in terms of anticipated results, I have analyzed official statements and there is no relationship between the amount of money that will be spent and the results that will be forthcoming. Why $100 billion? Why not $50 billion? The only reason I can give you for $100 billion is it's a nice round number. And I suggest that instead of Mr. Peterson knocking off the last zero, I would knock off the first integer.

In summary, here is what is wrong with the so-called Energy Independence Authority:

One: It avoids dealing with the fundamental need to provide basic market incentives.

If you are concerned about conservation, let the price system work. It will give more incentive for production and more incentive for conservation.

Two: There is no indication that this program will result in any increase in domestic energy production.

Three: It will be extremely cumbersome.

Four: It ignores the sad lessons of history. It is another RFC; and

Five: The Federal Government could very will wind up owning and operating commercial plants and selling commercial products. That is envisioned right in the bill.

Instead of that approach, I urge the committee to consider seriously the other alternatives available:

1. Greater reliance on normal market incentives.

2. Reducing regulatory barriers to the use of existing energy sources and the development of new ones.

3. Stockpiling petroleum to reduce the threat of embargo.
4. Encouraging research and development of new domestic energy sources. And,
5. More effective use of existing energy supplies.
Thank you very much.
The CHAIRMAN. Thank you.
Now, if it is all right with Mr. Nathan, I will go ahead and question Mr. Weidenbaum briefly.
I think this is a very fine paper, incidentally, and extremely logical and well organized.
I know, however, that you don't put much emphasis on what the previous witness did, conservation. This isn't one of your, or is it—did I miss it? It doesn't seem to be one of your principal points.
Mr. WEIDENBAUM. It is the point, "encourage more effective use of existing energy sources." On the first two pages I point out that letting basic economic forces, the price system, work, will both dampen down demand as well as encourage supply. That is the basic alternative to the EIA.
The CHAIRMAN. You say that to the extent the Federal Government via the EIA stands ready to share the financing of new projects, the likelihood of private capital investment in risky ventures will diminish.
Do you claim, then, contrary to other witnesses, that private capital will finance these risk ventures, such as oil shale and the trans-Canada pipeline if the Federal Government does not get involved.
Mr. WEIDENBAUM. I contend in my paper that as uncontrolled market prices of existing energy sources rise over time to the cost level of new energy sources, like synthetics and gasification, then it will become economical to go ahead with shale, coal gasification, et cetera, without a Government subsidy.
The CHAIRMAN. I see the trouble with the situation. You may well be correct. We don't know, of course. But, for one thing, you have had controls. You may get controls again if you—even if you take them off. And we are phasing them out, but you may get controls at another time. Perhaps even more troublesome in the fact that we are pouring tremendous amounts of money into research and we are likely to come on with new developments here that might reduce costs rather sharply in some of these areas.
Maybe they won't, but they very well might. So the uncertainty is great, I think that is the main part of the agrument that appeals to me on the other side. Certainly it is so great that unless you provide some kind of program of this sort, price guarantees, loan guarantees, and so forth, that private corporations simply cannot take the risk to get into these areas what would produce more energy.
Mr. WEIDENBAUM. Sometimes you have to defend the private enterprise system against individual private enterprisers. I am struck by the ability of this system to work, if you let it work. In other words, American industry has, over the years——
The CHAIRMAN. It has, Murray, but wouldn't you agree that it is a very unusual situation in energy now with the colossal efforts we are making to improve our technology and recognizing what tech-

nology has done over the last 30 or 40 years. Atomic energy is relatively new and so is space travel. All these things are tremendously new revelations. And if I were in a corporation and had to make a judgment as to whether or not to go ahead with a half billion or billion dollar project that would take several years to build I must say I would be very concerned about what the price structure might be 5 or 10 years from now.

Mr. WEIDENBAUM. Yes. But I also, if I were in that position, would have supposedly the benefit of hundreds of millions of dollars that would be spent by ERDA on demonstrations, on pilot projects, on pilot plants. Because this bill doesn't only exclude research, it excludes development.

In other words, the supporters of this bill, I think, are forgetting the vast sums of Federal Government money that ERDA will be investing in new technology during the riskiest stage—that is the development of new energy sources. The production and the distribution, which is the stage of the process envisioned here, will come after the high-risk ERDA projects.

The CHAIRMAN. You are a strong free market man and I highly respect that. I think there is an enormous amount of merit in that in our system.

However, I think you have to recognize if we deregulate oil we may get back to the very serious problem that provoked the worst recession we had since the great depression, that because energy inflation enormously increased prices and priced people out of the market; there were other elements causing the inflation but I think the fundamental cause was the colossal increase in the price of energy.

Now, might this not happen again if you just took off the controls, completely deregulated natural gas tomorrow and so forth?

Mr. WEIDENBAUM. I got caught in the cross-fire in the fall of 1973 because I urged a stiff increase in energy prices plus a stiff increase in energy taxes. So a portion of the added cost to tht consumer would go not to corporate treasuries but to the U.S. Treasury, and that money could be recycled into the economy in a progressive, not a regressive way.

The CHAIRMAN. Then, if you do that, what effect on conservation would you get?

I think you have to do something like that perhaps, but I am not sure that you would get an effective market discipline.

I understand. The fellow with the $5,000 or $6,000 a year income who has to drive 20 or 30 miles to work, if he is going to have a job and the price of gasoline goes to $1, he is going to be in a terrible position.

What you would do is refund part of that increase to reduce his net price to 60 cents a gallon?

Mr. WEIDENBAUM. Precisely. The State of Wisconsin refunds a portion of the sales tax on the income tax.

The CHAIRMAN. That's right. But when you do that, you don't get the conservation that you get if you just rely on the market.

You are not relying on the market. You are simply shifting around the opportunity to be transported.

Mr. WEIDENBAUM. Senator, I think the experience of Detroit in recent months is very instructive. When gasoline prices were rising, people were buying compacts like mad and the effect was the big gas guzzlers were sitting on the lots unsold.

In recent months, when the prices have come down, the compacts and subcompacts are sitting on the lots unsold and the luxury car sales are booming.

The price system does work if we give it a chance.

The CHAIRMAN. It does, but then I am thinking of something else. If you put that notion you have into effect, and provide enough so that the man with the modest income could still drive to work, you still would devastate, for example, the recreation industry.

In our State of Wisconsin, it is the third biggest industry. It is an industry that if the price of gasoline goes up sharply to $1 or $1.25 a gallon people might have enough and that would be the way we would opt, I presume, to get to work. But they wouldn't be able to drive to northern Wisconsin.

The CHAIRMAN. A lot of them would just stay home.

What I am saying is we have to do this and we have to recognize when we do it, we have to have our eyes open to see if the effect on the economy could be serious and the effect on unemployment, the effect on investment in recreation and other areas is perhaps more than we might otherwise expect.

Mr. WEIDENBAUM. But, Senator, the basic point in my paper is it is an anomaly to see the Congress make life difficult for development of energy sources by keeping down prices with one hand and then providing the bailout to the energy industry via these proposed subsidies with the other hand.

"The Lord giveth and the Lord taketh away." It is one of those situations.

The CHAIRMAN. Just one final question. You don't touch on the national security argument. This is one that has been raised by the Vice President and it is pushed very hard, the argument that we are becoming more and more dependent on the Middle East which is extremely uncertain and unsure, that we are importing now 40 percent of our consumption. It will be 50 or 60 percent until we take action of this kind.

However expensive these alternatives will be, we will have them.

There will be more gas, more oil, if we proceed with this kind of a program than we would have otherwise and in a national security emergency we would be far better off.

What is your answer to that?

Mr. WEIDENBAUM. My answer to that appears on the last page of my statement where I urge stockpiling petroleum to reduce the threat of embargo.

That clearly would deal with the very real national security concern.

The CHAIRMAN. It would for awhile, but that bill is a good bill and I support it, but it would provide perhaps a 6 months' or a year strategic reserve. Would that be enough?

Mr. WEIDENBAUM. I would think so indeed.

The CHAIRMAN. Not meet the blackmailing effect or the power effect of our not having adequate resources to proceed more than 6 months or a year.

Mr. WEIDENBAUM. Because, after all, we are still one of the world's major producers of petroleum. This country can withstand that kind of situation far more effectively than Japan or Western Europe.

The CHAIRMAN. Thank you very, very much.

Mr. WEIDENBAUM. Thank you, sir.

[The full statement and additional material follows:]

THE CASE AGAINST AN ENERGY INDEPENDENCE AUTHORITY

(By Murray L. Weidenbaum)

NOTE.—Mr. Weidenbaum is Director of the Center for the Study of American Business at Washington University in St. Louis and an adjunct scholar at the American Enterprise Institute. The views expressed are entirely personal.

The case against setting up a $100 billion Energy Independence Authority is compelling—on economic, financial, and administrative grounds. My analysis of this proposed federal credit subsidy for energy development shows numerous shortcomings.

This statement summarizes a more detailed study scheduled to be published by the American Enterprise Institute.

THE BASIC QUESTION: WHY A FEDERAL SUBSIDY?

Before getting to the technical aspects of credit programs, let us address the basic issue: Why does the domestic energy industry need federal credit assistance? It is not a matter of the size of the undertaking. Large commercial energy projects, such as the $7 billion Alaska pipeline, do proceed with private financing.

Nor is it a question of the weak financial condition of the energy industry. Although the profitability of the major oil companies has been exaggerated in much of the popular discussion, the industry's rate of return over the years is about average for manufacturing companies. Its asset structure is quite strong.

Neither is it a question of a static or declining demand for energy. Individual estimates vary, and for good reason, yet every forecast of future energy consumption in the United States shows a rising trend, far beyond the capacity of existing domestic energy sources. Why then is there such limited interest in the private sector is going ahead with the development of new domestic energy sources?

The answer is clear: under present circumstances, many such undertakings either are uneconomical or are restricted by federal regulatory programs. The cost of competitive, conventional sources of energy generally is much lower. But the situation is likely to change as the result of basic economic forces, if we let them work. It also could be improved by adopting more sensible regulatory policies.

In coming years, as more marginal and thus higher cost conventional energy supplies are used, the gap is likely to narrow between the cost of fuels from existing sources and potential alternatives—and then new sources such as synthetics could become competitive without government subsidy. Yet we must realize that the price of conventional energy in the United States is being kept artificially low by government policy. Of course we all prefer to pay less for something rather than more, but that is hardly a guide to sensible public action.

Clearly, the lower that the price of existing fuel sources is kept, the less attractive is the prospect of developing new domestic energy. An impartial observer can only gaze in wonderment at an approach to policy which first keeps conventional fuel prices artificially low (via government controls) and then finds that new domestic energy sources will not be developed on a sufficient scale without government help. The situation is made worse by the uncertainty arising from the limited duration of existing price controls. Given the higher

world price, the controls give domestic companies an incentive to hold off production until the future time when the controls may be lifted.

A more straightforward state of affairs is to eliminate the special price controls on existing conventional fuels. Such action will both encourage further exploration and stimultaneously promote greater conservation. As the price of convention fuel rises to the cost of new energy, there will be an automatic incentive for private companies to move ahead. But given the normal desire to minimize risk, private investments will be deterred as long as there is a strong possibility that the federal government will step in and assume the risk.

To those who are concerned that rising energy prices will be inflationary, we must point out that holding down individual prices is not the way to fight inflation (it is a classic way to create a shortage). The basic method to dampen down inflationary pressures is well-known—deal with the forces that influence the overall price level by reducing the budget deficit and maintaining a moderate monetary policy.

MORE GOVERNMENT IN BUSINESS

The Energy Independence Authority will represent a major involvement of government in sectors of the economy traditionally the responsibility of private enterprise. The federal government will become a major factor in financing energy industries.

To the extent that the federal government, via the EIA, will stand ready to share the financing of new projects, the likelihood of private capital being willing to finance the more risky energy undertakings on its own is likely to diminish. But EIA will be more than a financing mechanism. As the agency is authorized to make "high-risk" loans, the possibility of default by private borrowers certainly will arise and EIA will wind up owning and operating the projects that it finances.

So long as EIA meets the vaguely worded "restrictions" imposed by the legislation, its Board of Directors will have great discretion in selecting the companies to receive financial aid, the types of assistance, and the terms on which the assistance is provided. Unfortunately, historical precedence with government credit agencies exercising broad discretion is not comforting.

During the 1930's and 1940's, the Reconstruction Finance Corporation, a federal enterprise financed with many billions of dollars of Treasury debt and tax receipts, undertook a wide variety of activities. Without underestimating any contribution that the RFC made during its earlier years, we must note that Congress ended its existence amidst a rash of investigations of improper activities.

SHORTCOMINGS OF GOVERNMENT CREDIT AIDS

It is important to understand that when Congress enacts a credit program, such as the Energy Independence Authority, it does not increase the total amount of investment funds available to the economy. It merely gives some group of private borrowers a preferred position over other private borrowers.

It is not surprising that demands for new federal credit programs are insatiable. Every time one group is singled out for preference some other group winds up with less credit and asks for similar treatment. Who gets squeezed out? New and small businesses, school districts, smaller local governments, and individuals—the weaker borrowers. The unsubsidized private borrowers wind up paying higher interest rates.

BUDGET SUBTERFUGE

The establishment of EIA will be a major extension of off-budget financing of federal activities. To a far greater extent than at present, the reported totals of revenues and expenditures will understate the true magnitude of government operations, The reported budget deficits will become less meaningful measures of federal financing needs. The counterargument that EIA's credit extensions will be repaid is not persuasive.

Many programs in the budget do generate offsetting revenues, including the Tennessee Valley Authority, the Commodity Credit Corporation, the Farmers Home Administration, and the Federal Crop Insurance Corporation. The expectation that a federal spending program will ultimately yield receipts is not a sufficient justification for excluding it from the budget.

There are credit programs which properly have been excluded, but each of these—such as the Federal National Mortgage Association and the Federal Land Banks—have repaid the Treasury's investments and are now privately owned. That would not be the case of the Energy Independence Authority. All of its capital stock will be held by the Secretary of the Treasury. All of its debentures will be guaranteed by the full faith and credit of the United States.

ADMINISTRATIVE PROBLEMS

To avoid the scandals that led Congress to terminate the RFC, the proposed statutes sets up a multitude of restrictions on the corporation's operations:

1. Its projects are limited to those which would not receive "sufficient" financing upon commercially "reasonable" terms from other sources to make the project commercially "feasible."
2. Financial assistance is to be provided in a manner which, "to the extent possible," does not enhance "unduly" the recipient's competitive position.
3. Financial assistance may not be in the form of grants-in-aid.
4. "Adequate provision" must be made to insure that EIA will share in the profits that may result "commensurate" with the risk that it assumes.
5. Financial assistance can be given to regulated companies (e.g., electric utilities) only if the state regulatory agency has met various conditions which involve a basic loss of its authority.
6. Financial aid may not be given to projects involving technology in the research and development phase.
7. Financial assistance may not be given to projects where the applicant does not display "satisfactory" levels of "efficiency, management capacity, or similar factors."
8. No project may be approved unless EIA has taken into account "competitive alternatives" to meet the same energy need.
9. Financial assistance to any one business concern or affiliated business concerns is limited to $10 billion.
10. Before making any financial commitment, EIA must seek the advice of the Energy Resources Council and any other federal agency designated by the President.
11. "To the extent practicable" and "in the judgment of the Board of Directors," financial assistance shall be in the form of loans and loan guarantees.

It is difficult to see how these vaguely-worded and often conflicting statements can help achieve better results, although the time and expense involved will be substantial. For example, the expressed concern for an economically sound and competitive private sector conflicts with the requirement that the recipients of assistance conduct themselves like federal agencies and federal contractors.

The bill gives the Federal Energy Authority power to expedite the regulatory process for energy projects. But it also sets up a new level of reviews, requiring other federal agencies to examine each project prior to EIA extending financial aid.

REGULATORY BARRIERS TO DOMESTIC ENERGY PRODUCTION

The expansion of environmental and other regulation has resulted in a new obstacle in carrying out large developmental projects. Virtually every proposed energy project—including those that are ultimately approved—is delayed for some unpredictable length of time and at some significant cost. The EIA proposal does not face that issue squarely, but merely sets up a new effort to offset in part the adverse effects of earlier federal efforts.

The Synfuels Interagency Task Force, after listing the various regulatory requirements, states the matter succinctly: "In summary, some of these requirements could easily hold up or permanently postpone any attempt to build and operate a synthetic fuels plant." The uncertainty resulting from the way in which the various environmental programs are carried out is substantial. The comment of the Synfuels Interagency Task Force on the Federal Water Pollution Control Act Amendments of 1972 is indicative: "It would be next to impossible at this time to predict the impact of these requirements on synthetic fuels production."

It is hard to believe that those regulatory agencies have taken reasonable account of the impact of their activities on other important national objectives, such as fostering domestic energy independence.

ANTICIPATED RESULTS

The official statements supporting the Energy Independence Authority are vague on the specific results to be achieved. The White House Fact Sheet on EIA offers the hopeful statement that $100 billion of EIA aid "could help assure" that the equivalent of "up to" 10-15 million barrels of oil a day of new energy production is realized in 1985. No direct connection is made between any specific amount of financing and the resultant increase in domestic energy production.

No indication is provided as to why $100 billion is needed to achieve the independence objective, rather than $50 billion or $150 billion. Neither is any explanation available as to why 1985 was selected as the target date. Moreover, little attention is given to alternative ways of dealing with this nation's energy problems.

SUMMARY

The proposal to establish an Energy Independence Authority is undesirable for many reasons:

1. It avoids dealing with the fundamental need to provide basic market incentives to increase domestic energy production. Although intended to aid private industry, it will weaken the risk-bearing and entrepreneurial character of the American business system.
2. There is no indication that the program will result in any specific increase in domestic energy production.
3. It will be an extremely cumbersome program to operate, involving many government agencies.
4. It ignores the sad lessons of history, notably the RFC experience.
5. The federal government could wind up operating commercial plants and selling the products or energy that are produced.

Instead of adopting the EIA approach, I urge the committee to consider the other alternatives available to achieve a greater degree of domestic energy independence—greater reliance on normal market incentives, reducing regulatory barriers to use of existing energy sources and to development of new ones, stockpiling petroleum to reduce the threat of embargo, and encouraging research and development of new domestic energy sources and more effective use of existing energy supplies.

ANALYSIS OF PROPOSED GOVERNMENT CREDIT SUSIDIES FOR ENERGY DEVELOPMENT

(By Murray L. Weidenbaum, Director, Center for the Study of American Business, Washington University, St. Louis, Mo.)

NOTE.—The author is indebted to Linda Rockwood for assistance in the preparation of this report.

Since the embargo imposed in the fall of 1973 by major oil exporters, the United States has become increasingly aware of the importance of assured supplies of energy and of the inability to meet expected future demands from current domestic sources of supply. The proposals which have been suggested to deal with the situation have been far ranging. They include rationing existing supplies of energy, stockpiling an emergency petroleum reserve, subsidizing conservation and development efforts, relying on the market mechanism to encourage supply and dampen demand, and declaring a definite point in time as a national goal for achieving energy independence on the part of the United States.

One of the most ambitious and more expensive alternatives that has been advocated is the proposal for establishing a government corporation to provide funds to the private sector for developing new domestic energy sources. The idea of an Energy Independence Authority, largely attributed to Vice President Nelson Rockefeller, has become a central aspect of President Gerald Ford's energy program. A more modest, but similar version, a proposed $6 billion program of federal loan guarantees to promote a domestic synthetic fuels industry

is contained in the federal budget for the fiscal year 1977. That proposal is presented as an interim measure, pending establishment of the Energy Independence Authority.

The President's Budget message for the fiscal year 1977 states that, pending enactment of the EIA, the Ford Administration is strongly supporting the immediate authorization of a synthetic fuels commercialization program to be administered by ERDA. The new budget includes $503 million in budget authority for the fiscal year 1976 to cover $2 billion in loan guarantees as a first step in implementing the new program.[1] It is not clear why a guarantee program requires this magnitude of budget authority unless substantial losses are expected to be charged to the budget. Approximately $4 million of such net outlays are budgeted in the 15-month period July 1, 1975 through September 30, 1976.

The Budget Message also assumes that, with the creation of EIA, the synthetic fuels program would be transferred to the new agency during the fiscal year 1977 and would grow to a level of $6 billion in loan guarantees. The synthetic fuels promotion program may well turn out to be the entering wedge for broader legislation along the lines of the basic EIA proposal. In late 1975, the Congress seriously considered a similar proposal, but the House of Representatives finally rejected it in a floor vote.[2]

The practical problems associated with the initial synthetic fuel credit program could be formidable, in view of the numerous procedures that would have to be followed before making a loan guarantee.[3] The following are the restrictions that would be placed on the synthetic fuel program:

1. The Bureau of Competition of the Federal Trade Commission must review each proposed loan guarantee. The FTC is to give "serious and meaningful attention" and provide a "comprehensive and adequate" response.
2. The Department of Justice is to make a similar review.
3. A report must be submitted on each proposed guarantee to the House Science and Technology Committee and the Senate Interior and Insular Affairs Committee. Either House can then disapprove proposed guarantees (of $350 million or more) within 90 days.
4. The Department of the Treasury must concur on the timing, interest rate, and "substanital terms and conditions" of each guarantee.
5. The administering agency must be sensitive to the Congressional concern that concentration in the energy business is not to be "further aggravated" through the loan guarantees.
6. Guarantees are limited to construction and start-up costs.
7. A "high priority" is assigned to the demonstration of the synthetic production of pipeline quality gas.
8. If the administering agency seeks to override the negative recommendation of a governor, the burden is on it to show that the particular facility is indeed in the national interest.
9. No oil shale commercial demonstration facility receiving a loan guarantee shall be larger than is necessary to demonstrate the commercial vialibility of the process.
10. The agency must have due regard for the need for competition in making guarantees.
11. It can require each new commercial project to cover the capital costs for essential public community facilities (Where the private project cannot adequately provide for the capital costs of new community facilities, ERDA can make direct loans and can forgive all or part of their repayment).

It may be interesting to note that the private-financed Alaska pipeline project is expected to yield 1.2 million barrels of oil a day by November 1977. The Alyeska Pipeline Service Company estimates the total investment cost at approximately $7 billion.

To date little attention has been given to alternative ways of dealing with the energy problems facing the United States. For example, creating an emergency petroleum reserve would help to insulate the domestic economy from the threat of another OPEC oil embargo. Placing greater reliance on the price sys-

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[1] *Budget of the United States Government for the Fiscal Year 1977* (Washington: Government Printing Office, 1976), p. 87.

[2] U.S. House of Representatives, *Conference Report to Accompany H.R. 3474*, Report No. 94-696, 94th Congress, 1st Session, 1975.

[3] *Ibid.*, pp. 49-58.

tem would encourage greater domestic production and simultaneously dampen down domestic demand for energy.

In view of Arlon R. Tussing, Professor of Economics at the University of Alaska and consultant to the Senate Committee on the Interior, the most attractive alternative for increasing domestic energy production is to concentrate on the unexplored provinces of the Outer Continental Shelf and Alaska. He states his position quite forcefully:

"It is preposterous even to consider a major effort to produce new kinds of fuels from investments that cost ten, twenty or thirty thousand dollars per daily barrel of oil equivalents, and take a decade or more to complete, while we have yet to drill 95 percent of the sedimentary acreage on the Outer Continental Shelf."[4]

Professor Tussing estimates the cost per barrel on the outer continental shelf at nearer to $5,000 than $20,000, and the payoff time a fraction of that required for the synthetics. He also considers it "preposterous" to consider manufacturing synthetic gas, moving it by pipeline five thousand miles, for $3-5,000 per thousand cubic feet while price regulations still effectively prohibit producers from looking for or developing conventional natural gass that costs more than 52 cents.[5]

THE PROPOSAL FOR AN ENERGY INDEPENDENCE AUTHORITY

The proposed legislation to establish the Energy Independence Authority "The Energy Independence Authority Act of 1975," was introduced by Senators Fannin, Hugh Scott, and Tower on October 20, 1975.[6] The bill would establish a new government corporation with authority to provide financing and economic assistance for sectors of the national economy important to the development of domestic sources of energy or to the conservation of energy. The bill sets a target of achievement of domestic energy independence for the United States by 1985. The President's Budget for the fiscal year 1977 contains an estimate of $650 million of net outlays of EIA (which would be "off budget") and $42 million of net losses which would be included in the total budget expenditures.[7]

In the bill, the Congress makes two assertions that provide the rationale for the program: that energy independence and long-term security of energy sources and supplies (1) are "essential" to the health of the national economy, the well-being of our citizens, and the maintenance of national security and (2) cannot be attained by relying on "traditional" capital sources in the "traditional" manner (Section 101 (a) and (b)).

FINANCIAL ASSISTANCE BY EIA

The proposed statute provides a broad range of powers and discretion to a new federal agency, the Energy Independence Authority (EIA). The EIA is empowered to provide: "financial assistance to any business firm" which is deems to meet the requirements of the act (Section 302).

Numerous forms of financial assistance are authorized under the bill, including advances, extensions of credit, investments, participants, loan guarantees, price guarantees, purchases and leasebacks of facilities, and purchases of convertible or equity securities (Section 301). Subject to specific limitations in the Act (described below), the EIA is empowered to provide the financial assistance "in its sole discretion and upon such terms and conditions as it may determine" (Section 302). It is specifically authorized to make "high risk" loans (Section 308).

The financial assistance can be used to finance the ownership, construction, conversion or expension of production facilities; the acquisition of equipment, plant, machinery, and supplies; the acquisition and development of land and mineral rights; the purchase of services; and to provide working capital (Sec-

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[4] Arlon R. Tussing, *Good and Bad Examples in the Search for Energy Independence*, Prepared for the Rocky Mountain Energy-Minerals Conference, Billings, Montana, October 16, 1975, p. 12.

[5] *Ibid.*

[6] *S. 2532, The Energy Independence Authority Act of 1975*, introduced (by request) by Senators Paul Fannin, Hugh Schott, and John Tower, October 20, 1975.

[7] *Budget of the United States Government for the Fiscal Year 1977* (Washington: Government Printing Office, 1976), p. 87.

tion 302). In his transmittal message to Congress, President Ford referred to creating a "new partnership" between the private sector and the federal government on "vital" energy projects.

The projects which can be given this financial assistance are those which EIA's Board of Directors determines will make a "significant" contribution either to the achievement of energy independence by the United States or to long term security of energy supplies for the United States. Eligible projects are those which would not receive "sufficient" financing upon commercially "reasonable" terms from other sources to make the project commercially "feasible" (Section 303(a)).

A set of rather general technical criteria is given by which the EIA Board of Directors is to choose the projects to be given assistance (Section 303(a)):

1. Projects which use or would stimulate the application of technology which is essential to developing, producing, transmitting, or conserving energy and which is not in widespread domestic commercial use.

2. Projects which use or would stimulate the application of technology essential to producing or using nuclear power.

3. Projects which use or would stimulate the application of technology for generating or transmitting electricity from fuel sources other than oil or natural gas.

4. Projects which do utilize existing technology in widespread commercial use but where the project either (a) is so large that it would not be undertaken without help from EIA or (b) involves an institutional or regulatory arrangement not in widespread domestic commercial use and which could lead to improving the development or production of energy or innovative transportation or transportation facilities.

5. Projects which use or would stimulate the application of technology for protecting the envirnoment necessary in connection with any of the previous types of projects.

According to the Fact Sheet issued by the White House on the EIA proposal, the projects that could be supported range across the full spectrum of energy, excluding research. They could include commercialization of such synthetic fuel technology as coal gasification, liquefaction, and production of oil from shale, as well as solar and geothermal energy. In addition, such conventional technologies as uranium enrichment, coal, nuclear, and geothermal power plants would qualify. The projects of unusual size or scope indicated in the bill might include new energy parks and major new pipelines for transporting oil and gas.[8]

SUBSTANTIAL RESOURCES

The proposed statute establishing the Energy Independence Authority authorizes it to sell $25 billion of capital stock to the Secretary of the Treasury, subject to the availability of Congressional appropriations (Section 401). EIA is also authorized to issue its own notes, debentures, bonds, etc., up to a total of $75 billion outstanding at any point (Section 402(a)). The Treasury Department is authorized but not directed to buy these securities. All of EIA's contractual commitments to provide financial assistance are to be general obligations of the United States backed by its full faith and credit. As a result, the new agency may have as much as $100 billion available to it at any given time. That compares to the total outstanding loans by all federal departments and agencies of $312 billion as of June 30, 1975.

RESTRICTIONS ON EIA

The proposed law sets up numerous factors which EIA must take account of in its decision making. Some of these are clear restrictions, while others appear to be more in the nature of general advice or vague wishes on the part of the sponsors. In the aggregate, these restrictions would be likely to slow down considerably EIA's speed of action as well as to require substantial paperwork to justify the various actions that it does take.

The following restrictions on financial assistance are set forth in the proposed bill:

1. The projects assisted are limited to those which would not receive "sufficient" financing upon commercially "reasonable" terms from other sources to

[8] Office of the White House Press Secretary, *Fact Sheet, Energy Independence Authority* Washington, D.C.: October 10, 1975).

make the project commercially "feasible" (Section 303(a)). According to Federal Energy Administrator Frank Zarb, this provision is designed to provide maximum encouragement for private lenders to participate in energy projects.[9] Upon reflection, this provision is not likely to operate independently of other federal energy actions (or inactions). For example, so long as federal price controls remain on oil or natural gas or other price uncertainties continue, it is possible that a very substantial portion of proposed new energy projects would be considered uneconomical by private lending sources and thus would meet the standard for EIA aid. Yet, elimination of the price controls and a return to a free market situation might result in a far greater availability of private credit for the very same projects and thus in a sharply reduced need for EIA financial assistance.

2. Financial assistance is to be provided in a manner which, "to the extent possible," does not enhance "unduly" the recipient's competitive position (Section 304(a)). The latter objective supposedly is to be achieved by the requirement that EIA aid be given on terms comparable to those available in private credit markets. However, the implicit subsidy can be substantial; it is the difference between the rate of interest that would be paid to EIA (the normal market rate of interes) and he higher rae which would be required to obtain private financing for the project.

3. Financial assistance may not be in the form of grants-in-aid. That is, EIA may not make outright donations or gifts (Section 301).

4. "Adequate provision" must be made to insure that EIA will share in the profits that may result "commensurate" with the risk that it assumes (Section 304(a)). No guidelines are set forth as to what would be "adequate" recompense for the risk assumed by EIA, or how to measure that risk. An analyst submitted to the Congress by a senior partner of the investment banking firm of Dillion, Read and Company was relatively pessimistic as to the availability of private capital for synthetic fuel projects in the absence of government assistance:

"In order for synthetic fuel projects to successfully compete for capital funds, we believe that prior to the commencement of construction *assurance must be given to potential lenders that* all funds necessary to complete the projects have been committeed and *their loans will be repaid under all circumstances* . . ." (underscoring supplied).[10]

It would appear that 100 percent guarantees by the federal government are envisioned, in at least some cases. The risk involved for the private capital committed under such circumstances would be nominal.

5. Financial assistance can be given to regulated companies (e.g., electric utilities) only if the state or local regulatory agency has met several stated conditions. (Section 304(c)). In the aggregate, meeting those conditions would involve a basic loss of authority on the part of state or local regulatory agencies.

a. The state or local regulatory agency would have to issue a certificate of necessity for the project as prescribed by EIA.

b. It would have to enter into a three-party agreement with EIA and the company regulated requiring the regulating agency to permit, without prior hearing, quarterly rate adjustments so as to yield sufficient earings to provide a "minimum level" of coverage of interest charges. This would constitute a major change in state regulatory practices, and the assumption by EIA of a major responsibility-determining the allowable rate of return to be earned by a regulated utility.

c. EIA would establish what that minimum interest coverage should be. It would be required to set it at a level sufficient to assure repayment of its investment and restoration of the regulated company's credit rating to a level at which it can raise its own capital at "favorable" interest rates.

6. Financial assistance may not be given to projects involving technology in the research and development phase (Section 304(b)). Supposedly those activ-

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[9] Office of the White House Press Secretary, *Press Conference of Frank Zarb, Administrator of the Federal Energy Administration, James T. Lynn, Director of the Office of Management and Budget, L. William Seidman, Assistant to the President for Economic Affairs, and Robert Fry, Deputy Administrator of ERDA*, Washington, D.C., October 10, 1975, p. 4.

[10] *Prepared Statement of Arthur B. Treman, Jr., Before the Committee on Science and Technology, U.S. House of Representatives* (Washington: October 20, 1975).

ities would come under the jurisdiction of the existing Energy Research and Development Administration.

7. Financial assistance may not be given to projects where the applicant does not display "satisfactory" levels of "efficiency, management capacity, or similar factors" (Section 304(b)).

8. No project may be approved unless EIA has taken into account "competitive alternatives" to meet the same energy need (Section 304(d)). No guidance is given as to how EIA is to take alternatives into account, other than nothing their existence.

9. Financial assistance to any one business concern or affiliated business concerns is limited to $10 billion (Section 304(e)).

10. Before EIA may make any commitment to extend financial assistance, it must seek the advice of the members of the Energy Resources Council and of any other federal agency designated by the President. The advice is to assist in determining whether the financial assistance will "further the purposes" of the EIA law and how the assistance "relates" to other program and national policies (Section 801).

11. "To the extent practicable" and "in the judgment of the Board of Directors," financial assistance shall be in the form of loans and loan guarantees, rather than equity investment or price guarantees (Section 302).

ADMINISTRATION OF THE AGENCY

The basic power of the Energy Independence Authority is lodged in a five-member board of directors appointed by the President with the advice and consent of the Senate. The chairman of the board is designated chief executive officer of EIA, and is responsible for its management and direction, including administrative expenditures (Section 501(a)). The chairman, in turn, is given the power to appoint and set the salary of all of the employees of EIA (Section 501 (b)).

Although EIA is to avoid acquiring permanent controlling interest in commercial activities, the law contemplates that EIA may wind up in the energy business via operating some of the private projects for which it initially only provides financing. Section 305 empowers the agency to take over any collateral that it accepts as security for its loans. When EIA does acquire control of operating assets prior to the commencement of their commercial use, it is limited to retaining them for up to two years after outset of commercial use. When control is acquired by foreclosure or pursuant to a default under a lease, EIA may retain control of operating assets for as long as four years (Section 312(b)).

The agency is given a fairly broad grant of legal immunity. No private individual or organization or state or local government would be able to sue EIA alleging that it has acted inconsistently with its statutory charter; or that it has neglected to discharge its duties under the Act. Only the Attorney General may institute such a suit. Private parties would be free to sue EIA for breach of contract and the agency's activities would come under the Federal Tort Claims Act (Section 707). EIA is also given broad access to information about the operations of applicants for financial assistance (Section 313). Each applicant must consent to whatever financial examinations EIA may require and also agree to provide any reports of examinations by "constituted authorities."

BUDGETARY IMPACT

The establishment of EIA would represent a major expansion of the category of so-called "off-budget agencies." In the fiscal year 1975, approximately $10 billion of outlays (net of receipts) were made by the existing agencies in this category, which has been described as a subterfuge for showing smaller budget totals than are actually the case. Off-budget agencies are bona fide parts of the federal government, using federal money and employees. Their only common characteristic is that in each case the Congress has passed a law stating that their revenues and outlays (or some major portion of them) shall not be included in the budget. The revenues and outlays of the Energy Independence Authority are to be excluded from the totals of the federal budget and are to be exempt from any spending ceiling set by Congress.

MISCELLANEOUS PROVISIONS

The proposed statute establishing the EIA contains several other interesting provisions. Section 204 makes its real property subject to federal, state ,and local taxation. Thus, rather than the modest "payments-in lieu" of taxes that some federal agencies make, often on a voluntary basis, EIA's property would be subject to the same property taxes as privately owned property. The waiver of federal tax immunity is much broader in the case of commercial activities which EIA may come to own. Any company or activity acquired or established by the agency which produces, disrtibutes, or sells energy, fuels or related products will be fully liable for all federal, state, and local taxes, just as if it were privately owned. EIA may sell in public or private transaction the stock, bonds, capital notes or other financial instruments that it acquires through default, etc. (Section 310).

The proposed law contemplates that EIA will stop making new commitments for financial assistance by June 30, 1983. It is instructed to give no new financial assistance after June 30, 1986, when it is scheduled to be terminated. However, the President may extend its life for as much as another three years to permit the orderly liquidation of the agency's affairs. Any unliquidated activities at the time of the termination are to be assumed by the Secretary of the Treasury, who would assume all of the powers of the Board of Directors and its chairman. The Secretary is charged with returning any capital stock that is still outstanding and paying the balance of any EIA funds into the Treasury (Section 802(d)).

ANTICIPATED RESULTS

The official statements issued by the Ford Administration to support the proposed Energy Independence Authority are relatively vague on the specific results that are likely to be forthcoming from the new agency's activities. According to the White House Fact Sheet on EIA, the Federal Energy Administration estimates that investments for energy independence could total about $600 billion (in 1975 dollars) over the next ten years.[11] In a press conference in October 1975, Federal Energy Administrator Frank Zarb was more specific. He stated flatly, "It is our estimate that it is going to require $600 billion over the next ten years to become independent. . ."[12]

In forwarding the EIA proposal to the Congress, President Ford maintained that the risks in many of the projects are so great that private capital markets will not provide necessary financing. "The uncertainties associated with new technologies inhibit the flow of capital," he stated.[13] Thus, assuming that the full authority is used, the EIA might assist—through loans, guarantees, equity purchase, or in other ways—as much as $1 out of every $6 that will be invested in domestic energy in the coming decade. The White House contends that many new projects, such as uranium enrichment plants, are too large and economically risky to be financed by the private sector alone. Also, emerging technologies, such as solar energy and shale oil, have uncertain economics due to long lead times and technological uncertainties, and considerable risk if world oil prices drop.

In terms of direct contribution to energy independence, the White House Fact Sheet offers the hopeful statement that the $100 billion of EIA financial aid "could help assure" that the equivalent of "up to" 10-15 million barrels of oil a day of new energy production is realized in 1985. No direct connection is made between any specific amount of financing and the resultant increase in domestic energy production. When it becomes operational, EIA will be required to include in each annual report an evaluation of the contribution which each project or activity that it assists has made and is expected to make in fulfilling the purposes of the EIA Act. This is to include, "where possible," a precise statement of the amount of domestic energy produced or to be produced (Section 506(e)).

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[11] *Fact Sheet*, p. 2.
[12] *Press Conference of Frank Zarb*, p. 2.
[13] Office of the White House Press Secretary, *Text of Letters from the President to the Speaker of the House of Representatives and the President of the Senate*, Washington, D.C., October 10, 1975.

Over the years, many credit programs have been established by the federal government. Since most of these activities do not appear in the federal budget, they seem to be a painless way of achieving national objectives. In the main, the federal government is "merely" guaranteeing private borrowing or sponsoring ostensibly private institutions, albeit with federal aid. Existing examples include the federal land banks and the federal home loan banks. Serious proposals have been made in recent years to revive that credit instrument of the 1930's—the Reconstruction Finance Corporation.

Is this use of the federal government's credit power a variation of the proverbial "free lunch?" As will be demonstrated, upon closer inspection we find that this use of the governmental credit power does result in substantial costs to business as well as to taxpayers; it also generates obvious opportunities for the application of federal controls over private economic activity: credit serving as the sweetener for the recipent of the added regulation. Acknowledgement also needs to be made of the substantial benefits that may accrue from these programs in achieving various national priorities. The advantages of the use of the government credit power arises from its effectiveness in channeling more credit—and ultimately additional real resources—to specific groups of the society. In each case, the Congress has passed a law stating in effect that it believes that the national welfare requires that the designated groups receive large shares of the available supply of credit than would result from the operation of market forces alone.

What may not be apparent is the costs and other side effects that result from the extended use of government credit programs. In terms of their overall economic impact, they do little to increase the total pool of capital available to the economy. They result literally in a game of musical chairs. By preempting a major portion of the annual flow of savings, the government-sponsored credit agencies reduce the amount of credit that can be provided to unprotected borrowers mainly consumers, state and local governments, and private business firms.

An investment banker testifying in favor of the proposed financial aid to synthetic fuel development offered the following analysis:

"The proposed $6 billion government guarantee program, however, should not be taken too lightly, especially under the assumption that additional guaranteee programs for other energy sources will also be implemented. The ability of smaller companies and companies with lower credit ratings to compete for available capital could be lessened at times. In addition, higher grade corporate debt securities could face slightly higher interest rates in order to compete with an increased supply of government guaranteed debt." [14]

During periods of tight money, it is difficult for unassisted borrowers to attract the financing that they require. They are forced to compete against the government-aided borrowers. Federal loan guarantees reduce the riskiness of lending money to the insured borrowers. The result of that uneven competition is still higher interest rates. More detailed analysis of the phenomenon of federal credit programs is warranted. Over the years substantial numbers of credit programs have made their way through the legislative process of the federal government. These programs emerged on an *ad hoc* basis, with each program directed toward providing assistance in overcoming a specific problem at hand. As a result of this gradual but very substantial accretion, federal credit program subsidies are now provided to a great many and variety of sectors of the American economy—housing, agriculture, transportation, health, education, state and local governments, small business—as well as to foreigners.[15] As shown in Table 1, there are three major uses of the federal government's credit power.

Types of Government Credit Programs

Direct loans by federal departments and agencies.—These, such as the two percent loans made by the Rural Electrification Administration, generally in-

[14] *Prepared Statement of Arthur B. Treman, Jr., Before the Committee of Science and Technology, U.S. House of Representatives* (Washington: October 20, 1975) p. 13.

[15] Detailed information on individual credit programs is presented in *Special Analysis E. Special Analyses, Budget of the United States, Fiscal Year 1976* (Washington, Government Printing Office, 1975), pp. 82-100.

volve significant subsidies because of low lending rates. In many cases, the government also absorbs the administrative expenses and losses arising from loan defaults, thus further increasing the amount of the subsidy. Although not formally considered a federal credit program, the relatively generous progress payments made by the Department of Defense do represent interest-free provision of working capital to government contractors on a very large scale. Direct loans have become a less important form of federal credit aid, in part because they require the direct use of federal money.

Loans guaranteed and insured by federal departments and agencies.—These account for the greatest share of the current expansion in federal credit subsidies, largely because the loans are made by private lenders and thus are excluded from the federal budget. Also, there has been a substantial increase in the federal payments of part of the interest on insured loans for such programs as low income housing. Technically, all that the government does is to assume a contingent liability to pay the private lender if the private borrower defaults.

Loans by federally-sponsored agencies, such as the Federal National Mortgage Association, the Federal Home Loan Banks, and the farm credit agencies.—These involve relatively little direct subsidy. However, these ostensibly privately-owned agencies have various tax advantages and are able to borrow funds in the market at low interest rates because of the implicit government backing of their debentures and other issues. Loans made by these sponsored agencies have increased sharply over the past decade. They now comprise the dominant form of federal credit assistance to the private sector.

TABLE 1.—MAJOR FEDERAL CREDIT PROGRAMS, FISCAL YEAR 1974

[New commitments, in millions]

Category and agency	Direct loans	Guaranteed loans	Government sponsored enterprises	Total
Aid to business:				
Commerce	$19	$255		$274
Interior	19	35		54
Transportation	50	1,143		1,193
General Services Administration	20	483		503
Emergency Loan Guarantee Board		60		60
Export-Import Bank		7,039	$1,617	8,656
Small Business Administration	249	2,703		2,952
Subtotal	357	11,718	1,617	13,692
Aid to farmers:				
Agriculture	3,901	2,870		6,771
Farm credit agencies			1,941	1,941
Subtotal	3,901	2,870	1,941	8,712
Aid to local governments:				
District of Columbia	270			270
Washington Metropolitan Transit Authority		334		334
Environmental Financing Authority			300	300
Subtotal	270	334	300	904
Aid to individuals:				
Health, Education,and Welfare	132	1,671		1,803
Housing and Urban Development	15	15,269		15,284
Veterans' Administration	412	8,643		9,055
Federal Home Loan Bank Board	10		4,995	5,005
Federal National Mortgage Association			3,354	3,354
Subtotal	569	25,583	8,349	34,501
Miscellaneous:				
Funds appropriated to the President	1,125	664		1,789
Other agencies	70	308		378
Subtotal	1,195	972		2,167
Total	6,292	41,477	12,207	59,976

Source: Special analyses, budget of the U.S. Government for fiscal year 1974.

Impacts on Total Saving and Investment

The conclusions of the empirical literature on the impacts of federal credit programs on the total flow of saving and investment in the American economy are clear. These programs do little if anything to increase the total flow of saving or investment. They mainly change the share of investment funds going to a given industry or sector of the economy and, in the process of doing so, exert upward pressures on interest rates as investment funds are bid away from other sectors.

In commenting on existing programs of federally-assisted credit to the private sector, Dr. Henry Kaufman, the distinguished economist with the investment house of Salomon Brothers, has written: "Federal agency financing does not do anything directly to enlarge the supply of savings . . . In contrast, as agency financing bids for the limited supply of savings with other credit demanders, it helps to bid up the price of money." [16]

In referring to borrowing by the federal government and its agencies, Dr. Albert Wojnilower has made a similar observation:

"Because these governmental borrowers need have few if any worries about creditworthiness or meeting interest payments, they can preempt as much of the credit markets as they choose. As a result, the Federal sector has become one of the most relentless sources of upward pressures on interest rates." [17]

In a comprehensive study of federal credit programs for the prestigious Commission on Money and Credit, Warren Law of Harvard University concluded that they have caused inflationary pressures in every year since World War II.[18] Professor Patricia Bowers has noted what she terms "costs" of federal credit programs. One cost arises from the fact that given the availability of funds, an increase in credit for housing means lesser amounts for other borrowers. The other two borrowing groups most adversely affected by tight credit are state and local governments and small businesses. A further cost is that the operations of the federal credit agencies tend to increase the level of interest rates above the level that would have prevailed if they had not entered the credit markets.[19]

This phenomenon occurs for a variety of reasons. The total supply of funds is broadly determined by household and business saving and the ability of banks to increase the money supply. This is the basic limit on the availability of funds referred to by Professor Bowers. The normal response of financial markets to an increase in the demand for funds by a borrower, such as is represented by a federal credit program, is an increase in interest rates so as to balance out the demand for funds with the supply of saving. But the federal government's demand for funds are "interest-inelastic" (the Treasury will generally raise the money that it requires regardless of the interest rate) and the interest-elasticity of saving is relatively modest. Thus, weak and marginal borrowers will be "rationed" out of financial markets in the process, while the Treasury and other borrowers pay higher rates of interest.

Important insight into the effects of federal credit programs on capital markets has been provided by Bruce MacLaury, the President of the Federal Reserve Bank of Minneapolis and a former deputy Undersecretary of the Treasury:

"The more or less unfettered expansion of Federal credit programs and the accompanying deluge of agency direct and guaranteed securities to be financed in the credit markets has undoubtedly permitted Congress and the Adminis-

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[16] Henry Kaufman, "Federal Debt Management: An Economist's View from the Marketplace," in Federal Reserve Bank of Boston, *Issues in Federal Debt Management*, p. 171.

[17] Albert M. Wojnilower, "Can Capital-Market Controls be Avoided in the 1970's," in *Containing Inflation in the Environment of the 1970's*, Michael E. Levy, editor (New York: Conference Board, 1971), p. 42.

[18] Warren A. Law, "The Aggregate Impact of Federal Credit Programs on the Economy," in Commission on Money and Credit, *Federal Credit Programs* (Englewood Cliffs: Prentice-Hall, 1963), p. 310.

[19] Patricia F. Bowers, *Private Choice and Public Welfare* (Hinsdale: Dryden Press, 1974), pp. 494-496. See also Alan Greenspan, "A General View of Inflation in the United States," in Conference Board, *Inflation in the United States* (New York: The Board, 1974), p. 4.

tration to claim that wonder of wonders—something for nothing, or almost nothing. But as with all such sleight-of-hand feats, the truth is somewhat different." [20]

Dr. MacLaury goes on to point out that there are extra costs associated with introducing new government credit agencies to the capital markets, selling issues that are smaller than some minimum efficiently tradeable size, and selling securities that only in varying degree approximate the characteristics of direct government debt in terms of perfection of guarantee, flexibility of timing and maturities, "cleanness" of instrument, et cetera. He points out that, as a result of such considerations, the market normally charges a premium over the interest cost on direct government debt of comparable maturity. That premium ranges from ¼ of one percent on the well-known federally-sponsored agencies such as Federal National Mortgage Association to more than ½ percent on such exotics as New Community Bonds. In general, if cost of financing were the only consideration, it would be most efficient to have the Treasury itself provide the financing for direct loans by issuing government debt in the market.

Reduced efficiency occurs in the economy by providing a federal "umbrella" over many credit activities without distinguishing their relative credit risks. A basic function that credit markets are supposed to perform is that of distinguishing different credit risks and assigning appropriate risk premia. This is the essence of the ultimate resource-allocation function of credit markets. As an increasing proportion of issues coming to the credit markets bears the guarantee of the federal government, the scope for the market to differentiate credit risks inevitably diminishes. Theoretically, the federal agencies issuing or guaranteeing debt would perform this role, charging as costs of the programs differing rates of insurance premia. In practice, all of the pressures are against such differential pricing of risks.[21] This is a hidden cost of federal regulation via credit programs.

Impacts on Sectors of the Economy

The very nature of federal credit assistance is to create advantages for some groups of borrowers and disadvantages for others. The literature provides clear answers on who will tend to be rationed out in the process. It is unlikely to be the large well-known corporations or the U.S. Government. It is more likely to be State and local governments, medium-sized businesses, private mortgage borrowers not under the federal umbrella, and consumers, thereby contributing to additional economic and financial concentration in the United States.

The competition for funds by the rapidly expanding federal credit programs also increases the cost to the taxpayer by raising the interest rate at which the Treasury borrows its own funds. As shown in Table 2, there has been a massive expansion in the size and relative importance of federal government credit demands over the past decade. In 1960, the federal share of funds raised in private capital markets, using the Federal Reserve System's flow-of-funds data, was 12.7 percent. By 1970, the government's share had risen to 23 percent, and has continued to grow.

Virtually every session of the Congress in recent years has enacted additional federal credit programs. Since 1960, the Federal National Mortgage Association (Fannie Mae) has been joined by the General National Mortgage Association (Ginnie Mae), Student Loan Marketing Association (Sally Mae), and, most recently, the U.S. Railway Association (Fannie Rae). The upward trend has not leveled off. In view of the financial problems faced in raising sufficient funds for the extremely capital intensive energy industry, proposals are now being seriously advanced for federal credit guarantees of private electric utility bonds and for the creation of an Energy Independence Authority to provide credit to private companies.

[20] Bruce K. MacLaury, "Federal Credit Programs—the Issues They Raise," in Federal Reserve Bank of Boston, *Issues in Federal Debt Management*, p. 214.
[21] *Ibid.*, p. 217.

TABLE 2.—IMPACT ON CREDIT MARKETS OF FEDERAL AND FEDERALLY ASSISTED BORROWING

[Fiscal years, dollars in billions]

Category of credit	1960	1965	1970	1971	1972
A. Federal borrowing	$2.2	$4.0	$5.4	$19.5	$19.4
B. Federally assisted borrowing (off-budget) [1]	3.3	6.8	15.1	18.2	19.2
C. Total Federal and federally-assisted borrowing (A+B)	5.5	10.8	20.5	37.7	38.6
D. Total funds advanced in credit markets	43.4	69.6	89.0	120.0	145.6
E. =(C)÷(D) (percent)	12.7	15.5	23.0	31.4	26.5

[1] Obligations issued by Government-sponsored agencies or guaranteed by Federal agencies.

Source: Federal Reserve System; U.S. Treasury Department.

Summary

Boiled down to its basics, federal guarantees of bonds issued by business and other institutions really involve putting "the monkey" on someone else's back. They do not increase the amount of investment funds available to the economy. Rather, to the extent they succeed, they mainly take capital funds away from other sectors of the economy and lead to similar reqeusts for aid by those sectors. These government guarantees also tend to raise the level of interest rates in the economy, both for private as well as government borrowers. They thus increase an important element of business costs.

Since an increasing proportion of private saving is being borrowed by governments, the inelasticity of demand of the money and capital markets has been rising. That is, governments elbow private borrowers out of the capital markets simply because the federal government and its agenies are willing to pay whatever interest rates are required to cover their financial needs. Private borrowers are restricted by competitive pressures and the limits of their own resources.

The pressure on interest rates forces the Federal Reserve System to increase the reserves of the banking system to supply financing to the private sector. This, in turn, contributes to the general inflationary condition of the economy. Federal credit programs therefore tend to raise the private cost of production in two ways: (1) by causing an increase in interest rates and (2) by resulting in a higher rate of inflation.

Perhaps the most fundamental proposal does not deal with federal credit programs at all, but with the underlying conditions of which they are symptoms. Hence, if we can create an economic climate more conducive to private saving and investment, that will reduce the need for private borrowers to seek federal credit assistance.

FINDINGS AND CONCLUSIONS

It is difficult to forecast the development of government programs which have not yet been created, and which Congress may not ultimately approve. Yet this initial survey indicates a variety of important potential shortcomings of the proposals for federal credit subsidies to promote the development of domestic energy production.

The Basic Question: Why a Federal Subsidy?

Before getting to technical questions relating to credit programs, we need to raise a more basic issue. Why does the domestic energy industry need federal credit assistance in the first place? It does not appear to be a matter of the mere size of the undertaking. The $7 billion Alaska pipeline project is proceeding with private financing.

Nor is it a question of the weak financial condition of the industry. Although the profitability of the major oil companies has surely been exaggerated in so much of the current popular discussion, the industry's rate of return over the years is just about average for manufacturing companies.[22]

Neither is it a question of a static or declining demand for energy. Individual estimates surely vary—and for good reason—yet every forecast of future energy consumption in the United States shows a rising trend, far

[22] James M. Dawson, *Windfall Profits* (Cleveland: National City Bank, 1974), pp. 2-3.

beyond the capacity of existing domestic energy supply sources.[23] Why then is there such limited interest in the private sector in going ahead with the development of domestic energy sources and especially with the creation of a new synthetic fuels industry?

The answer seems quite clear: under present circumstances, many such undertakings either would be uneconomical or they would be restricted by one or more federal regulatory programs. That is, the cost of competitive, conventional sources of energy generally is much lower. But the situation is likely to change as the result of basic economic forces—and it also could be improved as a result of adopting more sensible regulatory policies.

In coming years, as more marginal and thus higher cost conventional energy supplies are used, and these fuels become relatively scarce, the gap is likely to narrow the cost of fuels from existing sources and potential alternatives—and then new alternatives such as synthetics could become competitive. The November 1975 report of the Synfuels Interagency Task Force is quite clear on this point:

"The results of the analysis imply that under normal investment and risk circumstances, market forces are likely to cause the introduction of synthetic fuels in the 1985–1995 time period. With the right combination of prices and costs, production of synthetic fuels in 1995 might be as high as 9 million barrels per day although the expected average is 5 million barrels per day."[24]

Yet it needs to be acknowledged that in good measure the price of conventional energy in the United States is being kept artificially low as a result of government policy. Of course we all prefer to pay less for something rather than more, but that is hardly a guide to sensible public action.

What is relevant to the present concern is that the lower that the price of existing fuel sources is kept the less attractive is the prospect of developing new domestic energy. An impartial observer can only gaze in wonderment at an approach to policy which first keeps conventional fuel prices artificially low (via government controls) and then finds that synthetic fuels will not be developed on a sufficiently large scale without special government assistance. If anything, the situation is made worse by the uncertainty arising from the limited three-year term of existing price controls. Given the higher world price, the controls—unwittingly—give domestic companies an incentive to hold off exploration, development, and production until the future time when the controls are lifted.

A natural and more straightforward state of affairs would be to eliminate the special price controls on existing conventional fuels. Such action would both encourage further exploration and simultaneously promote greater conservation. As the price of conventional fuel rises to the cost of synthetics, there will be an automatic incentive for private companies to move ahead. But given the normal desire to minimize risk, private investments will be deterred if there is a strong possibility that the federal government will step in and assume the risk.

To those who are concerned that rising energy prices would be inflationary, it needs to be pointed out that holding down individual prices is not the way to fight inflation (it is the classic way to create a shortage). The basic method to dampen down inflationary pressures is well-known—deal with the forces that influence the overall price level by reducing the budget deficit and maintaining a moderate monetary policy.

Government in Business

Other important shortcomings of the synthetic fuel program and the proposed Energy Independence Authority seem evident. If they ever get underway to the extent envisioned by thir sponsors, they would represent a major involvement of government in sectors of the economy which traditionally have been the responsibility of private enterprise. In the words of former energy administrator John C. Sawhill, "The proposed Energy Independence Authority . . . represents a major new intrusion into the private sector."[25]

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[23] U.S. Federal Energy Administration, *Project Independence Report* (Washington: Goverament Printing Office, 1974); J. A. Hausman, "Project Independence Report: An Appraisal of U.S. Energy Needs Up to 1985," *Bell Journal of Economics*, Autumn 1975.

[24] Synfuels Interagency Task Force, *Recommendations for A Synthetic Fuels Commercialization Program*, Report Submitted to the President's Energy Resources Council, Vol. 1 (Washington: Government Printing Office, 1975), Vol. 1, p. 27.

[25] John C. Sawhill, "What makes America Work? Energy . . . and it's time we became independent," *Wall Street Journal*, December 2, 1975, p. 15.

Via these new programs, the federal government would become a major factor in the financing of energy industries. This would be in striking contrast to the present situation. The multi-billion dollar Alaska pipeline project, for example, is privately financed, although this is one of the largest construction projects undertaken in the history of the United States. Because the underlying market is considered to exist, sufficient private capital has been attracted for the purpose. To the extent that the federal government will stand ready to share the financing of new projects, the likelihood of private capital being willing to finance the more risky undertakings entirely on its own is likely to diminish.

But EIA would be more than a financing mechanism. As the agency would be specifically authorized to make "high-risk" loans, the possibility of default by private borrowers certainly would arise and EIA would wind up owning the collateral, that is the projects that it finances.

So long as EIA meets the rather vaguely worded "restrictions" that would be imposed by the pending legislation, its Board of Directors would have great discretion in selecting the companies that would receive financial assistance, the types of financial assistance that it offers, and the specific terms on which the assistance is provided. Although the intent of the proposed program may be noteworthy, historical precedence with government credit agencies exercising broad grants of discretion is not comforting.

During the 1930's and 1940's the array of federal agencies included the Reconstruction Finance Corporation. This wholly-owned federal enterprise, financed with many billions of dollars of Treasury debt and tax receipts, undertook a wide variety of depression, wartime, and postwar activities. Without underestimating any contribution that the RFC may have made during its earlier years, it is pertinent to note that the Congress ended its existence amidst a rash of investigations of alleged improper activities. An extended Senate investigation disclosed what seemed to be gross abuses of the power and authority which had been vested in the enterprise.

Budget Subterfuge

The establishment of EIA would represent a major extension of off-budget financing of federal government activities. To a greater extent than at the present time, the reported totals of revenues and expenditures would understate the true magnitude of government activities. Likewise, the reported budget deficits would become less meaningful measures of federal financing needs. The counterargument that EIA's credit extensions will be repaid is not persuasive.

First of all, a number of programs which are in the budget do generate offsetting revenues, including the Tennessee Valley Authority, the Commodity Credit Corporation, the Farmers Home Administration, the Federal Crop Insurance Corporation, the Government National Mortgage Association, and the National Credit Union Administration. Clearly, the expectation that a federal spending program will ultimately yield receipts is not a sufficient justification for excluding it from the budget. To be sure, there are credit programs which quite properly have been excluded, and their transactions do not appear in the totals of federal revenues and expenditures.

But each of these latter organizations—such as the Federal National Mortgage Association, the Federal Land Banks, and the Federal Home Loan Banks—have repaid any investments that the Treasury originally made and are now entirely privately owned. That would not be the case of the Energy Independence Authority, all of whose capital stock would be held by the Secretary of the Treasury and all of whose debentures would be guaranteed by the full faith and credit of the United States Government.

Administrative Problems

In an apparent effort to avoid the type of scandals that led to the Congress terminating the Reconstruction Finance Corporation in the 1950's, the proposed EIA statute sets up a variety of restrictions on EIA's lending ability, criteria for the guidance of its directors, and reviews by other federal agencies. It is difficult to see how these vaguely-worded and often conflicting statements can truly help in achieving better results, although the time and expense that might be involved could be substantial.

For example, EIA may not give financial assistance to projects where the applicant does not show "satisfactory" efficiency, management capacity, and other factors usually considered by private sources of financing. Yet financing is limited to those projects which cannot obtain adequate financing from private sources who presumably have not been satisfied with the justification for the same project.

The proposed statute expresses a general concern for an economically sound and competitive private sector. Yet, in several respects it requires the recipients of EIA assistance to conduct themselves like federal agencies and federal contractors. This is the case with reference to adherence to federal labor standards, including the Davis-Bacon Act, and equal employment opportunity requirements.

On the one hand, the EIA bill gives the Federal Energy Authority new power to expedite the regulatory process for energy projects. But on the other hand, it sets up a new level of reviews, requiring the Energy Resources Council, among other federal agencies, to examine each project prior to EIA's extending it any financial aid.

Regulatory Barriers to Domestic Energy Production

This study is not the appropriate place for a general review of the effectiveness of environmental and other regulatory programs. What is clear is that the expansion of regulatory legislation has resulted in a new type of delay in carrying out large new developmental projects in the United tSates.

It is virtually universal that proposed major new energy development projects—including those that are ultimately approved—are delayed for some unpredictable length of time and at some significant cost. The EIA type of credit proposal does not face that issue, but merely would set up a new federal effort to overcome, at least in part, the adverse effects of an earlier federal effort.

The Synfuels Interagency Task Force, after listing the various regulatory requirements, states the matter very succinctly: "In summary, some of these requirements could easily hold up or permanently postpone any attempt to build an operate a synthetic fuels plant." [26]

The more significant regulatory constraints that would apply include the following:

1. Preparing an environmental impact statement, as required by the National Environmental Policy Act of 1969.

2. Meeting new source performance standards for air quality, under the Clean Air Act Amendments of 1970.

3. Meeting the hazardous pollutant emission standards, under the Clean Air Act Amendments of 1970.

4. Meeting the state air quality implementation plans required by the Clean Air Amendments of 1970.

5. Obtaining necessary point source discharge permits, under the Water Pollution Control Act Amendments of 1972.

6. Meeting state water quality standards and water quality management plans, as promulgated under the Water Pollution Control Act Amendments of 1972.

7. Complying with limitations applicable to "underground injections," under the Safe Drinking Water Act of 1974.

8. Complying with the regulation of interstate pipeline transmissions, under the Interstate Commerce Act.

9. Complying with the allocation of railroad cars transporting coal, under the Interstate Commerce Act.

11. Complying with the regulation of interstate transmission of synthetic gas once mixed with natural gas, under the Natural Gas Act.

12. Obtaining necessary plant and minet leases, from the U.S. Bureau of Land Management.

14. Obtaining necessary water allocations, from the U.S. Bureau of Reclamation.

15. Complying with the Coal Mine Health and Safety Act of 1969.

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[26] Synfuels Interagency Task Force, p. 134.

The comments of the Interagency Task Force on the impact of the various regulatory requirements deserve far more attention than they have received to date. The following is the evaluation of the effects of the environmental impact statements (EIS) required by the National Environmental Policy Act of 1969 (NEPA):

"Thus, the major uncertainty under NEPA is not whether or not the project will be allowed to proceed, but rather the length of time it will be delayed pending the issuance of an EIS that will stand up in court. The cost of such delays (construction financing and inflated raw materials and labor costs) is an obvious potential hazard to any synfuels project. . .

"In summary, the cost and delay occasion by NEPA constitute a substantial disincentive, aggravated by the fact that in dealing with new processes it is very hard to anticipate what the EIS requirements will be and on what grounds the EIS may be attacked. The general guidelines offered by the Council on Environmental Quality (40 CFR Part 1500) provide a drafting framework but no assurance of compliance." [27]

The uncertainty introduced by the way in which the various environmental programs are carried out is difficult to underestimate. The comment of the Synfuels Interagency Task Force on the Federal Water Pollution Control Act Amendments of 1972 is indicative: "It would be next to impossible at this time to predict the impact of these requirements on synthetic fuels production." [28]

SUMMARY

The proposed program of credit subsidies to promote domestic energy development is undesirable for many reasons:

1. It avoids dealing with the fundamental need to provide basic market incentives to increase domestic energy production. Although it is intended to aid a new private industry, it would weaken further the basic risk-bearing and entrepreneurial character of the American business system.

2. There is no indication that the federal credit program will result in any specific increase in domestic energy production.

3. It would be an extremely cumbersome program to operate, involving many federal, state, and local agencies.

4. It ignores the sad lessons of history, notably the RFC experience.

5. It would be a major extension of federal responsibility for local affairs. Under the proposal for loan guarantees for synthetic fuel projects, the federal government could guarantee up to 100 percent of a locality's bonds for "essential" public activities or it could guarantee the amounts of anticipated tax revenue from the energy demonstration facility.

6. The federal government could wind up operating commercial plants and selling the products or energy that are produced. It would be authorized to do so in case of default.

In the formation of public policy on fostering a greater degree of domestic energy independence decision-makers need to consider the various alternative ways of promoting the nation's objectives in the energy area—including greater reliance on normal market incentives, reducing the severe regulatory barriers to the use of existing energy sources and to the devlopment of new ones, and stockpiling petroleum to reduce the threat of embargo.

Despite the high hopes of its supporters, there is no assurance that the many billions of dollars contemplated to be used by the synthetic fuels program and subsequently by the Energy Independence Authority actually will result in the attainment of the objective of energy independence. Perhaps the fundamental shortcoming is the failure to demonstrate the superiority of this approach—subsidies to the private sector—to other alternatives.[29]

The CHAIRMAN. Our final witness is Mr. Robert Nathan. Go right ahead.

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[27] *Ibid.*, pp. C-18-C-19.
[28] *Ibid.*, p. C-22.
[29] See Edward J. Mitchell, *U.S. Energy Policy: A Primer* (Washington: American Enterprise Institute, 1974).

STATEMENT OF ROBERT R. NATHAN, ROBERT R. NATHAN ASSOCIATES, INC., WASHINGTON, D.C.

Mr. NATHAN. Thank you very much.

Let me be very brief, and start by saying I can't help but observe this morning you have got strange bedfellows on this issue; the combination of supporters of the bill—and I count myself as a supporter of the bill—and the combination of those opposed is probably as odd a mixture as I have seen on legislation for a long, long time.

When Murray Weidenbaum and Ralph Nader are on the same side, it is really a sight to see.

I don't envy this committee, because of the complexity of these problems. But I do think that we come down, Mr. Chairman, to one very real problem and subsidiary problems and that major problem is do we have an energy crisis or not.

I am not going to talk in detail about that. It is in my testimony. But, I really believe that a lot of people don't think we have an energy crisis, or it will somehow go away if we let the marketplace function, or give us enough time, and so on.

I don't happen to buy that and I think that for the greatest nation, the most powerful nation and I think the most important factor in the free world to have a sort of a razor or knife across its throat that might be moved or indented a little bit into the throat from time to time is not something we ought to resign ourselves to, and while I don't think we can achieve energy independence in totality in the foreseeable period, I think that the combination of our running out of our running out of our own oil and gas over a period of time and the combination of being subjected to political blackmail raises very, very critical problems in my mind. My support of this bill stems from my conviction that we are in a very serious energy crisis that is going to get worse in my judgment, not better.

Now, let me just deal very brief with 2 or 3 points.

First, as far as the marketplace is concerned, I don't see how anybody can say the marketplace has worked satisfactory in this country in terms of environment, in terms of low wages, in terms of social retirement or security.

You go back over a whole range of issues and we had to supplement or complement the marketplace when we had real problems that the marketplace doesn't take care of. I myself favor relying as much as we can on the marketplace, but to think that the solutions to our energy problems are going to come from marketplace reliance over the next several years is really hiding oneself from reality.

Second, we really don't know, Mr. Chairman, what the elasticities of supplies are going to be.

There are some who say if you just let the price of gas go there would be plentiful supplies, but I doubt it very much. By the way, if the price of natural gas were to be totally decontrolled today I know of no expert in this field who thinks it would be below $2 in very short order per 1000 cubic feet and your implication of what

that could do to inflation and what it could do to the ongoing recovery of this economy in my judgment is very important.

I would favor decontrol of new production in order to stimulate supply, but I don't see any point in decontrolling old supplies. I think that a double tier price situation, though it is a little abnormal would make a lot bettr sense in the face of the inflation threat than just decontrolling totally.

Now let me just turn to 1 or 2 things about this bill.

Mr. Chairman, I agree very strongly that conservation ought to be a major effort as well as efficiency of energy use. But I cannot take seriously, as more than an illusion, that in the next quarter of a century we won't need any more energy at all if we really go all out on efficiencies.

I have been to Sweden many, many times. Sweden is not the United States. It doesn't have the degree of industrialization of the United States. The whole pattern of life isn't the same as the United States. And to say if we could have 25 years from now their Btu consumption per person we wouldn't need any more energy is just like saying let's go to another world. Maybe if we will all move to the moon we won't need any more energy at all.

We have to recognize in the real world in which we live we are going to have increases in prices—and, by the way, electric production is not down primarily in response to higher prices. It just runs in the face of reality of what this recession has done namely, reduce employment and production as well as use of energy.

If you look at electric production in the last 3 to 5 months you can see what the recovery is doing to step up the production of electricity.

We ought to go all out on conservation and if this bill were enacted I would even say that some significant portion of the funds available, to the extent it can be effectively used, ought to go towards conservation and more effective utilization of energy.

And there are a couple of other things, Mr. Chairman, that you raised, that I would put into the bill. I would agree on the cost-benefit requirement for any kind of investment or any kind of a loan above some minimal amount.

I would certainly provide for monitoring.

Also no objections to outlays being included in the budget. But there are real problems of how you deal with the outlay timing for budget purposes.

You would have to gear it somehow to the timing of the outlays as well as the commitments.

But, there has been some things said here today, Mr. Chairman, that bother me a great deal.

For instance terms such as "bail out of nuclear projects."

I would hope that we could rely on conservatiion, on bringing up more oil and gas and coal, but I know of no one who seriously believes that in the next 20 or 30 years we are going to be able to provide our essential energy needs after conservation and after efficiencies, on an all-out bases, from just these sources.

I don't know of one person technically competent—and I hope Mr. Nader is right—who really believes that solar energy is going to

be available within a year or a decade or two decades on a practical basis for electric generation.

That would be just marvelous and if that were possible I would say toss out the nuclear field entirely. But I don't think that is realistic.

Now, the main problem I find, Mr. Chairman—I point out in my testimony that I have gone through some crisis when I was chairman of the planning committee of the War Production Board and the deputy director of the Office of War Mobilization and Reconversion—is the tragedy that with all of our understanding we may give to the problem of our energy crisis, unless certain steps are taken, unless certain policies are adopted, unless certain institutions are set up, we are not going to get results.

And in that respect, this authority has a great deal of merit.

Now, if you said why the $100 billion figure, I agree I think it was taken out of the air.

You say well what about starting with something less. I would rather have a $50 billion start than nothing, and I would put a lot of constraints on it such as the monitoring such as the cost-benefit studies, such as reporting to the Congress every 6 months or 9 months or year and, by the way, I would rather have that than have all the policies subject to the decision of the Secretary of the Treasury. I do think we are going to have some losses and I do think that this group ought not to be tied too tightly or too precisely to the surefire activities because risks are needed now.

I think the needed amount of money is not going to be forthcoming for new risky uncertain activities. Unless we take some risks now and try to break through the current uncertainties, 10 years from now I am afraid Mr. Chairman, we will have 70 or 80 or more percent of our oil imported and we will be sitting here worrying about what is going to happen and we will be talking about goals for 1995.

I come down in favor of this bill, because I believe we have a major crisis and I don't think we are doing much about it and we need to take some risks.

We need to overcome uncertainties. We need to provide means and mechanisms that will do the unusual, not rely on normally. As a matter of fact, Murray Weidenbaum advises us to rely on business as usual. I don't think that is going to lead us anywhere.

The CHAIRMAN. You say, Mr. Nathan, that you would be inclined to spell out the EIA's scope and responsibilities more ambitiously, more broadly?

They seem to have in my reading of the bill quite a broad area of responsibility now and, as Mr. Nadar pointed out, they are exempt from a number of requirements in the law that apply to other agencies.

How would you change this legislation to broaden their authority?

Mr. NATHAN. Well, I would make two or three suggestions, and one is that some conditions be permitted in the loans and these conditions I would say would tie to such measures as conservation, such measures as efficiencies.

I would give to this Authority a responsibility for setting up criteria which the free marketplace people won't like at all but

I think that some governmental participation in the risk and some sharing in the benefits—I like what you said before, that if a project should be successful and really turns out well, why shouldn't the government, which provides the money that is subject to the greatest risk, participate in those benefits.

These are areas of activity that I would provide for. I happened to testify 13 months ago before Senator Jackson's committee on his proposed National Energy Production Board bill, I would like that Board and this Authority to be tied in with FEA and ERDA in some kind of a top authoritative coordinating policymaking body whereby EIA would have a postive role in terms of being sure that we get constructive price regulations and incentive policies. At least it should get its voice heard in policy councils.

Let me just gve you one illustration, Mr. Chairman.

We are now raising prices to stimulate gas and oil production. We have raised prices of natural gas. We have decontrolled somewhat but we have decontrolled totally, on new oil.

At the same time, we are taking away the tax incentives.

For 20 years I favored getting rid of or reducing the cost depletion allowance.

I think the depletion allowance, at a time when we really had a surplus of oil in this country and when Texas and Oklahoma were setting 4-day-a-month limits or 5-day-a-month limits on production. we were giving these tremendous incentives in terms of cost depleton and the intangible allowances.

Now, when we desperately need to pursue oil and gas exploration, we are cutting those tax inducements.

We have already cut deeply in the depletion allowance. I would much rather even liberalize depreciation allowance today and to try to hold down prices.

I think there are these policy combinations that I would hope that this Authority might participate in formulating so that you have a coordination of expansion of supply with conservation, with pricing policies, and with sound regulatory determinations.

The CHAIRMAN. You have had probably as long and as profound experience in the Federal Government, administrative branch, as anybody in Washington, perhaps longer. I know as a young man, as a very young man, you had a highly responsible position in the Roosevelt administration right from the very beginning, and you are thoroughly familiar, I am sure, with the Reconstruction Finance Corporation.

Mr. NATHAN. Yes.

The CHAIRMAN. Now, the RFC did a lot of very good things, but they also were subject to a lot of scandals and a lot of political pressure.

When you have a $100 billion corporation it is going to provide guarantees and going to buy stock and so forth, it is one whale of a lot of power.

Do you see any danger that this authority would go the RFC route and the Federal Government would end up saddled with a lot of bad loans and worse scandal?

Mr. NATHAN. First, I really believe, Senator Proxmire, that the RFC, if one could put a cost-benefit on it and say what were the good and what were the bad results, I would say it was 10 to 1 favoring the good things versus the bad. It really wasn't until the very end that some of these bad measures came out. Nobody like Jessie Jones or the others at the top were ever accused of corruption. There were some bad performances at lower levels, but not so very many.

The CHAIRMAN. The RFC came on the scene when the country was flat on its back and we had to have that kind of capital infused into an economy where there was no confidence and we had enormous overwhelming unemployment, nothing really of the kind we have today.

Mr. NATHAN. No, but we have——

The CHAIRMAN. We have unemployment, but that was 25 percent.

Mr. NATHAN. But, Mr. Chairman, it isn't the unemployment that bothers me now. I think we are equivalent to being almost flat on our backs with respect to energy.

When I look at the figures and I see us relying on the Middle East and a few other countries for 40 percent of our oil use and I see that 5 years ago only it was about 15 percent, and I see it rising steadily year by year, I see the challenge in the energy area that is comparable to our challenge in 1932 in the general economy.

Our problem is to determine what risks do we take.

I would suggest some kind of li edetector test or some way to check and monitor investors and make them report regularly on investments and the like. We cannot avoid some risk, but I believe that there are enough honest people in this country and techniques can be devised whereby we can minimize corruption in this process and I would not let the fear of corruption stop doing what is essential.

The CHAIRMAN. Now you argue that the conservation argument is not realistic at least as pushed so hard by Mr. Nader.

You also say the American people are far ahead of the Government on conservation.

The GAO witness yesterady, Mr. Canfield, who impressed the committee very much, argued that there is more opportunity for saving in conservation than there is in production.

Do you think that this bill should be redrafted to place a greater emphasis on consevration initiatives and less emphasis on supply?

Mr. NATHAN. Well I think you need both, Mr. Chairman.

I worry a little bit about the either/or, but I certainly would put strong provisions on conservation and efficient utilization of energy into the bill, and I would in every bill.

The CHAIRMAN. How do you mobilize support for that?

You say you perceive a lot of popular support for it. Mr. Nader said the same thing. They are going to try to educate the Congress on it, and I think it is a very constructive effort.

But we always run into this opposition. We always run into people who are on other other side of this and make it very hard for us to enact legislation which will conserve energy.

Mr. NATHAN. Well, I think there are three things that ought to be done.

One, I agree that whatever price or tariff changes you permit in the regulated area, you do it in such a way as to seek conservation.

Let me give you an example.

For example, in the regulated area, it would be appropriate for the government to try to lay down guidelines, and this raises questions of excessive regulation, but I would like to see the regulatory agencies supported in some kind of way—and I am talking about public utility commissions in States as well as Federal—in such a way as to try to begin to restructure some of our utility rates which would encourage conservation.

I would like very much to see us go overboard on lowering rates at night as compared with daytime. Do your laundry at night. Run your dryer and cleaner at night .

Let's try to set up rate structures in a way to encourage conservation.

I think second, and very importantly, we ought to go in for standards. I don't believe that we can rely entirely on voluntarism.

We ought to go for standards in terms of cars. I would say put a $1,000 tax on an 8-mile-a-gallon car and $100 on a 20-mile-a-gallon car. Or nothing on small gas-using cars. In other words, shift your tax structures.

Another example, for instance, Mr. Chairman, would be to encourage cities to put very heavy taxes on all-day downtown parking and take that money and give it to the Metro system or the subway system or the bus system or rail commuter.

So in a sense, by your tax structure you are shifting incentives in a way that you can have much more conservation.

The CHAIRMAN. I go along with that, but, of course, the fundamental incentive is the one you resist and I think wisely and I resist it and I must say it is not consistent and that is that the greatest disincentive is to let the prices go up.

If the prices go up people won't drive as much and they won't consume as much.

But we have written into the law protection for the consumer and, as you and I recognize, the alternative is to hurt the economy because, as the price of energy goes up, the price of everything we buy—because there is a big energy component in everything we buy, food, clothing, everything—the price of everything goes up and it is inflationary.

Mr. NATHAN. I agree with that and that is why I would target in on price techniques.

When I say put $100 on an 8-mile-a-gallon car and nothing on a 20-mile-a-gallon car, this is using the pricing phenomenon. But at least it is targeted. If you price gasoline from 40 cents to 60 cents a gallon, I don't think we discourage an awful lot of use.

If we went from 60 cents to $1 or $1.50, I think we would. But heaven forbid what happens to the impacts of wage escalator clauses.

The CHAIRMAN. Once the OPEC countries become accustomed to their new wealth, is the threat of an embargo realistic?

Mr. NATHAN. I don't think the embargo is an economic determination, Mr Chairman. I think the embargo determination would be political.

In many ways, the more wealthy they are in terms of reserves, the more realistic it is that they would impose an embargo.

Now, if they get to a point where they are eating up their reserves as well as all their new income, then it would be less realistic because then they would be in trobule, too.

The CHAIRMAN. When they impose an embargo, they give an enormous incentive for developing alternative energy sources and, of course, as you know, I understand, and I think this is true—not having $1 million myself, I don't know if it is the case—but they say there is nothing more cautious than $1 million and they have a lot more than that.

Mr. NATHAN. That is quite true, but I do think, Mr. Chairman, that this issue you raise can be a very deterring issue to American investors.

Murray Weidenbaum talks about letting the marketplace determine it.

As of now I don't think if you absolutely decontrolled new oil altogether that new oil prices would rise insignificantly—they would rise insignificantly because you have already got a ceiling there of the OPEC prices.

Your domestic oil will not be produced in any significant quantity when it costs substantially more than the OPEC price.

Some people will drill. If you get one out of five wells and four are dry—everybody figures maybe I am smarter, and I will get two producers out of five. But by and large that OPEC price does set a ceiling and I think this is a problem about the uncertainties of what OPEC is doing on pricing, and that is a political decision, not an economic decision. I think it is one of the elements, Mr. Chairman, as to why I think the uncertainties necessitate something like this bill an authority.

The CHAIRMAN. Mr. Nathan, thank you very, very much. You are not only patient, but you are a splendid witness and we want to thank you.

Mr. NATHAN. Thank you very much.

[Full statement of Mr. Nathan and additional material received for the record follow:]

STATEMENT OF ROBERT R. NATHAN

Mr. Chairman and members of the Committee: Thank you for this opportunity to testify on the energy crisis facing this country and other oil importing nations around the world. Bill S. 2532 relates to many of the problems and needed actions associated with our energy impasse.

In the two and a half years that have transpired since the oil embargo was imposed by the OPEC countries, too little has been done toward the solution of this crisis. In the immediate months after the embargo, the people of this country faced much tension and many inconveniences with remarkable determination. Unfortunately, not long after large-scale imports were resumed there began a gradual lessening of concern over our precarious position in the critical area of energy and fuels.

We have become accustomed to higher oil prices. Too many of our leaders find it convenient or comforting to ignore the fact that oil imports represent a rapidly increasing share of our total oil consumption. We shrink from the thought that another embargo would bring much more serious chaos than followed the 1973 embargo. We do not want to face the prospects that our entire economy could be seriously undermined by external political and economic decisions relating to oil.

It is not necessary for me to elaborate at length on the energy crisis and what further interruptions of oil imports or further large increases in OPEC prices could do to this country. Much more important is the need to take stock of what we have done, are doing, and must do to halt the shocking trend toward increasing dependence of the United States on imported oil and to move toward greater energy self-sufficiency as rapidly as possible.

Probably most Americans agree on the directions that we should and must pursue. It is the details of policies and programs and measures where the major differences of opinion exist. We need now to move away from generalizations and get down to realities and affirmative decisions. I believe that S. 2532 can help serve that purpose.

We must do far more in the way of conservation. Some argue that we should rely on voluntary efforts in achieving conservation; others call for strict government standards and regulations; and still others favor combinations of incentives and disincentives to achieve conservation progress. The American people are far ahead of the government on conservation. They are prepared to make sacrifices if they are convinced that these sacrifices are necessary and that they will be applied firmly and equitably among different groups in the population. I believe our energy crisis is so severe and the needs for progress toward self-sufficiency so overwhelming as to warrant stricter rather than milder measures.

Conservation is one important first step, but not adequate relative to the severity of the challenges we face. We need to do our utmost to increase our production of energy sources and that includes oil and gas from traditional sources and from new sources. This will require careful attention to price policies and tax policies geared to maximizing exploration and exploitation of our oil and gas resources.

Clearly we must greatly expand our production and transportation and use of coal. It would appear that coal prices have risen sufficiently to stimulate much greater investment and greater production of coal. But the investment and output responses to these much higher price levels have not been commensurate with the needs of the nation. Nor have we achieved much in the way of increasing our transport capabilities for moving coal from the mines to the users. We have not moved significantly toward reconciling environmental and production solutions in the coal area.

We have slowed down substantially the construction of nuclear facilities for the generation of power. Economic and technical factors as well as conflicts between supporters and opponents of nuclear energy have been important elements in this situation. No matter what we achieve via conservation, increased domestic oil and gas supplies and expanded coal production, we will certainly need greatly increased supplies of nuclear energy over the next 15 to 25 years if we are going to have a growing economy and achieve a declining degree of dependence on oil imports. Given the tremendous technological achievements during and since World War II, and especially our accomplishments in space, we can be confident of producing nuclear energy safely and securely.

In addition to these domestic sources of energy we need to accelerate research and development on other sources, especially solar, geothermal, shale and other sources. Most scientists agree that it will be a long time before these added sources can be significant factors in supplying our growing energy requirements, but we should start immediately and intensively on these research and development efforts.

We need to ask ourselves why greater progress has not been achieved in getting more conservation, in increasing the exploration for new oil and gas reserves and recovering higher proportions of our known reserves, in expanding our coal production and in increasing our nuclear capacities. Part of the answer lies in the fact that we have engaged in too much talk and too little action. One of the reasons why our actions have been so inadequate stems from institutional deficiencies. What changes that have been made, like establishing FEA and ERDA, are not enough.

Just 13 months ago I testified before the Committee on Interior and Insular Affairs of the Senate on a bill introduced by Senator Jackson dealing with a proposed "National Energy Production Board." I expressed the view at that time that if we were going to get off dead center and do the things that must be done, we needed institutions with authority and funds which would focus

primarily on the energy problem. While many of the provisions in S. 740, as proposed by Senator Jackson, are much different from those proposed in the legislation under consideration here today, S. 2532, there are certain underlying principles which are involved in both of these bills and which might well be considered in some common relationship as these hearings proceed and as consideration of S. 2532 moves ahead.

I had the opportunity to serve during World War II as Chairman of the Planning Committee of the War Production Board and later as Deputy Director of the Office of War Mobilization and Reconversion. Certainly, the circumstances at that time were different from those we encounter today. We were then engaged in mobilizing for an all-out war, whereas now our problem is mobilizing in one crucial sector of our economy—the energy sector. I do not mean to imply that the two challenges are identical, but I believe that the seriousness of the challenge in this energy crisis does warrant our looking at past experience and recognizing the need for institutions and policies and people to do the jobs that need to be done if we are going to achieve greater energy self-sufficiency.

It should be clear by now that the goals that have been set for 1985 will be steadily cut back in size and scope if we rely only on the normal forces of "business as usual" in solving our energy problems. This is not meant to imply that the private business community should not and will not play the major role in expanding our capacity to produce energy domestically. Rather, it recognizes the need for government policies and government programs and government institutions which will motivate and energize the private business practices. Without appropriate policies, programs and institutions we will not do the unusual and will not get the focus and the emphasis needed for greater energy independence.

The size of the job is going to be a very big one and the level of investment in the energy field over the next decade must be very large. Perhaps it will not call for a sizably larger share of our total investment program than has been true over past decades since World War II. However, the absolute magnitude will be unprecedented. Further, and most important, the problems are going to pose much bigger risks and much greater uncertainties than in the past.

These risks and uncertainties include questions about the prices that OPEC nations are likely to charge soon and far into the future. I doubt if OPEC prices are going to be lowered, but when private individuals and private corporations are called upon to invest aggregates of many hundreds of billions of dollars over the next decade, they will take account of the fact that even remote possibilities of lowered OPEC prices must be factored into their investment decisions and the decisions of those who provided the funds.

Also, there are technological risks because intensified research and development will bring new technologies, innovative processes, new procedures, speedier obsolescence, and other developments. Also, long lead times will be involved in many of the large investments. There will be competition from other sectors as well as competition within the energy field to be taken into account. Reliance on normal capital market operations is not going to be sufficient in face of such risks.

As with all proposed legislation, there can and will be differing views about many of the features of S. 2532 and many changes can and undoubtedly will be made to improve the bill. Basically, it represents an important move in the right direction. I strongly urge its serious consideration. We need the establishment of an Energy Independence Authority with the financial means that are essential for vigorous and major progress toward energy self-sufficiency. As with so many problems, money alone will not assure solutions. However, without capital funds from the Government, it will be very difficult to make much progress.

Some will argue that $100 billion over the next ten years or to be committed within seven years is much too large a figure. The question of size is, of course, debatable. But $100 billion may prove to be inadequate rather than excessive relative to the challenge facing this nation and relative to the magnitude of the investment that will be needed in the energy field over the next ten years. I have seen estimates ranging all the way from $600 billion to $900 billion as the likely level of investment requirements in this sector between now and 1985. Whatever the total, it is not likely that the maximum needed will be forthcoming without special provisions and special incentives under-

taken by the Government. That is the key issue and given the crisis, I would prefer doing too much rather than too little.

One way to stimulate private investment in the energy area is to expand the incentives through taxation and regulation and related measures such as setting or allowing higher prices. Another is to make loans in association with private capital sources, with the Government assuming a higher risk than the private funds. Over the longer run the loan route will likely be the most important one for Government to play, but that does not preclude putting together a variety of combinations of incentives. The proposed bill, S. 2532, does give a fairly wide range of latitude to the top officials of the proposed Energy Independence Authority and I believe that considerable flexibility is needed. While we know the direction we want to go and while we have some fairly clear understanding of the magnitude of the effort that will be needed, there are still too many uncertainties to spell out the precise techniques and the precise devices that will give us the best and most effective results. As we move forward we will have a better understanding of what works and what does not work and what kind of leverage different financial programs will achieve as compared with others.

If the Congress wants to start with something less than $100 billion, I would certainly favor that as compared with no funding for such an Energy Independence Authority as proposed. However, I would certainly lean on the upper side rather than the lower side in order to get the degree of results we need. The risks are all greater on the under side because if this country does not move dramatically and vigorously we are going to be increasingly dependent on imported oil for years and years ahead and our economic leadership in the world and the status of the free nations of the world will be more precarious than if we take our risks on the upper side. More daring efforts may mean more losses or more government intrusion into capital markets, but that is a lesser risk than becoming more and more dependent on oil from abroad.

I would agree that the basic principle of supplementing or complementing private financial resources be pursued, as suggested in this legislation. In other words, there ought to be some evidence that private financing will not be forthcoming at reasonable terms, as a prerequisite for the making of government loans or guaranteeing loans or guaranteeing markets at given prices. It is not always easy to determine whether private resources will be forthcoming, but an effort ought to be made to test the private market first. Also, I agree that it would be better to have government funding in the nature of loans. Equity investments should be undertaken only when it is overwhelmingly demonstrated that the best route is through equity financing.

I would have some qualms about such decisions as debt terms and timing and methods of making loans and sources of funds being subject to the approval of the Secretary of the Treasury. This Energy Independence Authority might well be required to report regularly to the President and to the Congress and its major policy decisions might even be subject to veto by Congress within limited periods of time. Generally I would be inclined to give that Authority a considerable degree of latitude.

If anything, I would be inclined to spell out the Authority's scope and responsibilities and jurisdiction less precisely and perhaps more ambitiously. I would be inclined to give it more authority rather than less and more responsibility rather than less and perhaps even some broad policy decisions within the overall policy framework set by the Congress and the Administration. In other words, let us lean on the side of making this Energy Independence Authority truly a strong institution that will bring us much greater progress toward energy self-sufficiency and toward greater energy independence rather than treading gingerly in fear of making mistakes and in fear of doing too much.

STATEMENT BY S. DAVID FREEMAN, STAFF COUNSEL, SENATE COMMERCE COMMITTEE

I am glad to present this statement in response to the Committee's invitation. The views presented reflect my own experience and study of these issues both in and out of government and are not be attributed to the Senate Commerce Committee where I am now employed, or to anyone other than myself.

S. 2532, a bill to establish the Energy Independence Authority, correctly places the spotlight on the fact that market forces are failing to close the growing gap between domestic energy production and the demands of an expanding economy. The market place is certainly not attracting very much of the potential investments in energy conservation, investments that are much more economical than either importing more oil or increasing domestic production. And neither is the so-called "free market" attracting investments in synthetic fuels or shale oil or other marginal sources needed to reverse the down ward trend in domestic oil and gas production.

The rhetoric about "Project Independence" is out of touch with the facts that portray a growing dependence on imported petroleum from the Arab nations that embargoed us in 1973–74 and threaten to do so again at any time.

I therefore give the President's proposal for an Energy Independence Authority high marks for conceding that market forces are inadequate and that action by the federal government is needed. Unfortunately, the action proposed merely "throws money" at the problem and does not reflect any thoughful analysis of where federal subsidies may be needed and where they would be a mistake. It tends to neglect investments in conservation—which are more economical than increased production from synthetic fuels or electric power plants—and would subsidy all forms of more costly new production. It fails to distinguish between a new technology which might need a subsidy for a first-of-a-kind demonstration project and commercial plants where the subsidy represents a fundamental policy decision of adding the utilities and the fuel producers to the nation's welfare rolls.

The fundamental error in S. 2532 is its very first finding in Section 101(a)—that "The achievement of energy independence for the United States by 1985 and the long-term security of energy sources are essential to the health of the national economy . . ." That finding must be read in conjunction with Section 101(c) which states that "Energy independence for the United States can be accomplished by reducing imports of energy resources and increasing domestic supply of energy resources . . ."

This basic premise is wrong because every knowledgeable energy expert, including top administration officials such as Dr. Seamans, the Administrator of ERDA, knows that achieving independence by 1985 is virtually impossible and would cost us a ruinous price in dollars as well as irreparable damage to the environment. What is conspicuous by its omission in S. 2532 is a finding that investments in conservation can reduce imports more cheaply than could increased production or a finding that protecting the environment is really not consistent with the goal or energy independence by 1985. Nor does S. 2532 even explore strategies for obtaining needed supplies from at home and abroad at the lowest cost to the nation. Instead, the bill assumes that domestic production is preferable to imports no matter how much more it costs and without regard to the foreign policy of the oil producing nations and terms and conditions under which we purchase the oil.

Before writing a $100 billion blank check to yet another federal agency with a broad production-oriented charter, the Committee and teh Congress would do well to debate and decide the policy issues this bill raises.

The central policy issue raised by S. 2532 is whether the federal government should subsidize the commercial production of energy. If so, how? On a project by project basis? With a tariff or quota on imported oil?

Have we thought of the message we are sending to OPEC if we decide on a general policy of subsidy for domestic production of new sources of petroleum? After ranting and raving about the outrageous prices the OPEC cartel has fixed for oil we would be saying to OPEC, "Your prices are not high enough—alternative sources of petroleum in America cost much more and we must subsidize U.S. production or buy from OPEC." It would seem altogether plausible that OPEC would oblige us by raising their prices and thus eliminate the need to subsidize the American producer. But this would be a terribly expenses remedy for the American consumer, and for consumers throughout the world.

It may be quite true that synthetic petroleum will in fact cost more than OPEC oil. But that should be a "red flag" to warn us to stop and think before leaping into a program to subsidize such a sky-high source of energy. At the very least, we should limit the subsidy to the most promising first-of-a-kind demonstration projects. Subsidies are an essential part of the last phase of an R & D process, but they could be a very expensive mistake if extended to

commercial plants before we have examined other policy options that appear much more promising.

There is an altogether different strategy for balancing our energy budget that would save the American people untol billions of dollars, save our environment, and be more in harmony with the true role of the United States as a leader of nations on an increasingly interdependent planet.

Such a strategy would rely more on conservation to keep our total demand for energy from growing very rapidly. It would face that we are going to need to import oil and thus quicken the pace of building up an oil stockpile for use during an embargo or other emergency. It would include an active role for the U.S. government in seeking to help friendly nations around the world to develop their own petroleum resources. Such a Project Interdependence approach could enlarge the world supply of oil and thus exert pressure to keep prices from going up. And by diversifying the sources of oil we can minimize the risks of future embargoes. In addition, research and development efforts to harness solar energy and geothermal energy for large scale use should be greatly enlarged and intensified and the technology to use our large coal resource without endangering human health should be perfected on an urgent basis.

A conservation-oriented, Project Interdependence approach to our energy dilemma will also require the federal government to help finance certain activities. But it would be an altogether different mix of activities. The cost to the federal government would be a small fraction of the sums proposed for the Energy Independence Authority and the benefits to the nation would be much greater.

In my opinion it would be a mistake to set up a federal financing agency such as the Energy Independence Authority or even a scaled-down version without the Congress first deciding on the general category of activities that should be funded.

There in mounting evidence that the nation cannot afford to continue just to drift ahead until it encounters a real energy crisis. But it is equally clear that opting for a policy of all-out subsidy of domestic energy production would deal with one piece of the energy puzzle at the expense of environmental degradation and a huge extra cost to the American people.

The environmental concerns are very real. There is no way that a crash effort to build sizeable numbers of additional synthetic fuel plants, shale oil plants, nuclear power plants and the rest can be pursued without turning our back on the environmental ethic that this nation has so recently acquired. There would not be time for the careful planning and implementation of environmental protection features because the time-table for production would be too urgent. It is a philosophy of "build now—test later" that has characterized the past. It means "dumping" billion dollar plants in unspoiled areas, diverting scarce water supplies to their use, polluting the air and disturbing the peaceful lifestyle of people in the surrounding area. It is no accident in which they are to be located. It is a very expensive, centralized solution.

And the extra costs to the nation of the energy policy embraced by S. 2532 are also very real and very large. The direct subsidy—as large as it is—is only part of the cost. Consumers will pay extra billions for higher cost domestic production even if the loans guaranteed by the federal government are repaid.

There are three basic options for supplying the marginal supplies of fuel to meet America's growing needs in the next decade. Roughly speaking, they are:

Domestic production of synthetics & shale—$15–20/bbl.

Imported Oil—$13/bbl.

Investments in Conservation—$7–10/bbl.

S. 2532 opts for the highest coal solution.

The fastest, most cost-effective and most environmentally sound way to prevent future energy shortages in the United States is to encourage and facilitate energy conservation. Building codes and fuel economy standards can mandate that conservation be built into the design of new buildings and new cars. But massive investments of some $200 billion over the next decade are required to retrofit all the homes, non-residential buildings, and industrial plants that were built in the era of cheap energy. Such investments can reduce the need in such buildings by some 25 percent.

The conservation option offers a large source of domestic supply. The savings potential is at least as large as could be obtained by a crash effort to

produce synthetic fuel and it could be accomplished in several years instead of a decade. The savings from just retrofiitting existing buildings are larger than the entire flow of some 2 million barrels of oil per day expected through the Alaska pipeline.

The conservation opportunities are being only partially realized because, unlike the major petroleum companies and the utilities, most consumers do not have ready access to the necessary capital. Nor do homeowners, small business concerns and many industries have the engineering capability or the interest in finding out just how much energy they could save by investing in insulation, and a variety of materials, machines, and redesigns of their operations to save energy. Also, there is little incentive for landlords to spend money to save energy when the tenants pay the bill, and the reverse is true as well.

The investments in conservation can be repaid, with interest, from the funds that would otherwise be spent on the energy saved. The payout period is usually less than 10 years, about half the time required to repay the investment in synthetics or a power plant. But consumers are not in the energy business and they ordinarily have more demands for capital in their main business or to balance the family budget. Furthermore, the price for energy reflects the lower priced sources that are still available. Thus, while consumers pay the equivalent of less than $10 a barrel for oil and less for natural gas, the energy saved on the margin costs the nation $13 a barrel for imports or even if we produce synthetics.

There is an urgent need for legislation to provide consumers with reliable information and access to capital to make energy conservation investments that on the average will save twice as much energy per dollar invested as would be produced from the same investment in new production. S. 2932, the Energy Conservation Act of 1976, would enact such a program. It deserves prompt consideration by this Committee as a positive response to the problem of market failure which S. 2532 identifies.

In addition to investments in conservation I think there are needs for certain specified federal financial help on the production side. One area is the research and development of new technology including the funding of demonstration plants. This is the job assigned to ERDA. Their budget is now over $2 billion annually. My own view is that they can probably usefully spend more money on solar, geothermal energy and on conservation. And they probably need loan guarantee authority for first-of-a-kind demonstrations of coal gasification technology. But these projects need to meet stiff environmental standards and require a project approval both locally and by the Congress. There is no need to launch a new technology that isn't an improvement over what we have from an environmental and economic point of view.

Building up an oil stockpile for use in emergencies is another obvious program that requires federal financing. It is hard to believe that almost 3 years after the Arab embargo the United States has not built up any additional stocks. Such a program is now underway at a pitifully slow pace. The size of the stockpile and pace of buildup is an integral part of a strategy for security of supply. A billion barrel stockpile would cost some $15 billion but it would provide a full year's backup for all the oil we presently import from the Arab nations. And we would still own the oil.

Perhaps there is yet time to stop pursuing our "Drain America First" policy before we succeed in doing so.

I also believe there is a useful role for federal funding in joint ventures with friendly nations to develop their petroleum resources, as mentioned earlier. Any increase in petroleum supplies, especially outside the Arab world, is a help to all consuming nations. Petroleum resources that are much less expensive than making oil out of coal are almost certain to exist in many poor countries that are desperate for the revenues they would produce at prices far less than the cost of the high-cost sources this bill seeks to subsidize. We need to launch—Project Interdependence—a sort of modern-day "point Four" program of technical assistance and front-end capital for such nations.

In addition, there are a number of energy projects such as the transportation systems needed to bring natural gas from Alaska that may be just too large for private financing. Such special projects—if otherwise economic and environmentally acceptable—may be legitimate candidates for federal financial assistance.

There is thus a large agenda of specific programs that require federal funding. Some are being funded at present, but most of them are not. Action is needed to fund energy conservation research and development, oil stockpiles, joint ventures with friendly governments to produce oil and specific economical projects beyond the capacity of private capital.

But it would be a fundamental error to go beyond these specific areas where market prices cannot provide the necessary financial incentives and subsidize commercial energy production whose price can and should provide all the incentives that are needed. To launch a new agency with a broad charter to subsidize commercial energy production is a decision to embark on the road to corporate socialism or to nationalism. It is a dangerous and very expensive road that should be avoided.

Instead, urge the Committee to act favorably on the legislation before it to implement investments in the conservation of energy, our lowest cost source of supply. The supply-oriented initiatives identified earlier also require funding, but proposals must be much more specific and better justified than the request for a $100 billion blank check now before this Committee.

The ongoing federal and private investments in the energy field are a hodgepodge of uncoordinated ad hoc ventures that are not doing the job of balancing this nation's energy budget. This Committee could fill a basic need by establishing an overall planning mechanism to make sense out of the federal effort and be sure it is directed to supplement rather than supplant private investment. A federal financing entity could provide the funding for the necessary federal component of the overall plan, and at the same time provide an element of fiscal responsibility and coherence to the federal effort in energy which is in such a bad state of disarray.

The federal government needs to spend more money on balancing our energy budget than the current effort, but the funds must be directed toward programs that will alleviate the current fuel inflation, environmental degradation, and vulnerability to embargoes at the lowest possible cost to the taxpayer. A planning and funding mechanism to get that job done through specific programs approved by the Congress could enable us finally to put the pieces of the energy puzzle together, and perhaps even arrive at a public interest solution.

STATEMENT OF JOHN M. HOPKINS, ACTING PRESIDENT, UNION SYNTHETIC FUELS DIVISION, UNION OIL CO. OF CALIFORNIA

My name is John M. Hopkins. I am Acting President of the Synthetic Fuels Division of Union Oil Company of California in addition to my responsibilities as Vice President in charge of Union's refining, marketing and transportation operations in the western United States. I thank you for the opportunity to present our interest in federal programs for support of synthetic fuels development.

The Union Oil Company believes that the rapidly growing dependence of our country on insecure foreign sources of crude oil makes immediate development of synthetic fuels from coal and oil shale imperative. In addition, other sources of energy must not be ignored. Our company has sufficient oil shale property, water rights, technology and all the other requisites for production of important amounts of oil from shale and is ready to proceed as soon as economic and political conditions permit. My comments today, therefore, pertain to the development of an oil shale industry in general and specifically to Union's proposals to achieve that end.

There is a tremendous quantity of potential energy contained in America's oil shale formations which can contribute significantly to the stated objective of reducing our country's dependence on imported foreign oil. In the 16,500 square mile Green River formation of Colorado, Utah and Wyoming, total in-place shale deposits contain oil resources of around 1.8 trillion barrels of oil. If it is assumed that only one-third of the 1.8 trillion barrels is recoverable, it would represent: More than 80% of the world's proven oil reserves; 17 times the current proven U.S. reserves; or a 100-year supply of fuel for the U.S. at 1975 consumption rates.

At the present time, the technology for production of oil from shale is substantially further advanced than technology for recovery of either gas or oil from coal. We also believe it is the cheapest and most readily available fossil fuel energy source other than conventional petroleum. The Synfuels Inter-

agency Task Force, in its November 1975 report to the President's Energy Resources Council, estimated that Hi-Btu gas from coal will have a cost equivalent of $26.88 per barrel; oil from coal will cost $24.44; Lo-Btu gas from coal will cost the equivalent of $22.65; but shale oil, in a comparable energy basis, could be produced at the much lower cost of $12.70 per barrel. We believe that the relative costs indicated by these estimates reflect the current state of technology and indicate the greater value of oil shale as a source of early production of supplemental energy.

Although the significance of net energy analysis (or thermal efficiency) has not been fully established, Union's data indicates that the efficiency of producing syncrude from shale is much higher than for producing gas from coal. For example, at Union's proposed oil shale complex in Colorado, the facility would produce 4.5 barrels of shale oil for each barrel equivalent of oil and electricity consumed in the process. Coal gasification facilities have ratios ranging from a high of 2.6 to a low of 1.7.

The point these figures and statistics make is that shale oil should be given a high priority in any program our government establishes for development of alternate energy sources.

Union has been involved in the oil shale industry in western Colorado for more than 50 years, since it first began acquiring properties in the Parachute Creek area of Garfield County in the early 1920's.

Considerable research and other work necessary to the development of the resource has been accomplished over the years. In 1943, Union began active development of its own unique oil shale retorting process, first building and operating a small two-ton per day pilot retort at its Los Angeles Refinery. Later, in the early 1950's, a 30-ton per day research unit was built and tested. This retort was based on the rock pump upflow principle, with heat for retorting supplied by combustion of the carbonaceous residue left on the shale after retorting.

Based on this early pilot plant experience, Union designed and constructed a semi-plant in Colorado in early 1957 and operated it for a year and a half. During this time, sufficient data were obtained to permit engineering design and economic evaluation of a proposed commercial scale plant.

The semi-works plant was designed to retort 350 tons of oil shale per day. As operating experience was gained and improvements made in the process, the throughout rate was increased to a maximum of 1,200 tons per day, probably the highest rate of oil shale processing to date in the U.S. Testing included operating the retort under automatic process control for extended periods. Subsequent research and development work led to further improvements and resulted in today's retort concept referred to as Union's Upflow Retort "Model B."

Union owns outright approximately 20,000 acres of oil shale lands in the Parachute Creek area of Garfield County, plus more than 10,000 contiguous acres of valley and ranch lands acquired for support of a shale retorting operation. In addition, Union, recognizing that oil shale operations would require substantial water, over the years has taken appropriate steps to assure adequate supplies. Some 1.6 billion barrels of oil could be recovered by today's technology from the high yeld Mahogany zone within the 20,000 acres of our patented oil shale lands. To put these reserves in perspective, they are large enough to supply a 150,000 barrel par day oil shale retorting complex for more than 25 years.

Union Oil Company's studies lead to the conclusion that the most economical and practical way of achieving commercial operation is to first build and operate one full commercial sized retort module to be followed at a later date by additional modules as experience and economic conditions dictate. Union's proprietary aboveground retorting technology has been developed to the point that it is ready for immediate construction of this first commercial demonstration module.

Union, therefore, desires and is ready to build a single demonstration retort which would process 10,000 tons per stream day of oil shale to produce some 7,800 barrels per day of crude shale oil. Also included in the contemplated project are all ancillary facilities required to mine and crush the shale, dispose of the retorted shale, and ship the product. The crude shale oil product would be sold for use as boiler fuel in an electric utility generating plant.

Estimated cost of this facility is $118,000,000 (based on prices in effect in the first quarter of 1976). Because of inflation, the actual cost could be as

much as 50% higher. This facility could be designed and constructed in 32 months after approval. Union also has made the necessary environmental studies to assure that it can operate an oil shale plant in an environmentally acceptable manner. Start-up is estimated to require three months after mechanical completion of the facilities.

Following successful operation of the demonstration retort, and assuming political and economic conditions as favorable, additional similar retorts could be installed to increase production to the level of 50,000 to 70,000 barrels per day. Hydrogenation facilities would also be installed to upgrade the shale oil from boiler fuel grade to high quality synthetic crude suitable for use in almost any conventional petroleum refinery in the country. The cost of a synthetic crude oil plant of this magnitude would be in the order of one billion dollars.

In our opinion, under normal circumstances, private industry would be able to cope with the capital requirements, lead times and technical risks of shale oil development. However, private industry cannot stand alone in the face of the extraordinary risks imposed by today's political and economic environment.

The technical risks associated with oil shale development can be reasonably calculated and can be manimized by our proposed modular approach. Other risks listed here, however, are beyond the control of private industry.

1. The economic environment is largely controlled by federal government in a most uncertain manner. Existing oil reserves are being liquidated at prices substantially less than replacement cost. High cost shale oil certainly cannot compete with price regulated conventional petroleum.

2. Capital requirements for shale oil are higher per barrel than for conventional petroleum, even in the new high cost provinces such as offshore and Alaska. Limited capital available to private industry must obviously be allocated first to the lower capital requiring conventional petroleum opportunities.

3. Though we feel oil shale can be produced in an environmentally acceptable manner, there is considerable uncertainty about the requirements that government agencies on all levels will impose. Furthermore, environmental groups frequently bring litigation, which causes lengthy delays. Such uncertainties and delays in a period of high inflation add greatly to the ultimate production cost for high capital requiring projects.

For these reasons, it seems abundantly clear that private industry will not soon achieve significant synthetic fuel development on its own.

The development of these great resources thus awaits the action of Congress. Many ways in which government can share risks have been suggested by the Administration, by the Congress and by private industry. S. 2532 seems to encompass them all, and certainly its passage could result in accelerated development. We are concerned, however, that it may be an expensive and inefficient way to get the job done. It creates a second large governmental organization with considerable authority for very large expenditures.

The energy independence objectives set for the Energy Research and Development Administration are of greater importance, greater urgncy and greater magnitude than the objective set for the National Aeronautics and Space Administration by President Kennedy in May 1961. For the objective of putting a man on the moon within 10 years, the Administration and the Congress were able to work together to implement a successful program. Thus far, in the three years since the President set an energy independence objective, the Administration and the Congress have been unable to develop an effective energy program. The ERDA structure is there, but the added authority and budgetary appropriations necessary to a meaningful start on alternate energy development by private industry are still lacking. Creation of a second agency will not solve this problem.

We recommend consideration be given to amending S. 2532 to channel all federal assistance for synthetic fuels development through the existing ERDA structure. The useful methods for producing this assistance contained in S. 2532 could still make their important contribution without loss of efficiency.

Union Oil has on file with ERDA a proposal and request for assistance for the first commercial size retort module described above, and we are ready to commence construction as soon as suitable funding is made available. We believe the nation's energy needs dictate that such development be undertaken with a great sense of urgency.

Thank you.

STATEMENT OF ROBERT M. BARTNELL, PUBLIC RELATIONS CONSULTANT, LIBERTY LOBBY

Mr. Chairman and Members of the Committee: I am Robert M. Bartnell, Public Relations Consultant for Liberty Lobby. I appreciate this opportunity to submit for the record our statement representing the views of our nearly 25,000-member Board of Policy, and also on behalf of the approximately quarter million readers of our weekly newspaper, the Spotlight.

Liberty Lobby opposes the formation of the Energy Independence Authority, feeling that the establishment of another taxpayer supported government body is not conductive to the economic health of the nation.

Liberty Lobby feels that if it is true, as has been published in many newspapers across America, that the major oil companies are enjoying record profits, it would appear that the oil companies themselves have the necessary funds to expand the production of domestic oil and gas supplies.

If it is also true that the major oil companies pay an average 7% in federal income taxes, compared with the average American's 13.5%, then it would seem that once again the taxpayers are being required to finance their own bankruptcy.

If it is also true that the Alaska pipeline will deliver as much as 400,000 barrels a day of surplus crude oil to the U.S., and this surplus, though possibly desperately needed, could not be used because of lack of transportation—and possibly could be sold to Japan just to get rid of it—then it looks as if the major oil companies do not need government assistance in order to solve the energy crisis.

If there is an energy crisis, Liberty Lobby believes America should become as independent of foreign fuel sources as possible. But it seems the major oil companies are not going to face the problem squarely and honestly until they are assured the same profit margin on domestic production as they currently enjoy on foreign oil.

The solution to the price problem inside America is a tariff on imported oil. As it is now, domestic producers are letting wells go idle rather than bring oil out because they cannot compete with foreign oil. The increase in cost would be only temporary as domestic competition, especially now that the North Slope of Alaska has entered the market, would shortly force the price down again.

The author of this energy plan is reported to be Vice President Rockefeller. With his usual flair for profligacy, Mr. Rockefeller envisions the establishment of an energy with responsibility of channeling $100 billion into energy development. In other words, there is nothing wrong with energy development in this country that spending more money won't cure. Poppycock! The major oil companies want their investments guaranteed by the taxpayers, obviously feeling it is easier for the government to raise taxes to pay for the guarantees than it is to raise the prices at the gas pumps. This way government becomes the villain not the oil companies.

We are told Mr. Rockefeller objects to compare this new energy plan with his ill-fated and ill-conceived Urban Development Corp. in New York. Yet, in essence both are simply a means of letting the taxpayers pay for projects best left in the hands of private enterprise. Mr. Rockefeller's credentials as an economist and administrator are reflected in the fact that when he became governor of New York in 1958 he belabored his predecessor for running up an $879 million debt. When he left office 15 years later, the state debt stood at $11 billion, most of it incurred through the public authority route, precisely the same as the current prospective energy measure.

Liberty Lobby opposes the establishment of any agency designed to avoid congressional and executive branch reviews. Traditionally and historically there is no reason to believe this agency would not grow in power and size to become a "super agency" in charge of all energy financing and policy making in the Nation.

Government is already, in our view, pervasive and bloated. If American oil companies can assist the Soviet Union in their search for natural gas and oil; if they can assist Indochina and Vietnam in their exploration and development for oil; if American oil companies can afford to wildcat around the world as they are doing, then we feel they can afford to explore and develop energy sources, including oil, in this country.

Thank you again for this opportunity to submit our statement for the record.

STATEMENT OF THE AMERICAN PETROLEUM INSTITUTE

The American Petroleum Institute fully agrees with the principle, expressed in the Energy Independence Authority proposal, that this Nation must reduce its heavy and increasing dependence on foreign oil. Decisive action is needed if we are to maintain the national security and policy independence of the United States, and to ensure against the staggering costs that could be imposed on this Nation should another oil embargo be initiated by the Organization of Petroleum Exporting Countries (OPEC). We must also seek to constrain the ability of the OPEC cartel to extract monopolistic profits from the United States in the form of even higher crude oil prices.

The API, however, has serious reservations about the need for and value of the proposed Energy Independence Authority in achieving these objectives. We believe there are more effective and more immediate ways for this country to attain a greater degree of energy self-sufficiency and to reduce our heavy dependence on insecure and high-cost foreign oil, without levying an unnecessary burden on the Nation's taxpayers.

We share the concern of economic experts, within and outside of the Federal government, who have cautioned against the inflationary and other adverse economic impacts that could evolve from a government-financed and -backed program on the magnitude of $100 billion.

One area of particular concern to economists is the provision of the EIA proposal to provide Federal loan guarantees.

Secretary of the Treasury William Simon, in a recent speech to the International Association of Business Communicators, pointed to the substantial costs to taxpayers and the economy that would result from increasing government activity in this area.

Professor Henry D. Jacoby, an economist from MIT, stressed the same point in recent testimony he presented to the House Science and Technology Committee. He said: "Loan guarantees obscure the true cost to the economy of new energy sources or energy savings technology. They hide the cost from policy makers, and thereby bias key decisions in this realm." And he added, "More important, they hide the true cost from consumers and encourage wasteful consumption practices."

Another question to be considered is whether Congress should expose public funds to high risks such as those contemplated in S. 2532. Even though the EIA would not be allowed to permanently control, own or operate energy facilities, it would have the task of determining which projects to finance without having any prior experience in this area. Public funds would be exposed to unnecessary risks while the government corporation, in a very short period of time, attempts to grasp the totality of the energy situation. In addition to that consideration, Congress must be aware of the great risks inherent in rapidly bringing any new technology or process on line.

A third area of concern is the effect of the EIA on the competitive marketplace. EIA would divert financial resources from more efficient investments into economically inefficient projects. The EIA-subsidized projects would not have to compete for scarce private funds, and thus would subvert the discipline of the marketplace.

Gerald Parksy, Assistant Secretary of the Treasury for Trade, Energy and Financial Resource Policy, cautioned against the impact of heavy government borrowings on the long-term securities market. He pointed out that, in fiscal year 1976, the net flow of funds to the U.S. credit market is expected to be about $239 billion. Some 57 percent of these funds—of $136 billion—would be required to finance the Federal budget deficit and the net borrowings of the government for off-budget programs.

Mr. Parsky went on to say:

"We expect that such borrowings will absorb 82 percent of funds available in the long-term securities market. The funding of the EIA would add to the already large government presence in the capital markets and have an important impact on both the overall allocation of credit and the financing costs of both government and private borrowers."

In short, adoption of EIA will increase the *demand* for capital, but have little or no positive effect on the overall *supply* of capital.

Furthermore, the Federal government would be increasing its presence in the capital markets despite the absence of any evidence that government-owned or controlled corporations are more efficient than private corporations.

John A. Hill, Deputy Administrator for the Federal Energy Administration, in testimony last July before the Senate Committee on Interior and Insular Affairs, analyzed and compared the performance of U.S. oil companies and government-owned oil companies in other countries. Both in financinal areas and in operational activities, the FEA found the private corporations to be far more efficient than government-run companies. There is no reason to believe that the situation would be any different in this Nation with respect to energy development.

There is, on the other hand, good reason to believe that the reverse would occur. The EIA would be responsive to government administrators rather than to market forces. It would not necessarily strive toward the goals that accurately reflect consumer wants. At the present time, government pricing decisions do not relate to the cost of energy production or to the demand for energy programs. The EIA would compound this inefficient trend through the mechanism of higher floor prices for some synthetic fuels of through the mechanism of even higher taxes to further subsidize inefficient projects.

There is a better, more efficient and less costly may to solve the Nation's critical energy problem. It is a problem, as Professor Jacoby has stated, that "we must take with ultimate seriousness—facing head-on the true costs of our adjustment to it."

The true costs of dealing with the energy problem can best be revealed by permitting market prices in this country to spotlight the problem and by allowing energy users and suppliers alike to respond to the problem. And the most effective means of reducing our dependence on, and of lessening the threat of another embargo by, the OPEC cartel is for the Federal government to adopt policies that return this Nation to a marketplace economy in energy.

Congress has already taken a forward-looking step toward achieving a proper degree of independence from insecure foreign oil. This was the adoption of the National Security Storage Program as part of the Energy Policy and Conservation Act of 1975. This crude oil security storage program is now being implemented by the Federal Energy Administration. We support this program and believe it is an effective means of insuring this Nation against the economic costs and political risks of any future oil embargoes.

Unfortunately, in taking this one step forward, Congress took at least one backward, in continuing and expanding price controls on oil as another part of the Energy Policy and Conservation Act. We believe that complete and immediate decontrol of U.S. oil prices would increase domestic production, decrease unnecessary consumption of energy by Americans, and reduce imports.

This important step forward would thereby enable the security storage program to provide a greater amount of insurance against the possibilities and the costs of another OPEC oil embargo.

Decontrol of U.S. oil prices would also provide an effective constraint on the spiraling pricing policies of the OPEC cartel. The Federal Energy Administration, in its "National Energy Outlook, 1976," has estimated that decontrol of oil prices would hold imports to current levels through 1985. By contrast, continued price controls will make this Nation even more dependent on imported oil. The FEA estimates that, with price controls, imports by 1985 will be roughly *double* current levels.

Similar positive action should also be taken by Congress with respect to natural gas, through deregulation of field prices on natural gas sold for resale in the interstate market. The Senate, last October, sought to move in this direction. We recommend that both Houses of Congress take this full step forward.

The deregulation and decontrol of oil and natural gas prices would eliminate the need to adopt S. 2532, the bill to create the Energy Independence Authority. The real beneficiaries of price decontrol action by Congress will be the American taxpayers and consumers, who would not have to bear the more expensive and less efficient costs of the EIA.

The API believes that the proper role of the Federal Government in a competitive market system is to establish the goals and to encourage the private sector to develop the resources. In the case of energy supplies, we believe that the private sector can and will provide increased supplies to American consumers if government establishes the proper policies and the positive climate. The assumption on which the proposed EIA is based is therefore erroneous. The energy problem still facing this Nation can be solved by less. not more, government intervention. And it can be solved at less cost and risk to American taxpayers and energy consumers.

In the interest of this Nation and the American public, the API recommends that S. 2532 not be adopted.

Energy Independence Authority Act of 1975—Suggested EEI Position

INTRODUCTION

The Energy Independence Authority Act of 1975 would create a new government corporation with financial resources of $100 billion, whose purpose would be to help achieve energy independence by providing loans, loan guarantees, price guarantees, or other financial assistance to private sector energy projects. The proposed legislation also has provisions to expedite critical energy projects whether or not they are receiving financial assistance from the Authority.

The creation of a new government corporation to play a fundamental role in financing energy development in our country is a departure from the manner in which the nation has heretofore expanded its energy supply. Since the operation of the corporation could have a significant impact on the electric utility industry, this proposed legislation is of great importance to the Edison Electric Institute.

Numerous studies have been undertaken relative to the rate at which the public's demand for electricity will increase in the years ahead. Most analyses conclude that the growth rate will fall between 5 percent and 6 percent. A few indicate slower growth; some a considerably higher rate. Our expectation is that even with a high degree of effort on the part of the public to use energy in all its forms wisely and carefully, electric energy will increase in the coming decades at approximately 6 percent annually.

To provide for the anticipated growth, the electric utility industry must utilize the most effective and efficient means of generating electricity, and must have the financial ability to build necessary electric generating capacity and other facilities. By depending upon coal and nuclear fuel for electric power generation, we can maximize the use of domestic resources, thus reducing the cost of electricity and the nation's reliance on imported oil.

COMMENTS

Government assistance to demonstrate new and unproven technologies which will expand our use of domestic energy resources and permit more efficient use of existing sources of energy is both necessary and in the public interest. The role which the government adopted in the development of nuclear power for electric generation is an excellent example of how government can help foster a new energy technology without entering into the commercial phases of the energy industry. Under that program, the Atomic Energy Commission conducted research and development, undertook experimental projects and provided direct or indirect assistance for the design, construction and operation of demonstration of prototype plants.

While that method of assistance worked well for the nuclear power program, the most appropriate form of government involvement in other fields depends on the status of the energy technologies which are being developed, the type of assistance needed, and the interest and ability of concerned segments of industry to provide funding. Loan guarantees and other financial arrangements provided for in the Energy Independence Authority Act of 1975 might be suitable means for providing government assistance for the development of certain technologies, but the circumstances in each case should determine the form of help, if any, that might be needed.

Many different forms of energy development are needed. They may be categorized from the standpoint of the timing, the magnitude of the effort and the financial resources which may be required to bring them to fruition. For example:

1. With respect to such activities as shale oil development, coal gasification and coal liquefaction, the organizations and companies which have been developing these processes would be in the best position to know what might be necessary in the way of government assistance.

2. As to energy from such sources as solar and fusion, research and development efforts are proceeding in these areas, although it will be decades before any substantial benefits can be expected from them in terms of large-scale generation of electricity. Government financial assistance will undoubtedly be needed for continued research and development and may well be required for experimental and demonstration projects in such fields.

3. Government assistance in all likelihood will be required to assure that various aspects of the nuclear fuel cycle, such as additional uranium enrichment capacity and fuel reprocessing facilities, are developed to the point where ade-

quate supplies of nuclear fuel will be available for electric power generation. The magnitude of expenditures for such projects may require government participation in some form until these facilities can be provided by private industry alone.

ELECTRIC UTILITY FACILITIES

We do not believe that the financing arrangements proposed in the Energy Independence Authority Act of 1975 are appropriate means of providing capital to construct conventional electric utility facilities such as coal and nuclear fueled power plants presently being built or planned. Currently, the industry is experiencing difficulty in financing needed expansion. The solution to this problem, however, is not a restructuring of the manner in which generating capacity is financed. The answer is prompt and adequate rate increases so that electric utility earnings are sufficient to attract new capital from the financial markets. The Federal government can also assist by enacting tax policies which would encourage capital formation and increase the cash flow of utilities. The recent legislative recommendations of the President's Labor-Management Committee would help significantly in achieving these objectives.

If the Federal government attempts to utilize the normal capital markets for financing projects under the Act, it may disrupt these markets by competing for funds which normally are utilized directly by the energy and allied industries. The concept of loan guarantees, furthermore, has already been suggested as a substitute for adequate rate relief and has generally been found to be an unsatisfactory approach.[1] It seems highly unlikely that regulatory agencies would submit to the granting of mandatory rate increases proposed in Section 304(c) as a pre-condition for loan guarantees. Loan guarantees would not produce significant savings for consumers, would probably result in the violation of the rights of existing holders of utility bonds, and could encourage regulatory authorities to force utilities under their jurisdictions into less favorable financial conditions in order to qualify them for such guarantees.

Unfortunately, Section 304 specifically provides that the Authority shall not extend financial assistance to a project which would otherwise qualify if, in the judgment of the Board of Directors, it involves technology which is in the research and development phase. This provision thus appears to foreclose government financial participation where it is needed and fosters assistance in another area, electric power generation, where other means of providing adequate capital would be more effective and would not require a radical departure from a time-proven method of explaining needed generating capacity.

EXPEDITING OF LICENSING PROCEDURES

Title VI assigns certain responsibilities and functions to the Federal Energy Administration. Section 602(a)(1) provides that FEA "shall keep apprised of the processing of energy project licensing proceedings at the Federal, local, state, and regional levels and, where appropriate and consistent with applicable Federal, state and local law, may suggest procedures for expediting such Federal proceedings and similar local, state, or regional review and for consolidating Federal, local, state and regional applications and action to reduce duplication of effort and expedite the overall licensing process." Other provisions for expediting the licensing process include the development of a composite form of license application for all Federal agencies.

Title VI also authorizes the FEA to certify that an energy project, whether or not receiving financial assistance from the Authority, is of critical importance to the achievement of the purposes of the bill. The recipient of such a certification may then submit it to the appropriate Federal licensing agency. Section 603(e) provides that such agency "shall forthwith commence all necessary proceedings which may be required for the licensing of any aspect of the affected energy project, and is authorized to give such proceedings preference over all other questions pending before it expect other proceedings involving similar certifications."

The FEA's certification would not be considered a major Federal action so that an environmental impact statement would not be required.

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[1] See "Financing the Electric Utility Industry," conclusions of a Study for the Edison Electric Institute by Dr. Murray L. Weidenbaum, Mallinckrodt Distinguished University Professor at Washington University, St. Louis, Missouri.

Finally, Title VI provides for expedited judicial review of a Federal agency's final action concerning a certified energy project.

Expediting the licensing process is important to the electric utility industry. Title VI of the proposed Act could assist in reducing current delays in licensing procedures.

CONCLUSION

The Energy Independence Authority Act of 1975 contains some features which would be of great assistance in helping to solve the nation's energy problems. Providing government financial help, where needed, to bring technology in such fields as oil shale, coal gasification and solar applications to the point where presently untapped resources can make useful contributions to our energy supplies would be a positive step forward. The bill's proposals to expedite licensing procedures address a serious problem area that must be resolved if progress is to be made in the near future. These measures are constructive and we would support them.

Other provisions in the proposed legislation should, however, be modified. The proposed government financing of electric utility facilities, including the construction of coal-fired and conventional nuclear power plants, is not needed and could be counter-productive. On the other hand, financial aid of the type indicated should be made applicable to projects in the research and development phase, as well as to experimental, prototype and demonstration plants. Such activities are the very areas where additional funding can be most helpful and meaningful.

The CHAIRMAN. The committee will stand adjourned.

[Whereupon, at 1:15 p.m., the hearing was adjourned.]

ENERGY INDEPENDENCE AUTHORITY ACT OF 1975

MONDAY, MAY 10, 1976

U.S. SENATE,
COMMITTEE ON BANKING, HOUSING AND URBAN AFFAIRS,
Washington, D.C.

The committee met at 10:05 a.m., pursuant to notice, in room 5302, Dirksen Senate Office Building, Senator William Proxmire (chairman of the committee) presiding.

Present: Senators Proxmire, Stevenson, and Garn.

The CHAIRMAN. The committee will come to order.

Today the committee continues its hearings on S. 2532, the Energy Independence Authority Act.

In 3 days of hearings on this bill last month, the committee heard a number of arguments in favor of the bill—and some devastating criticism of it and the assumptions underlying it.

The bottom-line argument the Administration makes for creating a $100 billion energy development bank is national security. Vice President Rockefeller told the committee that if we don't undertake a massive effort to become self-sufficient in energy, we will be importing between 50 and 60 percent of our oil in 1985. At that point, he said, we would be enormously vulnerable. A cutoff of foreign oil supplies, probably another Arab oil embargo, could shatter our economy. Thus, he and others conclude that we must avoid this danger to our national security whatever the price of energy independence.

I have very strong reservations about this legislation. As it's presently written, it is a $100 billion blank check for the Administration to make any energy investments it wants to, for whatever reasons, without any effective congressional oversight.

It would provide the equivalent of one Lockheed loan guarantee a week for 400 consecutive weeks to finance risky energy projects that the private market won't touch. The Federal Government might well end up with a lot of immensely expensive, uneconomic, Post Office-type boondoggles. Squandering our limited financial resources is not the way to insure national security.

Most of our witnesses, whether they favored the Rockefeller bill or strongly opposed it, believed that the United States must do something to solve the energy problem. The controversy centers on what we should do, how quickly we need to do it, and how large a role the Federal Government should play in meeting our future energy needs. And the answer to these questions lies, to a large degree, in an expert assessment of how much and how immediately our national security is threatened by our dependence on foreign oil supplies.

We have with us today several witnesses who are highly respected experts in Middle East politics and the operations of the petroleum industry and the OPEC cartel. We want to find out from them the

answers to the basic questions. Will the price of oil stay high and go higher, or is it likely to fall? Will the OPEC cartel stay together or drift apart? What is the likelihood of another Arab-Israeli war? If this did occur, would the Arab countries impose another embargo, or are they now so dependent on a high level of oil resources that another embargo is unlikely?

The committee will hear first from Mr. James Akins, director of the State Department's Office of Fuels and Energy and U.S. Ambassador to Saudi Arabia, during the period of the Arab oil embargo. Our other witnesses are Melvin Conant, recently assistant administrator for International Energy Affairs with the Federal Energy Administration; John Lichtblau of the Petroleum Industry Research Foundation; M. A. Adelman, Professor of Economics at MIT; and Charles Maxwell, senior vice president and energy analyst for the brokerage firm of Cyrus J. Lawrence, Inc.

Will all of you gentlemen come forward as a panel and sit wherever you wish and then we will ask Mr. Akins to begin. We want to be sure that I have you down and properly identified.

All right. Mr. Akins, what I would prefer and I'm sure Senator Garn would too, if you gentlemen could confine your remarks to about 10 minutes, and then we will have the entire statement printed in the record if you skip over it. Go right ahead, sir.

STATEMENT OF JAMES E. AKINS, FORMER U.S. AMBASSADOR TO SAUDI ARABIA

Mr. AKINS. Energy independence would be very nice if it were attainable easily and cheaply. I would support S. 2532 as one of many measures we need to reduce our reliance on imported oil. We also need a strict strip mining bill, increased drilling of continental shelves and substantial increase in research in other energy sources, notably solar energy; and we need strong measures to conserve toward energy independence," not the "attainment of energy independence in 1985.

S. 2532 would certainly fall far short. I object to the implication of its name, a "bill to establish an energy independence authority." Can't the country be honest enough to say that it will "lead us toward energy independence," not the "attainment of energy independence?"

For a variety of reasons we did not move on a program of increased domestic energy production and conservation in 1967 when it became clear what were the trends in domestic and international energy. Supply and demand. In fact, we still haven't moved very far. There's little point in trying to cast blame or assign guilt for our inaction. I have no doubt that there is danger in our dependence on imported oil. We can talk of and we must consider natural disasters and revolutions in the oil producing countries. What we really mean by this is whether the Arab oil embargo of 1973 could be repeated? If there is a war in the Middle East it very likely will be. In fact, I think it would be irresponsible for us to assume anything other than that.

We haven't yet taken many measures since 1973 to protect ourselves. Not much has been done to increase storage. Not much has

been done to increase domestic production except to approve the Alaskan pipeline, and overall the oil production continues to decline. We have set up a National Energy Agency some 4 or 5 years too late, but the question is will it survive a real test, an embargo on the United States and not one in Europe and Japan? Will our allies share their oil with us if it means the embargo will be imposed on them, particularly if they do not agree with the actions which precipitated the embargo? It seems very likely to me that they would make their own accommodations with the oil producers.

We have talked of other measures to protect ourselves. For the last year we have heard plans to invade the Arab peninsula. This is one of the most stupid and criminal ideas I have ever heard out of Washington. We also have talked of directing our oil purchases to non-Arab sources, but that's not very practical and even if it could be done do we want to put ourselves at the mercy of the non-Arab oil producers? They are not all that benign and we couldn't switch easily to other suppliers if they were to become cantankerous.

Then we talk of breaking up the oil industry. Although this may provide some psychic enjoyment, let us hope that the purpose of any anti-oil company legislation is solely to increase competition and production and not to lay to rest the ghost of John D. Rockefeller, Sr. If it is the latter, then our energy problems will be made worse. If the energy industry is broken horizontally, that is if the companies are restricted to production or refinement or marketing and if they are forbidden to develop other forms of energy, they will die when hydrocarbons lose their preemina as a source of energy. The overall national energy supply could in fact become much worse if this type of divestiture were carried out. Smaller and yet fuller integrated companies makes more sense, but to force this would be risky at a time when we are trying to reduce reliance on imported oil.

I would suggest that we admit to ourselves that we are against a problem with no easy or magic solution. We could have energy independence right now today simply by excluding foreign oil imports, but the economy would be ruined.

The question is how much do we want to pay in terms of living standards and degradation of environment in the next decade for energy independence? I suspect that the American people would find the cost much too high.

I would hope that S. 2532 or some modified version thereof would be approved because I think it would help increase our domestic energy supplies. I would also hope that the Congress would approve other means to increase domestic oil production and, more importantly, that the Congress would adopt a strong program of energy conservation starting with new taxes on gasoline and allocating the money received to mass transit and other energy saving projects. But we should all recognize that with all these measures, we will continue to be dependent on imported oil for at least a decade and probably much longer.

The most recent figures of FEA I have seen now talk of reducing our imports in 1975 5 or 6 million barrels a day. This is too much to be lost. The only thing I can say for it that's favorable is that it's a lot better than 8 million and certainly better than the 10 or 12 million we had projected earlier.

The only way to insure that we have a continued flow of oil, in short, is by insuring that there is peace in the Middle East. This isn't an impossible goal. We can achieve it and no one else can. We can prevent an outbreak of war in the Middle East and no one else can. Full negotiations must of course be undertaken first but if they fail we must not wash our hands of the whole area. Politicians of all stripes, with the notable exception of George Ball, have expressed horror at the suggestion that we could impose peace in the Middle East. Not only can we do this, but we must, if negotiations are not successful. Not only would our oil supplies be jeopardized by a Middle East war, but there would be a possibility of a much wider war involving ourselves; this clearly would be intolerable.

This is an American election year and both sides we hope, in the Middle East, will remain patient. We must also hope that the new President, whoever he might be, will move quickly in 1977 without long studies or delays to solve the whole Middle East problem, to find a general overall solution that will surely please no one but will be roughly equally objectionable to all sides. If he doesn't move, a war will break out a long time before we approach our goal of energy independence.

The CHAIRMAN. Thank you, sir.

[Complete statement follows:]

STATEMENT OF JAMES E. AKINS, FORMER U.S. AMBASSADOR TO SAUDI ARABIA

It is argued, convincingly at times, that national independence in energy resources is not only highly desirable but necessary for both security and balance of payments reasons. Total independence could, of course, be achieved by nothing more complex than forbidding imports, or decreasing that all imports were to stop on a designated date. But the cost of such action would be staggering, particularly if this "independence" were to be achieved in a short time. We must weigh the relative merits and need for independence against these costs.

For a variety of reasons we did not move eight or ten years ago on a program of energy conservation and development of new energy resources. Although the reasons for our inaction should be understood in order to avoid repitition of error, there is little profit in trying to assess blame. We had far better look at our position today. It is not comfortable; we are importing over 40 percent of our petroleum needs and domestic production of hydrocarbons will continue to decline until Alaskan production begins.

We must start by asking ourselves a few questions. First, is there any reason for a strong government energy program? Probably yes; although this is somewhat less clear than it seemed a few years ago. The current high prices for energy will lead, by themselves, to greater conservation and to more extensive development of new energy resources than if prices had remained low. It seems, however, that market forces will be insufficient and that a concerted government program such as provided by S. 2532, by government sponsored research on new energy forms and by enforced conservation will also be necessary.

I find it difficult to take very seriously any program ostensibly leading toward energy independence which does not address itself fully to conservation, particularly to greater savings in the use of gasoline. Gasoline prices are now declining and the welcome trend of a year ago toward small cars seems to have been reversed. Yet we do not seem to be giving much consideration to higher gasoline taxes, even to proposals which would include means of softening the regressive nature of such taxes. And there seems to be currently very little talk of using gasoline taxes for construction of mass transportation systems rather than highways.

The second question is: would a strong government-directed program lead us to energy self-sufficiency in a relatively short time? The answer here is clearly that it would not without intolerable costs to the consumer, that is,

without a substantial decline in the general standard of living. Estimates of the Federal Energy Agency have varied widely first it was self-sufficiency in 1983; then it was imports of three million barrels per day of oil by 1985; now the present estimate, I believe, is 5 million barrels a day by that year. Even this latter figure seems optimistic as the assumptions on which it is based are questionable. Can we really count on large discoveries of new domestic oil in the next decade? Will there really be substantial new production from existing fields? And how will the savings in consumption be made? Yet even if this latter figure is correct we will be far from being self-sufficient and the loss of five million barrels per day of oil would be a disaster for the country. The most charitable remark that can be made on behalf of this figure is that it is better than 6 million and much better than the ten or twelve million barrels per day of oil imports we had projected just a few years ago for 1985.

The third question to which I have been asked to address myself primarily is "does any of this really matter?" Are there any real problems in reliance on imported oil? The answer can only be that there obviously are, but that nothing in the world is ideal and that we again must weigh these dangers against the cost to the economy and the society and the environment of a crash program leading to complete energy self-sufficiency.

We are now importing over six million barrels a day of oil. The terror, in 1974, surrounding the balance of payments costs of our oil imports seems to have vanished in the United States if not in much of the rest of the world. We are paying a heavy price for our imported oil but this has been made up through increased exports: food and to a considerable extent through arms sales to the Middle East, a matter of quite another concern.

The danger is, as it always has been, in a cut-off of oil imports and our inability to make up the loss. A cut-off could arise from a natural disaster in a producing country; it could follow a political upheaval in one or more of the producers. But what we really fear is a recurrence of an Arab oil embargo. Is this possible? And have we taken measures to protect ourselves? As to the first part, it is not only possible but we must count it a certainty that there will be an embargo if there is an outbreak of hostilities in the Middle East and the United States gives massive military aid to Israel, as it did in 1973. If there is a war, the United States maintains strict neutrality and Israel, with its stockpiled American arms, wins a crushing victory, an embargo, I would say, would also be very likely. If there were a stalemated war, then it might be possible to avoid a boycott. Success would depend largely on the skills of the American Ambassadors on the spot.

As for the second part, what lessons have we learned from the 1973 embargo and what precautions have been taken? Very few? I've thought in retrospect that the worst thing I did as Ambassador in Saudi Arabia was to work as hard as I did to get the embargo lifted. If it had lasted another six months I suspect the energy problem would be viewed here much more seriously than it is. But my instructions from Washington bordered on hysteria and had I replied that a continuation of the embargo would have been good for the American body and soul, my tour as Ambassador would have been even more abbreviated than it was.

We have talked of stockpiling oil but have done nothing. We are taking some measures to increase domestic oil production. We have, with our allies, set up the International Energy Agency, something we should have done in 1970 or earlier. But how effective will it be if it comes to the test? If there is a repitition of the 1973 embargo for the same reasons; if the Arabs announce that they have no desire to hurt their friends; but if they announce (as they have already made perfectly well known) that any country which participates in the sharing arrangement will be subject to an embargo itself, then the chances of the IEA standing firm would be small indeed. They would approach the vanishing point if the embargo were applied to the United States for actions taken by it which were opposed by Europe and Japan.

The chances of an embargo by the oil producers, Arab or non-Arab, for reasons unconnected with the Middle East conflict, seem to me to be very small. A more real possibility is that some of the main oil producers, notably Saudi Arabia and the United Arab Emirates, will restrict oil production for conservation reasons or because they cannot find adequate and productive means of investing their income at home or abroad. This particular problem could be resolved relatively easily, I believe, by encouraging Arab investment in the United States, rather than discouraging it as now seems to be the case.

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Words and slogans are not to be underestimated in American society. I was perhaps the first to use the expression "energy crisis" I used it for two reasons; the first was that I believed we were indeed entering a crisis situation; the second was the belief that in the United States we rarely take action unless we are shocked into it. "Crisis" seemed a good word. In President Nixon's energy message of April, 1973 all references to "crisis" were removed.

"How can we speak of crisis", it was asked, "people will wonder why the Administration didn't move four years earlier." It was a sound political point and the emasculated message, when it came out, spoke of the "energy challenge". No one was challenged and little was done. I understand, therefore, why the authors of S. 2532 feel they must talk of "energy independence". It sounds good; it is a noble goal; it might excite the citizens and they might be willing to accept some hardship. There is however danger in using words or slogans that do not mean precisely what they say. We must recognize that S. 2532 will not make us independent in energy in ten years, probably not in twenty, nor is it likely that anything else we will do will allow us to attain this state of bliss. We might as well face the fact that we will continue to depend on imported oil, largely Middle Eastern oil, for the next decade and probably through this century.

It would be much more honest to speak of S. 2532 as a bill "leading toward" energy independence not "leading to" independence. I believe it should be supported, nonetheless; and I believe we should also support a strip-mining bill with strong provisions for restoration of the land and with a tax on all strip-mined coal to be devoted to restoration of lands already devastated by strip mining. I would urge support for increased drilling on the continental shelf and an expanded program of research on new energy forms, fusion, solar energy and geothermal energy. A good case can also be made for complete deregulation of natural gas and petroleum prices but Congress has raised valid objections to it. And of course there should be tax incentives (through high gasoline taxes or other means) to use smaller, efficient cars and to reduce the waste of energy in other areas. All these actions should be taken—and many more;—they will help reduce our dependence on imported oil but they will not eliminate it in ten years and probably not in twenty.

We have almost always looked at oil with more emotion than reason. Oil is a commodity unlike any other and we tend to view it and its producers in a religious rather than an economic light. The time has certainly come when we should look rationally at the industry. It may have been over-favored in the past; it may have grown beyond the point of maximum efficiency today and perhaps these in the country who are attacking it are correct in believing that it should be broken into smaller competing units. But any division decreed by Congress would be, I hope, designed to allow the resulting smaller units to be completely integrated, viable companies. If one of the new units is to be limited to refining or to production of oil alone, it is being sentenced to death when conventional oil is exhausted. Let us hope that the purpose of any anti-oil company legislation is solely to increase efficiency and to increase competition and production, not to punish the industry or to exorcise the ghost of John D. Rockefeller, Sr. If the latter, then our energy problems will be made worse.

Another "easy solution" which we should avoid is the often proposed invasion of the Arabian peninsula. The Library of Congress study points out that even if the oil fields were occupied they could not be kept in production. My own views are even more negative. Leaving aside the morality of the suggestion (Morality in Foreign Policy has fallen into ill repute in the United States in the last few years) it would be catastrophic for the United States. Oil production from the Persian Gulf would be lost for several years and the resulting economic chaos in Europe and Japan would make them easy prey for domestic or even foreign communists. No normal, sane, informed person can propose invasion. Yet we still hear this advanced as the *deus ex machina* to solve our energy and our economic problems.

A third proposal has somewhat more appeal and more logic; that is a resolution in time of peace to import all our oil from non-Arab sources. This would be difficult; perhaps impossible. The non-Arab producers themselves would like diversified markets. Furthermore, restrictions of imports to a few countries might not in the long run be entirely attractive. We could be subject to pressure on price and possibly even on some matter of international politics,

e.g. the Panama Canal, which might not be entirely to our liking. To suggest that it would, in such a case, be easy to shift to other suppliers demonstrates only a lack of understanding of international oil production.

The details of an energy program have been discussed for several years now but I fear any program will fail unless it is based on a few fundamental precepts:

(1) That the world's conventional resources of hydrocarbons are finite and that at some time, probably before the end of this century, we will have physical not political restraints on oil production; that at that time we will have to have made plans for the shift to other energy resources;

(2) That government and private action to increase domestic oil production will be necessary; that it is possible to have a unified program which does not do violence to the economy of the environment but that such a program will not bring us to complete independence in ten years, and probably not in twenty;

(3) That there is real danger in reliance on imported oil and that most of our imports will probably come from the Middle East; Finally, and most critical

(4) That the only real guarantee now for security of energy supplies is peace in the Middle East. With peace there would be no likely reason for cutting off oil supplies; with war, production restrictions must be assumed to be certain. We must also recognize that the United States is the only Power capable of bringing peace to the Middle East. This in no way means selling Israel for Arab oil; it does mean an Israel essentially within its pre-1967 borders and security guarantees for Israel and its neighbors that all consider binding and adequate. We certainly hope this can be achieved through negotiations, but if it cannot then we must move to other alternatives. Politicians of all stripes (exceeding notably George Ball) have long said that we cannot impose peace on the Middle East. This is nonsense. Not only can we do it but we must if negotiations fail. War in the Middle East would be intolerable not only because of the disruption in energy supplies but for the danger of a wider war. And war in the Middle East can be prevented, if we have the will and the wisdom to act.

The CHAIRMAN. Our next witness is Mr. Conant. Go ahead, sir.

STATEMENT OF MELVIN A. CONANT, INTERNATIONAL ENERGY CONSULTANT, AND FORMERLY ASSISTANT ADMINISTRATOR FOR INTERNATIONAL ENERGY AFFAIRS, FEDERAL ENERGY ADMINISTRATION

Mr. CONANT. Mr. Chairman, I was asked to speak particularly on the question of our national security and the extent to which it is involved in a continuing high level of importing of oil. I would like to begin if I might by recommending strongly to you a report which was published for the Joint Atomic Energy Committee in December of last year by the Congressional Research Service entitled "Toward Project Interdependence: Energy in the Coming Decade." This is, in my view, the best report, looking to the years ahead, that we have had available to us. It has also appeared in briefer form in World Oil Report and I have submitted a copy of that briefer summary of the report in the hope that you would include it in the formal record of this hearing.

The CHAIRMAN. How long a report is that, sir?

Mr. CONANT. It's about five pages.

The CHAIRMAN. We will be happy to put that right into the record.

Mr. CONANT. Thank you very much. It's a most useful guide.

Mr. Chairman, I have long used as my guidelines, thinking about the security of our country in energy, three rather obvious objectives.

The supply of energy to our society must be adequate in volume; it must be continuous in its provision; and it must be obtained at a reasonable cost.

Against those three objectives, the following observations are pertinent to your inquiry. First, I believe, along with many others, that the United States for the next decade at least will remain dependent upon oil imports for a vital part of its petroleum supply. There is very little that can be done in the intervening period which will significantly alter that dependence.

Second, I believe, along with others, that there is no realistic possibility that the importance of the Middle East to us in oil supply, and the Persion Gulf in particular, will diminish as the major source of the petroleum imported into the United States.

Third, the quickest possible creation of a strategic reserve is really the only single measure of consequence that can be taken soon that would improve the security position of the United States and with the plans now submitted for moving in that direction I would hope that it would get enthusiastic support of the Congress.

Having said that, Mr. Chairman, the question before us is really the likelihood of a significant interruption of supply and if it is a possibility, what other measures than the strategic reserve, such as the bill before us, could be taken to improve our security? Ambassador Akins has referred to the ever-present danger of an Arab-Israeli conflict. I would support that view and so would many others. I would emphasize perhaps more than he did the utility to us of the International Energy Agency as the first measure which was taken after the embargo and which has, I believe, improved our prospects for sharing whatever oil is available amongst the key industrial states of the free world.

But let me make my principal point, Mr. Chairman; it is a situation which deeply concerns me and which I see coming toward us over this next decade. Surely, one case is the Arab-Israeli conflict and its meaning in terms of energy supply to our country and to our allies, but I would like to mention a perhaps broader and more intense concern.

I see, Mr. Chairman, a competition for Middle East oil throughout this decade which will transcend anything that we have ever known before. I see no possibility that Europe or Japan or our country will be able to take measures soon enough to reduce our collective or individual dependence upon that region. Moreover, Mr. Chairman, I would argue that in that same period of time the chances are good that the Soviet Union and the People's Republic of China will also be competing for some of that Middle Eastern oil. The prospect before us, Mr. Chairman, is one in which allies and potential enemies will be wrestling for access to one of the greatest geological accidents, so to speak, that we know of: the oil of the Middle East. And it is the complexity of that struggle and the implications of it to our foreign policy and to our domestic security, that would lead me to consider all kinds of measures, including the bill before you, to lessen our dependence as rapidly as possible upon that particular source.

We are among the very few nations that have alternatives in this regard and we should exploit these to the maximum extent.

With regard to the particular bill before us, Mr. Chairman, I don't possess the means to know whether such an unprecedented initiative is indeed necessary at this time. I don't know whether the energy industry cannot raise the capital to take an energy invention out of the laboratory into the marketplace. They have ayways been able to do so in the past and I am uneasy over the implication, despite the staggering capital sums required over the next decade, that the private industry is somehow incapable of continuing to meet the challenge. And so I must say I am skeptical of the need for this particular legislation.

I would like to know that other measures which I will list briefly are of no avail, or having tried them we found we were not succeeding in discovering new resources on or off shore or elsewhere than the Middle East; we are clearly not doing enough to resolve our energy problems and Ambassador Akins mentioned these

So it may seem ridiculous then to be wary at the same time of attempting too much, but it has seemed to me that we have a plethora of measures before us which are all aimed at bringing us closer to energy security and some of these will require more time before we know if we have been on the right track. For example, I would ask, and give myself time for the workings of industry, to see how we move. I would ask how is our off-shore search for oil and gas proceeding? How is our effort proceeding to develop intensively and intelligently our vast resources in coal? What will be the effect upon the decisions of the energy industry of a prolonged divestiture debate? Will some of the major capital investments that are necessary to achieve greater energy security actually be made or made in time?

But most important perhaps, Mr. Chairman, how is our effort proceeding to reform the regulatory procedures which may well continue to be the most significant barrier to progress in achieving our energy objectives? Title 6 of the bill before you, Mr. Chairman, addresses itself to this particular problem; I welcome it and hope that perhaps it could stand by itself: it may be that we should stress action in that direction at this particular time rather than provide enormous sums of money. Thank you very much.

[Complete statement follows:]

STATEMENT OF MELVIN A. CONANT, FORMER ASSISTANT ADMINISTRATOR FOR INTERNATIONAL AFFAIRS OF THE FEDERAL ENERGY ADMINISTRATION

Mr. Chairman, Members of the Committee, I am Melvin A. Conant, of Great Falls, Virginia, until recently Assistant Administrator for International Affairs, of the Federal Energy Administration. I am now following world energy developments in my private capacity. I was invited to this hearing to discuss our national security energy interests have bearing upon such proposals as the Energy Independence Authority.

I welcome this opportunity and thank you for it.

Only a very few years ago a discussion of the sort we are having this morning would have been of interest to a very few specialists in government and industry; today, there is no quicker way of emphasizing the change which has come over the topic than to cite the hundreds of studies which have emerged since 1974 alone on every conceivable aspect of the problems posed our nation, and all our citizens, by "energy": its adequate and continuous supply at reasonable cost.

Some of these studies have been first-rate. Quite possibly the most useful of all for the intelligent layman and policy-maker is the report "Towards

Project Interdependence: Energy in the Coming Decade" prepared for the Joint Committee on Atomic Energy by Dr. Herman T. Franssen, and his associates, of the Congressional Research Service of the Library of Congress, in December, 1975. This particular report is required reading for any serious discussion of energy and the U.S. National Interest. The key findings of this report have been published in "World Oil" for April of this year. Because of the importance which I attach to this paper, I request your permission, Mr. Chairman, to have the summary article from "World Oil" attached to my own testimony and included in the record of this hearing.

I believe that an informed debate about our national energy position could begin with agreement on the following points:

(1) The United States, for the next decade at least, will remain dependent upon oil imports for a vital part of its supply;

(2) There is no realistic possibility that the importance of the Middle East, and the Persian Gulf in particular, will diminish as the major source of our imported supply.

(3) Quickest possible creation of the "strategic reserve" is an absolute necessity if we are to limit the damage which could be done us if there were again an interruption of supply.

The question before us is the likelihood of a significant interruption of supply, and if it is a possibility, what other measures than the strategic reserve should be taken to improve our security in energy.

It is my view that the United States, along with many other industrial states has to deal with a situation in which its oil imports have already reached a "critical" level—some forty per cent of our total oil consumption—and that proportion is going to rise over the decade; we could well be importing as much as 11mm b/d by 1985.

What events could endanger that supply?

The most commonly cited one would be a tragic re-occurrence of an Arab war with Israel. A renewal of the conflict would result in another shortfall in supply; and this time, while its imposition might again affect largely the exports from the Arab states of the Gulf, the importance of Saudi Arabia would be considerably enhanced by virtue of its acknowledged preeminent position among oil exporters.

Since there appears to be no prospect of a significant lessening of the danger of war between Israel and the Arab states, we have to conclude that it is very much to our national interest that we take measures to reduce our vulnerability. In addition to the strategic reserve, we have in place the International Energy Agency whose principal purpose is to help insure there is an equitable sharing of available oil between its members; we are considerably better off in this respect than we have ever been before. Who can tell what the severity of an embargo might be? Who can forecast which producers would embargo and which would not? Who can tell which would formally attach an embargo but not enforce it?

While most discussion of our energy vulnerability rests with the Israeli case, so to speak, there is an even more serious prospect before all of us, and this larger danger should cause us to move swiftly to diminish our dependence upon imported supply generally, and supply from the Middle East in particular. Let me refer to the coming competition for Middle East oil.

In recent history, the competition for Middle East oil took the form of competition for concessions, or privileged access to oil. Once secured, there was ample oil to meet the world's needs, and competition, of the kind I forsee, simply didn't exist.

But in the years ahead, the United States, and most of Europe, Japan and some large part of the developing world will still not have found immense new reserves outside the Middle East; and, if by some miracle, such reserves are discovered, there will still be years of development, and the creation of the logistics systems before the oil could enter world trade in meaningful quantities. At the same time, the volumetric demand for oil will be rising and the Persian Gulf, especially Iraq, Iran and, above all, Saudi Arabia, will be the focal point of our attentions.

Let me go further and suggest to this Committee that the competition for access to Middle East oil will reflect not only the vital needs of the democratic, industrial states but the import requirements of the Soviet Union and China as well. In neither of these two communist nations can the bulk of

their import requirements be met from elsewhere, or such I see as the prospect.

It is inconceivable to me that a nation which has practical alternatives to its dependence upon the Middle East will not exert every effort to limit its energy dependence upon that region. And the United States has alternatives but none of them is either easy, cheap nor quick.

Over the past year we have engaged in an intensive, protracted debate; what should be done?

One of the larger proposals is the Energy Independence Authority whose principal purpose is, as I understand it, to shorten the time in which energy projects, which have gone beyond the laboratory, and are ready for commercial production, are made available to our society and economy. The sum required—one hundred billion dollars—is staggering; the need for intensive precautions to prevent abuse, and the necessity for guidelines and review to accomplish our objectives are all expressed in the proposed legislation.

I don't possess the means to know whether such an unprecedented initiative is necessary; I don't know whether the energy industry cannot raise the capital to take an energy "invention" to the market place; or whether out-there, somewhere, there are commercially applicable energy developments which languish from want of a hearing. If there are, some kind of assistance might be needed.

We are clearly not yet doing enough to resolve our energy problems. It may seem ridiculous, then, to be wary of attempting too much. But I am wary; I would want to know that if other measures fail we could resort to the use of such as EIA to insure that lack of money is not the cause of our failure to make us more self-reliant in energy.

Specifically, how is our off-shore search for oil and gas proceeding?

How is our effort proceeding to develop intensively and intelligently our vast resource in coal?

How are efforts going towards serious conservation?

How is our effort proceeding to reform the regulatory procedures which may well be the most significant barrier to progress in energy? (Title III of EIA could stand by itself)—

What will be the effect upon the energy industry of a prolonged "divestiture" debate? with key decisions understandably postponed and perhaps never made?

If we have tackled all these major questions, and still find our efforts wanting, then further examinations might cause us to have to look at such legislation as the proposed Energy Independence Authority Act. But I cannot, out of my own knowledge assert that time is now.

The CHAIRMAN. Thank you very much, sir.

STATEMENT OF JOHN H. LICHTBLAU, EXECUTIVE DIRECTOR, PETROLEUM INDUSTRY RESEARCH FOUNDATION, INC.

Mr. LICHTBLAU. The connection between the proposed Energy Independence Authority and national security is spelled out in title 1 of the bill which states that the principal purpose of the Authority is to attain energy independence by 1985 and that such independence is essential for maintenance of national security. The bill does not define independence. The administration first used the term at the end of 1973 and it was clearly meant to be taken literally, that is, reducing oil imports to zero or close to it. Since then, the concept has changed significantly.

Thus, while the FEA's first Project Independence report issued in November 1974 contained a zero import scenario for 1975 among its four scenarios which assumed maintenance of existing prices, the update of this report issues last February does not have any zero import scenarios among the eight comparable 1985 projections.

Similarly, the FEA's base case has undergone a substantial revision from an import ratio of 17 percent of U.S. oil demand in the

earlier case to 25 percent in the update case, which must still be considered optimistic on the basis of most of the other recent forecasts.

I'm only quoting these numbers to illustrate how far we have moved from the original concept of energy independence. I think one can say categorically that the attainment of true energy independence or even approaching this target is unachievable by 1985–86, almost regardless of what we do. But if we cannot achieve energy independence, we can at least attain a substantial reduction in dependence from the current level of 41 to 42 percent of U.S. oil demand, and can the EIA be of help in this endeavor?

There are two ways to reduce our level of oil imports significantly by 1985. One is luck. The other is a massive national effort, affecting all aspects of the economy. The first approach would require nothing less than the discovery of very large domestic reserves of oil and gas in the next 2 to 3 years. For instance, if we can find two fields the size of Prudhoe Bay in the Outer Continental Shelf and if we can develop them with a minimum of technical and regulatory delay, we might by 1985–86 be able to reduce our oil imports to perhaps 25 percent of our demand which would of course be a major improvement over our present dependence. The probability of such an occurrence is considered very low by oil company and government geologists. But capital availability has very little to do with it. Oil companies are willing and able to explore our frontier areas to the maximum extent possible. The only things that have held them back so far were government delays in putting frontier areas up for leasing and private and public environmental opposition to exploratory drilling. There is no indication that the search for offshore or Alaskan oil has been hampered by lack of capital.

Short of the unlikely event of such major new discoveries, a substantial oil import reduction by 1985 would require an effective national policy which would have to assign the highest priority to the attainment of this goal. Obviously, this would necessitate the reordering of other national priorities. Putting aside for the moment the question of whether such a reordering is justifiable or desirable, let us look briefly at what contribution, if any, the EIA could make toward the achievement of this goal.

The two principal means of import reduction over the period under consideration would have to come from a substantial lowering of demand and the modification of environmental restrictions. Demand curtailments can be achieved directly through rationing or indirectly through price increases—by means of excise taxes or by letting energy prices rise to world levels—or through conservation measures. The first two obviously do not require the type of financial aid the EIA would have to offer. Energy conservation does require some capital expenditures. But in general, the expenditure is likely to be self-liquidating through lower energy costs. Any conservation expenditure that cannot be justified in this way runs the risk of creating a resource misallocation. But apart from this, if the Government wishes to encourage the installation of conservation equipment and mechanisms there are much simpler ways of accomplishing this goal than by creating a $100 billion financial assistance agency. Fast tax writeoffs and tax credits have frequently and successfully been used in the past to encourage specific investments considered in the

national interest. I think capital expenditures for energy conservation equipment would respond readily to such treatment if the Government finds it desirable to encourage them.

In the area of environmental restrictions, the principal changes required in order to lower future oil imports would be a change in some air pollution standards to permit the burning of additional coal, and a change in the environmental restrictions on strip mining of low-sulfur Western coal. I am not here advocating these changes but without them the vast potential of domestic coal reserves cannot be fully utilized as a substitute for oil and gas in industrial and powerplants. Again, whatever effort this requires, additional capital not otherwise available is not one of them.

One environmental measure, the installation of flue-gas scrubbers to permit the burning of high-sulfur coal by utilities, does require a considerable amount of capital. However, the principal reason that many utilities are less than enthusiastic about scrubbers is that scrubbers are new and some utilities still lack confidence in their round-the-clock operability. Furthermore, they insist there are less expensive ways to cope with the hazards of sulfur emissions, such as intermittant sulfur control depending on weather conditions. Whatever the validity of these and other reasons for not installing scrubbers, they have little to do with unavailability of capital. Furthermore, all the scrubbers which are likely to be installed between now and early 1980's—when the EIA would have to cease giving financial aid—are expected to cost less than $5 billion, a large part of which would be financed privately even if EIA funds became available.

Next, a reduction in oil imports would of course require an increase in domestic oil and gas production. We have already discussed the search in the frontier areas. In the more conventional areas the expectation for substantial production increases is not very good. But the manmade constraints here are not capital availability but price controls. Higher prices for some of the "old" oil would encourage more secondary and perhaps even some tertiary recovery. Certainly, the removal of price controls on newly discovered gas, or at least a substantial increase in its price, would greatly encourage the search for this hydrocarbon. It is difficult to see what function the EIA would have in all this.

The situation is quite different for synthetic oil and gas. Here substantial amounts of high risk capital are required to start an entirely new industry whose product will probably be as high priced, at least initially, as the highest cost imported oil at current prices. So here a certain amount of government financial assistance would clearly be helpful. However, this is already provided in another much more modest bill which has the specific purpose of encouraging the development of a synthetic fuels industry. As you know, such a bill was passed by the Senate last year but, regrettably, was defeated in the House. Currently, a somewhat similar bill—H.R. 12112—is under consideration in the House. The $4 billion provided in this bill over the next 2 years would probably be enough to get the program off the ground, although I believe the bill would be much more effective if it were not limited to loan guarantees but allowed

a variety of forms of financial assistance. If the program proves successful, additional appropriations can be authorized later on.

It should be pointed out, however, that the absolute maximum of synthetic fuels production that can realistically be expected by 1985 under the most favorable circumstances would be 750,000–800,000 barrels a day. In the absence of any special government assistance, we may have 250,000–300,000 barrels a day by then. Thus, the contribution of Government-financed synthetic fuel plants to energy independence would be quite small, no more than 2.5 to 3 percent of total U.S. oil demand.

Finally, there is the question of financing nuclear power stations which is specifically mentioned in the bill. These have of course very high capital costs. But here again, capital shortage does not presently put a major restraint on the construction of these plants. Most recent cancellations are due either to excessive delays on the part of regulatory agencies in granting permits or to downward adjustments in electric power demand projections. If electric utilities were encouraged by funds available from the EIA to build additional plants they would then have to promote the sale of the output from these plants. This would tend to make them much less eager to institute such energy conservation practices as marginal cost rate structures. The result would probably be a net increase in the use of electric power which would be counter to the very purpose of the EIA.

Altogether, then, it would seem that we will not be able to do much more than we are already doing on the supply side towards reducing our foreign energy dependence. On the demand side we can do much more if we want to. But the more we do the more it will impact on the rest of the economy. We can also increase our domestic coal output but not without causing some additional environmental deterioration. But whatever we decide to do, the type of financial assistance proposed under the EIA would not be required.

Yet, the problem with an institution such as the proposed agency is that if it does not find economically and socially justifiable outlets for its activities it is likely to come up with some less justifiable ones. Thus, it is entirely possible that by 1985 we may be stuck with billions of dollars of uneconomic projects or with projects that would otherwise have been financed through private funds without risk or cost to the taxpayer.

Now I would like to return briefly to the national security aspects of our future oil imports. Obviously, all other things being equal, a lower level of imports is preferable to a higher but fairly substantial level of imports is quite tolerable over the next 9 to 10 years—strategically, economically and logistically. Let us suppose we will have to import up to 10 million barrels a day by 1985. Can we cope with a volume of this magnitude?

Let us look first at the strategic implications. The principal danger here is another political embargo or a cutoff of supplies as a result of foreign military actions. Our strategic petroleum reserves which are now in the process of being built up will go a long way to reduce this danger. By the end of 1982 we will have 500 million barrels of strategic reserves under the existing law. While this will certainly help, a higher level of strategic reserves would be more desir-

able. A volume of 750 to 800 million barrels, together with a relatively modest rationing program, could protect us for 7–8 months from the effects of a sustained foreign oil interruption large enough to deprive us of half of our total imports. This would probably enable us to cope with most realistically conceivable emergency situations. It would seem therefore that we could derive a much higher national security benefit from spending $3 to $4 billion over the next 5 years to raise our strategic oil reserves to 750–800 million barrels than by spending that same amount on EIA-funded projects.

The physical availability of 10 million barrels a day of foreign oil for U.S. import purposes would not seem to be in question between now and 1985. Current excess oil producing capacity in the OPEC nations, reasonable estimates of world oil demand increase over the next 10 years and the development of new supply sources abroad all indicate that such a volume of oil could be obtained without depriving other importing nations of their needs.

The future price of imported oil is of course a matter of conjecture. But if we can accept the statements of most of the more responsible OPEC spokesmen that OPEC's future pricing policy will aim only at the maintenance of existing oil prices in real terms we will be able to cope with the cost of a 10 million barrels a day import level in 1985, assuming the long-term historic trend in the growth rate of our export trade will continue, enabling us to pay for the higher oil imports.

I would like to make clear that I'm neither advocating nor projecting a 10 million barrels a day import level for 1985. I am merely saying that if we needed such a level it would probably be obtainable, affordable and protectable.

The year 1985 is of course an arbitrary cutoff point for an analysis of our oil import dependency. Beyond that date our dependency could become more problematic. By the later 1980s OPEC's excess producing capacity will probably have disappeared and most incremental world oil demand may have to be met from a very small number of sources with all the potential political and economic risks attendant to such a situation.

While such a development is not certain it is certainly possible. We can only hope that in the intervening 10 years we will have learned more about energy conservation, enhanced oil recovery techniques, and the utilization of coal without environmental degradation, will have constructed a first generation of shale oil and coal gasification plants and will have made a beginning in the commercial development of solar energy and other import dependency that will probably prove unfounded in the next 9 to 10 years may become only too real in the following decade.

I would just like to add, Mr. Chairman, that I agree with Mr. Conant on his comments on title 6 of the bill, that this is a very useful and significant proposal.

[Complete statement follows:]

STATEMENT OF JOHN H. LICHTBLAU, EXECUTIVE DIRECTOR, PETROLEUM RESEARCH FOUNDATION INC.

I would like to thank you for inviting me to testify at today's hearing on S. 2532, the bill to establish an Energy Independence Authority (EIA) which would have the authority to spend up to $100 billion over the next 8–9 years

in providing financial assistance to the energy sector of the U.S. economy. In your letter of invitation you asked me to address myself in particular to the national security aspect of the bill.

The connection between the proposed EIA and national security is spelled out in Title I of the Bill which states that the principal purpose of the Authority is to attain energy independence by 1985 and that such independence is "essential . . . for maintenance of national security."

The Bill does not define energy independence. When the Administration first used the term at the end of 1973 it was clearly meant to be taken literally, that is, reducing oil imports to zero or close to it. Since then the concept has changed significantly. Thus, while the FEA's first Project Independence Report, issued in November 1974, contained two zero import scenarios for 1985 among its four scenarios which assumed maintenance of existing prices, the update of this report, issued last February, does not have any zero import scenario among the eight 1985 scenarios which assume maintenance of existing prices. Similarly, the FEA's Base Case scenario has also undergone a substantial upward revision. The earlier Base Case showed an import ratio of 17% of U.S. oil demand by 1985 which was considered unrealistic by most other forecasters. This has now been changed to a 25% import ratio which must still be considered optimistic (though not unrealistic) on the basis of a majority of other recent import forecasts.

I am only quoting these numbers to illustrate how far we have moved from the original concept of energy independence. I think one can say categorically that the attainment of true energy independence or even approaching this target is unachievable by 1985–86, almost regardless of what we do.

But if we cannot achieve energy independence can we at least attain a substantial reduction in energy dependence from the current level of 41–42% of U.S. oil demand, and can the EIA be of help in this endeavor?

There are two ways to reduce our level of oil imports significantly by 1985. One is luck, the other is a massive national effort, affecting all aspects of the economy. The first approach would require nothing less than the discovery of very large domestic reserves of oil and gas in the next two to three years. For instance, if we can find two fields the size of Pruhoe Bay in the Outer Continental Shelf and if we can develop them with a minimum of technical and regulatory delay we might by 1985/86 be able to reduce our oil imports to perhaps 25–27% of our demand which would of course be a major improvement over our present dependency. The probability of such an occurrence is considered very low by oil company and government geologists. But capital availability has very little to do with it. Oil companies are willing and able to explore our frontier areas to the maximum extent possible. The only things that have held them back so far were government delays in putting the frontier areas up for leasing and private and public environmental opposition to exploratory drilling. There is no indication that the search for offshore or Alaskan oil has been hampered by lack of capital.

Short of the unlikely event of such major new discoveries, a substantial oil import reduction by 1985 would require an effective national policy which would have to assign the highest priority to the attainment of this goal. Obviously, this would necessitate the reordering of other national priorities. Putting aside for the moment the question of whether such a reordering is justifiable or desirable, let us look briefly at what contribution, if any, the EIA could make towards the achievment of this goal.

The two principal means of import reduction over the period under consideration would have to come from a substantial lowering of demand and the modification of environmental restrictions. Demand curtailments can be achieved directly through rationing or indirectly through price increases (by means of excise taxes or by letting energy prices rise to world levels) or through conservation measures. The first two obviously do not require the type of financial aid the EIA would have to offer. Energy conservation does require some capital expenditures. But in general the expenditure is likely to be self-liquidating through lower energy costs. Any conservation expenditure that cannot be justified in this way runs the risk of creating a resource misallocation. But apart from this, if the government wishes to encourage the installation of conservation equipment and mechanisms there are much simpler ways of accomplishing this goal than by creating a $100 billion financial assistance agency. Fast tax write-offs and tax credits have frequently and successfully

been used in the past to encourage specific investments considered in the national interest. I think capital expenditures for energy conservation equipment would respond readily to such treatment if the government finds it desirable to encourage them.

In the area of environmental restrictions, the principal changes required in order to lower future oil imports would be a change in some air pollution standards to permit the burnings of additional coal, and a change in the environmental restrictions on strip mining of low-sulfur western coal. I am not here advocating these changes but without them the vast potential of domestic coal reserves cannot be fully utilized as a substitute for oil and gas in industrial and power plants. Again, whatever effort this requires, additional capital not otherwise available is not one of them.

One environmental measure, the installation of flue-gas scrubbers to permit the burning of high-sulfur coal by utilities, does require a considerable amount of capital. However, the principal reason that many utilities are less than enthusiastic about about scrubbers is that scrubbers are new and some utilities still lack confidence in their round-the-clock operability. Furthermore, they insist there are less expensive ways to cope with the hazards of sulfur emissions, such as intermittent sulfur control depending on weather conditions. Whatever the validity of these and other reasons for not installing scrubbers, they have little to do with unavailability of capital. Furthermore, all the scrubbers which are likely to be installed between now and early 1980's (when the EIA would have to cease giving financial aid) are expected to cost less than $5 billion, a large part of which would be financed privately even if EIA funds became available.

Next, a reduction in oil imports would of course require an increase in domestic oil and gas production. We have already discussed the search in the Frontier areas. In the more conventional areas the expectation for substantial production increases is not very good. But the man-made constraints here are not capital availability but price controls. Higher prices for some of the "old" oil would encourage more secondary and perhaps even some tertiary recovery. Certainly, the removal of price controls on newly discovered gas, or at least a substantial increase in its price, would greatly encourage the search for this hydrocarbon. It is difficult to see what function the EIA would have in all this.

The situation is quite different for synthetic oil and gas. Here substantial amounts of high risk capital are required to start an entirely new industry whose product will probably be as high-priced, at least initially, as the highest cost imported oil at current prices. So here a certain amount of government financial assistance would clearly be helpful. However, this is already provided in another much more modest bill which has the specific purpose of encouraging the development of a synthetic fuels industry. As you know, such a bill was passed by the Senate last year but, regrettably, was defeated in the House. Currently, a somewhat similar bill (HR 12112) is under consideration in the House. The $4 billion provided in this bill over the next two years would probably be enough to get the program off the ground, although I believe the bill would be much more effective if it were not limited to loan guarantees but allowed a variety of forms of financial assistance. If the program proves successful, additional appropriations can be authorized later on.

It should be pointed out, however, that the absolute maximum of synthetic fuels production that can realistically be expected by 1985 under the most favorable circumstances would be 750–800,000 b/d. In the absence of any special government assistance, we may have 250,000–300,000 b/d by then. Thus, the contribution of government financed synthetic fuel plants to energy independence would be quite small, no more than 2.5 to 3% of total U.S. oil demand. Certainly, it would not warrant the expenditure of a substantial share of the proposed $100 billion to which the EIA would have access.

Finally, there is the question of financing nuclear power stations which is specifically mentioned in the bill. These have of course very high capital costs. But, here again, capital shortage does not presently put a major restraint on the construction of these plants. Most recent cancellations are due either to excessive delays on the part of regulatory agencies in granting permits or to downward adjustments in electric power demand projections. If electric utilities were encouraged by funds available from the EIA to build additional plants they would then have to promote the sale of the output from these plants. This

would tend to make them much less eager to institute such energy conservation practices as marginal cost rate structures than they would otherwise be. The result would probably be a net increase in the use of electric power which would be counter to the very purpose of the EIA.

Altogether, then, it would seem that we will not be able to do much more than we are already doing on the supply side towards reducing our foreign energy dependence. On the demand side we can do much more if we want to. But the more we do the more it will impact on the rest of the economy. We can also increase our domestic coal output but not without causing some additional environmental deterioration. But whatever we decide to do, the type of financial assistance proposed under the EIA would not be required.

Yet, the problem with an institution such as the proposed agency is that if it does not find economically and socially justifiable outlets for its activities it is likely to come up with some less justifiable ones. Thus, it is entirely possible that by 1985 we may be stuck with billions of dollars of uneconomic projects or with projects that would otherwise have been financed through private funds without risk or cost to the taxpaper.

Now I would like to return briefly to the national security aspects of our future oil imports. Obviously, all other things being equal, a lower level of imports is preferable to a high, from the point of view of national security. But a fairly substantial level of imports is quite tolerable over the next 9 to 10 years—strategically, economically and logistically. The question is of course what is tolerable. Let us suppose we will have to import up to 10 million b/d by 1985. Can we cope with a volume of this magnitude?

Let us look first at the strategic implications. The principal danger here is another political embargo or a cut-off of supplies as a result of foreign military actions. Our strategic petroleum reserves which are now in the process of being built up will go a long way to reduce this danger. By the end of 1982 we will have 500 million barrels of strategic reserves under the existing law. While this will certainly help, a higher level of strategic reserves would be more desirable. A volume of 750 to 800 million barrels, together with a relatively modest rationing program, could protect us for 7–8 months from the effects of a sustained foreign oil interruption large enough to deprive us of half of our total imports. This would probably enable us to cope with any realistically conceivable emergency situation. It would seem therefore that we could derive a much higher national security benefit from spending 3 to 4 billion dollars over the next 5 years to raise our strategic oil reserves to 750–800 million barrels than by spending that same amount on EIA-funded projects.

The physical availability of 10 million b/d of foreign oil for U.S. import purposes would not seem to be in question between now and 1985. Current excess oil producing capacity in the OPEC nations, reasonable estimates of world oil demand increases over the next 10 years and the development of new supply sources abroad all indicate that such a volume of oil could be obtained without depriving other importing nations of their needs.

The future price of imported oil is of course a matter of conjcture. But if we can accept the statements of most of the more responsible OPEC spokesmen that OPEC's future pricing policy will aim only at the maintenance of existing oil prices in real terms we will be able to cope with the cost of a 10 million b/d import level in 1985, assuming the long-term historic trend in the growth rate of our export trade will continue.

I would like to make clear that I'm neither advocating nor projecting a 10 million b/d import level for 1985. I am merely saying that if we needed such a level it would probably be obtainable, affordable and protectable.

The year 1985 is of course an arbitrary cut-off point for an analysis of our oil import dependency. Beyond that date our dependency could become more problematic. By the later 1980's OPEC's excess producing capacity will probably have disappeared and most incremental world oil demand may have to be met from a very small number of sources with all the potential political and economic risks attendant to such a situation.

While such a development is not certain it is certainly possible. We can only hope that in the intervening 10 years we will have learned more about energy conservation, enhanced oil recovery techniques, and the utilization of coal without environmental degradation, will have constructed a first generation of shale oil and coal gasification plants and will have made a beginning in the commercial development of solar energy and other exotic forms of energy. Un-

less we have, all the fears about oil import dependency that will probably prove unfounded in the next 9 to 10 years may become only too real in the following decade.

The CHAIRMAN. Thank you very much, Mr. Lichtblau.

Mr. Maxwell.

STATEMENT OF CHARLES T. MAXWELL, SENIOR VICE PRESIDENT AND DIRECTOR, CYRUS J. LAWRENCE, INC., NEW YORK

Mr. MAXWELL. Mr. Chairman, there would appear to be 2 main roads that we can travel in confronting our energy problems. The right hand of these would be the maintenance of the minimum 6 billion barrels a day of imports that's discussed here and attempts to solve our problem basically at home at very high investment costs. The left hand of these would be to allow the present trends to continue, the trends in being that will carry us on projections made by my firm to 50 percent import rate by 1980 and as low as 60 percent import rate by 1985 only if a number of factors involving deregulation and greater use of coal and release of outer continental shelf areas are pursued successfully perhaps the import rate by 1985 would be higher than 60 percent.

Obviously, such a course by 1985 represents unacceptable political and economic and military risks, but I would consider that these 2 roads are both extremes; that our course lies in the middle and I think that the testimony of the 3 gentlemen that preceded me generally bears out that view. In other words, to be short, I think that there are ways by which we can attempt to solve our problems that are within and which we have present technology we can use, we have present reserves better, we have means to deliver ourselves from our problems which we have not exhausted, and we should attempt to do those things first because they represent lower costs, less social disorganization, and I think in the end less risks, using the word risk in the wider context both involving imports from abroad and the maintenance of strong GNP growth at home with all that implies for our social scene.

I therefore would be against the EIA as the bill is presently written because I feel that it would involve the country in expenditure which has not yet been defined as needful. We have not pursued all other remedies which would give us the same result at substantially lower costs and I would suggest that there are risks in every course. One cannot defend the idea of going to Project Independence defined as a minimum 6 million barrels a day and say that is the less risky course. There are very substantial political and economic risks in maintaining that low import figure.

Specifically dealing with S. 2532, I think that it is a blank check. I think that the assumption that there are a lot of projects of traditional capital sources has yet to be proven. I think that there is a tendency to fund more and better projcest to produce energy when perhaps a far greater reliance should be placed on means to drop the rate of consumption both by work with people changing people's habits as well as new types of investment which would emphasize conservation. I think the time limit in the bill for EIA of 7 to 10 years is impractical in terms of what it will actually work out to be.

I think it will go for many years after that and probably will be a reservoir of losing projects that will always demand 5 more years in order to pay out into the public and the life of this organization will be extended and extended with new and more exciting overlays of bureaucratic layers.

I think that it also is difficult to assume that we can throw money in our energy problems and come up with solutions to them. This is a great deal of money. I think that we are relying here very much on new technological means to solve our problems. I think there are, as Mr. Akins has strongly implied, political means, foreign policy means to solve them also. I think there are also social means to solve some of our energy problems and in the end I think that an overall course involving pursuit of a number of different objectives, each of which is lower cost and closer to our grasp today, will prove to be more attractive to society than the pursuit of vast and grandiose plans on shaky technological grounds and incredible costs to the public.

Thank you.

The CHAIRMAN. Thank you very much, Mr. Maxwell.

[Complete statement follows:]

New York, N.Y., May 10, 1976.

Hon. WILLIAM PROXMIRE,
Chairman, Committee on Banking, Housing and Urban Affairs,
U.S. Senate, Washington, D.C.

DEAR SENATOR PROXMIRE: There are a great number of technical, legal and semantic points in the text of the legislative proposals to set up an Energy Independence Authority (EIA) which deserve close scrutiny. However, I would prefer not to deal with them at this time because I believe the core of the debate must, in the first stage, deal with an overall definition of the problem to be solved and the efficacy of the Act in doing this. I therefore wish to comment on the proposals as a body of principles rather than as a collection of specific measures.

The possible establishment of a government corporation of the size, scope, function and power of the Energy Independence Authority (EIA) inevitably raises three broad categories of public policy questions.

Firstly, is energy "independence," defined here is a maintenance of U.S. oil imports at levels no higher than 6 million barrels per day (b/d) by 1985 really necessary? What are the costs and risks and rewards of not pursuing this goal, vs. trying to achieve it? If the answer to this, usually treated as more obvious than it really is, should emerge as "yes," then we pass to the second category of question: Are there means to achieve energy "independence" which are considered viable, i.e., will they work in the required time span of the next 5–15 years? Can they be implemented on present technology, at costs normally supportable by the society and without disruptive side effects? If the answer to these is "yes" then it remains to be asked: Is this Act establishing the EIA the best means to achieve our objective of energy "independence" among other policy courses from which we might logically choose?

For purposes of illustration a "yes" has been accepted in the answers above. The weight of evidence, however, suggests that at best the case for positive answers to all three critical questions is an unproven one, and at worst subject to reasonable doubt by observers familiar with the issues.

The first question: "Is energy independence really necessary?

Proponents have argued that "vulnerability to an oil embargo, or any interference with a stable and continuing supply of oil would jeopardize our national security, decrease our freedom of action abroad and threaten the credibility of our pledge to stand by our responsibilities in the world."

Critics could logically assert a number of contrary views:

1. There would still be substantial "vulnerability" to the extent of six million barrels per day by 1985, or something between 25 and 30% of assumed oil consumption at that time even under the best of circumstances.

2. Oil is only one of over 50 critical commodities which we in the U.S. are having to depend more on foreign imports each year to obtain in sufficient quantity to meet our needs. "Independence" or greater "sovereignty" in foreign affairs may be a dream in the world of today unless we are prepared to drastically reduce the demand of the U.S. consumer or create substitute supplies across a broad range of raw materials. The problem is basically our high American standard of living and rising demands for raw materials. Current trends indicate we will continue to outstrip our country's ability to supply an ever-increasing range of commodities. The U.S., with 6% of the world population is already believed to consume some 35% of all raw materials produced.

What oil is important, perhaps the most important of all commodities, where do we draw the line? Defending our position in oil at substantial extra cost to the consumer while becoming more dependent in 49 other areas is hardly an argument in favor of the effort.

3. "Freedom of action abroad" which is so important to some proponents of energy independence, did not allow us to solve our major foreign policy problems when we were less dependent on foreign oil. Our involvement in Viet Nam or our position vis-a-vis Israel and the Arabs in the Middle East was not satisfactorily resolved by having larger oil supplies. Would the high cost to pay for achieving stability of U.S. imports at 6 million b/d provide some new and as yet unseen catalyst to give us the answers to issues such as these? The proposition is arguable. If for instance our relative "invulnerability" should embolden us to stay on in the Panama Canal Zone for years beyond the acquiescence of the Panamanians (in what they took to be a forced military occupation), would this be one of the advantages energy independence might confer on us in the foreign sphere? Obviously not.

4. On the terrible assumption that World War III remains a possibility, however remote, the issue of American vulnerability to an oil embargo in those circumstances would surely be irrelevant. The conflict would be decided well before any 6 or 12 month supplies of stored oil reached critical levels.

5. On the other assumption of "brush fire" wars short of all-out nuclear hostilities and/or selective embargoes from unfriendly nations the answer there might well be framed in terms of cultivating a wider diversity of foreign supply sources in advance, of implementing major storage programs in this country, and of establishing emergency programs of energy production combined with conservation that could be executed under a situation of duress. It must be remembered that oil cut offs are not the same as energy cut offs. Oil represents a dominant part of our energy, about 47% of the total in this country today, but a cutback in this figure by, say, 25% as representative of the aggregate Arab supplies would only reduce all available energy by approximately 12%. Storage, greater production of other fuels, conservation and some change in public consumption habits (as begun in the 1973 Arab oil embargo but not sustained) could carry us over the hurdle of a 12% shortfall for over a year without the economic or military damage predicted by some. In circumstances of real (and fully perceived) pressure, the American public has an unusual ability to respond.

6. Circumstances of the last embargo, in which heavy military help was given one side in the Middle East and not the other, are not likely to reoccur. America's stance is more even-handed now that simplistic and patch-up solutions have been abandoned in a more realistic appraisal of our own long-term interests in the area. That an embargo could nevertheless be imposed again is accepted. That its odds of occurring are high enough to cause reasonable men to take all possible precautions at extraordinary cost and effort is a debatable point unless such a cutoff would completely stall, or permanently damage our economy. Evidence of the last embargo indicates how many leaks there were in the tighest enforcement programs, how different the actions of OPEC members between Arab and non-Arab exporters and how quickly economic and political pressures to terminate the embargo built up. With Arab countries in the Middle East deeply committed to highly expensive development programs depending on Western technology and managerial help, these pressures would be even greater today.

A further point made by proponents of energy independence involves the inflationary impact and balance-of-payment problems believed to result from failure to meet most of our own energy needs, i.e., in rising levels of imported crudes at consistently higher prices.

Counterpoints to these arguments are relatively easy to uncover:

1. *The real cost of exploring for, finding and developing oil supplies is going up rapidly in this country under any set of circumstances.* The choices are not really between "cheap" domestic crudes and "expensive" foreign crudes. (To obtain the incremental barrel of U.S. crude, when it's available, already costs the country close to $6.00 per barrel before risks and profits and depletion and interest costs, etc. Oil to be derived from synthetic crudes may run $14–$18 per barrel on the margin.) While relative values still favor domestic crude, the gap is closing. As U.S. demand picks up and we move further into higher cost sources (North Slope, offshore East Coast, oil shale, etc.), the incremental cost of a barrel of foreign and domestic crude as purchased in the market may cross at about $15 per bbl by 1980. In terms of the investment cost to mankind as a whole, U.S. oil is already the most expensive in the world. Incremental oil supplies can be developed onshore in Saudi Arabia at an investment cost of about $500 per barrel per day (continuing production). In this country the incremental onshore barrel has an investment cost of about $6,000 while $8,000–$10,000 covers general volume options on the North Slope. Development of synthetic fuels in the years ahead suggests production investments in the stratospheric range of $16,000–$20,000 per bbl.

The selling price of a Saudi barrel of course carries a heavy government-imposed profit component akin to a tax. This should be seen as a transfer of funds out of our economy to theirs. However, to the extent that the Saudis at the same time buy our "way of life," importing our cars and consumer durables and equipment and technology at total costs close to those representing our purchases of their oil, there is an exchange here that allows us to win back some of the Saudi "profit" and obtain oil supplies at more reasonable real costs than are generally understood.

At the same time, by turning to a higher proportion of imports instead of developing new oil at home our economy does avoid large commitments to highly expensive productive capacity. There may be a price to pay for this but there are also advantages. Capital funds are freed to go into other areas where American know-how and manufacturing is basically more efficient, and comparable rewards can be gained from lower inputs. The effect of this is also to lower inflationary pressures on an economy that has for some years been trying to do too many things at the same time. This advantage only partially offsets the higher cost per barrel of imports and does not address the security issue.

2. There is security also in creating economic conditions at home that permit relatively high employment and growth of GNP and disposable income by consumers. This is particularly important in a society such as ours with many ethnic communities that are emerging from less attractive social conditions of past years. It could be termed a security issue that a policy of economic growth be maintained. If large increments of investible capital are to be diverted from hospitals, schools, factories, machines, research and so on to finance energy developments that themselves cannot meet commercial payout criteria, questions inevitably must arise as to whether this use of financial resources strengthens or weakens prospects for overall economic growth and social stability. This would be a particularly significant issue if EIA chose a course of developing a large industrial base in synthetic crudes from coal and oil shale. Such an investment priority might well be subject to special scrutiny since a virtual tripling of investment costs would inevitably permit our society to do less in other areas, possibly restricting conventional fuel developments, possibly limiting efforts to push forward in energy conservation.

3. As a question of fact, oil is not a large component of the consumer price index. The weighting of gasoline is about 3.1% of the total although there are other sectors that use oil pricing in the development of their cost structures. The percentage increase in this product over the past four years is on the order of 50–55%. As one of the more stable components of the index for many prior years, the last four should be seen in the light of a catch-up game in which a short time span witnessed recovery of rising real costs dating back over more than a decade.

The roots of inflation, however, would not appear to be in the gyrations or manipulation of commodity pricing in any case. Rather, commodities tend to react to the inflationary forces unleashed in the developed countries by unwise monetary and fiscal policies generally pursued by governments seeking expedient ways to maintain economic growth under difficult circumstances, and/or

seeking to placate organized interest groups in their own societies with forms of economic favoritism. In the same way, the burden of inflation therefore cannot be said to spring from oil pricing by the industry, or even OPEC. Rather, we would view pricing as a reflection of emerging geologic realities (less oil, in smaller reservoirs at greater depths, further from inhabited areas and available through more expensive technologies) and patterns of rising man-made cost trends resulting from our own economic mismanagement.

On the basis, then, of arguments involving "national security" and "inflation, with balance-of-payments problems," the case for having to achieve energy independence is not a compelling one in our view.

The second major issue at debate might be phrased in this way: "Are there viable, practical, socially responsible means for the U.S. to achieve energy independence?"

Critics of EIA would generally concede that there were viable means, and probably save their arguments to address the question of whether the government's present proposals were anything near the best ones to accomplish this. Nevertheless, some questions remain.

The oil and gas reserve controversy in the U.S. is a vexed one and unfortunately too often mixed with person and idealogical clashes. However, even the U.S.G.S. estimates of reserve ranges are now trending downwards, and the effect of more drilling in frontier areas recently has been to lower future projections of what these might yield (Destin anticline and Hatters Pond are two wondrously woven tales of vast underground riches recently bumped to earth, as examples). Realization is now widespread that: (1) Shallow gas in the U.S., where it appears associated with oil, is relatively well drilled up. By itself it is only marginally economic owing to a trend towards smaller discoveries and low productibility per well. (2) There are still assumed to be large reserves of deep gas (15,000 feet plus) to drill for, but costs are high, and continue to escalate well beyond the economics of the current FPC pricing system. (3) Large oil discoveries onshore in the U.S. are increasingly few and far between. Offshore they are more common but even here subject to sharply rising costs, environmental restrictions and a burdensome bonus leasing system. (4) Frontier areas such as the edge of the continental shelf or isolated parts of Alaska are going to require many years of development. Higher operating costs plus technology gaps make capital recovery difficult to calculate and thus reduce the incentives to gamble. (5) Meanwhile, owing to government pricing policies applied to "lower tier" (old) oil, secondary and tertiary recovery work is likely to make no more than modest progress, with result that overall depletion of existing oil reserves may well move down by 4–5% per year for some time. This makes the achievement of energy independence, i.e., maintenance of 6 million b/d of imports, even more difficult and puts added pressures on government and industry to come up with new (and more expensive) reserves to push into the "mix."

There would appear to be many lower-cost, lower-risk approaches the government could take to the energy crisis before plunging into huge and question-laden investments with the taxpayers' and bondholders' money in exotic areas such as coal gasification and oil shale. The transition from oil and gas to coal in utility use could be accelerated. True, this would require constant pressure, and would often be at odds with various local interest groups. The question comes down here to the political manageability of taking a hard line or an easy line, or something in between in terms of eliciting the public's cooperation in implementing energy policies and sustaining support for them. The consumer today starts with extreme skepticism about the roots of the energy problem and is more likely to base his judgments on theories of oil company conspiracy or OPEC conspiracy than on the more complex situation seen by those close to energy in government and industry. If conspiracy did cause the crisis, then political efforts to break up the conspiracy, not programs such as those endorsed in the EIA proposals, should be implemented. This is a fundamental dichotomy that will not be soon resolved. Nor is the previous sense of urgency to act on energy shortages at the time of the embargo likely to return to spur particular public support for industry or government programs.

The point is: there may be viable practical and socially responsible means to achieve energy independence, but can the public be convinced to go along with them over a workout of many years. In the case of EIA, there are bound to be early failures in attempts to open up new sources of energy, cost overruns, and some bankruptcies of pioneering companies in new technology areas,

etc.—elements of these are only to be expected in the early days of a new organization such as EIA. However, we would forecast little government or public patience with failure. Formation of EIA will inevitably raise expectancies that will be difficult (I would say, impossible) to fulfill.

The third major issue might be paraphrased as: *Does the EIA as a structured government corporation with certain assets and restrictions have a reasonable chance of success in terms of its own organizational format and the free market environment it will be operating in?*

Here the critics would appear to have rich lodes to mine.

1. EIA is probably destined to take on most of the conceptual non-starters in the energy experimentation field. If an idea looked practical, if the early tests gave valid results, it might be given enough of a chance of success to win the backing of private money and thus receive the push of human artifice and selfinterest. On the other hand, if the idea is "way out" or completely untried, the path would lead directly to EIA. This may be overstating the case. Yet even well-worked-out schemes in areas of developing technology often (usually) come into severe problems. It would be unrealistic *not* to expect huge and early losses in this organization.

2. If ERDA is to continue on the pure research and development side, and the established commercial energy companies are picking up the better proven and more solid energy ideas, is there a role for EIA in the middle, and where are the boundaries to be set?

3. The EIA proposals may convince members of the Congress and public that something important could be accomplished in 7 to 10 years of operations. However, that span of time is very short under current lead/lag conditions in the energy field. Confidence that answers could be discovered and implemented in that time period might create complacency. This could override more practical steps in areas that could have greater impact. As an instance, implementation of a program forcing mass switchovers by utilities to coal from oil and gas might more than equal all of the incremental oil saving/producing increments that could be accomplished by EIA in a multiplicity of other endeavors. The priorities comprising the EIA proposals may thus be incorrect. There would appear to be a number of areas where substantial, near-term and lower-cost results could be achieved with modest regulatory, administrative or price adjustments. This would avoid the superimposition of a new government organization such as EIA. To name areas we consider to be fruitful:

A. Greater secondary recovery of existing U.S. oil reserves (price incentives required).

B. Phased deregulations of U.S. natural gas prices.

C. Greater (enforced) use of coal to replace oil and gas in utility use.

D. Differential taxation on cars by the states or federal government at time of sale based on weight or horsepower, so that the incentive to move down the scale into smaller cars is maintained.

E. Breakthrough in legal and legislative barriers to faster development of Western coal.

F. Assistance from government in expediting nuclear power development.

G. Breakthrough in the legal, legislative and financing barriers to the faster development of the country's geothermal resources.

H. More rapid approval of offshore areas for drilling on the U.S. continental shelf.

I. Improved national insulation standards for housing, industry and commercial buildings.

It is true that many of these steps have no particular support from the general public, particularly as they point to higher consumer costs for fuels. However, as the natural gas shortage tightens its hold on us over the next nine months, and again in the winter of '77/'78, we feel confident that concentration on pricing issues will recede as demand for volume picks up. We would expect the labor movement, among other interest groups, to begin a process of judicious switching of position on energy issues to the side of "growth." This is likely to be particularly marked in states like North Carolina where shortages are likely to impact employment soon.

4. It is recognized that the objective of EIA is to be self-liquidating in time (the real danger is that it will be liquidated before its time). However, under our assumptions of early and severe financial problems (brought about by a charter that simply invites them), withdrawal by EIA from the game might prove to be quite prolonged, even without attempts to appear indispensable. At the time it will simply be bad politics to stop activities that are just be-

ginning to be fruitful, i.e., the EIA and the public would lose "value" if the network of cash-hungry companies were severed from their supply source 7–10 years out from now. The key argument would be that all the money could eventually be recouped if the operations were extended just another five years (and then another five, and so on).

5. The question of crowding out does not appear seirous in terms of new demand on the financial markets by EIA. Proponents of EIA rightly point out that the proportion of business plant and equipment expenditure on energy is normally in the 28–32% area in the U.S., and that these ratios would not be exceeded with the additional use of $100 billion over a period of 7 years of investment input. The issue, however, appears not to be the amount but the efficacy of what can be accomplished by the sums spent. Special lending at favorable rates to one business segment of the society implies a lowering of normal rates of return criteria for that particular group; they are to be subsidized. The subsidy, of course, comes out of the resources of all other members of the society. Will the ultimate return to society compensate for this form of "temporary" capital expropriation? Only if it is a "success" relative to the other uses it might be put to—in energy developments or in other growth fields. The odds of accomplishing this in EIA do not look impressive to this point.

In our view, the questions concerning the advisability of pushing ahead with energy independence, reasonable chances of success in the national effort, and the selection of a structured government corporation such as EIA to execute it remain basically unanswered. We could not therefore support these proposals in their present form.

Instead, we have implied the greater efficacy of government energy programs designed to:

1. Allow the best ideas to be funded from private sources willing to sponsor and manage them and gain superior rewards if they work out (ideas without particular attraction not to be funded at all);

2. Emphasize potential savings in energy use through more assistance to conservation efforts in the public and private sectors;

3. Concentrate government administrative and legislative efforts on removing roadblocks to faster progress in conventional and proven fields of energy development such as Western coal, nuclear and geothermal;

4. Unlock natural incentives to better performance through upward adjustments to the prices in natural gas, condensate, oil to be recovered through secondary means;

5. Accept some risk in pursuing a policy that yields the lowest cost "mix" of fuels we are likely to get, but does not and will not cover all our demand growth, thus allowing rising imports as a residual factor after our best efforts in conventional energy development; and

6. Blunt obvious vulnerability to a cutoff of oil by diversification of supplies, greater storage, development of alternative domestic energy sources, and recognition of the real weaknesses of countries that might confront us on oil. Avoid panic measures which in seeking to lower our vulnerability in one category might increase it in another. Treat with foreign countries on an "even handed basis" so as to minimize the dangers of resort to embargo.

Very truly yours,

CHARLES T. MAXWELL.

Attachment.

Exhibit

Comparable Investment Costs per Barrel per Day (or Equivalent) for the Development of Selected Fuel Sources

Saudi Arabia (onshore, incremental barrels)	$ 500
Persian Gulf (offshore, incremental barrels)	2, 000
Appalachian Coal (barrel equivalent)	3, 200
U.S. onshore (incremental barrels)	6, 000
North Sea (incremental barrels)	7, 000
U.S. offshore (incremental barrels)	7, 000
Alaska (North Slope)	9, 000
Athabasca Tar Sands	16, 000
Coal Gasification (Intermediate British thermal units)	18, 000
Oil Shale (Western United States)	18, 000

Source: Charles T. Maxwell.

The CHAIRMAN. Mr. Adelman.

STATEMENT OF M. A. ADELMAN, PROFESSOR OF ECONOMICS, MASSACHUSETTS INSTITUTE OF TECHNOLOGY, CAMBRIDGE, MASS.

Mr. ADELMAN. Mr. Chairman, I hope that S. 2532 is rejected and the sooner the better. My statement explains why the bill would result in very expensive energy, from technology obsolete before it even began to operate, in amounts negligible in 1985.

I turn now to the national security problem.

During the winter of 1973–74 the Arab oil producing nations cut back output by about 4.5 million barrels daily, about 15 percent of the oil moving into international trade. Fifteen percent was the approximate loss of imports to all the consuming nations, "friendly," Britain and France, the so-called "odiously neutral" Japanese, and the unfriendly Americans. There was no selective embargo. A selective embargo—that is against one or two nations—was and is impossible. If oil becomes unusually scarce in some countries it is profitable for those producers who don't cut back to divert exports there. The non-Arab governments are glad to collect higher prices and also show that they are reliable suppliers. They have had and will have no difficulty in doing well by doing good. American imports are now between 6 and 7 million barrels daily and by 1980 are expected to be around 9 million barrels daily. Non-Arab OPEC capacity is today 14.5 million and it will continue to grow.

This sounds like good news but it is a much bad news. The Arabs cannot hurt us without hurting everybody, but in hurting everybody else they also exert pressure on us. Therefore, even zero U.S. oil imports would not remove energy dependnc. It would only mitigate it.

So long as the cartel keeps prices very high, the oil producing nations get increasingly rich. They can afford production cutbacks and there is no energy independence. There is no gift or concession anyone can make to the producing countries which will insure secure supply. In ordinary business, people are kept to their promises by competition and by law. If anyone persistently breaks his word, his customers can go elsewhere or a court can force him to perform. But the oil cartel nations have suppressed competition and as sovereign nations they are beyond any law.

Hence, if the United States does anything that a large group of oil producing countries do not like, they can use the threat of interrupting or reducing supply. Whatever we do to meet their demands becomes past history and they can use the same threat later. There is no way to persuade or cajole or bribe them into doing otherwise.

The danger of another cutback is for the time being small because of great excess capacity in the cartel. If today the Arabs again cut back output by 4.5 million barrels, the non-Arabs could make up nearly all of the deficit. But when and if excess capacity dwindles, the chances of the cutback are greater now than in 1973.

The Arab nations know now that the consuming nations will act like the Europeans in the thirties—make friends with the tiger in the hope he will go eat somebody else. In 1973 the member nations

of the European Economic Community blockade the Netherlands in violation of their own land, the Treaty of Rome, which forbids barriers to the movement of goods within the Community. We now have their agreement to a plan of crisis management in the International Energy Authority. Whether they will dishonor their signatures next time as they did last time is something I would rather not find out.

As for this country, we have helped the cartel from the beginning. In January of this year, Mr. Parsky of the Treasury summed it up admirably: "Breaking up OPEC would be detrimental." He does not explain why. The short of the matter is that because of our help and the accumulation of huge amounts of foreign assets, Saudi Arabia and the cooperating countries can make much bigger cutbacks. Hence, the chances of another one become uncomfortably high without the production of excess capacity. Time is not necessarily on our side.

Taking this act at its best, it provides some very expensive, permanent assurance of a very small part of the fuel supply 10 years from now. But what we need is a short time asurance of a large part of the fuel supply. Hence the Energy Independence Act is useless for security.

A stockpile would help. Half a billion barrels would tie up an investment of about $8 billion for years, but it would protect us, as a simple calculation shows, for about a year and a half provided that we reduce consumption by 10 percent through a severe excise tax and rationing, recycling the tax revenues in order not to penalize consumers. Such a conservation program costs us nothing until the plan goes into effect and the knowledge that we are prepared makes another cutback less likely.

National security will continue to be a problem even with emergency stockpiles here and abroad as long as oil production is monopolized by nations which are ready to damage us. The more money they accumulate, the greater the danger. The worst aspect of the Energy Independence Act is that it gives the illusion of protective action, while the situation gets worse.

Thank you, Mr. Chairman.

[Complete statement follows:]

STATEMENT OF M. A. ADELMAN, PROFESSOR OF ECONOMICS AT MASSACHUSETTS INSTITUTE OF TECHNOLOGY, CAMBRIDGE, MASS.

I thank the Committee for its invitation to appear and comment on S.2532, the Energy Independence Act.

This Act has two declared purposes: first, to reduce the vulnerability of the United States economy to another oil embargo; and secondly, to provide cheaper oil or equivalent. Looking briefly at the second objective—the bill would result in very expensive energy, from technology obsolete before it even began, in amounts negligible by 1985. This is the only possible result of a crash program to start building facilities immediately. For example, with current methods, gas from coal will cost the equivalent of $21–$24 per barrel of oil, twice the cartel price. And since haste makes waste, this may be conservative. But the heavier costs are indirect. The huge demands on labor, capital, and engineering knowhow will raise construction costs to the whole economy, and starve efforts to develop new superior technology which might lower costs below the world cartel prices. These efforts might unlock vast supplies of high sulphur coal, now environmentally damaging; and of new oil, now much of it below ground but not produceable. Finally, large expenditures on known techniques would slow down our efforts at longer range solutions through solar and fusion research.

Although the heavy costs are certain, we are given no indication of how much additional primary energy will be available in return for the commitment of $100 billion. The White House statement of October 10, 1975 says the program "could help assure that the equivalent of 10–15 barrels of oil per day of new energy production is realized by 1985." This gives the impression that we could hope to get between 10 and 15 million barrels daily of oil equivalent from this program. In fact, the 10–15 million is the gross addition to capacity which it is hoped will be provided by all investments in all areas. Only a small fraction of 10 million barrels daily from new sources is even conceivable. (The maximum ERDA program is only 350 thousand barrels daily.)

The unstated assumption seems to be that there is a capital shortage which only the government can cure. This is untrue. If capital demands increase more quickly than capital supplies, interest rates will rise to equilibrate them. That's what capital markets are for. Nor is it a question of the great risks of new technology. If the price is high enough, it compensates for risk, and private companies form groups to spread risk and avoid ruin for any one of them. But the cost exceeds any likely price.

Assuming for the sake of argument that we want to subsidize energy production, it should be done directly by payment or by price guarantees. Loan guarantees make capital artificially cheap. The builders of the new plants are given an incentive to substitute the subsidized cheap capital for labor or materials or transportation cost or anything not subsidized. The outstanding distortion would be to build capital-intensive nuclear electric plants where coal plants were really more economic. As for synthetic fuels, we are sure to receive the wrong information from the first generation of plants.

This brings me to the national security problem, usually mis-stated as an embargo.

During the winter of 1973–1974 the Arab oil producing nations cut back output. The maximum reduction was in November, about 4.5 million barrels daily, 15 percent of oil moving in international trade. And 15 percent was the import loss for the "friendly" British, the "odiously neutral" Japanese, the "unfriendly" United States. There was no embargo against this country, and grovelling did not make the oil supply elsewhere any better than here.

A selective embargo, that is, against one or two nations, was and is impossible. If oil becomes unusually scarce in some countries, it is profitable for those producers who don't cut back to divert exports there. The non-Arab governments would like nothing better than to collect higher prices and also show that they are reliable suppliers. They have had and will have no difficulty in doing well by doing good. American imports are now between 6 and 7 million barrels daily and by 1980 they are expected to be around 9 mbd. Non-Arab OEPC capacity is today 14.5 million, and will continue to grow.

This is both good and bad news. The Arabs cannot hurt us without hurting everybody even worse. But in hurting everybody else they also exert pressure on us.

Therefore even zero U.S. oil imports would not remove energy dependence, only mitigate it. So long as the cartel keeps prices very high, the oil producing nations get increasingly rich. They can afford production cut-backs, and there is no energy independence.

There is no gift or concession anyone can make to the producing countries which will ensure lower prices or secure supply.

In ordinary business life, people are kept to their promises by competition and by law. If anyone persistently breaks his word, his customers can go elsewhere or a court can force him to perform. But the oil cartel nations have suppressed competition, and as sovereign nations they are beyond any law. Hence if the United States does anything that a large group of oil producing countries do not like, they can use the threat of interrupting or reducing supply. Whatever we do to please them becomes past history, and they can use the same threat later. There is no way to persuade or cajole or bribe them into doing otherwise.

The danger of another cut-back is, for the time being, small because of great excess capacity in the cartel. If today the Arabs cut back output again by 4.5 million barrels, the non-Arabs could make up nearly all of the defict.

But if and when excess capacity dwindles, the chances of a cutback are greater now than in 1973. The Arab nations know now that the consuming nations will act like the Europeans in the 1930's—make friends with the tiger in the hope he will go eat someone else. In 1973, the member nations of the

European Economic Community blockaded The Netherlands, in violation of their own law, the Treaty of Rome, which forbids barriers to the movement of goods within the community. We now have their agreement to a plan of crisis management in the International Energy Authority. Whether they will dishonor their signatures next time as they did last time is something I would rather not find out.

As for this country, we have helped the cartel from the beginning. In January of this year, Mr. Parsky of the Treasury summed it up admirably: "breaking up OPEC would be detrimental" to us; he does not explain why. Six years ago, the State Department helped the Libyans blow the door off the hinges, but neither then nor since did they explain why. (Hearings Before The Sub-Committee on Multinational Corporations, 92 Con., 2d Sess., Part 8, pp. 771–773 (1975). See also: "A Diplomatic Situation Where Oil and Hauter Just Didn't Mix," *Washington Post*, March 14, 1976, p. F–11, and "How OPEC Came to Power", *Forbes*, April 15, 1976, pp. 69–85.)

The short of the matter is that because of our help and the accumulation of huge amounts of foreign assets, Saudi Arabia and the other cooperating countries can now make much bigger cutbacks. They also have more support in the United States. Some people are getting rich selling them armaments, civilian goods, construction services, and so on.

For this reason, the chances of another production cutback become uncomfortably high without the protection of excess capacity. Time is not necessarily on our side.

Taking EIA at its best, it provides some very expensive *permanent* assurance of a *very small* part of the fuel supply, ten years from now. (It also tells the oil cartel that incremental supplies of oil are worth to us much more than even the prices they charge today.) But what we need is a *short-time* assurance of a *large* part of the fuel supply. So the Energy Independence Act is useless.

It is also expensive. If the oil-equivalent cost were $21/barrel (the low end of the range for coal-based gas), the premium per barrel would be $9.50 over the 1976 cartel price. If one million b/d were provided, the *annual* insurance payment would be $3.5 billion, for which we would have very little insurance.

A stockpile would help. Half a billion barrels would tie up an investment of about $8 billion, for years. But even on conservative assumptions (see Appendix) it would protect us for about a year and a half—*provided* that we reduce consumption by 10 percent through a severe excise tax and rationing, recycling the tax revenues in order not to penalize consumers as a group. Such a conservation program costs us nothing until it goes into effect. And the knowledge that we are prepared makes another cutback less likely.

Some parts of the oil supply are much more sensitive than others. The penalty of a residue fuel oil shortfall is loss of jobs. In November 1973 the then U.S. Ambassador to Saudi Arabia predicted a "critical" situation at the East Coast if the Arabs did not increase output "within a matter of days" (N.Y. Times, November 10, 1973). This was far fetched. In any case, residual fuel oil is particularly cheap to store, here or in Caribbean islands.

National security will continue to be a problem, even with emergency stockpiles here and abroad, so long as oil production is monopolized, mostly by nations which are ready to damage us. The more money they accumulate, the greater the danger. The Energy Independence Act is not merely useless but harmful, because it gives the illusion of protection.

Appendix.—Protection by Stockpile Against 50 Percent Arab Cutback in 1980.

Assumed.—Arabs produce 65 percent of OPEC oil; no non-OPEC imports; no significant excess capacity; hence 50 percent Arab cutback—33 percent less output; consumption cut 10 percent by excise tax and rationing.

		Before cutback	After cutback	Difference
1. Total consumption	mbd	20.0	18.0	−2.0
2. Total imports demanded	mbd	10.0	8.0	−2.0
3. OPEC supply	mbd	10.0	6.6	−3.4
4. Deficit	mbd			−1.4
5. 30 pct of normal stocks (45 × 20 × 0.3)	mbd		270	
6. Security stockpile	mb		500	
7. Total stockpile	mb		770	
8. Days supply (770÷1.4)			500	

The CHAIRMAN. Well, thank you, gentlemen, very much.

I take it, Mr. Akins, that you favor this legislation. You support it. Mr. Conant, you probably do not support it and you weren't quite as decisive as the other members of the panel. At least you wouldn't make it the top priority. You wouldn't rely on this plan. And Mr. Lichtblau, Mr. Adelman, and Mr. Maxwell all opposed the legislation.

First, Mr. Lichtblau, one argument for this legislation is that we should do everything possible to provide for greater protection of our precious energy resources and that while other means may be more attractive and efficient, that this at least is one means. When Vice President Rockefeller testified he, for example, pointed out that without this kind of action a gas pipeline through Canada probably wouldn't be built because it would require such an enormous amount of capital and it would take a lot of risk. He said that some of the nuclear plants wouldn't be constructed.

Now you answer that to some extent. You said the reason the nuclear plants aren't constructed is because they are being held up in court and because they are being held up by regulatory bodies and so forth on environmental grounds. Capital isn't the fundamental issue. But doesn't it seem logical that at least some capital to bring on scene technologies which are risky, which are marginal, and which would probably not be profitable—that this kind of investment would provide sources of energy we wouldn't otherwise have?

Mr. LICHTBLAU. The only area where this might be the case is synthetics. I think we cannot start a synthetics fuel industry, shale or coal——

The CHAIRMAN. You say we already have that. We have a $3 or $4 billion program anyway.

Mr. LICHTBLAU. It's not a program. It's a bill that's under consideration right now.

The CHAIRMAN. It passed the Senate, didn't it?

Mr. LICHTBLAU. It passed the Senate last year. It was the $6 billion bill which passed the Senate, but it was defeated in the House.

The CHAIRMAN. It probably would have a better chance than this bill would have.

Mr. LICHTBLAU. I would think so. It's specifically directed to the one area where Government funds are required. I don't think you will ever see—or at least you won't in the next 10 years see a shale oil or coal liquefaction or gasification industry get off the ground unless you have Government financing or financial aid of some sort. It's a very risk industry. Probably the cost of liquefaction coal or coal gasification would be as high as the highest cost of imported oil or even higher. So unless you know what the future price of oil will be, unless you can make an assumption that price of oil will continue to rise——

The CHAIRMAN. That's one of the very things that this legislation would do, as you know. It would provide price supports. It would provide guaranteed prices for a period of time.

Mr. LICHTBLAU. Yes; but all of this can be done on a much smaller and much more limited basis. This is an overall bill which

is supposed to supply financial support for every sector of the energy economy while there's only one sector where it's really needed. Furthermore, you couldn't possibly spend anything like $100 billion in 7 years in synthetics. The FEA report talks about——

The CHAIRMAN. No; that's right, and I think the proponents of the legislation would agree with that. They indicated, as I say, that much of this—I think more than half would be spent on, in their view—their estimation—would be spent on nuclear plants and others on means of moving gas and oil by pipeline, tanker and so forth.

Mr. LICHTBLAU. Well, I would say that the nuclear aspect is the most questionable. The idea that pipelines will not be built unless the Government gives them some financial assistance is also very questionable. Right now, there are several groups that are fighting over who should build the gas pipeline from Alaska to the United States. There are at least three projects right now underway. So it's not a matter of not having the money. It's a matter of which way it should be built, what are the environmental impacts, which is the most economically justifiable, and the Government will have to make the decision. But in none of these projects has there been a serious question of not being able to build the pipeline because the money isn't here.

As far as nuclear power is concerned, I think there's a danger if you build more nuclear powerplants on the basis of EIA financing than utilities would otherwise build, it would clearly lead to the promotion of electric energy and this is of course exactly what we would like to avoid. There's a great deal the utilities can do to conserve energy merely by changing their rate structures.

The CHAIRMAN. I'm told that the Commerce Committee has a record that establishes to some extent that capital would not be available, especially for pipelines.

Mr. LICHTBLAU. For pipelines?

The CHAIRMAN. For the Canadian gas pipeline.

Mr. LICHTBLAU. I don't see that. Well, you know, that's an opinion. I think I would not agree with that. I would think that the money would be available and we have seen there's no problem—there's the El Paso project right now which obviously would be available because otherwise they wouldn't be pushing for it. There's the Canadian-Alaskan highway project. Again, the question of unavailability of capital hasn't come up. If it is, well, then we can look at it specifically, but I doubt very much that the utilities which need that gas desperately, plus the companies that have found it, will not be able to raise the money to develop and build that pipeline. It's an absolute sure thing if you build this pipeline there's a ready market for it. It's a matter of price perhaps. It depends on what price the government will permit this gas to sell in the U.S. mainland, but I don't see any constraint as far as capital is concerned that would prevent the building of that pipeline. I can't imagine that this capital wouldn't be available.

The CHAIRMAN. Well, let me ask Mr. Adelman, you indicated you thought an embargo would be unlikely, as I understand it, because if you embargo any one country or two countries that it's impossible for the oil-producing countries to prevent oil from moving from the countries that would be getting it to the scarce countries that

needed it. How about the likelihood of a war? How about the possibility of an Arab-Israeli war? Wouldn't that create a situation in which we could be at a terrible disadvantage and a situation which might be even much worse thn the one we had in 1973–74 when we had the deepest recession we have suffered in recent years a loss of $10 or $20 billion in gross national product with skyrocketing energy prices and a shortage of energy?

Mr. ADELMAN. Senator, if such a war came about, I'm sure there would be another production cutback, but a selective embargo was impossible then, even with the best or worst——

The CHAIRMAN. I'm not thinking about an embargo now, but a war. Wouldn't a war just result in a reduction, sharp reduction in the availability of oil in the Middle East?

Mr. ADELMAN. It would result I'm sure in a cutback of production with very much the same results as previously, a reduction in supply to all consuming countries, including the United States, with all the consequences that you have mentioned.

The CHAIRMAN. Mr. Akins, you're the lone—not quite the lone—Mr. Conant gives you a little moral support there—the lone proponent of this legislation. In view of the powerful arguments that Mr. Maxwell, Mr. Adelman, and Mr. Lichtblau have given us on the likelihood that this $100 billion might well be wasted and would not really provide additional energy resources and that there are options available, particularly strategic reserve, that are far more practical, do you feel at all shaken in your suggestion that we should go ahead with this?

Mr. AKINS. No. I said at the very beginning that I don't think this bill would assure us energy independence. But I think it's one of a series of actions we should take. Many of the proposals other witnesses have referred to, I have also referred to in my oral statement and in the written statement. I think for example we should certainly move to build up a strategic reserve for the United States.

I have no doubt that a lot of money will be wasted in any crash program. You always have money wasted. I have absolutely no doubt that some of this $100 billion would be used improperly, but I think the energy problem is so severe we should take all measures that we can to correct it. I think a loss of the 5 or 6 million barrels a day imports would be almost intolerable for us. I think that the prospects of much higher imports in 1985 are great and I support this bill only as one measure, one of many measures we should take to reduce our dependence on imports.

As I said earlier, I think it's dishonest to refer to this as an "energy independence authority." It's not going to bring about independence.

The CHAIRMAN. Aren't you impressed at all by the colossal size of this thing, $100 billion?

Mr. AKINS. Yes. When the bill is presented it's not $100 billion. It's $25 billion plus $75 billion in loans. It's over 10 years and at least the authors of it——

The CHAIRMAN. On loans, yes, but loans that are pretty soft really.

Mr. AKINS. Well, it's hard to say. I presume that authors of the bill think that most or all of this is going to be recovered.

The CHAIRMAN. There's nothing in the legislation that the loan only be made on the grounds that the Secretary of Treasury or whoever administers the bill is convinced that the loans would be repaid.

Mr. AKINS. That's quite true, but $10 billion of this could be for the Alaskan-Canadian gas pipeline, a project that Mr. Lichtblau pointed out will pay off. If capital is not available, and the Commerce Department thinks it's not available, this would seem a worthy candidate. I presume that there are other projects that would also pay off eventually; that is, at no cost to the taxpayer.

The CHAIRMAN. What are the prospects for negotiated settlement in the Middle East?

Mr. AKINS. Fairly good, but not yet—not now. I think we will have to wait until the next administration.

The CHAIRMAN. Until what?

Mr. AKINS. Until the next administration. I don't think it's possible for use to play a major role in the Middle East this year.

The CHAIRMAN. Well, we're talking about by 1985 now. That's what this legislation in timespan would encompass. You say that not in 1976 we're not going to get a settlement.

Mr. AKINS. In 1977 I think a settlement is quite possible. This was the whole gist of my presentation: The only way we can preserve our energy security is through peace in the Middle East. I think peace is quite possible.

The CHAIRMAN. Mr. Maxwell, as I understand it, believes that the OPEC cartel is likely to weaken as the possibilities of peace in the Middle East increase. Do you agree with that?

Mr. AKINS. No, I don't think so. I don't think that the Middle Eastern Arab-Israeli problem has too much to do with OPEC solidarity. There are a lot of countries in OPEC that are not Arab and have little interest in the Arab-Israeli settlement. And all the countries of OPEC which are the best off financially have reasons to preserve the organization. I don't think that it's going to be weakened substantially, at least not to the extent that we will benefit through collapse of oil prices.

The CHAIRMAN. I'm not sure that I recall—was it Mr. Maxwell who quoted Mr. Parsky—or Mr. Adelman quoted Mr. Parsky saying that the continuation of OPEC is constructive and implied it's in our interest. Is that your view?

Mr. AKINS. No. I think that OPEC is, however, a fact of life that we have to adjust to and blindly saying that OPEC is about to——

The CHAIRMAN. It's a fact of life we have to adjust to, but it seems to me we should make up our mind whether or not we want this kind of combination of a very powerful cartel particularly in view of the amount of oil that they have under their control and the consequences that has for our economy. It would be to our great interest if the OPEC cartel did not continue.

Mr. AKINS. It would be very nice if the OPEC cartel were to disappear, but we have to decide whether we have the capability of making it disappear or not, and I think we haven't.

The CHAIRMAN. Well, that may be, but there's also the consideration Mr. Adelman implied that whether or not we ought to have a policy of encouraging the OPEC cartel. That's a great disadvantage

it would seem to me of our consumers, at least that would appear to be the situation. Apparently, the State Department has some notion that it's a stabilizing force of some kind, that it provides a basis for a nice organization situation.

Mr. AKINS. I don't think that's true at all. I think there is finally a recognition——

The CHAIRMAN. Were you aware of Mr. Parsky's expression on this?

Mr. AKINS. No, I hadn't heard about it.

The CHAIRMAN. Would that reflect the views that you understood in the State Department?

Mr. AKINS. No, not exactly. I think there's a recognition that——

The CHAIRMAN. What do you mean, "not exactly?"

Mr. AKINS. I think there's recognition that OPEC cannot be destroyed.

The CHAIRMAN. So what you're saying it's a fact of life, you've got to live with it and that's it?

Mr. AKINS. That's right.

The CHAIRMAN. It's not a matter of approving of it.

Mr. AKINS. Approving or disapproving.

The CHAIRMAN. Well, I don't know why we don't disapprove it. It doesn't mean—I would agree with you wholeheartedly, or Mr. Conant—one of you gentlemen pointed out how ridiculous it would be for us to invade Saudi Arabia with military force. I agree with you that's outrageous and would be counterproductive in the worst sense. Nevertheless, it seems to me it should be clear that our economic and political interest is not served by the continuation of OPEC.

Mr. AKINS. Yes.

The CHAIRMAN. Just as the interests of Saudi Arabia and the Arab countries wouldn't be served if the consuming nations got together effectively in a very powerful negotiating stance which we haven't done and probably aren't going to be able to do. What I'm saying is that I would think that our policies would just frankly and honestly recognize that fact and do our best to encourage where we can the dissociation of the nations in OPEC.

Well, may I ask—I want to come back to Mr. Lichtblau, and I also have some questions of you other gentlemen. Mr. Lichtblau, you ended up with a statement on page 10 where you said, "We can only hope that in the intervening 10 years we will have learned more about energy conservation, enhanced oil recovery techniques, and the utilization of coal without environmental degradation, will have constructed a first generation of shale oil and coal gasification plants and will have made a beginning in the commercial development of solar energy and other exotic forms of energy."

I don't like this bill either, but it seems to me that's what the proponents of the bill intended, exactly what you have here. They want to make these techniques effective. It's not a research bill; it's a development bill. It's a bill that would take these techniques that have been developed to some extent and bring them on and try them out and let them succeed or fail, but work out some of the bugs involved.

Mr. LICHTBLAU. Yes; I was afraid this last paragraph might be considered an endorsement of the bill, but it really isn't meant to be that at all. I think most of the things in here are in the research

area and not in the area of commercial development. I can't see how we can spend the kind of money on these things over the next 10 years. But if we will have learned something through research, then in the post-1985 period we can apply some of the things we have learned in those 10 years. We have a 9- or 10-year period left before oil imports could be so large that we simply will have no way of protecting ourselves against them. In those 9 or 10 years some new energy substitutes can be developed. Energy conservation would be a very important one.

The CHAIRMAN. You say they can be developed and you won't need to have some kind of subsidized capital program to bring them on?

Mr. LICHTBLAU. With the exception of synthetics we won't.

The CHAIRMAN. And the market will bring them on?

Mr. LICHTBLAU. The market will bring them on and the research will bring them on. In some of the most important areas money is not at all the prime consideration. For instance, for curtailing energy demand you don't need a $100 billion program. You may need a very high excise tax on gasoline which has been proposed in Congress any number of times. If you gradually increase the gasoline tax to 40 or 50 cents perhaps over a 6- or 7-year period, you would have a very sharp reduction in gasoline demand. It has nothing to do with investment.

In the area of conservation, as I said before, you can give tax credits or fast tax writeoffs to businesses which put these facilities in. So, again, there's no money involved for capital expenditures that couldn't be recouped by business.

So most of these things can be done without any additional funds required and where the funds are required they are available from business because they will pay off. That Alaskan gas pipeline is going to pay off. In fact, I don't know why the Commerce Committee said the money won't be available because I know there are three or four applications pending until the Government decides which one it's going to approve.

The CHAIRMAN. It's not the Alaskan pipeline I'm talking about; it's the Canadian pipeline. I have a parochial interest in that because that would be very helpful to Wisconsin and the Middle West. I was one of the five Senators who voted against the pipeline, the one the yare building now.

Mr. LICHTBLAU. They may have put it the wrong way, but it's too late now. At any rate, these projects are going to be built and I think if the Government entered into them it would probably delay them, if anything. What I'm also afraid of is that a very large part of the money in this bill would be loaded on nuclear power and we will go the nuclear way without having made a decision whether this is the best way as far as our energy sector is concerned, merely because more and more money will be put into it. We might perhaps have more nuclear power then and less coal power if we built some of the nuclear powerplants at the expense of coal, yet, there is a question which of the two is the better, the more secure, as far as environmental and other factors are concerned. So this could possibly lead us in the wrong direction.

The CHAIRMAN. Let me ask Mr. Conant. Vice President Rockefeller contends the continued dependence on foreign sources of oil

could cause us to lose credibility with our allies because they will conclude that we are more interested in our own economic welfare than theirs and we will side with the oil suppliers rather than with them. It seems to me they might be more likely to draw that conclusion if we embarked on an expensive energy independence effort and showed we were willing to pay any price to achieve self-sufficiency while most of them don't have the capacity to do that.

Mr. Conant, what do you believe would be the reaction of our allies of an establishment of a $100 billion energy independence program? Would they feel supported or abandoned?

Mr. CONANT. Generally, I'm inclined to agree with you, Mr. Chairman. This is a complicated question. I think for the reasons that I have advanced in my testimony that we are moving into a period in which I see competition with Middle Eastern oil on the part of all of us, that the Europeans and the Japanese might welcome signals that we were not going to be as important a contender with that source. On the other hand, the supply of energy is an integral part of the workings of our alliance and I think they would be uneasy if we moved in that direction, that is of reducing our dependence, and at the same time became less concerned about their own vulnerability, perhaps less cooperative in the anticipatory planning to help us secure in the event of another shortfall; it is another way of saying that we can't think of energy solutions or the progress we'd make in very black and white terms. This is an enormously vital subject and the reactions vary from country to country. If we are strong in our own leadership in foreign policy, I think moves of this sort would be more welcome than not. If they have doubts about our staying power, then such a move of that sort would simply add fuel to their own uneasiness.

The CHAIRMAN. Would the establishment of an Energy Independence Authority tend to strengthen or weaken the bargaining power of the consuming nations as a whole?

Mr. CONANT. Vis-a-vis producers?

The CHAIRMAN. Yes, sir.

Mr. CONANT. It would be sending a signal, but I believe—and I tried to make the point in my testimony—that we are sending signals already and the stronger they become with the search for offshore resources, in conservation and so on, then that's enough.

The CHAIRMAN. What's your general assessment of the effort of consuming nations to achieve more of a voice in OPEC policy?

Mr. CONANT. Success of consuming nations in achieving more of a voice in OPEC policy?

The CHAIRMAN. Yes, sir.

Mr. CONANT. You mean by that the success of the consuming nations in affecting OPEC policy?

The CHAIRMAN. That's right.

Mr. CONANT. Yes. I think in terms of another shortfall, be it a selective embargo or a general one or a result of war; the key OPEC States now recognize that we are in better shape to cope with such than we have been in earlier crises. As far as the most important aspect of consuming nations' strategy goes, that is to say the extent to which we welcome and make them an integral part of the international economic and financing system and make real the

achievement of their developmental objectives in the markets of consuming States—I'm not yet satisfied that we either severally or togther have done enough.

The CHAIRMAN. How effective is the International Energy Agency?

Mr. CONANT. Untested. All we can say is that we now have an agreement between governments, in which the United States is a formal part, which has created a formula for sharing available oil. We have never had that before.

The CHAIRMAN. Senator Stevenson.

Senator STEVENSON. Thank you, Mr. Chairman. I apologize for being late and I don't want to repeat anything that's already been gone over, but let me just say at the outset that it seems to me that it would be a great mistake to label this general effort, Project Independence. I have been suggesting that it ought to be renamed Project Dependence and that we ought to face the impossibility of true energy independence. If we're going to remain dependent on foreign sources of energy for a long time to come, certainly through this century, then, consequently, one of our objectives ought to be, in addition to the development of domestic sources, the diversification of foreign sources of energy.

As a general proposition, would you all agree with that? Let me add one other point that I don't know if you're aware of. The recent and, generally speaking, unnoticed report by the U.S. Geological Survey which, with the imperfect data base we have, concludes that most of the world's undeveloped and undiscovered oil and gas resources are not in the OPEC nations. They are not in the so-called Communist countries. They are in Africa, and in Africa they conclude that there's very little exploration effort. Why shouldn't we make one of our objectves not just independence—it's also been called the Drain American First Syndrome—but the diversification of foreign sources and so that we also end up with a larger supply, reduce OPEC imports and consequently put some pressure on price?

That's more of a statement than a question, but would you respond to that statement? Mr. Akins, we'll start with you.

Mr. AKINS. I think exploration is going on around the world. The statement put out by the Interior Department was somewhat misleading. It was based on the number of wells drilled in the United States compared to the number of wells drilled outside the United States. We have drilled far too many wells and have produced very little from each well. The rest of the world has not had this extraordinary drilling program.

To make a projection from the number of feet drilled here and the number of feet drilled in Latin America or the Far East or Middle East or wherever, and say that reserves can be a linear projection, I think is quite misleading. A lot is being done already in looking for oil around the world. Perhaps not enough. Brazil is one of the countries that probably has a large potential, but the Brazilian laws inhibit the participation of foreign oil companies in exploration. The East Asian continental shelf possibly is rich, but again the Chinese have not yet moved on giving concession or entering into drilling agreements with companies. But, in general the prospects around the world are not too good. We have looked for oil for a long time. We may yet find another Middle East, but the chances

are not very great. The demands of the world for oil are so extraordinary that we're going to have to look in all areas where there are prospects, but to think we are going to duplicate the reserves of OPEC or even approach these reserves through drilling outside the present OPEC area would be overly optimistic.

Senator STEVENSON. Any other comments on that comment of mine?

Mr. CONANT. Senator, I would agree with your propositions.

Mr. LICHTBLAU. I would agree with it. I think that oil supplies are more or less indivisible around the world. Wherever we can find additional supplies it will be a positive factor for our security, regardless of whether these are secure or insecure supplies, I think the addition of any insecure supply is going to make our overall supply more secure because it's going to spread the risk so to that extent I think it's terribly important that American oil companies look for oil not just here, and that we don't measure our success only by finding oil within the United States, but by finding oil on a global basis. But what this requires, of course, is a U.S. Government policy that would encourage this, and we haven't seen that lately. I think the philosophy of the last several years has been, "bring the oil companies home. They should explore for oil here and not abroad." Our tax policy has specifically changed against foreign oil activities if you compare it to the tax policy we had in the pre-1974 period. So I think a change in our policy is called for. A recognition that wherever oil is found it will add to our security is important. We should not think that if we don't find it in the United States it's all something that can be used against us.

Mr. MAXWELL. Senator Stevenson, I also would agree with your point. Three items of perhaps some interest. The greatest areas of potential reserves that the oil companies are speculating on, nothing more than speculation, would be in the far north of Canada where the reserve of both oil and gas could be vast, but we are looking at long development times and incredible expense. Perhaps a great triangle bound by the Spitsbergen-North Cape of Norway and Novaya-Zemlya in the Barents Sea which is very exciting but is loaded with political and military portent; and thirdly, of course, the Middle East; and every indication we have is that while there are very attractive new geologic places beginning in the Gulf of Thailand and Andaman Sea, the Bombay high offshore India—many places that one could name—the practical effect of these would be small additions to reserves which 10 or 15 years from now would still leave the Middle East in the present dominant position it has been short of these incredibly large discoveries that would take place in these other spots, but given their expense and development time, I guess most of us in the industry would continue to look at the domination of the Middle East for the next 20 or 30 years in practical terms as being a fact of life.

Mr. ADELMAN. Senator, like the others, I agree with the suggestions. There will undoubtedly be some large discoveries in the next 190 years but they have very little to do with our problems of supply and national security in the intervening 10 or even perhaps the succeeding 10 years.

Senator STEVENSON. Well, having basically accepted the underlying assumption that diversification of foreign sources and development of additional sources is desirable, now I return to the immediate question about the adequacy and the availability of capital. I think this proposal may be misunderstood and quite understandably because of the form in which it was introduced, but in the course of these hearings the Vice President and others have indicated this should be an instrumentality to make capital available for development of foreign sources where that is needed and also for development of such transportation as the trans-Canada pipeline which I understand has been alluded to, and to the way of thinking of many of us, perhaps even more important, energy conservation where we are running into critical capital problems.

Now I want to make sure that all of you in considering this possibility are aware of its international dimensions—what could become international dimensions. The United States has already established an Eximbank which does make financing available in connection with American exports for the development of energy sources abroad. That capital is not supposed to be made available if it is available in private markets and yet the Eximbank is becoming a source of that, particularly the advancing of capital for nuclear reactors and energy production facilities abroad.

If the United States has capital to make available abroad outside the present producing states, and if the United States has technological resources that no other state has, wouldn't it then be in a position to do what you have already suggested should be done, or is being done now? My impression is no. We could do far more if we could make capital and technology available. Now does anybody care to comment on that?

I might just say, if you're going to say no—you're saying it's a bad proposition, then I'm going to ask you why don't we just fold the Eximbank. Is it breaking the law by making capital available that's not necessary?

Mr. CONANT. Could I confine my remarks to the question of capital and technology for oil, for the oil search? I would be surprised, Senator Stevenson, if there was any lack of available private capital for exploration anywhere in the world. I would be willing to concede that having found a significant resource developmental costs of an area which was appalling environmentally and technically, such as off the North Cape, that those developmental costs might prove to be a very heavy burden and perhaps too much. But I feel quite certain, Senator, that the real problem is not the question of capital because if the resource is found in sufficient magnitude, I think the capital would be made available privately.

The real question is the durability of the agreements that are reached between those who are searching for oil, developing it and wanting to produce it for the world market and the host government. This to me is probably the No. 1 problem which causes an American company to be reluctant to go again abroad. Therefore, I try to think of ways in which the durability of these understandings could be improved. If we were able to do that, then I think the capital problem would simply not be undertaken or be before us.

Senator STEVENSON. May I resopnd to that point? I've tried to address the same problem by, among other things, proposing that an agency of the U.S. Government assert the authority of this Government in the negotiations with the governments of foreign producers for joint ventures, production facilities and also purchase of oil. Would you support such a proposal as that? It's received every kind of abuse and it's quite adaptable to any constructive suggestions that you would like to make. At the moment it has no chance of being enacted into law.

Mr. CONANT. I would not yet support such a proposal. I'm all too conscious from my recent experience in government that problems get added when governments involve themselves in matters as vital as energy in overseas relationships. I would be interested in having a country's acceptance of an energy resource development project made part of the general credit worthiness of that country and even go so far as to have an implied U.S. interest in the preservation of the agreement without direct involvement.

It seems to me, for example, that we have not yet been able to use the facilities of the World Bank toward such an end. I'm not thinking of the provision of capital to replace that of private industry, but the sanction of an institution like the World Bank to help preserve the sanctity of these agreements.

Senator STEVENSON. Well, the involvement as a creditor would accomplish that purpose, would it not?

Mr. CONANT. Through the aegis of the World Bank?

Senator STEVENSON. Well, through the aegis of an Energy Independence Authority of the kind we are describing also.

Mr. CONANT. In my view, I don't think it's necessary to have an EIA at this point. We have so many other things that we should try first before going once more to the public trough, and I think that in my earlier remarks, Senator, I emphasized the necessity of proceeding rapidly on the review of the regulatory process, how long it takes, can it be cut down, can our objectives be met without these inordinate delays. I'm just uneasy about proceeding such a massive way when I'm not sure that the need exists at this time.

Senator STEVENSON. Before we go on, we have a number of propositions on the table. Would others like to respond?

Mr. ADELMAN. Senator, there is a little bit of history relevant in this connection of whether a government ought to involve itself in oil production investments outside its borders. A number of companies operating in the OPEC area were partly or wholly government owned and they were expropriated just as fast as the private companies.

Senator STEVENSON. Take for just a moment the question of the availability of capital. In dealing with the various Arctic gas proposals that were made in Congress, one of the problems that we faced is the risk to transportation facilities and the protection of the west coast and transportation across Canada without, of course, at that point knowing what the potentials are for discoveries in the Beaufort Sea—I don't believe that anyone, including the proponents of these applications, including Canadian officials, the financial experts—has claimed that it would be possible, remotely possible for

private money markets to finance either of these $10 billion pipelines. Did I hear accurately that you gentlemen are making such a claim?

Mr. LICHTBLAU. I think it would be possible. I don't see that this is going to be very basically different from the Alaska pipeline which was financed privately. I don't mean privately out of company earnings, but through bonds and other traditional financial sources. I think an $8 or $10 billion project of this sort could probably be financed over a period of time.

Senator STEVENSON. Maybe you're making an assumption which I'm not making. Are you assuming an "all events tariff" for natural gas? There is one assumption upon which there are some assessments that capital could be found in the private market. That assumption is an "all events tariff" on natural gas. That assumption is unreasonable. There is not a regulatory commission in any of the consuming states that will accept it and they have made it bluntly and most emphatically clear to us. This is one of those noneconomic, nonmarket facts of life that somebody has to face. First of all, do you disagree with me, or if it is an unreasonable assumption do you still suggest that private markets will supply the capital?

Mr. LICHTBLAU. If the capital cannot be supplied privately and I'm not convinced it cannot, but if it cannot, I think this would be a special case and maybe a special law, special financing means can be devised. We still don't need an overall energy agency for a period of 10 years to look at any number of projects and among them I think atomic energy, nuclear energy is the most important one. You get that feeling out of reading the administration's background comments. I would also say that when you read the FEA's Project Independence report that just came out in February you don't get the impression that capital shortages are going to really impinge on the energy development in the United States, with the exception of the synthetic fuels area; that while there are problems, according to the FEA analysis most of the money is expected to be raised within the industry or within conventional traditional channels. When you go through that FEA report, particularly the oil and gas sections, there is no expectation that a major shortage of capital really will restrict the development of oil and gas, including Alaskan oil and gas.

Senator STEVENSON. Do you understand what some of us are suggesting? We are not proposing to make anything available that isn't necessary. This is only for the ad hoc emergency situation where the market doesn't produce the capital, and I grant you there are a lot of problems in trying to draft it and it may be impossible, but the only purpose is to have capital available on a virtually emergency basis. Now you have carved out one possible exception, the pipeline. You have also mentioned synthetic fuels as another area.

Mr. LICHTBLAU. There's a separate bill on that in Congress elsewhere.

Senator STEVENSON. That's what I'm getting at. We're going to have a separate bill for every energy conservation system or pipeline. We have a $10 billion conservation bill out of the Commerce Committee that's now come to this committee because of its relevance to this other legislation that we're proposition. We're carving out synthetic fuels, another multibillion dollar area. We have such other

responsibilities as the financing of solid waste treatment facilities, municipal facilities which will produce not only energy but also aluminum and steel. The teechnology is there but there's just no financing of such solid waste treatment facilities for most municipalities and if they don't have creditworthiness that, too, might fall within the aegis of this agency even though the purposes in that case are multiple.

Would you suggest still another agency for that area or is that one not worthy of special attention?

Mr. LICHTBLAU. What criteria do we have in each of these cases that the lowest cost, the most economic project is being financed? For instance, there's a new suggestion that natural gas in Alaska be turned into methanol and be shipped by tankers from a certain point to markets. I'm not saying this is good or bad, but it's a new idea and perhaps the economic battle between the various projects will result in something better than would otherwise be the case, but we have no guarantee that if the energy authority moves in it will really offer the most economically justifiable.

Senator STEVENSON. Mr. Lichtblau, that's our determination. We can't make the decision in Congress on every single project but we can do something that the administration is not doing in its proposal. We can establish criteria. I'm trying to establish some very tough criteria in connection with methanol transit and others. That's the best we can do and we should do it. We should attempt in the cases of these alternative energy proposals for public financing, it seems to me, to establish criteria including cost-benefit ratios. Maybe we want to do something to downgrade the nuclear area which you mentioned. There certainly ought to be some attention to the environmental problems, certainly some attention to the whole question of dependence or interdependence. We can build some safeguards.

Mr. LICHTBLAU. If you change the bill, if you build some safeguards into it, I'd like to look at it again. As it is, I don't see any safeguards. I see a blank check of $100 billion.

Senator STEVENSON. That's an atrocious proposal and I don't quarrel with your characterization of it, if that is the position being taken here. I might say it's not the first time it's been taken and enacted into law. The Eximbank is a $35 billion carte blanche for the export sector of our economy and in this case I don't think there's any serious thought at all up here to create a carte blanche. If there's going to be anything, it's going to have some tough criteria and we are interested in insuring that the capital is available when, and where, and if, it's needed. We need some help in developing those criteria. To mention just another area, coal conversion to oil and to gas. I think the latest figures on the commercialization of the gasification plant are up over $1½ billion each.

Mr. LICHTBLAU. That goes into the area of synthetic fuels. I agree this is one where where Government help is absolutely required.

Senator STEVENSON. But it's a big area.

Mr. ADELMAN. I wonder if I might disagree with Mr. Lichtblau on this point. Where capital is not available, private capital, that's an indication that the anticipated price is going to be lower than the anticipated cost. Now there may be reasons for subsidizing the development and production of this fuel, but I think each such pro-

posed subsidy ought to be carefully examined. There are two principal objections. One, if you're setting the price, let's say of gas from coal at what's currently estimated in terms of oil equivalent around $21 to $24, you're serving notice on the cartel that incremental energy supplies are worth to you almost twice as much as the current price. I think that's bad from our point of view and good from theirs.

The second point is that if, nevertheless, we are going to subsidize this or another energy source, subsidies to capital are the worst possible way of doing it and loan guarantees are one means of subsidizing capital. You're encouraging people to overuse the cheap and abundant resource instead of looking to see the best method of blending capital, raw materials, transportation and so on. You're telling them to bear down on the capital intensive method and Mr. Lichtblau's point of coal versus nuclear is I think a very good example of that.

Senator STEVENSON. Well, my time is up.

The CHAIRMAN. Go ahead.

Senator STEVENSON. Let me just conclude by saying, Mr. Chairman, that we can rely on the market to make the capital available and rely on judgments in the marketplace about where the return is, where the highest return is, where the safest return is, judgments that aren't going to have anything to do with what is really best for the country over the longest period of time. We're going to end up I think with misallocations of resources, not with the allocation of capital resources to major conservation efforts, for example, where the return is not immediate, not perhaps to solar energy, and even some of the short-term possibilities have political factors at work or unknown quantities that might materialize, and you won't get the capital. The system across Canada for Arctic gas may be a marginally attractive or unattractive transportation system from Alaska and the McKenzie delta, but if it's built it can become the first step toward the transportation system for the transmission of oil out of the Beaufort Sea. Well, in the private money markets they can't make that judgment until years from now when we know what's in the Beaufort Sea. But in the meantime, we can leave the gas up there and try to turn it into fertilizer in Alaska or something like that, but the market at the moment is not in the position to make the kind of judgments that you were saying should be made. Now in all those situations, why don't you agree with me that we ought to have an agency that can make just exactly the judgments which I think you are saying ought to be made and in some cases on grounds which are traditional grounds, but which private sources cannot judge, because of these uncertainties and because private sources just aren't particularly interested?

Mr. ADELMAN. Is the question addressed to me?

Senator STEVENSON. That's another one of my questions in case you couldn't tell.

Mr. MAXWELL. Could I have a go at that one?

Senator STEVENSON. Go right ahead.

Mr. MAXWELL. I'll try to make it very short. I think that of the many projects that such an agency would undertake, Senator Stevenson, obviously there would be some big winners. I think the problem

that most of us have in dealing with the proposition that we should go ahead on a broad front is that there may be a collection of non-winners among the winners that is absolutely overwhelming as the very best propositions are brought to the commercial sphere and are for various reasons rejected and then are subsequently pushed off into an organization such as EIA. Therefore, the organization will point to its successes but the failures will be large enough and frequent that questions will be raised at the end of the process as to whether the total allocation of capital would have been as attractive towards EIA as allowing that same capital to be taken by the commercial market and pushed into areas such as greater coal use on the correct burning base or natural gas price rises which causes incentives which allows us to produce more conventional fuel such as natural gas, the question of total return that we're talking about here. I'm not disagreeing with your point that there will be some areas where capital is afraid to tread.

Mr. ADELMAN. Senator, I think you stated quite eloquently the case for the Government spending to acquire knowledge which doesn't pay anybody, any private party, to acquire on its own because it can't capture the use of that knowledge. I would point out that this kind of spending requires the very same facilities which are going to be drawn down by large-scale projects of the kind we have been talking about. Money is the least of the problem, but some materials and engineering know-how are small pools, quickly preempted. So if we are to learn much more, for example, about shale oil extraction by better methods, or solar energy, and so on, we can't do them while at the same time we have an extravaganza of large-scale development.

The CHAIRMAN. Mr. Maxwell, an economic argument for the bill is that if we continue to spend billions of dollars abroad for foreign oil this takes away jobs at home. Now we know that when we do spend that money the Arabs are doing something with the money. They are buying goods in industrial nations and they are buying a great deal from us. Last year we had the most favorable balance of trade we have ever had. What happens if we buy energy self-sufficiency through this legislation at a high cost? Will we lower unemployment and bolster our economy or would we just lose jobs in the export sector and gain them in the energy sector with no real net gain?

Mr. MAXWELL. Well, I think you're aware, Mr. Chairman, that as an energy specialist you have asked me something somewhat over my head. I'll reply anyway because you asked me and I do have an opinion but the question of export jobs is a very complex one, particularly as it involves things that are far beyond energy, but we are talking about the petrodollar recycling problem and long-term balance of payment. I would maintain that those who believe that sharply raising levels of imports from a purely economic point of view we are not discussing political or military—is a disastrous course to embark on. Obviously the Middle East is in the position for the next 20 years to put it graphically if they wish to buy the American way of life, at least the Saudis do. We're looking at the creation of an incredible infrastructure starting with roads and utilities and airports and harbors and ports going into the main indus-

trial areas, eventually ending up in light industry, housing and so on, at the amount of business which we can transact over there in which we help them in procurements of material, engineering design, construction work, giving them the benefit of our technology and exporting vast amounts of equipment, machinery and process know-how is huge. There may be many years down the road a situation in which we cannot export these things to the degree which we are importing oil, but surely this is a great job creator and will be so for many, many years.

The CHAIRMAN. Of course, now we're selling them arms. We're buying their oil and they're buying our arms.

Mr. MAXWELL. That part personally, Mr. Chairman, I would like to see reduced and the huge economic flow increased.

The CHAIRMAN. But the principal economic effect is the fact that the extent that we are dependent on foreign oil and that price tends to rise and we of course suffer an inflation in this country, and based on the experience we had in 1973–74 and inflation which translates itself rapidly into a recession because people price themselves out of the market for various things. So that this bill would attempt to overcome that by providing a more assured source of energy with a price which wouldn't be outside of our control as much as the foreign price.

Mr. MAXWELL. It could be argued in line with the peaking of various OPEC countries in the production in the middle and late 1980's in real 1976 dollars, we could when this surplus Mr. Lichtblau and Professor Adelman spoke about with you stopped, we could be in a situation in the late 1980's or the early 199's where the price of oil took another incredible leap. I believe it could rise into the $25 to $28 a barrel range in 1976 dollars, but that's a long way away and I would say that at least for the next decade the chances are that it will remain in a range of where it is now, perhaps rising slowly in line with world inflation or perhaps as I would guess slightly below world inflation. But this issue of inflation therefore, taking the next 10 years—and that's what I'd like to limit it to because the rest is speculation—the indications to me would be that such a vast effort mounted at home would create conditions of much higher inflation than the comparable situation of lowering our investment to sources of energy which are much more economic to develop and bring onstream more quickly. I'm thinking, for instance, of investment in natural gas where we're obtaining it today, failing to obtain it from Texas, a price of 40 cents a thousand cubic feet, whereas we can obtain it relatively easily, large incremental amounts, at higher prices which actually approximate $10, $12 or $13 a barrel for oil.

The CHAIRMAN. You may win the argument on the shorter range, the 10 years. I wonder if you went out longer than that.

Mr. MAXWELL. I wanted to agree with you on that.

The CHAIRMAN. In the longer range view, can we continue to sustain a high level of imports through 1990 or the year 2000 or do you believe that we have good assurance wherein that period of time the private markets would finance alternative energy developments, synthetic fuels, solar energy, or some other type?

Mr. MAXWELL. There is a real question as to how long we can sustain these levels of imports. This gets into again complicated issues on the agriculture side particularly and on the military side.

The CHAIRMAN. Mr. Akins, you had some very fascinating testimony before Senator Church's committee. As I understand it, the administration's argument for an energy independence initiative appears to contain some contradictions. On the one hand, it is argued that we need an Energy Independence Authority to make us less vulnerable to OPEC price increases. On the other hand, the success of the energy independence drive seems to depend on oil prices staying high and going higher.

You testified before the Multinational Corporations Subcommittee last week that the Nixon administration in mid-1974 refused to let you consult with Saudi Arabian officials about a potential oil auction which could have brought down OPEC oil prices.

Do you believe that there are similar price-cutting opportunities available today?

Mr. AKINS. No, not very many.

The CHAIRMAN. You do not?

Mr. AKINS. No. I think we are probably going to have to live with the present price in 1975 dollars for the next 10 years plus or minus a percent, assuming there's no war in the Middle East.

The CHAIRMAN. Your testimony at that time was that there was an opportunity.

Mr. AKINS. There was an opportunity that was lost.

The CHAIRMAN. At least a powerful person in Saudi Arabia an important person who was trying very hard to moderate prices and he had some support within the country, but I think he had to rely on Iran to get the other OPEC countries in line and just couldn't pull it off.

Mr. AKINS. Well, there were two separate things, but I don't think either will duplicate itself now. I don't know that either would have worked if we had tried. The point I was making was that we didn't try.

The CHAIRMAN. Isn't there any feeling on the part of these OPEC countries that if they insist on high prices or even a higher price that they're going to encourage the development of alternative sources of fuel and they're going to end up with a situation in which their oil wouldn't be worth nearly as much?

Mr. AKINS. I don't think that bothers them very much. But as everybody at this table this morning has said, we are not going to be able to do very much for the next 10 or 20 years to turn things around. In 20 years their resources will be well on the way toward exhaustion except in Saudi Arabia and Iraq. The other OPEC countries are looking at the present market opportunity as a very short term prospect. They know how much oil they have and they want to make as much money as they can in the short run. We can't frighten any of them with the prospect of garbage conversions in the year 2000.

The CHAIRMAN. You think it's just unrealistic to expect oil prices to come down, no matter what we do?

Mr. AKINS. Yes, I do. I think in the next 10 years the best we could hope for would be a modest decline in constant dollars.

The CHAIRMAN. That's the best. What's the worst? Do you think there's a possibility that prices will go up rather sharply?

Mr. AKINS. If there's a war in the Mideast, the prices certainly will go up because there would be production restrictions, production cutoffs. Prices could reach a very high level, but I think that would happen only if there were a war in the Middle East.

The CHAIRMAN. You're for this legislation. How important do you rate this as compared to a different regulatory policy?

Mr. AKINS. I wouldn't rate this very high. I said that I think this is one of the things that should be done. I certainly don't think it is the begin all and end all.

The CHAIRMAN. It's an awful lot of money if you don't rate it highly; $100 billion is a terrific price tag.

Mr. AKINS. But we hope we're going to get a lot of it back.

The CHAIRMAN. Some of the people who favored this—Mr. Peterson made a very impressive appearance before the committee, the head of Lehman Bros. and former Secretary of Commerce. He argued it was too much money, $10 billion or $15 billion is where we ought to start. That would be more reasonable and we could have more careful scrutiny of it and $100 billion—there's no justification for that. He thinks we should start off at a much lower level.

Mr. AKINS. It's obviously not going to be spent all at one time. You start with $10 billion and if it works you go into another $10 billion and then other increments. That sounds like a good idea to me.

The CHAIRMAN. Senator Stevenson?

Senator STEVENSON. Mr. Chairman, I don't have any more questions. I would hope, though, that the committee might soon have a different proposal in committee print that would reduce the numbers, and contain something about criteria for determining priorities, something about the way you finance it and where you're going—the scope. It's not just the production of energy, but conservation and transportation, maybe even garbage conversion. And we might then go back for additional comments. I would just hope that this hearing, much of which I was unable to attend, didn't leave anybody with the impression that we're not interested in an effort to assure that capital is available when it's needed for the production of energy.

The economic arguments frequently tend to overcome and obscure the national security considerations. How would you rate the chances of another Middle East war in the next 5 years?

Mr. AKINS. It depends on what we do.

Senator STEVENSON. Well, you're quite right. I agree with you. Therefore, I can't be very optimistic.

Mr. AKINS. I am very optimistic.

Senator STEVENSON. You are?

Mr. AKINS. I am very optimistic.

Senator STEVENSON. You have the outcome of the election figured?

Mr. AKINS. Not yet.

Senator STEVENSON. Could you give the committee before we break up, a description of the Strait of Hormuz? Isn't this a source of vulnerability in oil transportation that we ought to be concerned about? How about the Strait of Hormuz? I don't think anybody

has ever heard of the Strait of Hormuz. How much of the world's oil flows through the Strait of Hormuz?

Mr. AKINS. A good deal of it, and it could be closed, but it would only be closed if there were a war.

Senator STEVENSON. Well, the Middle Eastern leaders in my recent trip said if the Strait is closed, it would be closed in a mysterious way and it might well not be an event such as outbreak of war.

Mr. AKINS. I can't imagine that. That is, the straits are not that narrow. They are quite deep and accidental sinking of a tanker is not going to close the straits.

Senator STEVENSON. That has been said. Is that untrue? What is the case?

Mr. AKINS. It would have to be mined. Or you could have artillery on one side.

Senator STEVENSON. But it could be done by one tanker?

Mr. AKINS. No; it could not be done by one tanker.

Senator STEVENSON. Or a couple of tankers?

Mr. AKINS. You'd need mines and you'd need artillery. You'd have to have a situation of war.

Senator STEVENSON. But it has been said by sinking one or two tankers the Straits could be closed. Is that untrue?

Mr. AKINS. I don't think that's true.

Senator STEVENSON. Well, I'll pursue that a little later. I would like to be educated on the Strait of Hormuz.

Mr. AKINS. The transportation through Hormuz is of course extremely important and the straits could be closed, but as I've said before, I think it would only be if there were a war in the Middle East, then it would have to be something that would have to be considered.

Senator STEVENSON. Thank you, gentlemen.

The CHAIRMAN. I would like to say to Senator Stevenson that his suggestion that the committee come up with a committee print is a very welcome suggestion and a good one. I understand Senator Stevenson is working on legislation along that line and I certainly welcome it. We have before the Congress, before the Senate, a Kennedy-Hollings bill which has been endorsed by Ralph Nader and some others. That's the synthetics bill which Mr. Lichtblau spoke of and supported which is another element in this whole picture. I do hope we can come up with something to provide capital. That's our responsibility as the kind of credit committee for the Senate.

Senator STEVENSON. If the chairman would yield, all of these proposals are going about it piecemeal, ad hoc, as usual, and would create a parade of agencies in addition to those already in existence for the development and delivery of capital. So I suggest to you, Mr. Chairman, that some consideration ought to be given in this case, to putting together something that begins to make some judgments on priorities and to be sure the capital isn't made available indiscriminately through a dozen different agencies but according to our highest priorities. The Kennedy-Hollings bill which I had a hand in drafting, just that one bill has $10 billion.

The CHAIRMAN. That was before the Commerce Committee?

Senator STEVENSON. Yes, sir, it's been referred to this committee now.

The CHAIRMAN. Well, as I say, we will have to see what we can do to put this together because I think, as Senator Stevenson has pointed out, there's a lot of opposition not only in this panel but this committee and this Congress to this kind of bill as it is. It provides so many exemptions—exempt from the budget, exempt from the Freedom of Information Act, exempt from regulatory bodies—it has a number of weaknesses and defects that just have to be corrected.

As Mr. Lichtblau and others who oppose this bill have indicated, perhaps if we came up with another bill that might get more favorable consideration.

Gentlemen, thank you very, very much. You have been most helpful. I have some other questions I will ask for the record. Senator Stevenson, do you have any more questions?

Senator STEVENSON. No further questions.

The CHAIRMAN. This is an excellent panel. You gentlemen are obviously very, very well informed and you have been most helpful and made a fine record.

[Whereupon, at 11:55 a.m., the hearing was adjourned.]

[A letter from Ralph Friedman commenting on the remarks of Charles Maxwell was received for the record as follows:]

RALPH FRIEDMAN,
New York, N.Y. May 25, 1976.

Hon. WILLIAM PROXMIRE,
Committee on Banking, Housing and Urban Affairs, U.S. Senate,
Washington, D.C.

DEAR SENATOR PROXMIRE: Charles Maxwell was good enough to send me a copy of his letter to you of May 10th relative to his appearance before the Senate Banking Committee on that day. While I greatly respect Charlie's intelligence and knowledge of the oil, gas, and coal industries, and I do agree with some of the points made in his letter, I differ on others, and with some of his conclusions as to what the United States should do about improving its energy situation. Hence this letter to you, out of the cold so to speak, as I do not recall having had the pleasure of meeting with you.

First let me introduce myself, Giographical information is listed in the current as well as past volumes of "Who's Who in America". In addition to that let me say: 1. I am active on the Yale University Council Committee for its School of Forestry and Environmental Studies, the oldest and possibly the most influential and prestigious School of Forestry in the country. 2. For many years through other organizations I have been involved in conservaton and natural resource problems; I was a member of Governor Carey's New York State Task Force on Problems of the Environment; I am a member of the Adirondack Council, etc. 3. My business activities in past years included domestic oil and gas exploration and production, and contract drilling in the Gulf. 4. I have a long involvement in matters of the Middle East and have been repeatedly to various of the countries. As part of this I am the American director of the Bank Leumi, the dominant commercial bank of Israel, with offices worldwide and assets of over 8 billion dollars.

Mr. Maxwell poses the question: "Is energy independence really necessary"? Without defining the meaning and limits of "necessary" the question of course cannot be answered flatly, but it is unquestionable that energy independence, to the greatest degree possible, is extremely desirable for the United States. The only room for serious argument is the price that we are willing to pay.

While I strongly agree that an initial funding of 100 billion dollars through a proposed new Authority (EIA), or through ERDA, is not the sober way to proceed, I do believe that the Federal Government should, and indeed must, underwrite the costs and take the directional responsibility for a very major research and pilot program in these fields, funding it as you go along, and therefore not just squandering money. A precedent research undertaking was the

Manhattan Project during World War II. If it had not been for that and its technological break-throughs, we would not have had the birth and development of the nuclear power industry, our newest and best single bet for energy betterment. Another parallel illustration currently is the Federal Breeder Atomic Reactor Program.

Mr. Maxwell in his letter to you seems to oppose any such government support of research for bringing down the costs, in money, and in damage to the environment, of producing oil from shale, tar sands, of coal gasification, of nuclear power, and in the more exotic fields of nuclear fusion, solar energy, and geothermal power. He suggests relying on the private sector, sparked by the profit motive. This I believe is dead wrong as they cannot afford the gamble of a crash research program.

An "evenhanded' stance by us in the Middle East (Page 6, Paragraph 3 of his letter) is the current euphemism or code phrase for a pro Arab stance, regardless of their oft-stated intent of eliminating the State of Israel. The Arab Rulers' objection to Israel goes beyond its Statehood. It also is keyed to Israel being an uncomfortable example of progressive western civilization in a feudal part of the world.

A walk out on Israel will buy us no dependable friendship or freedom from future economic blackmail. Over the long term it will not get us a barrel of oil at a price cheaper than they are able to extract anyway, through the power of their cartel, egged on as it is and will be by the Russians. The Soviet need for turmoil in the Middel East (and elsewhere) and their appetite for dominating Western Europe and for our destruction have never really varied.

Research towards energy self sufficiency is the only prudent course in the jungle world we live in. The problems involved are not easy; the sociological adjustments we may well have to face are not easy; but there is no other reasonable course. Appeasement is a can't-win, downward spiral without end.

Regarding America's energy resources and opportunities:

1. *Nuclear Power.*—Licensing procedures for nuclear power plants, inland and off-shore need to be standardized and expedited. Research for additional safety checks and procedures, for abatement of thermal pollution (which is a real problem), and for more convincingly secure disposal of radioactive wastes must continue, and it will as the art develops. It is also imperative that the public become better educated to the realities; to the present levels of safety, which are comparatively good, and to the lack of non-polluting alternatives. There is no Utopia. Strip mining of coal poses risks (almost certainties) of environmental degradation far greater than nuclear power plants. On this I would refer you to "An Inseparable Linkage: Conservation of Natural Ecosystems and Fossil Energy" by Professor F. H. Bormann of Yale University; also the report just published of the meeting in April on Nuclear Energy of the American Assembly (Columbia University).

2. *Domestic Oil and Gas Exploration and Production.*—Both oil and gas price controls should be phased out as rapidly as political attitudes will permit. Domestic crude will never rise above world prices and price controls are nightmarish and counter-productive. They effectively discourage the all out exploration for hydrocarbons that we need as well as some secondary or tertiary recovery procedures in older fields. The end result is to prolong the agony and incidentally to intrench the power of our enemies and fair weather friends.

Continental shelf exploration should be permitted under strict and sophisticated standards with responsibility for any minor or major accidents resting with the operating companies. Since off-shore production would all be used domestically, on-shore storage facilities and refineries where the gathering lines would terminate, should be a few miles inland—not on estuaries, or sea coasts. The greatest damage to marine life is done in the estuaries and coastal shallows. As the off-shore oil and gas would be used within the United States, distribution from storage tanks and refineries should be required to go by pipeline, not by tanker. Having the on-shore facilities inland will reduce the chance of marine pollution. The oceans of the world are being damaged rapidly and seriously by tanker spills and illegal discharges of bilge and oil from other vessels.

3. *Coal.*—Production should be encouraged, but not by relaxation of environmental controls. Where strip mining is done reclamation and revegetation of the surface with indigenous trees and grasses must be meaningful, although this in many cases may not succeed, and subject to monitoring by a Federal agency

having enforcement powers to assure acceptable standards and to stop the mining where damage is grave and seems likely to be permanent. Research, private and public, should continue on this, as well as on gasification of coal and desulphurization. Air quality standards as now established by Federal legislation should not be measured at close ground levels despite some utility propaganda.

The above comments are offered for whatever they are worth and with full realization that they only touch the highlights of the whole vast complex of problems.

One closing word if I may be prophetic. The economy of America and its future may well hinge on the decisions in this matter by your distinguished committee and the Congress.

Sincerely yours,

RALPH FRIEDMAN.