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THE IMPACT OF THE PRESIDENT'S ENERGY PLAN ON THE NORTHEAST

HEARING

BEFORE THE

SUBCOMMITTEE ON ENERGY

OF THE

JOINT ECONOMIC COMMITTEE

CONGRESS OF THE UNITED STATES

NINETY-FIFTH CONGRESS

FIRST SESSION

MAY 13, 1977

Printed for the use of the Joint Economic Committee

U.S. GOVERNMENT PRINTING OFFICE

97-013 O WASHINGTON : 1977

For sale by the Superintendent of Documents, U.S. Government Printing Office
Washington, D.C. 20402

847

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THE IMPACT OF THE PRESIDENT'S ENERGY PLAN ON THE NORTHEAST

FRIDAY, MAY 13, 1977

CONGRESS OF THE UNITED STATES,
SUBCOMMITTEE ON ENERGY
OF THE JOINT ECONOMIC COMMITTEE,
Washington, D.C.

The subcommittee met, pursuant to notice, at 9 a.m., in room 208, John W. McCormack Post Office Building, Boston, Mass., Hon. Edward M. Kennedy (chairman of the subcommittee) presiding.

Present: Senator Kennedy and Representative Heckler.

Also present: Jerry Brady, subcommittee professional staff member; and Charles H. Bradford and George D. Krumbhaar, Jr., minority professional staff members.

OPENING STATEMENT OF SENATOR KENNEDY, CHAIRMAN

Senator KENNEDY. The hearing will be in order.

This is a hearing of the Subcommittee on Energy of the Joint Economic Committee of the House of Representatives and the Senate of the United States.

I want to welcome you to this morning's hearing on the impact of the President's recently announced energy plan. It is especially appropriate that the Joint Economic Committee is beginning its deliberations with the people who pay the bills, haul the fuel oil, search their imaginations for alternative solutions, and care about their environment.

In coming to New England the subcommittee has come to the right place. Where else could the subcommittee begin and find a region which has borne the full impact of the four fold jump in world oil prices; a region which has already devoted itself wholeheartedly to conservation and; a region which is searching with so much enterprise for ways to use alternative fuels.

Just consider these facts: Over 80 percent of this region's energy needs are provided by petroleum, the highest percentage in the country. When combined with New York, New Jersey, and Pennsylvania this region consumes over two-thirds of all the residual and distillate fuels in the country. Of the 31 utilities ordered to convert to coal last month, 16 are in New England.

New England is using nuclear power as an energy source more than any other region, with over 30 percent of our electric power now provided by nuclear energy. New England is farther ahead in adopting conservation measures than any other area, and Massachusetts has the most advanced State conservation plan in the Nation.

The search for alternative sources of energy, from solar heat, wind and wood is far advanced here. More exciting, original thinking and community organization is going on in New England concerning these topics currently than at any other time in our postwar history.

In many ways the debate and turmoil the country is experiencing about energy can be the basis of our renewal. We must move from an ethic of wanton consumption of energy and resources to an ethic of conservation. If we are wise in our decisions this year and next, we will be laying the groundwork, not for a time of austerity, but for a new era of energy security and economic progress.

President Carter has made a strong beginning. I commend him for the plan he presented to the Congress on April 20 and for the legislative package of April 29. In calling us to the challenge, the President revived the words of William James who, 65 years ago, suggested that all citizens should be called upon to serve their country for 2 years. If, as the President has suggested we are engaged in the "moral equivalent of war," then New England has already enlisted. For those of you who are asking yourselves whether you want to sign up, we hope these hearings will be the first step in an effort to insure that the burdens will be borne fairly.

In the hearing today we will be looking at questions of equity. We will also be looking for practicality. Will the President's plan be fair to all regions of the country? Will it provide evenhanded treatment for consumers? Is it possible to mine, transport, and assure an adequate supply of the coal New England is being asked to burn?

We are assured that the plan's ultimate effect will be beneficial to New England but we would not be New Englanders if we did not look this gift horse in the mouth, count its teeth, and feel its nose.

I would like to draw special attention to the President's emphasis on conservation. I believe conservation is our long suit and should be pursued for all it is worth. Last year I sponsored legislation which promoted conservation in homes, apartments, industries, public buildings, and nonprofit institutions. I also proposed a special program for weatherizing the homes of low-income families. Some opposed this program on the grounds that what we needed was production, not conservation. But the Congress saw otherwise and approved a $200 million demonstration program of incentives for conservation in homes and apartments, a $2 billion loan guarantee program for industry, Government, and nonprofit institutions and a $200 million program for low-income weatherization was enacted into law. Now we see this approach at the heart of the President's program and I could not be more pleased.

To cite just one example of what is possible, the American Institute of Architects has calculated that by 1990, 12.5 million barrels of petroleum per day—about one-third of our current national energy use—could be saved just by employing energy-efficient systems in old and new buildings. To generate this much energy by traditional, centralized energy systems would require a capital investment of $415 billion and require consumers to pay more than $1 trillion for unneeded energy. Certainly the message is clear enough to speak for itself.

Today we want to let the people of New England speak for themselves. Since the President announced his comprehensive plan last month I have received over 600 letters from people in New England—people who welcome the President's initiative and his pledge that the plan will be equitable.

These letters, and the calls and visits that have been made to my office in Boston and in Washington also show that there are many unanswered questions on the minds of the homeowners, business men and women, and consumers of New England. These are the questions that we want our witnesses to bring to us this morning.

We will begin our hearings with a panel of witnesses concerned about the impact of the President's plan on homeowners and conservation. Then we will hear from Mr. John O'Leary, Administrator of the Federal Energy Administration, whom we hope will remain with us throughout the morning. Mr. O'Leary will be followed by a panel on oil, coal conversion, and employment, and we will then hear from a panel on nuclear and alternative energy sources.

At the conclusion of the hearing we will ask Mr. O'Leary to respond to the questions that concern our panels. And if we can't get the answers today we will take these questions back to Washington to be fully examined in further hearings.

The people of New England need the facts before a new energy policy goes in place—not after. This is the objective of the hearings we are beginning today.

Your prepared statements, if they are summarized, will be made a part of our hearing record.

But first we will hear from the distinguished Congresswoman from the 10th Congressional District of our State, Margaret M. Heckler, who is a very active member of the full committee, and we welcome her comments.

OPENING STATEMENT OF REPRESENTATIVE HECKLER

Representative HECKLER. Thank you very much, Mr. Chairman, and I wish to commend you, for your initiative in bringing the Subcommittee on Energy to Massachusetts, and for your leadership on the question of energy in the Joint Economic Committee in Washington.

I, too, have heard responses from my constituents on the question of energy. A few of these comments indicate to me that there is great hope in the minds of the people of Massachusetts and a willingness to sacrifice, but there is a question about the equity of the program and some of these issues will be explored in our hearing today.

From Wellesley, one constituent wrote:

President Carter's emphasis on energy conservation is a long overdue point of view for our country, for if Europe can have as high or higher standard of living using far less energy, why can't we?

From Marion I heard:

While we are both Republicans, this is clearly a matter that should transcend partisan politics. It is extremely important at this time that definite steps be taken to curb energy outflow while also taking into account the sources of energy available.

From Halifax:

Overall the proposal contained a good balance of rewards and punishments. Even the less appealing parts are easier to swallow at this time, this way, than the more drastic shortages and price increases in a few years.

Thus it seems clear to me that we have our mandate and that the people of New England are watching and are supportive of the thrusts which the President's proposals have raised. However, there remain a number of questions which must be answered.

The President has proposed a comprehensive program. I have reviewed this in part and I find a summary of the program runs to over 100 pages. The bill itself is over 300 pages long. According to one prominent Washington official, it is the most comprehensive program he has ever seen. It is the very comprehensiveness of this program which raised an issue. All too often in Washington we suffer from big-picture-itis. We take a comprehensive view of things, forgetting that the country is divided into regions, and that the regions are composed of cities and towns and villages, populated by individual citizens with individual points of view. And thus, the hearing today is significant.

The chairman of the present Council of Economic Advisors testified yesterday on the overall economic impact of this plan. His assessment was that the impact would be neutral. In other words, he is satisfied with the aggregate numbers. But doesn't this mean that some people will win and some people will lose? Who are the winners from this plan? Who are the losers? These questions have to be answered.

We get some idea of the winners and losers when we look at the question of the proposal for pricing natural gas versus crude oil. These two energy sources will be controlled at comparable prices on a pretax basis. Then the tax changes in the energy program will leave oil at a higher relative price than gas. Does this mean that oil dependent New England will still have to pay higher prices for energy than the rest of the country?

Thus we can go on from one aspect of the program to another, but just yesterday Mr. Shultz emphasized repeatedly that the future is wrought with uncertainty. One thing that is certain is that the program constitutes a massive increase in taxes. I question what the plan for redistributing the taxes will be. How will the rebate tax credits aspect of this program work?

As anyone in Washington who has had any experience knows, when Washington funnels out money to the States and to local government, a lot of money sticks to the funnel, and I am worried about how much of the rebate will stick to the funnel and how much of it will actually go back to the people.

Another area that concerns me is the question of environmental standards and requirements of the administration's plan to convert to coal usage from other fuels. Massachusetts is a downwind State. We import a lot of pollution, thrown up into the air by other States. Therefore we already start at a disadvantage from an environmental point of view.

What does coal conversion mean in this setting? Reports that I have read from economists familiar with the New England situation raised problems of prices, and also the problem of transportation—how to get the coal from coal producing areas to our utilities

in Massachusetts. I wonder if our Federal policy planners have considered that and have an alternative in response, on that very serious question.

These and many other issues will be explored in our hearings, not only today but at hearings in the future in Washington. I suppose most important of all will be the question of the incentives for homeowners to make their own houses energy-efficient.

How will the plan work? Will the sudden demand for insulation and related materials caused by the program raise the prices so that in the final analysis the Federal Government ends up lining the pockets of the insulation manufacturers? Are the incentives for solar energy really sufficient to promote solar energy conversion as a viable source of heat and power?

This is a partial list of some of my constituents' concerns. I come with questions and I am seeking answers. I am very impressed with the list of witnesses which you have assembled, Mr. Chairman. I look forward to the testimony of the panels, of the experts of both panels, who will speak to the issues. I particularly welcome Mr. O'Leary who has met with the New England caucus and has been very willing to face the problems of New England earlier, and continues to do so. It is with this spirit of support and questioning that I participate in this hearing. Thank you, Mr. Chairman.

Senator KENNEDY. Thank you very much, Mrs. Heckler, for a fine statement. We had invited the Governor to participate with us today but he had another commitment outside of the city however we do have the Secretary of Consumer Affairs, Christine Sullivan, who will place into the record a statement by the Governor.

We welcome as our first witness the Honorable John F. O'Leary. We are delighted to have him in Massachusetts today. I can tell from personal conversations and communications that he has a grasp of the energy problems we are facing in New England. I must say it was a pleasure this winter when we were facing some very real challenges, to be able to meet with Mr. O'Leary about our particular problems and to get a very positive response regarding entitlement programs which mean a lot to the continuation of the supply of natural gas. Although other parts of the country were unable to obtain adequate supplies of natural gas—we were able, through the entitlement program, to give the assurance of continuity for the homeowners and industry here in our State. Mr. O'Leary has been responsive and has an understanding; we look forward to hearing him this morning.

Mr. O'Leary, I think Congresswoman Heckler raised many of the questions as we tried to in our statement, and we now look forward to your comments. As I mentioned, there is probably no place in the country where really the energy issue is of greater importance than this area of New England.

Over the years we have been closed out of the oil overseas when it was cheap, and then required to buy it when it was expensive. We have been opposed and denied refineries in our part of the country by many of the different oil groups, and we have been discriminated against in terms of transportation and movement of energy resources here to our areas, and so we have a great willingness to work closely with the President and we are delighted that he has underlined both conservation as well as establishing a pro-

gram of equity and fairness between the regions. We are looking forward to hearing how that is going to be done.

We want to welcome Mr. O'Leary.

STATEMENT OF HON. JOHN F. O'LEARY, ADMINISTRATOR, FEDERAL ENERGY ADMINISTRATION

Mr. O'LEARY. Thank you very much, Senator. It is a pleasure being here and a pleasure to see both you and Congresswoman Heckler this morning. I want to tell you that to an O'Leary, coming to Boston is like coming home.

Mr. Chairman, during the 1950's and 1960's, the real price of energy in the United States fell 28 percent. During the same period, U.S. consumption of energy increased at an average annual rate of 3.5 percent. As a result of the availability of cheap energy—and if there is anything that was a hallmark of U.S. energy policy over the last 50 years it's the provision of cheap energy—the United States has developed a stock of capital goods, automobiles, appliances, buildings, industrial equipment—which uses energy inefficiently.

To meet its growing energy demands, the United States has been forced to turn increasingly to oil imports as domestic production of oil and natural gas peaked. The crux of our energy problem is clear: Economic and national security considerations make future reliance on unrestrained growth of oil imports unwise. At the same time, massive development of U.S. energy resources would have severe economic and environmental consequences.

The national energy plan addresses our energy problems comprehensively. It proposes measures that would reduce imports to a manageable level, rather than incur the full costs of eliminating imports completely.

It proposes effective measures to gradually shift our existing stock of capital to a more energy-efficient one, without changing our basic standard of living or interfering with continued economic growth.

It would provide generous incentives for new energy production, without providing profits to producers disproportionate to the economic risks assumed.

And it would encourage increased reliance, in both the near and longer term, on more abundant energy resources, with appropriate concern for human health and the environment.

Our analysis of the economic impacts of the national energy plan indicates that if we begin now to become more efficient users of energy, we can make the transition to the period of world oil scarcity with virtually no negative impact on the economy.

In my testimony today, I will first discuss the overall results of our macroeconomic analysis and then address the effects of major components of the plan. I will then turn to a discussion of the impacts of the President's energy proposals on New England.

Macroeconomic forecasting is, by its very nature, imprecise. Given the many uncertainties surrounding the response of the different sectors of the economy to a program as comprehensive as the national energy plan, the estimates of the macroeconomic effects of the program are, at best, suggestive.

Several analyses have been made of the impacts of the plan. They all suggest that the macroeconomic impacts on the economy will be quite small. In general, the plan is projected to have no significant impact on the growth of real GNP or on unemployment, and a measurable, but modest net inflationary impact.

The administration's macroeconomic analysis covers the period 1978–81. Estimates were made of the impact of the national energy plan with and without the gasoline tax, since it is hoped that gasoline consumption can be reduced to the target levels without triggering the gasoline tax.

Depending on the econometric model used and upon the subperiods, the effect of the program—without the gasoline tax—on the annual growth rate of real gross national product over the next 4 years is estimated to range from minus 0.1 percentage points to plus 0.1 percentage points.

The plan is estimated to result in a small increase in inflation. Over the next 2 years, the annual rate of inflation would be 0.3 to 0.4 percent higher than it would be without the energy program. In the subsequent 2 years, the price impact would be smaller, with an increase in the annual inflation rate of 0.1 to 0.3 percent.

If the gasoline consumption targets were not met, and the gasoline tax were triggered in each year, the annual rate of inflation would be higher by an additional 0.2 to 0.3 percentage points over the period 1978–81. The impact of the gasoline tax on real GNP would generally depend on its effect on consumer purchases of new automobiles. The annual growth rate in real GNP could be 0.2 percentage points lower than otherwise projected if the tax resulted in a reduction in vehicle miles driven. This could have the effect of extending the life of the existing stock of automobiles, thus lowering automobile sales. However, the net impact of the gasoline tax on real GNP could be zero if the tax acted to reinforce the gas-guzzler tax and rebate to further stimulate the purchase of more fuel-efficient cars.

There are, of course, major uncertainties associated with evaluating the overall economic impact of the plan.

The analysis assumed that OPEC oil prices would rise at the same rate as the general price level, whether or not the national energy plan were implemented. However, it is reasonable to expect that over the next decade, reduced U.S. dependence on imported oil will induce OPEC to restrain price increases. Even a slight moderation in OPEC price increases would offset a sizable fraction of the inflationary impact of the program.

With regard to the oil pricing provisions and wellhead tax, the plan's net effect on oil prices is expected to add approximately $5 billion to expenditures on oil products by 1981. However, this estimate assumes that only two-thirds of the wellhead taxes will be passed through into increased product prices. This assumption was based on the likely prospect that profit margins at the refinery level will be reduced due to the pressure of world prices on domestic market prices. However, some macroeconomic models assume implicitly that all of the tax will be passed through to product prices, sometimes with an additional markup. This latter assumption would, of course, result in substantially greater expenditures for oil products.

I think you will note, Mrs. Heckler and Senator, that this will be one of the open points for debate for the next month or two until the figures begin to settle down. This is an area that really isn't thoroughly understood yet.

The effect on the automotive industry of the gas-guzzler tax and rebate is likely to be a small increase in the number of vehicles sold, assuming that the share of imported cars remains unchanged. This increase is expected to be accompanied by a very small reduction in the total dollar value of sales for the industry, due to the shift in demand from relatively expensive fuel-inefficient cars to less expensive, more efficient cars. However, some of the savings to the consumer due to the shift to more efficient cars may be offset by cost increases necessary to achieve better fuel efficiency. The impact of the plan on the automobile industry is further clouded by the uncertainties I mentioned earlier regarding the effect of the gasoline tax, if it were imposed.

Although investment behavior is difficult to predict, it is likely that the national energy plan will have a positive net effect on investment. The plan will in some cases induce, and in other cases mandate, investment in equipment and facilities to replace those now burning oil and gas. The amount of investment in conversions will, to a large extent, depend on the degree to which major industrial and commercial users respond to the consumption taxes on oil and gas, and to the rebates and investment tax credits. There will, however, be a positive impact on investment from industrial coal conversions, as well as from consumer expenditures on energy-conserving measures. This increased investment will to some degree be offset by lower investments in new electric-generating capacity as a result of more efficent use of existing generating capacity due to peak load pricing provisions.

We recognize that there will be some transitional effects on the economy over the next few years as we implement the plan. The automotive industry will need to move more rapidly to fuel-efficient vehicles. Industries that are induced or mandated to convert to coal may experience technical problems or equipment shortages. Although those potential problems will require monitoring, we do not expect the transition to the national energy plan to create any severe shocks to the economy. This is a point I really want to underscore. I think we can achieve that without seriously disrupting the economy.

I will now turn to a discussion of the impact of the President's program on New England, since I know that this is an area of special concern to the group gathered here today.

In the recent past, New England has been heavily dependent upon oil for generation of electricity. In 1975, 58 percent of electric generation was from oil-fired plants. Although New England utilities have already begun to reduce their oil dependence, there is a need to accelerate this trend. The President's program attacks this problem in three ways.

First, conservation measures of utility customers result in reduced demand, lowering the demand for electricity to 5.2 percent a year through 1985 as opposed to the 5.8 percent which otherwise would have occurred.

Second, through consumption taxes on utility users, it is expected that some oil-fired plants will be retired early and replaced with new coal-burning or nuclear units.

And third, the extension and modification of the Energy Supply and Environmental Coordination Act of 1974 will allow for continued orders to utilities with coal-burning capability to switch to coal, as well as to prohibit the construction of new oil-fired plants. The net result of these initiatives is that oil dependence for electric generation in New England is expected to be substantially reduced. An aggressive program of oil to coal conversion and construction of new coal plants will be required.

While the burning of coal will be greatly increased in New England, the President's program requires that the best available technology be used to mitigate the environmental impact. In addition, a rebate mechanism against oil and gas consumption taxes is incorporated for qualifying replacement investments to facilitate the financing of these programs.

As you can see, the program is expected to achieve a major objective of substantially reducing oil dependence. It is also important to note that New England which has had high electricity prices relative to other parts of the country, will be in a better price position in 1985. I think we should underscore that.

Senator KENNEDY. That is a question, I think, that we want to deal with during the course of the morning. We will hear later from other witnesses, including Mr. Buckley, who states in his testimony that the 1979 industrial users of residual oil in New England will pay the equivalent of $7 per barrel more compared to industrial users of natural gas, and by 1985, this disparity will be $3 a barrel. Even with the movement into coal it seems that we are going to be in a similar kind of position, that we are going to have additional costs over the rest of the country. What can you tell us about this?

Mr. O'LEARY. Let me go on and I think this will help you on that, Mr. Chairman.

In 1975, the residential and commercial sectors of New England paid electricity prices that were 39 percent higher than the national average. In 1985, under the President's program, the difference will be reduced to 21 to 24 percent. It won't be eliminated, but it will be about cut in half, and I think this is congruent with the testimony you will receive later on this point.

Senator KENNEDY. What can we do to try and even bring that down further? The goal ought to be of establishing equity between regions. The President has stated that as a goal, and I think that the people of this area of the country have warmly welcomed that fact. If we recognize that this is basically a national issue and a national crisis—if we were talking about national defense, we wouldn't expect Texas to do more than Massachusetts. We now have a national energy problem and it seems to me that in addressing that, the President put his finger on it when he said he wanted to reduce the inequities in different regions, to make sure that if we have to tighten our belt as a country, that all of us tighten it together. We want to reduce these inequities. And yet with your own figures, with implementation of the President's program, there

will be a differential between 21 and 24 percent. How are we going to explain that to the people of Massachusetts or New England?

Mr. O'LEARY. I think this is a problem that we are going to have to cure over time, Mr. Chairman. I am really heartened by the fact that this extreme imbalance between New England and the rest of the country, almost 50 percent, is being cut approximately in half in this relatively short period, that the plan will bite between now and 1985. Remember in only 6 years we will have real impacts upon relative energy costs.

Now, let me tell you while we are on the subject, that the regional impacts are not by any means confined to New England. We have had discussions across the entire country and I will give you an example or two. In Texas today, most of the electric power generation comes from natural gas. Under the plan that will be eliminated by 1990. There is not going to be conversion of those plants, to coal, because you can't convert them. It is going to mean a wholesale rebuilding of the entire electrical plant down in that part of the country over the next 12 to 13 years. They will be going from, I would say, 6, 7, 8 mil power on the plants that were built prior to 1970, to plants that will cost between 30 and 40 mils for electricity at the bus bar. The cost of those plants as they stand, probably was on the order of $100 per installed kilowatt and they will be turned over for plants, either coal fired or nuclear, that will cost almost $1,000 per killowatt. I give this to you just as an example.

New England has severe problems in the energy sphere, largely because, Mr. Chairmen, of history and geography. You are where you are, at the end of the pipeline from the Southwest as far as natural gas is concerned, and of course your history has mitigated against the siting of refineries here. Within the limits of the art of the possible, however, this plan I believe is going to bring New England closer to the national norms in energy over time, because we will make continued progress after 1985 and I think that is going to be good for the New England economy and, indeed, good for the U.S. economy as a whole.

Senator KENNEDY. Which areas of the country will benefit and which will suffer? Are we going to lose those industries we have to other parts of the country? Is there going to be another new southern region, a new Sun Belt, in some other part of the country? Under your assessment in which New England will reduce the cost differential approximately by half, and you go up somewhat over a long-term utilization in the Southwest, what is going to happen to the Sun Belt and areas where we traditionally have lost a good deal of our industry?

Mr. O'LEARY. Mr. Chairman, I think that if we can move to the point where solar energy becomes a reality over the next 25 to 30 years, there may be some advantage conferred on the Sun Belt as a result of the fact that they are the Sun Belt. This plan, however, will arrest the tide of outflow of industry from New England to other parts of the country. You know that New England lost industry to the Southeast and particularly to the Southwest as a result of the availability of low-cost labor and low-cost energy. Of course the plan doesn't address the first of those, but this evening of

national energy cost that is a by-product of the plan, I think that will be beneficial.

Senator KENNEDY. In terms of jobs and business requirements, your testimony is that this differential of energy costs will be significantly reduced in the period of the next 8 years.

Mr. O'LEARY. Yes. Let me say another word about that. The gas market has been, although national in scope, much more intensive in the gas producing regions. Even in the interstate market you find that Louisiana for example, draws very substantial volumes of gas from the interstate market at prices that to its industry have been well below both the replacement cost for natural gas and of course the competitive cost for oil. The net effect of the plan will be to force increases in the acquisition cost to industry to the extent that they have been benefiting from this cheap natural gas down in that part of the country. I think one of the side effects of that is quite clearly to reduce the economic advantage that that part of the world has had over New England and consequently, as I see it, this is going to mean major pluses from the standpoint of jobs, industrial expansion and other measures of economic growth for this part of the world. Thank you.

Senator KENNEDY. Thank you, Mr. O'Leary.

[The prepared statement of Mr. O'Leary, together with answers to additional written questions follow:]

PREPARED STATEMENT OF HON. JOHN F. O'LEARY

Mr. Chairman, it is a pleasure to appear before your subcommittee today to discuss the National Energy Plan and its economic impact.

During the 1950's and 1960's, the real price of energy in the United States fell 28 percent. During the same period U.S. consumption of energy increased at an average annual rate of 3.5 percent. As a result of the availability of cheap energy, the United States has developed a stock of capital goods—automobiles, appliances, buildings, industrial equipment—which uses energy inefficiently.

To meet its growing energy demands, the United States has been forced to turn increasingly to oil imports as domestic production of oil and natural gas peaked. The crux of our energy problem is clear: economic and national security considerations make future reliance on unrestrained growth of oil imports unwise. At the same time, massive development of U.S. energy resources would have severe economic and environmental consequences.

The national energy plan addresses our energy problems comprehensively. It proposes measures that would reduce imports to a manageable level, rather than incur the full costs of eliminating imports completely.

It proposes effective measures to gradually shift our existing stock of capital to a more energy-efficient one, without changing our basic standard of living or interfering with continued economic growth.

It would provide generous incentives for new energy production, without providing profits to producers disproportionate to the economic risks assumed.

And it would encourage increased reliance, in both the near and longer term, on more abundant energy resources, with appropriate concern for human health and the environment.

Our analysis of the economic impacts of the national energy plan indicates that if we begin now to become more efficient users of energy, we can make the transition to the period of world oil scarcity with virtually no negative impact on the economy.

In my testimony today, I will first discuss the overall results of our macroeconomic analysis and then address the effects of major components of the plan. I will then turn to a discussion of the impacts of the President's energy proposals on New England.

OVERALL ECONOMIC IMPACT OF THE NATIONAL ENERGY PLAN

Macroeconomic forecasting is, by its very nature, imprecise. Given the many uncertainties surrounding the response of the different sectors of the economy to a

program as comprehensive as the national energy plan, the estimates of the macroeconomic effects of the program are, at best, suggestive.

Several analyses have been made of the impacts of the plan. They all suggest that the macroeconomic impacts on the economy will be quite small. In general, the plan is projected to have no significant impact on the growth of real GNP or on unemployment, and a measurable, but modest net inflationary impact.

The administration's macroeconomic analysis covers the period 1978-1981. Estimates were made of the impact of the national energy plan with and without the gasoline tax, since it is hoped that gasoline consumption can be reduced to the target levels without triggering the gasoline tax.

Depending on the econometric model used and upon the subperiods, the effect of the program—without the gasoline tax—on the annual growth rate of real GNP over the next four years is estimated to range from minus 0.1 percentage points to plus 0.1 percentage points.

The plan is estimated to result in a small increase in inflation. Over the next two years, the annual rate of inflation would be 0.3 to 0.4 percentage points higher than it would be without the energy program. In the subsequent two years, the price impact would be smaller, with an increase in the annual inflation rate of 0.1 to 0.3 percentage points.

If the gasoline consumption targets were not met, and the gasoline tax were triggered in each year, the annual rate of inflation would be higher by an additional 0.2 to 0.3 percentage points over the period 1977 to 1981. The impact of the gasoline tax on real GNP would generally depend on its effect on consumer purchases of new automobiles. The annual growth rate in real GNP would be 0.2 percentage points lower than otherwise projected if the tax resulted in a reduction in vehicle miles driven. This could have the effect of extending the life of the existing stock of automobiles, thus lowering automobile sales. However, the net impact of the gasoline tax on real GNP could be zero if the tax acted to reinforce the gas guzzler tax and rebate to further stimulate the purchase of more fuel-efficient cars.

EFFECTS AND UNCERTAINTIES OF MAJOR COMPONENTS OF THE PLAN

There are, of course, major uncertainties associated with evaluating the overall economic impact of the plan.

The analysis assumed that OPEC oil prices would rise at the same rate as the general price level, whether or not the national energy plan were implemented. However, it is reasonable to expect that over the next decade, reduced U.S. dependence on imported oil will induce OPEC to restrain price increases. Even a slight moderation in OPEC price increases would offset a sizeable fraction of the inflationary impact of the program.

With regard to the oil pricing provisions and wellhead tax, the plan's net effect on oil prices is expected to add approximately $5 billion to expenditures on oil products by 1981. However, this estimate assumes that only two-thirds of the wellhead taxes will be passed through into increased product prices. This assumption was based on the likely prospect that profit margins at the refinery level will be reduced due to the pressure of world prices on domestic market prices. However, some macroeconomic models assume implicitly that all of the tax will be passed through to product prices, sometimes with an additional mark-up. This latter assumption would, of course, result in substantially greater expenditures for oil products.

The effect on the automotive industry of the gas guzzler tax and rebate is likely to be a small increase in the number of vehicles sold, assuming that the share of imported cars remains unchanged. This increase is expected to be accompanied by a very small reduction in the total dollar value of sales for the industry, due to the shift in demand from relatively expensive fuel-inefficient cars to less expensive, more efficient cars. However, some of the savings to the consumer due to the shift to more efficient cars may be offset by cost increases necessary to achieve better fuel efficiency. The impact of the plan on the automotive industry is further clouded by the uncertainties I mentioned earlier regarding the effect of the gasoline tax, if it were imposed.

Although investment behavior is difficult to predict, it is likely that the national energy plan will have a positive net effect on investment. The plan will in some cases induce, and in other cases mandate, investment in equipment and facilities to replace those now burning oil and gas. The amount of investment in conversions will, to a large extent, depend on the degree to which major industrial and commercial users respond to the consumption taxes on oil and gas, and to the rebates and investment tax credits. There will, however, be a positive impact on investment from industrial coal conversions, as well as from consumer expenditures on energy conserving measures. This increased investment will to some degree be offset by

lower investments in new electric generating capacity as a result of more efficient use of existing generating capacity due to peak load pricing provisions.

We recognize that there will be some transitional effects on the economy over the next few years as we implement the plan. The automotive industry will need to move more rapidly to fuel efficient vehicles. Industries that are induced or mandated to convert to coal may experience technical problems or equipment shortages. Although these potential problems will require monitoring, we do not expect the transition to the national energy plan to create any severe shocks to the economy.

I will now turn to a discussion of the impact of the President's program on New England, since I know that this is an area of special concern to the group gathered here today.

IMPACT ON THE PRESIDENT'S PROGRAM ON THE ELECTRIC SECTOR IN NEW ENGLAND

In the recent past New England has been heavily dependent upon oil for generation of electricity. In 1975, 58 percent of electric generation was from oil fired plants. Although New England utilities have already begun to reduce their oil dependence, there is a need to accelerate this trend. The President's program attacks this problem in three ways. First, conservation measures of utility customers result in reduced demand, lowering the demand for electricity to 5.2 percent a year through 1985 as opposed to the 5.8 percent which otherwise could have occurred. Secondly, through consumption taxes on utility users, it is expected that some oil fired plants will be retired early and replaced with new coal burning or nuclear units. And thirdly, the extension and modification of the Energy Supply and Environmental Coordination Act of 1974 will allow for continued orders to utilities with coal burning capability to switch to coal, as well as to prohibit the construction of new oil fired plants. The net result of these initiatives is that oil dependence for electric generation in New England is expected to be substantially reduced. An aggressive program of oil to coal conversion and construction of new coal plants will be required.

While the burning of coal will be greatly increased in New England, the President's program requires that the best available technology be used to mitigate the environmental impact. In addition, a rebate mechanism against oil and gas consumption taxes is incorporated for qualifying replacement investments to facilitate the financing of these programs.

As you can see, the program is expected to achieve a major objective of substantially reducing oil dependence. It is also important to note that New England which has had high electricity prices relative to other parts of the country, will be in a better price position in 1985.

In 1975, the residential and commercial sectors of New England paid electricity prices that were 39 percent higher than the national average. In 1985, under the President's program, the difference will be reduced to 21 to 24 percent. Also, the New England industrial sector electricity prices which were 67 percent higher in 1975 are expected to be only 31 percent higher than the national average in 1985.

INDUSTRIAL COAL CONVERSION

In order to stimulate conservation and shift consumption away from oil and natural gas, the President has proposed that taxes be imposed on oil and natural gas used by large industrial consumers, beginning in 1979.

It is expected that most of the large users will take advantage of either the augmented investment tax credit or the tax rebate mechanism to initiate conversion to coal or other abundant fuels. To New England this would mean a substantial increase in coal use by the industrial sector with corresponding decreases in distillate and residual fuel oil consumption. Although the industrial program has the potential for increasing adverse environmental impacts, the President has proposed additional measures to mitigate them. These measures include support of legislation requiring best available air pollution control technology; support for non-significant deterioration policies to protect areas with clean air; a 20 percent business energy tax credit for pollution control equipment required by Federal, State and local regulations or a credit against oil and gas consumption taxes for pollution control equipment; and support for accelerated research and development programs on pollution removal techniques and fluidized bed combustion.

OVERALL CONSUMPTION AND PRICE IMPACTS

The National Energy Act is a comprehensive proposal which deals with many supply and demand factors of the energy problem. One of its fundamental principles is that it be fair. The solutions ask equal sacrifices from every region, every class of people, every interest group. I would now like to address the question of the impact

of the entire proposal with respect to energy prices in New England. I recognize that New England has paid very high energy prices in the past few years and that the region seeks to reduce its price disparity relative to other regions of the United States. I believe the President's proposal will result in both an improved price position for New England and also lower expenditures on energy consumption in the region than would otherwise have occurred.

In 1975, the weighted average residential price for all forms of energy in New England exceeded the national average by 27 percent. Under the President's plan, it is expected that this difference will decline to 12 percent in 1985.

The differential in the commercial sector in 1975 was 5 percent. By 1985 under the President's plan, the average commercial energy price in New England may actually be less than the U.S. average.

Historically the largest price difference has been in the industrial sector; the New England average price was double the national average in 1975. With the President's plan, New England's price difference would only be 44 percent in 1985.

The President's program generally results in lower 1985 national average energy prices for the residential and commercial sectors than what would have otherwise occurred. Although the program results in slightly higher prices for New England, it nonetheless results in reduced regional price disparity.

Further, the conservation impacts result in significant savings in energy expenditures. The combination of the conservation savings and the price changes is expected to result in New England saving about $280 million in the residential sector, $90 million in the commercial, $130 million in the industrial, and about $40 million in the transportation sector as compared to what would have been spent in 1985 without the plan. The potential conservation savings are of major importance. Certainly this is an area in which New England has demonstrated a strong interest and is already moving ahead with implementation of conservation programs.

Although we have not estimated the employment effects on a regional basis, I might mention that FEA has a study currently in progress with the State of Massachusetts to estimate the economic impact of energy alternatives available to the region. I am sure that much of the information to be derived from the study will provide an even more detailed analysis of employment and income effects.

I want to thank you for the opportunity to appear at your hearing today. I believe it is important to publicly discuss energy policy, its objectives and impacts. I hope that my testimony has been of assistance to you and I would be glad to answer any questions you may have.

RESPONSE OF HON. JOHN F. O'LEARY TO ADDITIONAL WRITTEN QUESTIONS POSED BY SENATOR KENNEDY

Question. You mentioned the Department of Transportation would soon start the Administration's analysis of coal shipments and the state of the rail network. You indicated you would be receiving a preliminary analysis in a short time. Can you tell me when this information might become available?

Answer. An integral part of the National Energy Plan is a study of the National Energy Transportation System. The President has announced that he will create a commission to study the Nation's energy transportation needs and to make recommendations to him by the end of this year. The study is in its formative stage, and I cannot predict when preliminary results will be available. We anticipate, however, that the President's time frame of "recommendations to him by the end of the year" will be adhered to.

Question. What are the present estimates of the transportation costs of coal delivered to New England from mining sites.

Answer. For the purposes of determining the economic feasibility of burning coal at electric utilities in New England, the Federal Energy Administration estimates transportation costs rom East Kentucky to destinations in New England to be $15 per ton for an all-rail shipment and $11 per ton for a combination rail/barge delivery to the Boston area.

Because of stringent air quality standards in New England, a low sulfur coal is called for. East Kentucky is the nearest source of available coal that meets these requirements.

Although the rates cited above are representative, it should be understood that they are subject to negotiation.

Question. The point was brought out at the hearing that the FEA is currently studying, with the State of Massachusetts, the economic impact of energy alternatives to the region. You indicated you would have information on employment and

income effects. What information is currently available and when can we expect a report?

Answer. FEA awarded a $75,000 contract to the State of Massachusetts on behalf of all New England States to study the economic impact on New England of alternate energy policies. It is expected that the final report will be completed in October 1977. The work to date has consisted of compiling historic data, analyzing trends and published information, conducting a survey on New England business attitudes, and calibrating two models for use in forecasting direct and indirect impacts.

It is expected that several sections of the final report will be drafted before October. I am enclosing the section on the business survey findings. If you wish to obtain other sections as they become available you may contact either Robert W. Mitchell, Regional Administrator, FEA Region I (617/223-3701) or Paul Levy, Deputy Director, Massachusetts Energy Policy Office (617/727-4732).

Representative HECKLER. Mr. O'Leary, I am encouraged by your long-range forecast in terms of the equalization of opportunity because, as you know, we have not only had an energy problem we also have the exodus of industry to the Sun Belt. We are experiencing that right now. But it seems that in the short run, not looking at 1985, 1984, 1983—but 1977 and 1978, we are faced with the potential mandate presently, since our Federal courts are involved in this right now, of coal conversion.

I question what is going to be the total cost of coal conversion to the industrial and utility companies in New England, and what will be the cost of coal conversion this year in other sections of the country?

Mr. O'LEARY. Mrs. Heckler, the fact is that this is another matter of a regional bias that is introduced into the system inadvertently.

Representative HECKLER. It's a bias against New England, isn't it?

Mr. O'LEARY. Yes, it is. The New England industry has built to a larger extent than most other parts of the country what we refer to in the business as switch-burning capability. That is, they played a basic Btu market and they could switch between oil and gas depending upon which was the most attractive in the short run. Now, some time ago as a result of two factors, New England switched away from coal to oil. First the price of residual fuel oil coming in from Venezuela was very low, and that went, Mr. Chairman, I will remind you, to 30 cents a million Btu's in the mid-1960's as a result of discriminatory pricing by the Venezuelans. They sold as much crude as they could and then they installed topping plants which topped off the heavy oil, the resid, and moved that into the United States in competition with coal. Well, as a result of the Venezuelan incursions into the heavy oil market and second, as a result over the same time period of immergence of concern for clean air, New England and indeed the whole eastern seaboard, switched away from coal to residual fuel oil.

Representative HECKLER. Yes, but you are mandating that they switch to coal immediately. Now, who will pay the capital cost of this?

Mr. O'LEARY. The capital costs, of course, are incurred for coal capable plants. We are directing this program, Mrs. Heckler, at plants that do have the capability as demonstrated by the fact that they at one time burned coal.

Representative HECKLER. Are you saying industrial plants as well as utilities?

Mr. O'LEARY. No, the orders that we have out are directed at utilities. These are the ones that are causing the concern in New England.

Representative HECKLER. How are you going to bring the coal to New England, considering the state of our roadbeds, the inadequacy of railroad services and transportation facilities and so forth?

Mr. O'LEARY. In the course of the development of the notices of intent that were issued approximately a month ago, we examined the quality of the coal that was available, the overall question of the availability of coal, and the economics. And indeed I am pleased to be able to tell you that in most cases the net result on prices of the conversion to coal, will be a reduction in cost of electrical energy. I think that is one of the things you might——

Representative HECKLER. The net result after the capital cost?

Mr. O'LEARY. After the capital cost has been made.

Representative HECKLER. And who will absorb the capital cost?

Mr. O'LEARY. The capital cost will be absorbed, of course, by the ratepayer. But the ratepayer will benefit by reducing his cost of acquisition of the oil from somewhat more than $2 a million Btu's to something in the range of $1.10 or $1.25 for coal. So in the analysis that I have seen, plant-by-plant, most plants will show a net saving in the cost of generation of the electricity which after all is the point they are interested in.

Representative HECKLER. What is the time lag between the time the capital investment is made, then passed on to the ratepayer, and the time in which the ratepayer enjoys a lower energy bill as a result of the savings?

Mr. O'LEARY. This depends upon the practices of local public service commissions, Mrs. Heckler. Generally speaking the public service commissions around the country do not permit a utility to earn revenues on construction work while it is in progress, so generally speaking the rate impacts are felt after the equipment goes into operation and of course that is the time when the rate savings are effected due to the conversion from a high-cost oil to the low-cost coal.

Representative HECKLER. What about this transportation question? How are you going to transport, and what quantities of coal are you talking about right now?

Mr. O'LEARY. I am sorry, Mrs. Heckler, I don't have those numbers at hand, but they are not, in terms of strategic movements, enormous. They are substantial but they are not enormous. My understanding is that in all the examinations of this that have been done over the last 2 years, by the FEA staff, that they have, in consultation with the railroads, concluded that there was no logistics bottleneck that couldn't be overcome relatively easily, on the basis of a small expenditures principally in rolling stock. And in looking at rolling stock, you can augment the supply of both the cars and the engines to pull the cars in a matter of 6 to 9 months. I think that when we find this conversion process proceeding it will take much longer than 6 to 9 months so that transportation will not be a constraining factor.

Let me just describe the process as I understand it. We have now issued the notices of intent. We are in the process, in some parts of the country, of holding hearings.

Representative HECKLER. Isn't it just New England, though? How many plants are——

Mr. O'LEARY. I think the last round was 29 plants altogether and 16 in New England. We have plants in the Southwest as well—Texas, Oklahoma plants, that are also having hearings.

The hearings must be concluded by June 30 because at that point our current mandating authority disappears off into the blue somewhere. By that time we will have to have digested the hearings and we will then, in the event that our preliminary judgment that was incorporated in the notice of intent stands up, issue an order. At that time, I would assume, there will be some challenges to the order. When those challenges are completed, or indeed if there is not a challenge, the utility will proceed to the capital investments required in order to get it to the point where it will meet the air quality requirements, as well as accommodate the coal. This process will take anywhere from—I would suspect—a minimum of 1 year up to maybe 4 or 5 years. So we are not looking for a sudden rushing of an enormous volume of coal into New England. It will come quite slowly spread out, simply because of the different positions of the several plants that are involved. This will come over the next 3 or 4 years; perhaps as long as 5 years.

Representative HECKLER. The Center for Energy Policy prepared a study last year on the impact of powerplant coal conversion on New England energy policy, in which they said, after the conversion to coal in order to recover the cost of conversion and higher operating costs, the utility would need to obtain higher rates from the Department of Public Utilities and public utility commissions of the appropriate States. Do you agree with that?

Mr. O'LEARY. In most of the assessments that I have seen, Mrs. Heckler, we find that, as I pointed out earlier, I think with only one or two exceptions in New England, the rate actually goes down. This is the sort of thing that the hearings are designed to determine. We have done paper studies, essentially internal studies, of the best assessment we could make of (a) the conversion cost, which of course is a key factor in the ultimate impact on the ratepayer, and (b) the cost to bring the coal into the plant. We know pretty well the trade-off cost of the oil. And from those studies we have concluded that at worst, in one or two cases, there may be a modest increase in rates. I think less than 10 percent. In other cases there will be a significant reduction in rates, running from a few percent to quite a few.

I would be glad to share that with you, Mrs. Heckler. I don't have the data with me, but when we return to Washington I will ask Mr. Hanfling to get in touch with you and he will provide the plant-by-plant detail behind our notice of intent. I want to make it clear that the order will not be issued until the public hearing is completed. The public hearing is designed to hear the other side. We have made out analysis and it is the best professional assessment that we can make. Now it is the utilities' turn and the Public Service Commission's turn and the ratepayer's turn to come in to

these local hearings that we are having and saying, "No, you're wrong," and to make their case.

I have to stress that we are not going to get into the issuing of orders until sometime just prior to June 30.

Representative HECKLER. June 30, 1977?

Mr. O'LEARY. Yes, a month and a half from now. And during that period of time we want to hear from the people. The utilities, of course, have known about this all during the last 3 years. They are thoroughly prepared to provide their own counteranalysis and we are going to assimilate that analysis as rapidly as we can and where we are thoroughly off base we will not issue the order.

Representative HECKLER. In those cases in which there might be an enormous capital cost which would necessitate further action by the State Department of Public Utilities, which would have to be passed on to the consumer, and everything is always passed on to the consumer—in those cases, should the data support that conclusion, you would be willing to reconsider issuing an order?

Mr. O'LEARY. Let me make it, as we say, perfectly clear what I am saying. Your enormous might not be my enormous, for one thing, and what we are interested in is the impact on the rate. Now let me tell you why there is resistance in the system, Mrs. Heckler, on this point.

Up until 3 or 4 years ago there was substantial regulatory lag in the regulation of public utilities, including the electric utilities, that ran in the favor of the utility. Their costs were by and large going down as they got bigger and bigger plants, greater and greater efficiency, and as I pointed out earlier, they got more and more cheap oil from abroad. That meant that they were quite willing to make investments because they were in a good cash flow position. Over the last 4 or 5 years, and this started well before the Yom Kippur war, but has been accentuated by the post impacts of the Yom Kippur war, the utility industry has been starved for funds. I think that you could look to the near disaster of Con-Ed, the Consumers Power, this occurred all over the country. Companies missed their dividends; Con-Ed had to sell one of its nuclear plants to the State of New York in order to stay solvent, and so on it went. We had a disastrous situation that was not addressed, one that I think is probably as significant a situation with regard to the long term future of this country in the energy business as we have before us. It is essentially a local problem the way things are constructed in this world of ours, but the fact is that the utility industry was put into a position with regard to cash flow where it was starving to death. That has been changed modestly, principally by one factor, the decline in the growth of electric energy requirements. What we find is instead of having the continued capital requirement that I think would have brought this to the point of crisis proportions and probably brought the Federal Government into a massive bail-out operation, the Yom Kippur war had, among other things, one good effect in that it depressed the demand for electrical energy. And the consequences is, that in New England for example, reserves instead of being the historical 20 percent are about 40 percent as a result of investment decisions that were made 10 and 12 years ago. Powerplants were dedicated then, and are coming on now, in anticipation of great growth at the conven-

tional levels but the great growth hasn't materialized. Consequently you've got a lot of excess capacity.

If we didn't have that factor, if we had the investment requirements going forward now, we would have a full-blown crisis in the electrical industry. Fortunately we don't. That is one of the good sides of the coin, of the steep change in oil prices that caused so much disarray in our energy economy.

The result, however, has been that the electric utility industry understandably doesn't want to invest a dime in anything at the moment.

Representative HECKLER. But, Mr. O'Leary, I am concerned with what the consumer is going to pay. I am concerned about my constituents. I understand some of the intramural disputes between your agency and the utility companies and various other factors and so forth, and there are many legitimate points that can be raised on both sides, but ultimately our people have suffered a great deal, as Senator Kennedy has said. We have been through an economic wringer in Massachusetts, and the question is we want to support the President's program and we want a sound energy policy. At the same time there is just so much capacity for our people economically to endure, and the question I am concerned with and I won't prolong this, is what is the bottom line to the consumer?

Mr. O'LEARY. My examination of the data to support our ordering program indicate, one, that the bottom line is a net benefit not a disadvantage to the consumer, and two, if that proves to be incorrect with respect to particular plants as a result of evidence developed at these hearings that are either proceeding now or will be proceeding in the next week or two, then we are quite prepared to reexamine our orders.

Senator KENNEDY. In terms of the transportation of freight rates, you are very much aware, I am sure, of the ICC ruling that there is a discriminatory freight rate system and in the challenges that have been made by industry and business from the New England area, the ICC has said. "It is true that freight rates are discriminatory but we haven't found injuries." It is some of the most convoluted thinking that you can imagine from the regulatory agency, although we see an awful lot of it.

Can we expect something from the administration to help in terms of the equalization of the freight rates? All of us know that basically it was a political decision made years ago to bring some strength to the Southern railroads. Now they are the most profitable in the country, and we paid the price for that. I just want to flag that issue with you, and I hope that in looking at our particular problems, that this is something that we could expect some leadership on.

Mr. O'LEARY. Mr. Chairman, you may have noted that the President has called for a study of energy transportation as part of the plan. The Department of Transportation will be taking the lead on that as I understand it, and I think you will see that this problem will be addressed in the course of the next few months.

Senator KENNEDY. There are some very substantial studies that have indicated that you can't move coal from the Western part of the country competitively or at reasonable cost coming east past, as

I understand it, about the Pittsburgh line. Once you move further east than that, it gets virtually prohibitive and this is going to be an essential question.

Beyond this, I understand the figures which you extrapolated on, has coal at $30—or what dollar a ton?

Mr. O'LEARY. Approximately $30 a ton, delivered. But that does vary.

Senator KENNEDY. As I understand, the projections over any kind of reasonable time period have that price going up anywhere from $30 to $50.

Mr. O'LEARY. Well, Mr. Chairman, without getting into a long debate on that, I look upon coal as something that there is just so darn much of that it isn't going to flow with oil. It isn't going to follow oil and gas prices. Coal competes with coal, always has. The price that we just have been talking about on a Btu basis is about $1.10 a million Btu's. There are roughly in these eastern coals, 25 million Btu's per ton—24 to 26. I think what you will find is that there will be an inflation rate on that and maybe a little bit more, but it is not going to go up at the rate that oil has gone up.

Senator KENNEDY. The long-term commitments of the coal companies to the utilities, as I understand their contracts, are already committed through 1985.

Mr. O'LEARY. Yes. Virtually all of the coal—I would say at the moment probably something approaching 80 percent of the coal, is mined on the basis of long term contracts. Coal producers simply won't go out today and make a merchant mine. They construct a mine on the basis of the contract and the utilities in New England I am sure are going to have to confront this over time. But the fact is, there is plenty of coal around. There is plenty of capabilities within the limits of the tonnage that we are talking about for New England to mine it, and I don't think we are going to see a runaway market, Senator.

Senator KENNEDY. When does your study on the pricing of transportation start?

Mr. O'LEARY. My recollection is that it will start up in the next few months and be completed probably in a 6-month time frame, in that sort of a time frame. Let me check my recollection, Senator, and get back to you.

Senator KENNEDY. Fine. Why don't we continue with your statement. I don't know whether or not you would like to summarize those points.

Mr. O'LEARY. I tell you, I think we have probably talked about the important things, Mr. Chairman. Why don't I just submit the rest for the record. I was going to talk about the coal conversion program and a couple other things, and I will just let those go in.

Senator KENNEDY. We will make it a part of the record as if read. I think another issue regarding coal is the environmental aspects. We have stricter laws here in this State than in other parts of the country, and how do you quantify those various distinctions between Massachusetts versus the rest of New England and also in terms of cost? How are we going to deal with those?

Mr. O'LEARY. This is the situation as I see it. From the standpoint of the overall future of the United States, we are going to have to move to coal and we are going to have to do it without

doing damage to air quality. The act under which we are now operating and the act that we hope will go through, keeps us in the coal conversion business, and requires that the conversions be accomplished within the limitations of both Federal and State law. In our examination, for example, just recently of these new orders, we found that some probable changes in the State implementation plans, the SIP's, would make it futile to go forward. There was an obvious tightening up and it was beyond the capacity of the plants to get into a frame where they could meet that, and so there were a few last moment deletions in the plans for ordering. I stress that just to let you know our sensitivity to the air quality requirements.

This is a matter that, I hate to tell you, is not resolved. It has been a debate, as you know, for the last 5 years. How do you work out the national requirement to go to coal with the national requirement for cleaner air? I think that there are two things we are going to have to do in the next few months. We are going to have to put ERDA more deeply into the business of improving the technology for coal handling, particularly the fine particulates which from where I stand are the worst technological problem associated with burning coal now. Similarly we have a problem with $NO\chi$, that we don't understand and that we are going to have to understand a little bit better. So I think there is a need for research on this.

In the meantime I am working with Doug Costle of EPA in the development of a common ground that meets his requirements fully, and I want you to understand that we will not sacrifice air quality, but at the same time we will meet the national imperative for conversion to coal. So we are very much aware of the problem. We don't have the final answers, but we are coming along.

Senator KENNEDY. In Mr. Buckley's statement he indicates that under the Carter plan, users of home heating oil will be paying approximately 10 cents a gallon more on a Btu basis. than the residual users of natural gas.

Mr. O'LEARY. I think what he is saying is, we are, as you know, going to assure that the purchaser of home heating oil is not influenced adversely by the excise tax. We are at the same time going to do the same thing in a slightly different way for the small burner of natural gas. I think what he is referring to is probably some historical accident. We are where we are on natural gas prices, and we are where we are on oil prices. There is very little really in this plan that we can do about that unless we choose—we can't reduce arbitrarily the price of oil without doing all sorts of violence on down through the system. I don't think it would be desirable to increase arbitrarily the price of gas to householders in order to get that sort of an equalization, although that increase will occur over time. You understand that as we roll over the cheap old gas and replace it with the much more expensive new gas, we are going to come in time to equalization here.

Here again, Senator, I think if you look at the short term effects, we may have these residual discriminatory elements in the program. Over time, however, it will tend to equalize.

Senator KENNEDY. What kind of withholding should the consumer expect regarding these rebates? As I understand it, you have anywhere from $27 to $30 billion that you expect to collect in

wellhead and natural gas taxes. Now, when consumers see this they wonder if this means that they are going to be the ones to pay for the tax. Then they hear about the rebating program and are told they are not going to be discriminated against, they really wonder about this, as I wonder about it. Could you tell us how you are going to give assurances to those in our part of the country who are 80 to 85 percent dependent on home heating oil—how this will work?

Mr. O'LEARY. It is going to work in this part of the country in two ways. Let's first of all get to how the tax is collected. The tax will be collected by the refinery. What will happen is, the refinery will intake its oil at a variety of prices—$5.25 for some, $11.28 for some, the world price $13.50 for some—and it will send us a check at the end of every month—I wish it were us. It is not the FEA. It's the Treasury—send a check at the end of every month that represents an equalization up to the imported price. As soon as that gets in the Treasury's hands, if this works right and we haven't finalized the decisions on this, this will come back as a reduction in withholding for the people who are buyers, less the amount of money that is involved on a one-for-one reduction in the income tax on the people who are involved in burning oil in households. One is sort of an averaging. Everybody in the country will receive a rebate on a pro-rata basis which as I understand it runs ultimately to around $50 per person. A family of four, for example—the net effect would be a reduction in his income tax of about $200.

With regard to the specifics of the person who uses oil for household heating, he does what he does now with his gasoline tax.

Senator KENNEDY. Is that refundable?

Mr. O'LEARY. Yes. He gets a direct refund.

Senator KENNEDY. But what if he doesn't fill out the tax form? If this system functions like the work credit, which is targeted in to the neediest people, the poorest people, but it is vastly underutilized.

Mr. O'LEARY. This will take the form, if it works right, that the Internal Revenue Service actually will be looking for you with a check, which is a refreshing change, I might add.

Senator KENNEDY. How are they going to find them?

Mr. O'LEARY. This is something you will want to talk to the Treasury people about, I'm sure. But it is not our intent to have any glue in the funnel. This is ultimately your disposition. I think here more than any other part of the plan—Congress is going to have to say now we have a large pot of money coming in. Are there other better things we can do with it? And if it is to get back to the people, and my own judgment is that it should get back to the people, we are all going to have to exercise a certain amount of discipline.

Senator KENNEDY. What is the administration's feeling? What do they want to do with the dollar that is collected? Is the administration going to earmark it for other programs or is it going to be programed for refundability?

Mr. O'LEARY. They want to use it for refunds in three ways. The one-for-one refund for the householder. The general per capita rebate that we just discussed and the construction or development of a fund for reinvestment back into industrial improvements,

which of course the company if it pays the tax gets the tax rebate on its own operation. So far as I am concerned, I think we should discourage other uses of this, and if we want to do social programs or something, go to the regular tax route. Not use this as the vehicle. But here again, I think we have a long way to go on this, Senator, and I am sure you want to discuss this at length with the officials of the Treasury Department.

Senator KENNEDY. I think we are going to be very reluctant to support new taxes until we are sure about how this is going to come back out.

Mr. O'LEARY. You are dead right.

Senator KENNEDY. This is complex, involved, and is going to take a lot of doing. Since we do expend more in terms of energy, regarding our part of the country, we are still going to have the cost differential, anywhere from 24 to 30 percent higher. We want to make sure our people are going to get the additional kind of return and that it isn't sort of spread out. Any time you have that formula, we don't do quite as well. It varies more with some programs than with others, but that is going to be a factor to go into with the administration, and I know you are sensitive to it.

Mr. O'LEARY. Hearings will begin at House Ways and Means on that on Tuesday, and shortly before Senator Long's committee and I think we will all have to pay very careful attention to that.

Representative HECKLER. Well, I would like to pursue the same point because I think the rebate that goes to everyone regardless of who paid the tax, can only penalize New England. We are paying a heavier share and therefore we should receive a greater return. It would seem to me, at least, that those who pay the most should receive the most. I think there is going to be a great deal of pressure to recycle this funding, and incidentally, the figures vary and that bothers me. I have heard $27 million today, and yesterday I believe that Secretary Blumenthal said $51 million by the time you add on the gas guzzler, the stand-by gas tax, the wellhead tax and the utility tax.

Mr. O'LEARY. The gas guzzler tax is an equalizing tax. What you capture with your left hand you release with your right, if it works right.

Representative HECKLER. But then Secretary Blumenthal also said the gross tax would be $100 million which is a very, very substantial amount of money.

I am concerned with the rebate and how this money will be recycled to the people. What the returns will be to our regions—and I am also concerned about your transportation study. I think it is very important that you are conducting it, but there is a very serious flaw in the timing, it seems to me. If all utilities are going to be mandated to have coal conversion on stream by June 30, and your transportation report is coming in 6 months—are we putting the cart before the horse?

Mr. O'LEARY. No. I predict that the first ton of coal burned as a result of our ordering authority, will be way, way, way long in time after that study is published, digested and possibly forgotten.

Representative HECKLER. May I ask, is this a correct statement of the central essential issues, that there would be three components to the problem? One of the energy component, one the environmen-

tal component and one the economic, and all are equal? Is that true?

Mr. O'LEARY. Yes. Here is the thing. If you look at the strategy of it, we've got to change the life style, the economic underpinnings of this society without doing violence either to the environment or to its economic prospects. It is very easy to achieve any one of these three. We can have a strong, dirty economy that falls off the cliff in 10 years. We can have an environmentally pristine economy that goes nowhere, with great human suffering, and what we are trying to do really is to find the art of moving between these more or less competing objectives and get a public interest result. And believe me, the people who are involved in this have a full understanding of the desirability of retaining a strong, vigorous economy, regionally and nationally, of continuing the enormous progress that we are making environmentally and at the same time meeting this imperative of getting our energy economy under control.

Representative HECKLER. I certainly would agree with you in terms of setting those aims as a target. I would like to ask just one other question. On the issue of scrubbers that you read about and hear about, in terms of achieving the compatibility between technology and economy and ecology, the best available technology is what you are requiring. Are scrubbers the best available technology? What about the waste that they would emit? Would that involve the construction of a chemical plant beside the utility plant? How are you looking at this concept of scrubbers as being one of the essential ingredients in this coal conversion?

Mr. O'LEARY. A very useful way to look at the scrubber waste problem is to quantify it as about comparable to the existing ash problem. It is one that was vexing when we first began to worry about disposal without messing things up. It has been handled now. It is not an aggravation. As a matter of fact there is a ready market for the ash, and from the standpoint of tonnage and potential contamination, it is about the same sort of a problem. It is doable. It is not an easy task. The ash solution was not easy. Given time, and we do have some time on this—the technology of scrubbing has been demonstrated at several plants—one in Kentucky and the so-called Mojave module is another. However, I went through that story of the economic woes of the utility industry in part to tell you that they don't want to make these investments and there is some small technological question associated with some coals. However, I think that we have to get over that because we've got to go to coal nationally and we've got to do it in ways that are consistent with protecting clean air.

Representative HECKLER. I agree with you. Now you have said, the notice of intent, as I understand it, will expire and result in a further proceeding on June 30?

Mr. O'LEARY. No. The notices of intent that we issued in early April, mid-April, will result in hearings about now. Those will culminate in an order, if the order is appropriate, prior to June 30. That will then take us through a procedural mode, into a procedural mode, where possibly some people will appeal into the courts for a time after June 30, or if they don't they will begin the engineering and design of the stuff that they are going to have to put on the plant.

Representative HECKLER. From a practical point of view, when are we realistically thinking of coal conversion as——

Mr. O'LEARY. One to 2 years is the minimum.

Representative HECKLER. Thank you, Mr. O'Leary.

Senator KENNEDY. I want to thank you very much, Mr. O'Leary. I would appreciate it if you could perhaps stand by for a short while.

Mr. O'LEARY. I would be delighted, Senator.

[Witness withdraws.]

Senator KENNEDY. We now have a panel of home owners and those interested in conservation. We will have Christine B. Sullivan, secretary of the Massachusetts Department of Consumer Affairs representing Gov. Dukakis. Natalie Schneiderman, who is the chairperson of the Energy and Utilities Committee, Massachusetts Fair Share. Charles Burkhardt, executive secretary of the New England Fuel Institute; and Wilson Jefferson, of the Springfield Action Commission.

What we will try to do is ask each of you to make a brief opening comment, maybe 4 or 5 minutes, and then we will get into some interaction with you. If you have a longer statement we will make that a part of the record, as if read.

Ms. Sullivan, would you begin first.

STATEMENT OF HON. CHRISTINE B. SULLIVAN, SECRETARY, MASSACHUSETTS DEPARTMENT OF CONSUMER AFFAIRS

Ms. SULLIVAN. Thank you, Mr. Chairman. First of all I want to thank you for entering Governor Dukakis' letter in basic support of the Carter program into the record. Second, I would like to make a brief statement in the interest of time and relate four points.

I would point out that my title is Secretary of Consumer Affairs and I have a great interest in that field. Part of my job also is the entire State energy policy, so it is a combination and a coincidence of interests which are particularly relevant today.

First of all, I wholeheartedly endorse President Carter's basic plan. There is an energy crisis. Existing supplies are going to run out. We must conserve and the use of the price mechanism to encourage conservation is, in my opinion, the most effective and efficient approach to the problem. I am not going to speak to the particular problems of poor people this morning. Others on the panel, I know, are going to address it, but it is a very important problem that we must address.

No. 2, in the short range, energy conservation is the most important action that the American consumer can take. Contrary to prevailing opinions, energy conservation does not have to mean a diminshed lifestyle. Conservation in the home will save money on fuel bills and in no way diminish the quality of life in the home. Buying automobiles with higher gas mileage conserves gasoline, saves money, and still gets you where you are going.

However, there is one side effect of a major energy conservation effort that concerns me. This is the potential for consumer fraud in the home insulation field. In fact, it seems to me that the worst consumer rip-off for the next few years may potentially lie in that area. The proliferation of the fly-by-night insulation company is going to cause untold grief and financial loss to many consumers. I

would hope that the Congress and the administration would assist the States in warning people about this future problem, in educating consumers about how to buy insulation, and how to insure its proper installation. The Federal Government might wish to consider establishing some basic standards. If it does not, I would hope that there would be strong encouragement to States to do so. We are working on various alternatives now in Massachusetts.

I am particularly excited about provisions in President Carter's plan to encourage the growth of the solar energy industry. Our fuel bills in Massachusetts are 38 percent above the national average. Solar energy offers us the potential to lower our bills without pollution. It also offers New England an energy source which does not have to be transported thousands of miles. Most importantly, solar energy will provide Massachusetts with thousands of new jobs. The State Energy Policy Office, part of my secretariat, estimated last year that even minimum increases in solar installations would create 11,000 new jobs in the plumbing and carpentry sectors by 1985. If the Carter tax credit plan passes, we now estimate that those 11,000 jobs will be created by 1982. The Dukakis administration is committed to doing everything it can to encourage the development of a solar industry in Massachusetts. The Carter plan will help us enormously.

I am also concerned about consumer fraud in the solar area. The actions to protect consumers, which I outlined in point two above, should also be taken to ensure consumer protection in the solar field. We hope by the end of this summer to have put together a series of measures to ensure that a consumer purchasing solar equipment will be fully protected in Massachusetts. But the problems any consumer encounters in Massachusetts will also be faced by the rest of the Nation.

Finally, I have one concern about the Carter plan—a concern that the plan does not go far enough. I do not believe that any of us can ask the people of this country to sacrifice indefinitely without providing some clear-cut effort at finding the ultimate solutions to our problems. Our energy policy has been a piecemeal one. We talk about alternative energy sources and scatter our dollars into research efforts on a number of fronts. The Carter plan has addressed clearly our short-term and near-term energy goals.

But basically it seems to continue our scatter-shot approach on long-term goals. We need some clear vision of how we are going to solve this crisis. Some, such as myself, believe that we need a commitment equal to that of the Manhattan project on solar energy. Without a clear and total commitment to finally solving our problem, I am afraid we will extend this crisis for years longer than necessary. Thank you.

Senator KENNEDY. Thank you very much, Ms. Sullivan.

Governor Dukakis' letter will, without objection, be printed in the hearing record.

[The letter referred to follows:]

THE COMMONWEALTH OF MASSACHUSETTS,
EXECUTIVE DEPARTMENT,
STATE HOUSE, *Boston, May 12, 1977.*

Senator EDWARD M. KENNEDY,
John W. McCormack Federal Building, Boston, Mass.

DEAR SENATOR KENNEDY: Thank you for this opportunity to express my views on the President's energy proposals. The subject of energy is much discussed these days, but we have a great deal of work still to do to educate and inform our citizens about the complex choices facing us. Your public hearing is an important and valuable part of this process.

President Carter's proposed energy program is a welcome and long-overdue relief to Massachusetts citizens. His realistic assessment of the value of conservation reflects our own philosophy here. For too long, national energy policies have emphasized increasing supplies at the expense of conservation. Clearly, an intelligent policy must incorporate both of these necessities. This, President Carter has done.

For the past three years, Massachusetts residents have led the nation in energy conservation. Because we pay the highest energy prices in the country, we have been forced, by economic necessity, to become pioneers in energy efficiency.

Much that the President proposes has already been started here. We have turned down our thermostats. We have launched Project Conserve, an extensive energy conservation outreach program to educate and inform Bay State citizens. We are in the process of changing our state's building code, to make it more energy efficient. We have begun a widespread and effective carpooling program for employees of Massachusetts firms. We have passed legislation mandating life-cycle costing in all state and municipal buildings. We have provided tax incentives to corporations for the use of solar energy systems, granted homeowners protection from having their property taxes increased as a result of their investments in such systems, required state bidding procedures to include estimates for the cost of alternative energy systems, and begun a Solar Action Plan to educate businessmen, unions, contractors, and builders about the present availability of solar energy.

In fact, we believe that solar energy constitutes an exciting new industry for Massachusetts and that President Carter's plan of tax incentives, if passed, will create 11,000 new jobs in the plumbing and carpentry fields by 1982. When solar really gets going, the job potential will soar to many thousands more.

I have one long-term concern about the plan. Although I certainly support conservation, coal, and solar energy programs as outlined, they deal mainly in short-term measures. We cannot expect the American people to sacrifice for decades on end without a clear government commitment to long-term solutions. By this, I mean we should look specifically at our energy research and development program. The present emphasis on nuclear power, with a scattergun approach towards other areas, needs to be reworked. We should therefore encourage Washington to reset priorities to reflect three major concerns: (1) use of solar energy; (2) technologies to clean coal before and during burning; and (3) advanced energy conservation technologies.

But there is much, much more to be done. And the energy conservation program President Carter has outlined will be of enormous help to us in our work here. We will finally have the federal commitment necessary for a full, comprehensive approach to energy. Let me cite a few specifics.

First, we support the use of federal tax incentives for energy conservation and for solar energy systems. Without this kind of economic benefit, many of our ctizens and businesses may find it difficult to make these investments. It is critical that Congress pass these tax credits as soon as possible, since many people are awaiting their enactment before making such conservation investments. Delay will cause us to miss a building season in which hundreds of solar collectors could be installed, and will put tremendous pressure on the price of conservation materials.

Second, the President has made it clear that we must conserve on our use of gasoline. He has suggested a tax on large, gas-guzzling cars, and a tax on gasoline itself. As controversial as these measures may be, I am concerned that they may not really be enough to significantly cut gasoline consumpton and that we may have to consider more drastic options, such as banning the use of large, gas-guzzling automobiles altogether.

Obviously, such a ban would have to be thoughtful and intelligent in its workings, with provisions made for necessary large cars such as station wagons. But in general we believe such strong alternatives must be considered. In fact, in a recent statewide poll, taken by our Energy Policy Office, 33 percent of those surveyed supported such a ban. Only 11 percent supported the idea of a tax on large cars. In

many ways, the public is ahead of us in their awareness of the energy problem, and their willingness to change.

Third, we believe the President is moving in the right direction with his home insulation program. But, we think he should also consider involving other groups bsides the utilities in this process. Banks, oil dealers, and non-profit organizations might have a valuable contribution to make in such a program.

We are also concerned that renters and apartment dwellers be included in any comprehensive public education and conservation program. Many of these people pay their own heat and utilities, and could well profit from conservation assistance and advice.

Finally, we support the general concept of pricing energy supplies so that their prices reflect their actual cost. We await further details on how the proposed rebate program would work. We believe it is important that this proposed adjustment to the pricing mechanism not harm low income families, already so hard pressed to pay for home heat.

President Carter has put forth a strong energy program for the country. He has given us a new direction and clarified the terms for the much-needed debate and discussion to follow. While we may have differences with certain aspects of his plan, I believe it is crucial that all Americans join in pursuing the long-range goals the President has specified. We, in Massachusetts, stand ready to help implement this program, and to do whatever we can to ensure that energy conservation become an active reality in this country. Our citizens are overwhelmingly aware of the need for conservation, and for moving toward a more balanced energy mix. We understand that the President's program is only the first step in a long, difficult, and urgent task. We pledge him our fullest support and cooperaton.

Sincerely,

MICHAEL S. DUKAKIS,
Governor.

Senator KENNEDY. Ms. Schneiderman, please proceed.

STATEMENT OF NATALIE SCHNEIDERMAN, CHAIRPERSON, ENERGY AND UTILITIES COMMITTEE, MASSACHUSETTS FAIR SHARE

Ms. SCHNEIDERMAN. Good morning. My name is Natalie Schneiderman and I am a lifelong resident of Chelsea, Mass. I am also the chairman of the Energy and Utilities Committee of Massachusetts Fair Share, the statewide citizen action organization.

For the last 3 years we have been working for reforms in the electric rate structure—eliminating the declining block rate system, providing lower cost electricity for basic needs and promoting conservation by larger residential, commercial and industrial users. It has been a lonely fight. Very few politicians had the foresight and courage to work with us on these reforms. Just last fall the basic elements of the Carter proposal on utility reform were being denounced in this State as unsound, bad for business, and unfair. Now many of the same political figures are calling the same programs necessary, farsighted and responsible. Members of Fair Share feel that we have been slightly ahead of our time.

In general we support the Carter program. Electric rate flattening on a national level, as provided in the Carter proposal, will mean fairer rates for small users and encourage conservation by larger users. We wrote this type of reform for Massachusetts. We support it nationally. Rate reform should be adopted nationally to prevent the larger users who benefit from unfair rates from playing one State off against another, as was done here last fall.

We support the emphasis on conservation, even though some of the proposed taxes would raise the price we consumers pay for oil products. I think that you will find that the American people are willing to sacrifice if they believe that the sacrifice is needed and that the burden is fairly spread around. The rebate program is

very confusing. I think I like the rebate program, but I'm worried about how it will work out for poor people. I think that most people will have trouble figuring out what it is supposed to do and if it does it.

Fair Share members generally like and support the plan's promotion of solar power, hydro-power and other renewable sources of energy, and we hope that these new techniques and technologies will become available to the people who really need them.

During the campaign for flat rates in Massachusetts, we discovered that many industries had recently switched from generating their own power to buying electricity from the utilities and that residential customers were being charged for the new powerplants needed by these industries. We applaud the Carter proposal to encourage industries to go back to providing their own electricity.

We believe that the biggest problem with the plan for the people of our neighborhoods is that we don't believe that there is a real shortage of oil, at least not now. We have been through too many scares before—oil scares, gas scares, sugar scares, and coffee scares. Every time the price goes up, the shortage we're supposed to be scared of disappears. No wonder everyone is skeptical.

Fair Share believes that with the waste of oil in this country, sooner or later we're going to run into serious problems if we don't start conserving. We cannot replant oil. We cannot get back a natural resource that we have drained dry. So even though we believe that the oil companies are holding back oil and gas and gouging the public, we also believe that we must conserve, and that the supply of oil is limited.

We believe that the price of oil has been going up because the oil exporters and the oil companies think that they can get away with raising the price of oil—and no one will ever convince that the price increases are legitimate. But we will support the conservation measures, the utility rate reforms, the conversion to new energy sources and so on just don't insult our intelligence by telling us that the oil business is playing fair with the American people.

The Carter proposal has several major flaws which should be corrected before the final legislation is passed.

One, the programs to encourage conservation don't deal with the problems of really poor and many working people.

Encouraging people to use smaller cars is fine—if you can afford a new car. I can't. In fact, I'm having trouble paying the insurance bill on my old car. Higher gas prices mean that I can't drive as much, and mean that my neighbors who have to drive to work end up with less money. And the program does not include any money for better public transportation.

All the programs to encourage home insulation are fine—if you own your home. I don't. And I probably never will. My landlord wouldn't even buy new valves for the radiators, let alone put insulation in the walls or buy decent storm windows. So once again the Carter proposal does not address the problem of really poor people, or most tenants, for that matter.

The program for protecting heating oil customers from the tax increase is fine—if you can afford to pay for heating oil now. I can't. There is no system of credit, no special allocations for help-

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ing to pay back bills. Once again, a lot of poor people are going to be left out in the cold.

It bothers me that helping the poor is either left out, mentioned in a little paragraph at the end of the proposal, or dumped into a general reform of the welfare, which will happen sometime in the future. I've been on welfare for 4 years, and I've seen a lot of sometime in the future reforms come to nothing. Most people are not on welfare, but most of us either can't afford a new car, or don't own our own homes. A lot of us are going to be in trouble unless these problems with the Carter energy package are corrected.

I don't think that President Carter got enough input from the people who are getting hurt the worst by the energy price increases. We could have told him that tax credits wouldn't get most landlords to insulate their houses.

We're worried about pollution and safety in the program. In Chelsea, we live in the middle of the largest storage facilities for oil and liquified natural gas in the country. We have special dangers because of airport approaches going right over the storage tanks. We have the further blessing of being downwind from several powerplants which the Carter proposal would convert to coal. And the oil companies are proposing to drill off our coasts. We hope that the solution to the national energy problem will not be to cover us with coal dust, turn our already polluted shores into oil slicks and then blow us up in an LNG accident. We don't want poor and working people, the environment and public safety to be the casualties in the energy war.

The problems with the program are serious. Yet, as I said at the beginning of my statement, we generally support the program anyway. These specific problems can be resolved by your committee proposing the right changes in the Carter proposal, and then by passing the whole improved program.

I would really like to say that this is a perfect package, since the major attacks on the plan seem to be coming from the utilities, the oil companies and the businessmen who don't want to conserve. But the program does not provide enough protection for the working people and the poor people who have been hurt worst by the energy crisis. The Carter plan must be modified and passed. I hope that you will support the changes in the plan which I have mentioned, and we would be very happy to participate further in designing the details of these changes.

Thank you very much for the opportunity to address this committee.

Senator KENNEDY. Thank you. That was an excellent statement.

We will not hear from Charles H. Burkhardt, executive vice president and managing director, New England Fuel Institute.

STATEMENT OF CHARLES H. BURKHARDT, EXECUTIVE VICE PRESIDENT AND MANAGING DIRECTOR, NEW ENGLAND FUEL INSTITUTE

Mr. BURKHARDT. Mr. Chairman, I am Charles H. Burkhardt, and I am executive vice president and managing director of the New England Fuel Institute.

The New England Fuel Institute is an association of 1,300 independent retail and wholesale heating oil distributors out of the 2,200 in New England. These independent marketers serve over 2.4 million retail home heating oil consumers and they market 85 percent of the 4 billion gallons of No. 2 home heating oil sold in our area at the retail level and 40 percent of the gallonage sold at wholesale. What is more important, 71 percent of all of New England's buildings and 74 percent of its population are heated by oil. Members of our association also market residual fuel oil at the wholesale and retail levels.

New England Fuel Institute is highly pleased with the President's energy message and program. There are a number of details, however, which we feel the mechanisms would be detrimental to the economy of New England, to the consumer of New England and to the 2,200 small businessmen who deliver this heating oil.

We would like to take this opportunity to thank Senator Kennedy, the chairman of this subcommittee, for the opportunity to appear here and many times before, to plead for the consumer and small business.

As the leader of the New England delegation on the vital issue of energy policy, Senator Kennedy is well aware that the shape and contents of the President's national energy program will have profound and lasting effects on our region and its citizens.

The first part of the energy program that we are pleased with is, the carrying forward and strengthening of the conservation efforts of the Federal Government. For a long time there has been no continual motivation whatsoever, especially through the last administration, to do anything but talk about conservation rather than bring it into reality. The present administration is now attempting to make an effort that would provide long term motivation on the part of the public both economic and psychological, that would result, we believe, in substantial conservation.

Second, we strongly support and recognize the special recognition given in the national energy program to the home heating oil consumers and the independent retail dealers who serve them. NEFI and the members of the New England delegation have fought long and hard for such recognition. The President's plan is based on two vital facts—that the price of fuel has escalated rapidly since 1973, doubled in price, and has already led consumers to make serious conservation efforts. And that fuel oil will continue to play an essential role in the heating of homes for many decades to come.

Acting on these facts, the President has developed a plan which, with a few changes set forth below, we believe would be in the best interest of the New England fuel oil consumer.

The national energy plan in theory is intended to embody the basic principles of regional equity and equal pricing for all fuels. This is a wise and important goal and is to be commended. However, we are disturbed that a permanent cost advantage for natural gas of about 10 cents per gallon has been built into the price relationship between that fuel and home heating oil. This is clearly unfair and must be changed to insure the equity of pricing for competing fuels, and also to assure regional equity in the cost of energy consumed.

We have serious doubts about the cost impact of this plan on the New England economy. While as indicated, the home heating oil consumer is given recognition, consumers of other fuels in our region, particularly industrial consumers of residual fuel oil, apparently have not been. We cannot, of course, comment in detail on this aspect of the President's plan, but wish to urge the subcommittee to examine it closely. A proposed tax of $3.50 per barrel on residual oil for industry and a $1.50 per barrel for residual oil for utilities to encourge the transition to coal, imposes a tremendous economic burden during the transition period that would effect our economy and its job related capacity.

Now we have some specific comments—four of them, which relate to the legislation and provisions that have already been submitted to Congress.

First, the rebate for home heating oil consumers. Under this provision, which is found in section 1402 of title II, a rebate of the crude oil equalization tax is to be provided directly to the retail heating oil dealer. We represent 1,300 of them. "The ultimate vendor" is the terminology used, who must then pass this rebate on to the consumer. NEFI is directly opposed, as is our entire membership, to this rebate going to us, the retail dealers. We believe it should go to the consumer directly. We believe to interpose 11,000 independent heating oil distributors between the 12 million retail customers in the United States is a monumental administrative absurdity and completely unnecessary. This money should go directly to the 12 million consumers, and it can be done in a very simple manner.

Just as the Federal Government or IRS receives a certification from a bank or a corporation on dividends, a 1099, certifying that so much money was paid to the taxpayer, our individual dealers can issue an equivalent of the 1099 to the consumer stating that he paid for 1,800 gallons of oil and then the tax rebate could be calculated on that figure right on the 1040 return. But in no manner or means are we agreeable to having this entire rebate come to our individual dealers. We believe it to be an administrative monstrosity and one that really could not be handled. When you consider that the average heating oil dealer in the United States employs 18 people, and runs three and a half trucks, you cannot impose a tax collection burden on him and a redistribution burden of hundreds and hundreds and millions of dollars. There is something wrong in that type of thinking and something must be done to see that this rebate goes directly to the consumer.

In a little while NEFI will submit a detailed plan including this sort of reporting that will authenticate the amount of oil used or paid for by the consumer, to facilitate our recommendations.

Second, the tax credit for home conservation: This provision, found in section 1101 of title II, is a major step forward. For this first time, a President has recognized that effective conservation in the home involves not just storm windows, caulking, and insulation, but also the home heating system itself. We have 2,433,000 of these home heating plants operating in New England at the present time. We have 30 percent of these furnaces and boilers that are 18 to 20 years old. You can imagine how efficient they are! The present tax rebate system will provide a rebate or tax credit,

rather, just for the replacement of the burner, but the most important piece of equipment which is the furnace and the boiler, is completely left out of the tax credit system. We feel that unless this larger equipment, furnaces and boilers, are included in the tax credit system and not just the oil burner, it is going to be completely ineffective. It is like providing a tax credit for an old automobile so you can get new tires, and doing nothing about rebuilding the engine.

Senator KENNEDY. How much are we talking about, and what is the cost?

Mr. BURKHARDT. The cost of an installation like this could run from $1,200 to $2,000, and we are talking about approximately 30 percent of 2,433,000 of them, or roughly 740,000 installations, which are operating at sub-efficiency because the equipment is so old.

The potential for conservation is immense here, if there can be some recognition that it is not just the oil burner itself, but the boiler and furnace which is the important factor. Part of this, of course, was recognized in Senator Kennedy's conservation legislation passed by Congress last year. It recognized a number of these facts. So a tax credit for full heating equipment is important.

However, the specific language of the credit does not provide sufficent coverage to meet the real needs of New England homeowners and must be broadened. As I mentioned a moment ago, the replacement of the oil burner itself is not enough. Therefore, NEFI strongly recommends that the language be amended to include: "A replacement burner, boiler or furnace which device is designed to reduce the firing rate or to achieve a reduction in the amount of fuel consumed as a result of increased combustion or absorption efficiency."

Such an amendment would assure New England homeowners of a tax credit to install a completely new, more efficent oil heating system and will insure that the most effective energy conservation measures are adopted. To install a brand new oil burner in a 20-year old furnace is a form of folly, and to encourage that by a limited tax credit just for the oil burner is a compliment to that folly.

NEFI is concerned that the administration is not providing sufficient support and encouragement to the independent fuel oil dealers to participate in the residential energy conservation programs. Under title I, part A of the President's plan, the major responsibility and emphasis is placed on the electric and gas utilities. We are frankly confused and alarmed. The fact sheet and other background material released by the White House clearly stated that the fuel oil dealers would also be encouraged to provide these services. Unfortunately, the legislation is silent on this issue.

In view of the serious anticompetitive impact of granting exclusive control of home insulation and equipment installation business to a monopoly—the utilities—and in view of the serious cost impact on consumers who would be deprived of the benefits of competitive service, NEFI urges that this subcommittee seek clarification of this vital issue.

I would like to bring to the subcommittee's attention that there is a single dealer who has already over a period of 2 years reinsu-

lated 3,000 homes. Why should he not benefit under this program, with all of the experience he has had in doing this in 2 years, and why should the benefits go to utilities only? These 2,200 dealers in New England, back in 1962, handled 18 percent of all the insulation business in New England at that time, but have gradually gone out of it. They should be encouraged to come back.

NEFI supports the commitment to solar energy in the President's plan.

Senator KENNEDY. These are all worthwhile points, but why don't you just summarize them.

Mr. BURKHARDT. Well, I'm at the last one. I am finishing now, with this paragraph.

Fourth, NEFI supports the commitment to solar energy in the President's plan. For more than 2 years, the New England Fuel Institute has played a leading role in the field of testing of solar-adjunct equipment and the training of solar heat technicians. In September our technical training center will begin offering the first complete vocational training course for solar heating installers and service technicians in the Nation, fully approved by the Massachusetts Department of Education.

In addition, we have over 121 installations in at this time to test the application of solar heating as an adjunct to oil systems.

Now, there is just one other point. We feel that the legislation as it is put forth now, fails to provide independent marketers with the basic procedural rights to a hearing on the record, and the right of appeal to a Federal court system that are afforded independent marketers by all other cabinet agencies. This is a serious threat to our survival. It is an unwarranted and dangerous grant of power to a Government agency, particularly one with the power and jurisdiction of the proposed Department of Energy.

On behalf of all members, of NEFI, we would like to ask Senator Kennedy, as a leading member of the Judiciary Committee, to take an active role in assuring that we are granted in this legislation the fundamental due process rights as guaranteed by the Constitution, which essentially would be public hearings.

Thank you.

Senator KENNEDY. Thank you, Mr. Burkhardt.

[The prepared statement of Mr. Burkhardt follows:]

PREPARED STATEMENT OF CHARLES H. BURKHARDT

Mr. Chairman: My name is Charles H. Burkhardt. I am executive vice president and managing director of the New England Fuel Institute. NEFI is an association of 1,300 independent retail and wholesale home heating oil distributors throughout the 6-state region. The independent marketers serve over 2.4 million retail home heating oil consumers and market 85 percent of the 4 billion gallons of No. 2 home heating oil sold in our area at the retail level and 40 percent of the gallonage at wholesale. Seventy-one percent of all of New England's buildings and 74 percent of its population are heated by oil. Members of our association also market residual fuel oil at the wholesale and retail levels.

On behalf of all the members of NEFI, I wish to express NEFI's appreciation to Senator Kennedy for convening these hearings and for inviting us to appear. As a leader in the New England Delegation on the vital issue of national energy policy, he is well aware that the shape and content of the President's National Energy Program will have profound and lasting effects on our region and its citizens.

We are particularly pleased to offer comments on the impact of the National Energy Plan on the thousands of independent retail fuel oil dealer-distributors who

are members of NEFI and who serve the millions of fuel oil consumers in New England.

I. General Comments

In general, NEFI supports the thrust and intent of the National Energy Plan presented to the Congress on April 20 and embodied in a massive legislative package transmitted on April 29. The President deserves the commendation and support of all Americans for attempting to develop a comprehensive national energy policy. Congress in general and leaders such as Senator Kennedy in particular have already done much to alert the nation to the energy crisis and, in fact, have supported and enacted a number of major bills, including the Emergency Petroleum Allocation Act of 1973, the Energy Policy and Conservation Act of 1975 and the Energy Conservation and Production Act of 1976. Therefore we feel it is important to view the President's Plan in the context of existing legislation and policies.

First, NEFI, is pleased that the President is carrying forward and strengthening the conservation efforts of the Federal Government. Senator Kennedy was, of course, the sponsor of the major conservation legislation passed by the Congress last year in Titles III and IV of P.L. 94-385 (the Energy Conservation and Production Act). As a consistent, long-term supporter of conservation of fuel oil, NEFI is pleased that the President has placed major emphasis on this area.

Second, NEFI strongly supports the special recognition given in the National Energy Plan to the home heating oil consumers and the independent retail dealers who serve them. NEFI and the members of the New England Delegation have fought long and hard for such recognition. The President's Plan is based on two vital facts: that the price of fuel has escalated rapidly since 1973 and has already led consumers to make a serious conservation effort and that fuel oil will play an essential role in the heating of homes for many decades to come. Acting on these facts, the President has developed a Plan which, with a few changes set forth below, is in the best interest of the New England fuel oil consumer.

Third, the National Energy Plan is intended to embody the basic principles of regional equity and equal pricing for all fuels. These are wise and important goals and the President is to be commended for supporting them. (We might note that NEFI last month invited Senator J. Bennett Johnston of Louisiana to speak at our 15th Anniversary Celebration here in Boston. That occasion marked, we hope, the beginning of a more fruitful constructive dialogue between the great oil producing and great oil consuming regions.) Unfortunately some parts of the Plan undercut these principles of regional equity and equal pricing, and we urge this Committee and the Congress to examine the specific legislation closely and adopt the changes necessary to make the specifics consistent with the President's general principles. We are deeply disturbed that a permanent cost advantage for natural gas of about 10 cents per gallon has been built into the price relationship between that fuel and home heating oil. This is clearly unfair and must be changed to insure equality of pricing for competing fuels.

Fourth, NEFI has serious doubts about the cost impact of this Plan on the New England economy. While, as indicated, the home heating oil consumer is given recognition, consumers of other fuels in our region, particularly industrial consumers of residual fuel oil, apparently have not been. We cannot, of course, comment in detail on this aspect of the President's Plan but wish to urge the Committee to examine it closely.

II. Specific Comments

NEFI would like now to present comments on four specific provisions of the legislation that have been submitted to the Congress.

First, the rebate for home heating oil consumers. Under this provision, which is found in Section 1402 of Title II, a rebate of the crude oil equalization tax is to be provided directly to the retail dealer ("the ultimate vendor") who must then pass this rebate on to this customer. As indicated, NEFI is very pleased at this recognition of the vital interests and severe financial difficulties of the fuel oil consumer. However, we are worried about the complexity of the draft legislation, the bureaucratic morass it creates for the small fuel oil dealer, and the difficulty of implementation without resort to a massive system of price controls and audits. In brief, NEFI strongly favors the rebate principle, but believes that a better mechanism can be developed—one that will insure the fullest cost reduction to the homeowner at the least cost and difficulty to the independent retail dealer. The Fuel Oil Supply Study Committee of NEFI is presently developing such an alternative and respectfully requests permission to submit its recommendation to the Chairman and the Committee in the very near future.

Second, the tax credit for home conservation measures. This provision, found in Section 1101 of Title II, is a major step forward. For the first time, a President has recognized that effective conservation in the home involves not just storm windows, caulking and insulation, but also the home heating system itself. NEFI's experience in the field has shown that the installation of a new oil burner and furnace or boiler can result in fuel savings of 25–40 percent. When one recognizes that the average heating plant in New England is 14 years old and that 30 percent of the furnaces and/or boilers are from 18–20 years old, the potential for conservation is immense. NEFI, of course, strongly supported Senator Kennedy's conservation legislation passed by the Congress last year, which was based on a recognition of these facts.

That is why the tax credit for equipment is so important. However, the specific language of the credit does not provide sufficient coverage to meet the real needs of New England homeowners and must be broadened. As the Committee will; note, Section 44B(c)(4)(A) includes only "a replacement burner for a furnace", which is one, but not the major, heat transfer part of the heating plant. The remaining integral part—the furnace (for hot air heat) or boiler (for hot water heat) is not. Therefore, NEFI strongly recommends that the language be amended to include: . . . a replacement burner, boiler, or furnace which device is designed to reduce the firing rate or to achieve a reduction in the amount of fuel consumed as a result of increased combustion or absorption efficiency.

Such an amendment will insure that New England homeowners are given a tax credit to install a completely new, more efficient oil heating system and will insure that the most effective energy conservation measures are adopted.

Third, NEFI is concerned that the Administration is not providing sufficient support and encouragement to the independent fuel oil dealers to participate in the residential energy conservation programs. Under Title I, Part A, of the President's Plan, the major responsibility and emphasis is placed on the electric and gas utilities. NEFI is frankly confused and alarmed. The Fact Sheet and other background material released by the White House clearly stated that the fuel oil dealers would also be encouraged to provide these services. Unfortunately, the legislation is silent on this issue.

In view of the serious anti-competitive impact of granting exclusive control of the home insulation and equipment installation business to a monopoly—the utilities—and in view of the serious cost impact on consumers who would be deprived of the benefits of competitive service, NEFI urges that this Committee seek clarification of this vital issue. It would be ironic indeed if the independent companies who have been deeply involved for many years in the installation of heating equipment and insulation were suddenly shut off from this business, and the utilities—who have little or no experience—were given exclusive or major responsibility. In view of his position as Chairman of the Senate Antitrust Subcommitte, NEFI earnestly requests that Senator Kennedy take particular interest in the impact of this provision on the small, independent fuel oil dealer.

Fourth, NEFI supports the commitment to solar energy in the President's Plan. For more than two years, the New England Fuel Institute has played a leading role in the field testing of solar-adjunct equipment and the training of solar heat technicians. In July our Technical Training Center will begin offering the first complete vocational training course for solar heating installers and service tehnicians in the nation, fully approved by the Massachusetts State Department of Education.

NEFI has long believed that, while solar energy cannot provide all the heat for a New England home, it can provide a supplemental energy source for the hot water used in washing and the water or air used in heating and can do the same for oil heating. We believe that, when the technology is fully developed, solar energy can replace up to 25–30 percent of the oil or other fuels used to heat New England homes. This is an area of great potential. NEFI welcomes the President's support and pledges its continuing efforts to provide the best equipment and service—solar as well as conventional—to the consumers of New England.

Before concluding, NEFI wishes to call to the Chairman's attention a matter of grave concern to the independent fuel oil dealers and small businessmen of New England. Earlier this week, the Senate Committee on Governmental Affairs reported out S. 826, the bill to establish the Department of Energy. Unfortunately, that bill fails to provide independent marketers with the basic procedural rights to a hearing on the record and the right of appeal through the Federal Court system that are afforded independent marketers by all other Cabinet agencies. This is a serious threat to our survival; it is an unwarranted and dangerous grant of power to a Government agency, particularly one with the power and jurisdiction of the Department of Energy. On behalf of all members of NEFI, I should like to ask that Senator Kennedy, as a leading member of the Judiciary Committee, take an active

role in assuring that we are granted in this legislation the fundamental due process rights as guaranteed by the Constitution.

III. Conclusion

In summary, the New England Fuel Institute strongly supports the basic principles of President Carter's National Energy Plan—the emphasis on conservation, regional equity, equal pricing of all fuels, and competitive equity for the small independent fuel oil marketer. Unfortunately, perhaps through an oversight, the draft legislation sent to the Congress does not fully embody these vital principles. Therefore, NEFI urges the Chairman, this Committee and the Congress to support the amendments necessary to insure that the President's principles are translated in legislative reality. The specific issues outlined above—particularly the tax rebate for fuel oil consumers, the tax credit for fuel oil equipment and the role of fuel oil dealers in the residential conservation program—are of vital concern to the thousands of fuel oil dealers in New England and the millions of consumers they serve.

Thank you very much.

Senator KENNEDY. Before turning to Mr. Jefferson, I would like to ask Mr. O'Leary what reaction he has to the Burkhardt proposal in terms of that rebate.

Mr. O'LEARY. I think that is something we really ought to think about.

Senator KENNEDY. You are familiar with the procedure which he outlined, and also the form?

Mr. O'LEARY. Yes.

Senator KENNEDY. Will you look into that?

Mr. O'LEARY. We will take a look at that. I made a note as he was speaking to do that. I think that is an excellent thought and we ought to look at that very carefully. The difficulty is the real time problem. That's a once a year event and what we were trying to do on the other proposal was to give it back to you more or less as you were spending the money. Maybe there is something in between that we could find, so you don't have to wait until April for all the expenditures of the whole cycle to get your money back.

Senator KENNEDY. Mr. Jefferson directs the work of the Springfield Action Commission in weatherizing low-income housing. This is a program that I sponsored in the Senate last year and we are delighted to have you with us. You have one of the most successful programs in the country and we want to hear from you.

STATEMENT OF WILSON JEFFERSON, SPRINGFIELD ACTION COMMISSION

Mr. JEFFERSON. Thank you very much, Senator. Our program is geared to servicing low-income families, by providing insulation and all types of weatherization. Weatherization basically is preventing the loss of heat, and the infiltration of cold. This is a very substantial program and I think most of the supports that go along with it are good.

But I have one basic problem that I have run into continually. This concerns the administrative end of the program. The program itself services the maximum amount of people but it is so tied up in redtape that we can't move along and get the job done. I think a lot of this is because of the way the legislation is written. It doesn't give access to the people who have to do the job. You write a program on paper and it looks good, but when we try to go out and do the job we run into problems. For instance, most of it is federal-

ly funded—there are proposals involved so we can't stray very far from our grant when we carry out the program.

How do we know 6 months down the line whether we are going to need an extra piece of equipment to do a job? What about transportation to the job? This is not written into these grants. We are given money to do the job but no transportation. How can we be expected to take weatherization to somebody's house if we don't have a vehicle? No one seems to have an answer to this, so it is just more or less going along step by step, making whatever makeshift arrangements we can. This severely restricts myself and other directors like me.

This cold season we successfully have done 70 homes, totally insulated. But we have 250 people waiting. We can't get to them. We don't have the people. We have a problem with personnel regarding CETA Title 6 legislation, which is a manpower legislation. The grant we operated under last year for the 1976–77 year ended in January. We lost 18 personnel, with the stipulation that we assumed we had an approval grant from CETA to go in effect no longer than 2 weeks after losing these people. I'm still waiting for the CETA people. This is May. They were supposed to be on May 15 and now they tell me they won't be there until June.

These are the problems. I think if the Federal Government had a little input from the working staff, the people that actually go out and do these jobs we might be more useful. It's a very valid program. A lot of people need it. There is no doubt about that, but some of the administrative redtape has to be cut out of the project, and I think it is going to be just as bad this year.

I am open for questions if you have any, but that's, in essence, what I have to say.

Senator KENNEDY. Could you tell us a bit about the kinds of homes you have done and what the cost has been of those homes, and what you think some of the savings would be?

Mr. JEFFERSON. We are operating under the CSA guidelines, which are for low-income people, and we can service, I guess, 90 percent of the people under the program. I have one case in mind where we installed insulation in a lady's home; the fuel bill was something like $275 a month. She is on a fixed social security income and there is no way in the world that she could approach a businessman to do the job. We insulated her house and the following month the bill went from approximately $275 to about $140 a month, just with insulation which she could not afford to have done out of her income.

Senator KENNEDY. What was the cost of the insulation?

Mr. JEFFERSON. The cost of the total job was approximately $350, which is the maximum we are allowed to spend. There could have been a little more work done, but the guidelines wouldn't allow us to spend any more than that on the property.

I had another case of an elderly person on a fixed income who has a single home. She was on the verge of moving out. Last year she had to live in a friend's house because she couldn't stay warm in her own house. We effectively insulated that home and she still has a problem paying for her fuel but it is not as bad. As a rule there is probably a 65-percent savings after the total job is done.

Senator KENNEDY. Those are impressive statistics and figures. To tell you the truth, I am prepared to do a pilot study to see what works more effectively—this kind of direct expenditure or the tax credit. I have serious reservations with relying upon the tax system to get things done. There are a great number of people who do not use the tax credits and unfortunately these are the people who stand to benefit the most from the program.

I have some serious reservations and questions about the method and the process involved. We will certainly look into it. I represent about 22 in the Senate on it. I think the last vote was about 77 in favor of it. I've seen the incremental aspects of the tax program, the credit program, in terms of trying to target in to a certain income group, but in most circumstances it is basically an underwriting for what they would be doing in any event because of the savings on it.

The program you have mentioned here is a central part of the administration's program and I am a strong supporter of it being even more so.

It would be very helpful to us if you could give us 10 or 12 different specific examples about bills. I imagine it would be bothersome for you, but it would be very helpful to us. I can assure you I will use it in the Senate. Just give us what people paid prior to the insulation and what they are paying now. I think that can be very useful.

Representative HECKLER. It would be of great interest to me, too. I have to say I think this is fascinating.

Senator KENNEDY. Find out who it is in the weatherization program and ask him to come out to Springfield, or Boston, a mutually convenient place, and have you sit down and go over this thing and see if we can't get it on track. Let's see if we can get you together with the people and see what can be done.

Mr. JEFFERSON. Thank you.

Representative HECKLER. I would like to ask about the training. For example, in one community in my district, insulation was put in by the family itself, without any training, reading a manual, and they had a very unfortunate experience. There was a heavy snowstorm. The snow remained on the roof and the roof caved in. This actually happened in Mansfield. So obviously there is a degree of training required. How do you become trained? And is this something that someone can learn fairly quickly with a degree of expertise that the people can make valid judgments?

Mr. JEFFERSON. It is something that can be learned. Basically we developed our method by trial and error, but not to anybody's detriment. Basically what we did was ask for input from the companies that are our suppliers—Owens-Corning, Monsanto. They've been really great in training our crews to do the proper implementation of the insulation. Then it is just a matter of handling it on as new crews come on hand. We also train them at the skill center in Springfield in the basic mechanical aptitudes that they would need to do the job. It is a manpower job-oriented school and they have assisted us in our trainees.

Senator KENNEDY. I think Mr. Burkhardt brought up the point that there are only three major producers of insulation—and in terms of achieving the President's program they can't produce the

amount that is needed. The other kinds of problems in terms of credits, is no matter what we do if we provide tax credits, that is just going to be the cushion by which prices will be increased. So basically we are underwriting that particular kind of factor.

Mr. JEFFERSON. I have that problem now. Insulation has gone up 10 percent in the last 2 months.

Senator KENNEDY. This is something we are going to follow very, very closely. We raised these issues with Attorney General Bell in terms of the antitrust implications.

Thank you. We will follow up on that with you.

We have a panel now on oil, coal conservation, and employment. John G. Buckley, vice president of Northeast Industries; Guy Nichols, president of New England Electric Systems; and Richard Syron, assistant vice president, Federal Reserve Bank of Boston.

Mr. Buckley, we will start off with you and perhaps we can keep each statement down to about 7 minutes. This is going to be important to Mr. O'Leary, too.

STATEMENT OF JOHN G. BUCKLEY, VICE PRESIDENT AND DIRECTOR, NORTHEAST PETROLEUM INDUSTRIES, INC.

Mr. BUCKLEY. Thank you, Senator Kennedy. I think it is fair to say that all of the independent marketers are very pleased that you are taking an interest in the national energy plan. The manner in which it is finally adopted is of crucial importance to the economic viability of this region. The New England congressional caucus, which Congresswoman Heckler is very familiar with, has certainly emerged in the last 2 or 3 years as a very important element in national energy policy adoption, and of course your interest, Senator, goes back a long time and we marketers who do play the predominant role here in distributing to the homeowner and to business and industry, appreciate your continuing interest. We know you bear a very heavy schedule and staying involved in energy this year is going to be very important.

We certainly welcome the President's initiative in putting forth this national plan. We welcome the national debate that now has to take place. We share your praise for Mr. O'Leary. I certainly don't blame him for the negative parts of this program because he came into his job a few months ago in the midst of a crisis with millions of people unemployed. He had to get involved immediately in crisis management and certainly in connection with our own energy problems here and the shortage of home heating oil, showed he could act quickly and effectively to help us.

I think if there is any one criticism I would have to make of the President's plan, it is its overreliance on the computer—Mr. O'Leary suggested that the computer analysis was not precise and at best suggestive of answers. But this plan is an extremely complex one and it goes into great detail. It represents a very massive Government intervention into every facet of the energy industry. I think Mr. Jefferson's testimony was very eloquent in showing that you can't pass a law or put the Government in, without causing problems. Moreover, sometimes you end up with a far less efficient and effective method of coping with things than if you didn't have the Government involved at all.

I think if there were one or two difficulties I would want to emphasize with the plan, they would be to question the assumption that coal is going to solve all of our energy problems. That's naive. The numbers that Mr. O'Leary used in connection with lessening the impact on New England are very soft numbers, I think. It's going to be a long, long time, if ever, that industry uses coal in New England.

The President asked for a national objective of 400 million tons of extra coal by 1985, but as Mr. O'Leary pointed out, over 80 percent of that is already committed through 1985 on long-term contracts. There isn't much available, if any, for industrial conversion. The President very rightly has indicated there will be no compromise on environment. Health and safety are put first, as they should be. But you have to recognize it is going to be very difficult to meet the production goals for coal and nuclear and liquified natural gas under the constraint of no compromise on the environment.

I notice that you are going to hear from nuclear opponents next. The President has indicated he wants a very fast timetable on nuclear. The national energy plans call for 11 percent of our energy to be nuclear by 1990, as compared to 3 percent today. That represents more than 3½ times current growth. And he proposes to streamline Federal guidelines to achieve that. I suggest to you that even if he streamlines Federal guidelines, the President's own language on nuclear as a fuel of last resort is going to be watched and listened to very carefully by the citizens who live in the some 200 communities where the 200 new nuclear plants are going to have to be sited. And there will be law suits and environmental concerns, and I just don't think it is practical to assume you are going to achieve 11 percent of our energy with nuclear by 1990. Or that we are going to be able to double coal in the next 7 or 8 years. Or that the people who are asked to take LNG tanks in order to have a larger supply of gas are going to take them lightly when the President's own message says that we are going to foreclose the possibility of siting them in densely populated areas.

Why? Because obviously they are dangerous. But people who live in a town of 300 or 400 population love their children just as much and they are not going to say, "Well, it's OK because we are not densely populated, we are remote?" They are not going to like that. You have to recognize no matter what the computer says, that we are going to fall somewhat short of a few trillion tons of LNG, certainly somewhat short of 11 percent contribution to energy by nuclear, and even if we meet our coal objectives we are going to use a lot more oil in 1980, 1985 and 1990.

Representative HECKLER. Mr. Buckley, you are an expert in oil, particularly. As I understand it, oil and gas will be sold at comparable prices on a pretax basis under the President's plan, but that the tax changes in the energy plan will leave oil at a higher relative price than gas. Is that correct?

Mr. BUCKLEY. That's correct.

Representative HECKLER. Is that going to negatively impact New England, or is it not?

Mr. BUCKLEY. Well, even now we are disadvantaged in terms of price on oil and gas. Gas has been held down artificially for a long

time. What was encouraging in the President's message was that he said he wanted—and I think I will use his exact words—roughly the same or reasonably uniform energy prices in all sections, in all regions. Now, 10 cents a gallon difference is not the same. And that 10 cents is after the home heating oil user gets his rebate.

On the industrial side, certainly for the next 7 or 8 years, we will be much more severely impacted because since there isn't enough coal, even under the most optimistic assumptions of production, our industry is going to be on oil and starting in 1979, which is a year and a half from now, our companies have got to start paying a tax because they are not converting to coal even though they can't, and they are going to end up in 1985 paying a tax of $3 per barrel.

Representative HECKLER. They will pay a tax because they cannot convert to coal?

Mr. BUCKLEY. That is correct. That is a tax to spur them to convert, but there is no coal to convert. There is no transportation method to get the coal here if it could be produced. The coal is mostly committed already.

Representative HECKLER. Even though it is absolutely impossible for them to get coal, they are going to be taxed for not using coal? That is an all time absurdity, even for the Federal Government.

Mr. BUCKLEY. U.S. industry today burns the equivalent in oil and gas of 700 million tons of coal. The President has asked for extra production of 400 million, almost 90 percent of which is already committed, leaving 10 percent for conversion, or 30 or 40 million tons, assuming we can reach those objectives in production. And here we are with 700 million tons needed to convert. So obviously, people at the far end of the supply line are not going to get the coal, and are going to pay the tax, and are going to end up in 1985 at a price for their oil being used to fuel industry here at $3 above OPEC. That means our industry not only is not going to be competitive with the rest of the industry in this country that is burning gas or coal, but we are not going to be competitive with France or England or Germany or Japan either, because they are at OPEC level—not OPEC plus $3.

Representative HECKLER. And this would impact equally on all sections of New England.

Mr. BUCKLEY. It certainly will. Just in Massachusetts the cutoff point for industry with this tax—qualified by Btu use per hour—leaves some 165 companies that would be impacted in this State alone.

Representative HECKLER. What size companies would they be?

Mr. BUCKLEY. These would be the medium to large factories. The 165 largest factories. And that is the great bulk of our manufacturing and employment base.

Representative HECKLER. There would be great impact.

Mr. BUCKLEY. That is correct. And small paper companies, textile mills, electronics, jet engines, you name it—any of our key manufacturing facilities would be directly impacted. In New England as a whole, probably 300 companies would be affected; in the United States, something over 2,000 companies. There is a procedure whereby they can get an exception. But they have to have a hearing and you may have 2,000 companies coming in to get an exception because the coal isn't there. They all have to have panel

hearings. I don't know how many hundreds of thousands of people are going to work for this energy department, but I suggest to you that nationally we are already going to coal. The economic incentives will be much greater to go to coal with these new taxes they are putting on crude oil and higher prices for oil and gas. I don't think anything else has to be done and I am certainly not in favor of forming a big bureaucracy to try to force conversion to coal. I don't think this bureaucracy will force anything except perhaps slow us down so we do not get there quite as quickly as we would without it.

The plan is far too complex. There are many, many holes. I just have great trouble with computer analysis. It is only as good as what you put into it. Mr. O'Leary mentioned the $5 billion impact on oil prices by 1980–81. I suggest to you that no matter how you look at it, using reasonable assumptions the impact has got to be more nearly $50 to $60 billion—inflationary impact on oil prices.

Representative HECKLER. How do you compute $50 or $60 billion?

Mr. BUCKLEY. You look at the tax they are going to put on controlled oil prices, to bring them up to OPEC levels. You make assumptions on inflation, on a relatively modest, say 6 percent a year growth in OPEC prices, and by 1980 that means that just from crude oil alone you are going to have 14 cents added to every gallon of petroleum product made in the United States. It is going to cost money to store that higher cost crude, to store the products, refining costs are going to go up. It costs more to buy a truck today. It is going to cost more to run the truck, maintenance is going to go up. So you are looking really at an 18- to 20-cent gallon increase in every gallon of petroleum product used whether it is for petrochemicals, synthetic fibers, running a car, or running a diesel truck to bring agricultural product to the market. That is an enormous inflationary jump.

So I have grave reservations about the computer analysis which shows a $5 billion impact on oil prices as a result of the tax and pricing policies. Our own analysis indicates that the direct inflationary jolt on oil prices alone by 1980–81 will be between $50 and $60 billion with another $25 to $30 billion in ripple impact. That is the kind of inflation that this Congress and this subcommittee particularly must be very concerned about. You have to make sure that if we go this route—and I am in favor of bringing all energy costs up to the cost level of alternate energy to promote conservation—we have got to be very careful particularly in this region, not to impact negatively on the economy.

Representative HECKLER. There is a very substantial disparity between Mr. O'Leary's figure of $5 billion and your figure of $50 or $60 billion.

Senator KENNEDY. Why don't you submit to us the method and statistics as to how you reached those figures, and we will try and follow up with Mr. O'Leary's end and find out the terms of the disparity.

Mr. BUCKLEY. I would be happy to. I did put a good deal of it into my statement, which I assume will be put in the record.

I have two quick final comments. One, I really hope this Congress doesn't get stampeded into having to do something just for the sake of doing something. This is far too critical a problem. It

covers the rest of the century. Ninety days is not enough to formulate a rational policy. I hope you take the whole year. You notice that Mr. O'Leary said the President has got a committee that is going to report to him on health and coal next fall. Well, if Congress has enacted this legislation and then the health people find out the coal particulate matter and the sulphur and all the other things are really going to pose a health problem, where are we? You ought to know what those health issues are and whether we are going to be able to meet our coal objectives before you pass this legislation. So I hope you will do it slowly and in a deliberative way and the country will have to recognize that it is too important to rush through.

Finally I would like to suggest, Senator Kennedy, one immediate problem that has to do with energy and specifically S. 826. Mr. Burkhardt alluded to it. That bill is coming up for floor debate next week. If it is passed as it is now presented by the committee to the Senate for a vote, this will become the only Cabinet department in the United States to which the Administrative Practices Act does not apply and it is going to squeeze thousands of independent businessmen; the decisions FEA makes and the Department of Energy makes are of direct and obvious concern to us; we will not have access to U.S. district courts; will not be able to have a hearing and confront the facts and the adverse witnesses. I would hope that in the next week we can at least make this Energy Department to the same constraints and the same due process rights for independent businessmen and other businessmen that every other Cabinet department has.

Thank you very much for asking me to come today. I look forward to working on these issues over the next year.

Senator KENNEDY. Thank you very much. As the former chairman of the Administrative Practices and Procedures Subcommittee I have more than a passing interest in it. We have changed and altered that board to try to make it much more responsive, to speed up cabinet responses in a wide variety of areas. I think it has an extremely important function in the protection and due process area.

[The prepared statement, with attachments, of Mr. Buckley follows:]

PREPARED STATEMENT OF JOHN G. BUCKLEY

My name is John G. Buckley. I am a Vice President and Director of Northeast Petroleum Industries, Inc. of Boston. I am a former fuel oil chairman of the National Oil Jobbers Council and currently on the Steering Committee of the Fuel Committee of NOJC. I am also a member of the Utility Advisory Committee to the Federal Energy Administration, Washington, D.C. and a member of numerous other energy-oriented committees dealing with national regional and state energy problems.

Mr. Chairman, I would like to start by thanking you for the leadership you have displayed in the development of energy policies during the past 2½ years of intense Congressional effort. Of course, your concern and direct involvement in energy and its impact on the New England region goes back well over a decade. We independent companies appreciate the role you have played in trying to win equitable energy pricing treatment for consumers both at home here in New England and across the country.

Your hearings this morning are just another example of your effort to make sure that this region does not pay a disproportionate price for the achievement of national energy goals and objectives. Clearly, the cost of achieving national objec-

tives should be borne equally by consumers in all regions and sections of the country.

In my statement this morning, I should like to divide my comments in two parts: The first, dealing with aspects of the Administration's program which I believe deserve both support and approval by the Congress; and, the second, dealing with those parts of the Administration's program that I believe will be harmful to Massachusetts, New England and the nation as a whole.

Conservation

On the positive side, I strongly support the basic thrust of President Carter's Energy Plan to conserve energy and use it more efficiently. I know you, Senator Kennedy, have played a key role in enacting a number of major bills designed to conserve energy and use it more efficiently.

The hard reality that we must use energy more efficiently has, of course, already been brought home to this New England region in the last 3½ years since the Arab oil embargo of October 1973. New England has been forced to conserve through the higher energy prices that resulted from that embargo and the subsequent fourfold increase in world oil prices adopted by the OPEC countries. This region is unique in the sense that it depends so heavily upon oil, much of it imported, for its economic life. So we have felt the burden of higher prices and have conserved. New England industry has already taken all of the easy conservation steps, as well as many of the sophisticated measures needed to insure more efficient energy use. On the average, we believe industry in this region uses 20 percent less energy today than 3½ years ago to produce the same volume of goods.

Homeowners too have conserved both by lowering their thermostats and by insulating and weatherproofing their homes. Some 80 percent of all the homes in New England are insulated. That does not mean we cannot do more, but it does mean that the homeowner has reacted to the tripling of home heating oil prices by using that energy more efficiently. Heating oil sales data (weather corrected) shows that the average New England homeowner uses 20 percent less fuel today than just 3½ years ago.

These conservation achievements suggest that President Carter's objective of significantly reducing energy consumption can be achieved and that with the proper energy package, it will be achieved. These figures also suggest that our experience in New England in using energy more efficiently gives us a good basis from which to offer constructive criticism of some of the more questionable parts of the President's National Energy Plan.

Energy Pricing

All of us living in New England can support the President's strong stand on the principle that the U.S. must solve its energy problems in a manner that is equitable to all regions and sectors of the country. In his "National Energy Plan" booklet of April 29, 1977, the President said ". . . the Plan must assure that policies are equitable across the country and the special needs of each region are met. Prices for energy should be reasonably uniform to prevent economic dislocations and unjustified variations in consumer costs." A New Englander could have said it better. It is the same message that you, Senator Kennedy, have been carrying to four successive national Administrations. If that principle is really adhered to, we shall indeed have a national energy plan worthy of support. Unfortunately, the specific legislation proposed to Congress fails to carry forward this principle. I shall come back to this subject later.

Stability of Government Policy

We would also single out for strong support the President's clear commitment to establishing certainty and stability in government policy so that private consumers and producers of energy can make intelligent investment decisions. The President's leadership should also stimulate much needed additional legislation to insure that we will have sufficient energy to spur economic growth and provide the opportunity for tens of millions of Americans to achieve a fair share of economic return from our system. We must not and cannot solve energy problems at the cost of severely limited growth in our national economy. To do so would deny millions of citizens any chance of improving their standard of living and more importantly would remove the word "aspiration" from the American vocabulary.

So the Congress, in looking at the President's program, must, as a first principle, examine the economic impact. And I might say at this point, Senator Kennedy, that the Congress should not be rushed to judgment. I know the drums have been beating loudly for action. But this National Energy Plan, covering as it does the laws and regulations which will govern us for the balance of this century, is simply

too important to do on a "crash" basis. Unfortunately, the President set a 90-day schedule on the day of his inauguration—90 days to tackle and master the single most complex problem facing the nation. I suggest 90 days was not enough and that Congress must refuse to be stampeded into any similar 90-day time framework.

Under the time schedule set by the President, a national Plan evolved which contains a number of serious inconsistencies and structural defects. The Congress must not, therefore, rubberstamp a Plan which would seriously harm not only this region of the country but the nation as a whole.

Major Criticisms

The President in his many television appearances on the energy plan constantly stressed that the program "above all" would be fair and balanced. Yet, an analysis of the specific legislative proposals submitted to Congress reveals that many aspects of the plan are neither fair nor balanced. There are inconsistencies, gaps in the data, conflicting priorities and, I am afraid, an over-reliance on the computer and an under-reliance on common sense.

Lack of Equity in Oil and Gas Pricing

It is clear from the rhetoric of President Carter's message to Congress and the various descriptive material which has been distributed to the Congress and to the press that the National Energy Plan is supposed to equate on a Btu basis the prices of alternate fuels such as oil and gas. In this way, residential, commercial and industrial users of these fuels would pay approximately equal prices. It follows as a corollary that if the taxes that are to be imposed on various fuels and the prices to be paid to the producers of each of these various fuels are allowed to rise, the "sacrifice" (i.e. price paid) by users in various regions of the country would be approximately equal.

We fully support this objective. Unfortunately, the legislation proposed to Congress relating to oil and gas pricing will not achieve the objective. For example, under the Plan, a ceiling is established on the price of natural gas for residential users. This ceiling is tied to the Btu equivalent of domestic crude oil, excluding taxes. Residential users of home heating oil, by contrast, have prices tied to the cost to refiners of all crude oil including a 40 or 45 percent volume of foreign crude oil. To be sure, home heating oil users are given a rebate equal to the tax on price-controlled domestic crude oil but that still leaves them paying approximately 10 cents a gallon more on a Btu basis than the residential user of natural gas. That is not fair, nor is it balanced. In fact, since about two-thirds of all the heating oil used in the country is used to heat homes in only nine states (New England, plus New York, New Jersey and Pennsylvania), citizens living in these nine states will bear a disproportionate burden and will be asked to "sacrifice" more than citizens in the states that use natural gas for home heating.

An even more blatant price disparity exists under the Plan between the cost of natural gas and the cost of residual fuel oil (heavy fuel). The proposed user tax designed to force industrial users and utilities to convert to coal impacts disproportionately on industrial and utility consumers of oil. I would like to submit for the record a table showing the discrepancies in cost per million Btu's under the President's Plan for industrial and utility users of gas and those who rely on oil. (See Attachment A.) Under this Plan, as you can see, in 1979 an industrial company here in New England will be paying about $3.15 per million Btu's of oil consumed. At the same time, industrial users of natural gas in other regions will pay only $1.95 per million Btu's. That adds up to a price differential of $7 per barrel in favor of industrial natural gas users.

Such a regional disparity is enormous. As you know, the New England region depends on light and heavy fuel oil for some 80 percent of its energy requirements. Other regions are equally dependent on natural gas. Thus New England, indeed the whole northeast quadrant of the country, would be severely damaged by this formula throughout the transition period from 1979 to 1985. Even at that point, while the disparity will be less, the oil user will still be paying $3 more than the gas user and incidentally, $3 more than the then prevailing OPEC price. Our region simply cannot compete in the U.S. market or indeed in the world market if it is burdened with such an economic disadvantage vis-a-vis not only other regions of the country but also other industrial countries around the world.

Utilities here will be operating with the same kind of disadvantage but in their case there is at least one mitigating factor; namely, some of the utilities may, in fact, be able to convert to coal. Unfortunately, for reasons which I will discuss in a later section of this paper, New England industry does not realistically have such an alternative. They will forever be bearing the costs of coal conversion taxes, thus

severely retarding their competitive viability. That situation would be neither fair nor balanced.

In short, the inequities built into the existing energy pricing system need to be rectified. The obvious step would be to equate the price ceiling for new natural gas with the weighted average price of all crude (including foreign crude) to the U.S. domestic refiner. Since that would result in a price level that would yield excessive profits to gas producers, part or all of the higher gas price could be in the form of taxes on the new gas produced. I would estimate that the new gas selling price under such an approach would be about $2.45 per thousand cubic feet rather than the proposed ceiling of $1.75 per thousand cubic feet proposed by the President's Plan.

Coal Conversion

Perhaps the most vulnerable area of the entire National Energy Plan is the section dealing with forced or mandatory industrial and utility conversion to coal. Under this part of the President's Plan as you know, Senator Kennedy, a massive and permanent bureaucracy would be established to tax industry and utilities now operating on natural gas and oil in order to force them to convert to coal. The philosophical question is whether the establishment of this bureaucracy, with all of the attendant inefficiencies, will cause any additional conversion to coal that would not take place anyway without direct and massive government involvement.

It is clear that utilities and industry are already deeply involved in the switch to coal from oil and natural gas. I would like to submit for the record a recent statement by the President of the National Coal Association before Senator Haskell's Subcommittee on Energy Production and Supply. (See Attachment B.) You will note that Mr. Bagge attached to his testimony a recent Federal Power Commission study on the status of coal supply contracts for new electric generating units covering the period from 1976 to 1985. The highlight of that report, which included a nationwide plant-by-plant survey, was that some 358-million tons of new coal have already been contracted for delivery by electric utilities by 1985. In addition, the study revealed that no utilities plan to add facilities operating on oil after 1982 and that no new gas-fired plants were planned after 1979. In short, the switch to coal is already on.

The President has said repeatedly that he wants to increase coal production by two-thirds by 1985. That would add some 400-million more tons of new coal production by that year. The number sounds impressive and one might be quickly led to believe that the government would have to take extraordinary action to insure that all this new coal is used by the utilities and industry. The Federal Power Commission study, however, reveals that 88 percent of that 400-million tons of new coal is in fact *already* committed to the utility sector. Moreover, under the crude oil tax and new natural gas pricing plans, the cost of these fuels will rise quickly to the world price for oil. Those new higher prices will certainly give great economic incentive to utilities and to industry to accelerate the use of coal; while the remaining 12 percent of the 400-million tons President Carter wants produced by 1985 is likely to be committed well before the vast new bureaucracy to force conversion is established.

In sum, I question the need for the whole coal conversion program. Perhaps this Committee could ask the Executive Branch to demonstrate effectively how much more coal conversion will occur because of the Carter Plan than without it, given the economic incentives that exist already or will be established by proposed price and tax meaures on oil and gas.

Is There an Over-Reliance on Coal?

The discussion of coal conversion raises another equally serious consideration. Namely, does the Plan rely too heavily on coal as the single source for solving our national energy problems? As you know, Senator Kennedy, new federal strip mining legislation will be enacted this year. In addition, a number of state strip mine rules are also likely to be tightened this year. As necessary as these measures are, they will obviously restrict our national ability to expand coal production rapidly.

Coal also faces serious labor problems and the threat of a United Mine Workers strike later this year is very real. Productivity in the mines is down sharply since 1969. The output per man day of work in deep mines has dropped from 15.6 tons to 8.5 tons over this period. At the same time, output from strip mining has dropped per man day from 34 tons to 26 tons. This is partly a reflection of new, tough safety requirements and partly, I think, due to an actual drop in labor productivity.

Coal also faces significant transportation problems as larger volumes move to market. In parts of the country such as New England there is simply no transportation network available, and a massive upgrading of rail facilities will be needed

before any substantial volume of coal could move here. The President recognizes the potential for transportation bottlenecks and has appointed a task force to study the matter.

Perhaps more serious than any of these difficulties is the question of public health which surrounds the burning of vastly increased amounts of coal in the United States. Here, too, the President has recognized that the massive switch to coal will cause some uncertainty in the area of health and has announced that he will appoint a committee ". . . to study the health effects of increased coal production and use, and the environmental constraints on coal mining and on the construction of new coal burning facilities". That committee will report to the President next October.

But even if all of the problems with producing, transporting and burning coal are overcome, the 400-million tons of increased production projected by the President will still leave us far short of any meaningful conversion by industry from gas and oil to coal. I understand from discussions with people in Mr. Schlesinger's office that the President already recognizes that 400-million tons of increased coal production will not really cut our increasing dependence on additional foreign oil imports and that there will be a revised target of 600-million tons of new coal by 1985. Reaching that level—a virtual doubling of coal capacity in eight years—will be very difficult to say the least.

The problem with this excessive reliance on coal as the only bridging fuel to an era when energy growth in the United States can be covered by renewable energy sources such as solar power, is that it leaves us no alternatives if our economic growth or our energy growth vary from the predictions made by Mr. Schlesinger's computer. Let me illustrate the point. Mr. Schlesinger's office is projecting a growth in energy demand between now and 1985 of 2.5 percent per year. Another well-known organization, the Exxon Company, has recently completed a long-term supply and demand forecast which projects a 2.8 percent annual compound energy growth rate. Yet, these two reliable groups, which seem to have adopted very similar assumptions, show a wide discrepancy in the volume of oil this country will be using in 1985. Mr. Schlesinger's team comes up with a little over 18 million b/d, the same volume we are currently using. Exxon shows consumption of over 22 million b/d.

There is one significant difference between the two studies. Mr. Schlesinger assumed a growth in GNP of 4.3 percent annually while Exxon projected a GNP annual growth rate of only 3.8 percent. If Exxon's figures are adjusted to reflect Mr. Schlesinger's GNP annual growth rate we would need another 5 million b/d of oil to meet our energy requirements by 1985. Total imports under that assumption would be on the order of 15–16 million b/d.

In sum, Senator Kennedy, very small changes in annual GNP growth or annual energy growth can make an enormous difference in the number of barrels of oil per day we are going to have to import in 1985. And, as you are well aware, no Federal agency or industrial company has ever projected eight years ahead with anywhere near total accuracy in these areas.

That leads us to ask the question: what happens if Mr. Schlesinger's computer is wrong? The answer is that the total extra energy needed to keep the economy functioning will come in the form of imported refined products. That would be a big mistake. If we are forced to import more oil, it should be in the form of crude oil, not refined products. Yet there is not one word in the President's National Energy Plan about United States refining capacity or the need to expand it beyond its current capabilities.

This represents a gaping hole in our strategy for energy between now and the end of the century. Oil is the largest single source of energy. It will still be the largest source in 1985, in 1990 and in the year 2000. Oil's share of total energy will decline, but I certainly expect it to grow in absolute terms at least over the next 15 years. It won't grow as fast as it would without a National Energy Plan but it will grow nonetheless. And as it grows, we will need more refining capacity here unless we are to become even more dependent on imports of refined products.

Strategic Storage

As you know, the President has accelerated the plans to achieve a billion barrels of strategic oil storage by 1981. We strongly support that objective. We would like to point out, however, that should our dependency on foreign oil involve ever-larger imports of products, the credibility of our strategic storage program will be first eroded and then destroyed. In short, those foreign producing countries assessing our immunity to supply disruptions would know that another embargo could indeed be effective, for, although our strategic storage program provides us crude oil, our lack of refining capacity provides no way to effectively use such crude oil.

For this reason too, it is essential that a refinery incentive program be a basic element of any National Energy Plan.

At present, the total FEA effort through the small refiner "bias" in the entitlements program has done nothing but promote a host of small, inefficient, high cost, "new" refineries over the last two years. In fact, it could easily be argued that all the FEA has succeeded in doing over the last three years is to create a cottage industry in both oil production, with the proliferation of stripper wells, and in refining, with the proliferation of tiny, high-cost, inefficient 10,000 b/d refineries designed to make their owners rich in a hurry. No major new large efficient refinery is under construction in the United States today nor will any be built unless the National Energy Plan addresses the need and provides the incentive required for such new capacity.

Mr. Schlesinger's team apparently sees no need to construct new refining capacity and seems willing to simply rely on foreign capacity to meet our needs. I would like to insert for the record a recent article entitled "Crunch in the Caribbean" from Forbes Magazine of May 1, 1977 (see Attachment C) which dramatically illustrates the risks and the uncertainty of depending on that region for an ever-increasing volume of product imports.

Inflation

The National Energy Plan will undoubtedly lead to short-term inflation. The crude oil tax and crude oil pricing arrangements will, by themselves, raise the price of every gallon of petroleum product used in the country by 14 cents a gallon by June 1, 1980—just 2½ years from now. When one considers that refining costs will also go up, as will the cost of financing crude oil and product inventories, labor, new trucks, equipment, maintenance and delivery of products, it is clear that President Carter's Plan will result in price increases of 18–20 cents for every gallon of petroleum product used by 1980. That is about a $60-billion inflationary impact. And, of course, there will be a ripple effect of another $25–30 billion.

I don't intend to be an alarmist in making these projections. I favor a crude oil tax. We need to price energy at its alternate source cost if we are to have effective conservation and efficiency of energy use. However, the Congress must insure that the counter measures taken to offset this inflationary jolt are sufficient.

Economic Growth

The President says that the National Energy Plan is designed to have a "neutral" impact on the economy. Most economists agree, however, that if the impact is truly neutral the net result will be a depression in the GNP of about ½ of 1 percent. We can't afford that kind of a drag on the economy, which as long last is heading upward and reducing our unemployment problem. It seems to me that the Congress ought to link our energy policy actions with a stimulative policy for the economy. I would like to submit, for the record, a memorandum prepared by Dr. Paul London, Research Director of the New England Congressional Caucus, which argues persuasively for the establishment of a stimulative energy policy and for the linking of economic stimulus to energy reform. (See Attachment D.) This memorandum will be useful to the Committee in its analysis of the economic impact of the National Energy Plan, and in developing recommendations to insure that in achieving energy objectives we do not reduce economic growth and exacerbate unemployment.

Gasoline Tax

The proposed 5 cents per gallon tax on gasoline—scheduled to rise to 50 cents per gallon if we are unable to curb our appetite and reduce gasoline demand—is, I think, a case of overkill. Even if we accept Mr. Schlesinger's estimate that each 5 cents per gallon incremental tax will reduce consumption by 50,000 b/d (a number which I feel is much too high) the total program would result in some $50-billion of new taxes in order to achieve something like a 1.3 percent reduction in consumption of energy. That is far too high a price to pay for such a modest result. We believe the legistlation which the Congress has already enacted (in which you, Senator Kennedy, played such a key role) which requires automobile efficiency to reach 27.5 miles per gallon by 1985, will curb the growth of gasoline demand in the early 1980's and lead to its stabilization or slight decline thereafter. Adding a $50-billion gasoline tax program and a tax rebate program on large and small cars respectively is a case of too much fire power against too small a target. There is simply not much conservation potential left thanks to past Congressional action. I would like to submit for the record a statement by the Independent Oilmen's Association of New

England which deals directly and in some depth with the gasoline tax program and a number of other aspects of the National Energy Plan. (See Attachment E.)

SYNTHETIC NATURAL GAS

Ironically, while totally ignoring the need for more refining capacity in the country, the President's Plan does call for government intervention and support in the building of new SNG plants designed to triple current production of synthetic natural gas. Sepcifically, the President proposes to "guarantee an adequate return" on investment in such new SNG facilities and "assure" that such new plants will receive adequate feedstock supplies. Again, there seems to be a certain lack of consistency here. Even at today's feedstock prices, SNG was manufactured this past Winter at a cost of between $4.50 and $5.25 per thousand cubic feet of gas. That is the equivalent of $30 per barrel of oil. To propose government action to force the tripling of plants designed to turn out high cost ($30 per barrel) energy, while totally ignoring the need for normal conventional refining capacity, does not make sense. Without additional domestic refining capacity, the feedstock for these new SNG plants is likely to turn out to be imported foreign naphtha. How will that add to our energy supply security?

SUMMARY

In closing, Mr. Chairman, I would like again to commend this Committee for holding these very vital hearings this morning.

This Committee needs to examine each part of the National Energy Plan to see if such massive government involvement is needed. The test that might be applied is President Carter's campaign pledge to simplify those Government regulations which are needed and to eliminate those that are not. The Committee might also by mindful of OMB Director Bert Lance's comments in the May 1977 issue of Nation's Business:

. . . The amount of time that people in the business community—chief executive officers and on down the list—are spending on regulatory problems is almost unbelievable. We are seeing so much of our productivity directed toward something that is totally nonproductive. It doesn't make any sense. It is costing too much money, it is imposing too many restrictions. Business people are not able to plan the future of their companies because they don't know what the results of regulation are going to be. Government has been terribly unpredictable. (Page 22.)

We need and support a National Energy Plan designed to use energy more effectively. Congress must insure the plan is really fair and equalizes energy costs for all sectors and regions of the Nation. It must also protect against inflation and promote rather than retard economic growth.

Thank you for inviting me to testify. I shall be happy to work with you, this Committee, and its staff in the weeks and months ahead to insure that positive legislative action is taken on energy during the current session of the Congress.

ATTACHMENT A

THE NATIONAL ENERGY PLAN

[Cost of fuel—dollars per million Btu]

	Industrial user		Utility user	
	New gas [1]	No. 2 fuel [2]	New gas [1]	No. 2 fuel [2]
1979	1.95	3.15	1.84	3.00
1980	2.17	3.26	1.90	3.05
1981	2.40	3.37	1.96	3.10
1982	2.62	3.48	2.02	3.15
1983	2.85	3.59	2.70	3.46
1984	3.07	3.71	2.85	3.51
1985	3.30	3.82	3.00	3.56

[1] "New" gas at $1.75 per million Btu in 1978, plus "user tax," as appropriate.
[2] Assuming No. 2 at $3 per million Btu in 1979 as projected in energy plan.

ATTACHMENT B

STATEMENT BY CARL E. BAGGE, PRESIDENT, NATIONAL COAL ASSOCIATION, BEFORE THE SUBCOMMITTEE ON ENERGY PRODUCTION AND SUPPLY OF THE COMMITTEE ON ENERGY AND NATURAL RESOURCES, APRIL 5, 1977

Mr. Chairman and members of the subcommittee: My name is Carl E. Bagge. I am President of the National Coal Association, which represents the major coal producing and sales companies of the nation as well as many other organizations concerned with the production, transportation and use of coal. We appreciate the opportunity to present the coal industry's views on the bills you are considering today (S. 977, S. 272, and S. 273) which relate to the greater use of coal—instead of oil and gas—by electric utilities and other major fuel-burning installations.

We strongly support the objective of making greater use of coal in supplying the Nation's growing energy requirements and reducing our dependence on imported oil and dwindling natural gas supplies. However, we strongly oppose the mandatory approach to greater coal use proposed in the bills you are considering.

Since it may seem strange that the coal industry would oppose a bill which has the stated purpose of increasing coal use, this statement provides in some detail our analysis of the matter, the reasons for our position, and our suggestions for an approach that would achieve the desired objectives—without the disadvantages of the bills you are considering.

Briefly, Mr. Chairman, I plan to cover six major points in this statement:

First, I plan to discuss three governmental requirements—not recognized or dealt with in the bills you are considering—which are the principal obstacles to greater use of coal and thus conflict with your objectives. I am referring to requirements concerned with air quality, electric rate setting, and pricing of oil and natural gas. Second, I plan to discuss our principal reasons for opposing the mandatory features of the bills which, in summary, are that:

(a) The mandatory requirements of the bills would add little, if anything, to the trends toward coal—and away from oil and natural gas—that are already underway in the case of new electric generating plants and major fuel-burning installations.

(b) The 3-year old FEA coal conversion program has, itself, not contributed enough to the movement toward coal to warrant continuation or expansion of a regulatory approach to force conversion to coal.

(c) Efforts to force conversion of *existing* facilities may even detract from the overall objective of substituting coal for oil and gas.

(d) The bills would lead to a new or expanded regulatory program and bureaucracy which is not necessary or desirable.

(e) The mandatory conversion requirements of the bills could easily lead to federal coal allocation and price controls—steps that have proven counterproductive and damaging in the case of natural gas and oil, and which could discourage planned expansion of coal production.

Third, I plan to describe the principal issue in the debate over mandatory conversion—as revealed in our detailed analysis of the subject, and summarize the principal arguments that have emerged.

Fourth, I will outline and recommend an alternative program which would contribute more to the basic objectives of the bills you are considering but which would avoid the pitfalls.

Fifth, I will discuss the ability of the coal industry to respond to the expected increase in demands for coal.

Finally, I will list briefly other existing or potential constraints on coal production and use which warrant attention—so that the matter of coal conversion can be considered in its proper context.

I would now like to expand upon each of these topics.

I. GOVERNMENT-IMPOSED OBSTACLES TO COAL USE

First, Mr. Chairman, I believe the Congress has an obligation to recognize and address the obstacles to the use of coal in lieu of oil and gas that are present in at least three existing governmental requirements. If these conflicting requirements are not dealt with, your objectives for coal conversion simply will not be realized, even with "mandatory" features.

A. *Air quality requirements.* Undoubtedly, the most important obstacle to greater coal use are state and federal air quality requirements. Several points warrant attention:

1. *State requirements.* Sulfur oxide control requirements imposed by many states are much tighter than needed to meet national health standards and these requirements are preventing the use of coal. Such requirements—which were encouraged

and approved by the Federal Environmental Protection Agency—were imposed before their implications, particularly for energy, were understood. Instead of dealing with this problem, the bills you are considering merely provide that applicable environmental requirements must be met.

Thus far, the Federal Government has ducked its real responsibility for helping states to change requirements which are unnecessary and which, in the public interest, should be changed. Instead, the Federal Government—hiding behind a "states rights" cloak—has left to Governors and state goverments the burden—including the political burden—of trying to adopt less restrictive and moere balanced clean air requirements.

The conflict is further illustrated by the fact that another Committee of the Senate is now considering amendments to the Clean Air Act which would make coal use even more difficult—without adequately taking into account the energy and economic impacts.

Meanwhile, utilities and other major fuel users are forced to use natural gas or expensive foreign oil.

2. *Doubts about scrubbers and uncertainties about future clean air requirements.* Federal EPA requirements and enforcement actions have been directed toward forcing electric utilities to install first generation flue gas desulfurization equipment (scrubbers) on many new and existing plants, at great cost to customers. EPA provides no assurance that scrubbers will work or that they will be adequate to meet new requirements and standards that EPA or states might establish in the future. In the face of these uncertainties, utilities quite understandably have been reluctant to invest additional sums in coal burning facilities and found it easier to continue burning natural gas and imported oil in existing plants.

B. *Regulatory biases against investment in coal-related equipment and in favor of higher cost oil.* A second obstacle to greater coal use results from state utility commission treatment of electric rates. In most states, the full cost of fuel—even if higher priced than alternatives—can be passed through automatically to customers. Utilities face quite a different situation when they want to invest in coal-related equipment. In all but a very few states, costs of construction work in progress for new facilities are not even eligible for consideration in electric rates. New facilities must be completed and in use before rate commissions will consider including these costs in the rate base. This must be done in an often lengthy hearing which results in regulatory delay before rates are adjusted. The utility thus faces a cash flow problem, out-of-pocket costs and the burden of the borrowing needed for the new facility.

This different treatment of costs provides a powerful incentive to postpone or avoid capital expenditures—even if customers would benefit from lower total costs through the use of lower-priced fuel with the new facility. This problem can be solved to the benefit of consumers and to our national energy situation if rate commissions acted more promptly and allowed the utilities to earn a return to cover the costs of construction work in progress by inclusion in the rate base. While it is a national problem, the Federal Government has traditionally failed to deal with it because it would be necessary to interfere with states' rights to control utility rates.

C. *Controls on oil and natural gas prices.* A third governmental obstacle to increased coal use is the Federal controls which hold oil and natural gas prices to artificially low levels. These controls discourage domestic production of these fuels and encourage greater dependence on imports. Even more important for this forum, controlled prices have the effect of encouraging the use of oil and gas under utility and industrial boilers, a wasteful practice which these proposed bills are attempting to prevent. Allowing prices to reach market levels would aid conservaion efforts and provide an additional incentive to encourage voluntary conversion to the use of coal.

II. REASONS FOR OPPOSING MANDATORY COAL USE

I would now like to turn to the five principal reasons we have for opposing mandatory coal use requirements.

A. *Mandatory requirements would add little to the trend away from oil and gas.* First, it is far from clear that a mandatory requirement would add significantly to the trend away from gas and oil-fired utility boilers that is already well underway. Recent data from the National Electric Reliability Council (NERC) show that Texas utilities will depend upon natural gas for only 15 percent of its electric generation in 1985—compared to 88 percent in 1975. The share going to coal jumps from 10 percent in 1975 to 52 percent in 1985. Our computer analysis of data reported to the FPC on new steam electric plants planned to come on line over the next ten years shows no new gas-fired plants are planned after 1979 and no new oil-fired plants

after 1982. By contrast, the same data, which are summarized in the table at Appendix A, show an overhelming commitment to new coal and nuclear plants.

The higher prices for intrastate natural gas and imported oil and the uncertainty of supplies of these fuels are clearly major factors in utility decisions to select either coal or nuclear for new facilities. This commitment is particularly important since new plants are much larger and more efficient and can replace several older and smaller oil or gas-fired plants.

Less data are available on major fuel-burning installations (MFBI's) in industrial plants, but a trend has emerged toward new facilities with coal-burning capablity—according to data recently made available to this Committee from the American Boiler Manufacturers Association.

B. *Accomplishments of the FEA program do not justify its continuation or expansion.* Our second reason for opposing a mandatory program is our conclusion that the FEA coal conversion program—though manned by dedicated and well-intentioned people—has not made a significant contribution to coal conversion. In fact, no coal is yet being burned as a result of an FEA order. Additional coal is being burned by plants covered by orders that FEA may someday issue, but that is due to utility decisions—not to FEA prohibition orders. Pertinent factors about the program for converting existing plants are summarized at Appendix B. It is clear from these facts that:

Based on past experience, the potential for converting utility plants from oil and gas to coal is very limited. The program is cumbersome, time-consuming and bureaucratic with regulations, hearings, orders, findings, exceptions, and people who may or may not be well-equipped to make decisions that are in the best interests of the customers served.

The incremental impact of the program—beyond what utilities would do without the program—is hard to identify.

The cost to taxpayers is high: $6.7 million in FY 1978 and this will increase if authority is extended.

A few new baseload plants using coal will contribute more than can be expected from potential conversions.

C. *Efforts to force conversion of existing facilities detract from voluntary use of coal in new plants.* Our third reason for opposing a mandatory program is that such efforts with respect to existing plants would interfere with actions leading to new coal-burning facilities and greater voluntary uses of coal. It is clear that planned new facilities are generally larger and more efficient than the older and smaller units now being considered for conversion and thus represent a much greater opportunity to switch from oil and gas to coal use.

In fact, mandatory conversions of existing plants may actually divert capital and manpower from the planning, justifying, siting and construction of new coal burning facilities. We should emphasize reduced consumption of oil and gas, not conversion of power plants just for the sake of conversion. We should be concerned with running new and existing coal-fired plants more and running gas and oil plants less.

D. *New or expanded regulatory program and bureaucracy are unnecessary.* Our fourth reason for opposing a mandatory program is the fundamental disadvantages of the regulatory program that is required and the bureaucracy that would be needed to carry it out. While the purpose of the approach in S. 977 may be to switch the burden of proof to utilities and industrial organizations, there would remain a need for a major regulatory program. This means a long string of regulations, orders, assessments, impact statements, evaluations and administrative costs; a need to evaluate the justification for the many exceptions and exemptions provided for in the bill; the potential for considerable litigation if fuel users, their customers or others affected by enforcement actions disagree; and a large staff of Federal employees. We believe all of this can be avoided by an effective and realistic program to encourage—rather than enforce—switching from oil or gas to coal.

E. *Mandatory conversion requirements would lead to Federal coal allocation and price controls.* Our final reason for opposing a mandatory program is the considerable likelihood that a mandatory program would lead to extensive federal coal allocation and price controls. The Energy Supply and Environmental Coordination Act (ESECA), which S. 977 would amend, already has provided the basis for FEA's assertion that it has allocation and price control authority, and FEA regulations prescribing the circumstances under which it would become operative have already been adopted.

We are well aware of the damaging effects of federal allocation and price controls in the case of oil and natural gas—damaging in terms of distorted markets, reduced competition, reduced incentive for new production and reduced incentive for new investments. We can only assume that the adverse effects of regulatory requirements would be just as severe for coal as they have been for gas and oil. Further,

allocation and price controls mean still more Washington-dictated standards, criteria, regulations, exceptions, etc., and a larger and more costly government.

We are not concerned about the ability of the industry to meet demands for increased coal production—as I will discuss in more detail below. Instead, the road to allocation and price controls could begin—even with ample supplies—with a few forced conversions where those ordered to act felt that prices were too high or supplies not readily available under conditions the user so ordered felt were to his advantage.

Major coal producers have a vivid recollection of the price controls imposed in the 1971–1973 period which were directly responsible for substantial operating losses by nearly all major companies. Those price controls also prevented the necessary expansion of coal production capacity which contributed temporary market distortions during the Arab oil embargo. Such losses cannot help but discourage the increased investments that the nation is counting on to increase coal production in the years ahead.

III. SUMMARY OF THE PRINCIPAL ISSUES AND ARGUMENTS ON MANDATORY CONVERSION

At this point, I would like to summarize briefly the areas of agreement, the remaining issues and the arguments for and against a mandatory program.

A. *Areas of agreement.* There seems to be general agreement on several major points, specifically:

That it is in the national interest, and generally in the interest of consumers because of the lower cost of coal, to encourage switching from oil and gas to coal wherever practicable.

That there are powerful incentives now operating on utilities and industries in the form of fuel price advantages and threats of interrupted natural gas and oil supplies—to encouraging switching.

There remain some serious obstacles which are discouraging switching such as unnecessary air quality requirements, regulatory disincentives, and price controls.

That there is a very strong trend toward using coal in steam electric facilities and an expanded interest in the case of industrial plants.

B. *Remaining issues.* The remaining issues are (1) whether the trends will continue and increase, and (2) whether switching back to oil and gas will be avoided—unless there is a mandatory federal regulatory program.

C. *Arguments against a mandatory program.* Briefly, the principal arguments against a mandatory program are that:

It adds very little, if any, of marginal value to the trends that are already underway due to existing incentives and voluntary actions.

Experience with the FEA program is unfavorable.

Forced conversion of existing facilities could detract from the objective of greater coal use.

A mandatory conversion program and bureaucracy are inherently costly to the taxpayer and counter to the Administration objectives of reducing Government regulations and red tape.

A mandatory program would lead to allocation and price controls.

D. *Arguments for a mandatory program.* On the other hand, the principal arguments for a mandatory program appear to be that:

Even more conversions should be occurring than are now planned and a mandatory program will help.

A mandatory program is necessary to overcome the obstacles such as regulatory biases which discourage capital investment.

A mandatory program is needed as a "threat" to encourage conversion to coal and to prevent switching back.

IV. A RECOMMENDED ALTERNATIVE

In view of the coal industry's strong opposition to the mandatory features of the legislation you are considering, it is only reasonable that you expect our industry to recommend an alternative. We are fully prepared to recommend such a program which we believe would be effective and meet the arguments of those who support mandatory coal conversion programs. Our alternative program has three major parts:

A. *Reducing or overcoming obstacles.* To deal with the obstacles to coal conversion identified earlier, we recommend the following steps:

1. In the case of clean air requirements:

(a) The Congress should refrain from tightening clean air requirements as proposed in the amendments now pending before Senate and House Committees, and provide relief from existing significant deterioration and non-attainment regulations

promulgated by EPA. The Congress should extend deadlines for meeting presently unattainable air quality standards, particularly since deadlines have passed and in many instances are not being met.

(b) The Federal government should override state air quality requirements that are not necessary to meet national health standards when such requirements are encouraging use of oil or natural gas instead of coal.

(c) The Federal government should guarantee to those installing available pollution control equipment to comply with Federal or state standards—and to their customers who must pay for such equipment—that the equipment will be deemed acceptable and that no new requirement will be imposed requiring additional expenditures or change in operations for at least ten years or until the investment is amortized—whichever is sooner.

2. In the case of state regulatory biases which discourage investment in new facilities, the Congress should place restrictions on Federal aid to states which are contingent upon actions by state agencies to (a) speed up rate revisions, and (b) allow construction work in progress to be included in the rate base.

3. In the case of price controls, the Congress should act promptly to remove federal price controls from wellhead prices of new natural gas and phase out the remaining petroleum price and allocation controls.

4. In general, the Congress should accept the obligation of identifying conflicting requirements before laws are enacted and find a balance among objectives that is in the national interest—including tradeoffs among environmental, energy and economic objectives. In this connection, we were pleased to learn that President Carter has stated publicly his recognition that environmental tradeoffs will be necessary to permit the greater use of coal that he favors. He identified tall stacks as an effective way of controlling air pollution.

B. *Providing incentives and encouragement for voluntary conversion.* To supplement existing price and supply incentives—and help overcome obstacles, the Congress should:

1. Provide for more rapid writeoff of expenditures for pollution control and coal handling and utilization equipment and facilities.

2. Increase to 12 percent the investment tax credit for investments in such facilities.

3. Provide loan guarantees and direct loans—as proposed in Title III of S. 977—but the purpose of the loans should be expanded beyond pollution control equipment to include cost of conversion, including coal handling and utilization equipment.

There is one additional incentive that is being discussed and the Congress undoubtedly will consider it: an excise tax on the use of oil or gas in facilities that could and should be using coal. This would have the effect of offsetting artificially low oil and gas prices which are due to Federal regulation and controls. It would be far better public policy merely to remove the price controls, particularly since such a tax does nothing to encourage production.

C. *Assuring continued progress toward conversion.* There is a much easier and less costly way of providing a "threat" that would help encourage progress toward conversions. This approach would avoid the evils of a regulatory approach. Specifically, I propose that the Congress:

1. Provide such additional authority as needed, if any, to obtain advance information from fuel users on plans for building new fuel burning facilities and on the type of fuels that will be used.

2. Require FPC or the new Department of Energy to monitor the reports and notify Congress immediately of any significant trends that appear counter to the objective of greater coal utilization.

This approach would allow the Congress to investigate and, if then found essential, enact mandatory requirements.

V. ABILITY TO PROVIDE THE COAL THAT WILL BE NEEDED

One matter that is certain to be of interest when considering steps to increase the use of coal is the ability of the coal industry to produce the amounts required. Subject to potential constraints which I will list later, we are confident that our coal industry can increase production to meet expected demand. We base that conclusion on several important factors:

A. Coal production has, for years, been demand-limited. In 1976 the coal industry could have added an estimated 50–60 million tons to the 665 million produced.

B. NCA studies of planned new mines and major expansions completed in August 1976 showed cumulative additions planned by 1986 of more than 500 million tons. (Study provided for the record.)

C. A recently completed FPC study (summarized at Appendix C) of new coal supply for new electric generating plants shows that 85 percent of the 173.9 million of new tonnage required in 1980 and 68 percent of the 357.7 million of new tonnage required in 1985 is already under contract.

We are also encouraged that a large share of the required new production is already covered by transportation contracts, particularly in the West. However, the picture for rail transportation in the East is less promising and additional action will be needed by several lines to meet demands.

While we are confident of our ability to produce the coal required, several developments could add severe constraints on that ability. In addition to the air quality standards mentioned earlier, these include:

Potentially restrictive federal surface mining requirements which could cut expected production and prevent mining of reserves that already have been assembled into logical mining units for production in the years just ahead.

Reinstitution of the moratorium on leasing of Federal coal lands.

New mine health and safety law amendments—which could severely cut production with no improvement in safety.

Unreasonable water quality requirements imposed under the 1972 amendments to the Water Pollution Control Act.

Horizontal divestiture requirements which would take away needed capital and management talent.

Delays by Federal agencies in completing necessary environmental impact statements.

VI. OTHER ELEMENTS OF A FEDERAL COAL POLICY AND PROGRAM

Finally, in order that you might have the full context for the actions you are considering today, I would like to list other actions that are needed and warranted as a part of a realistic Federal coal policy and program. These are:

An increase in Federal funding for coal-related research, development and demonstration. Particularly important, funding for the development of new mining technology should be increased to at least $70 million in fiscal year 1978 (compared to $57.8 million in 1977)—rather than cut to $55 million as proposed in the President's 1978 budget. Improved mining technology is needed to overcome the productivity loss the industry has experienced since 1969.

Increased support for the Federal share of costs of improving rail and water transport facilities needed to move coal.

Right of eminent domain for coal slurry pipelines.

Roll in pricing (rather than incremental pricing) by FPC for gas produced from coal; and assistance for industry to build commercial scale synthetic fuels plants.

Federal encouragement for new uses of coal, for coal exports, and for mining research and mining engineer training.

A focus for coal-related activities in the proposed new Department of Energy.

In conclusion, we believe the facts and analyses presented herein lead inescapably to the conclusion that the mandatory features of the bills you are considering are not in the public interest.

Thank you for the opportunity to present my statement. I will be pleased to respond to any questions you might have.

SUMMARY OF NEW STEAM UNITS PROJECTED FOR 1977-1985

	COAL NO OF UNITS	COAL CAP (MW)	NUCLEAR NO OF UNITS	NUCLEAR CAP (MW)	OIL NO OF UNITS	OIL CAP (MW)	GAS NO OF UNITS	GAS CAP (MW)
UNITED STATES								
1977	24	11976	9	8247	8	4410	8	1436
1978	29	11770	6	6104	6	2497	0	0
1979	31	13062	11	10916	6	3013	1	100
1980	34	16688	9	10592	2	1210	0	0
1981	29	14986	15	15841	1	775	0	0
1982	27	13039	17	18034	3	1635	0	0
1983	23	12775	16	18428	0	0	0	0
1984	25	13536	22	24140	0	0	0	0
1985	28	15518	20	23570	0	0	0	0
UNITED STATES TOTAL	250	123350	125	135872	26	13540	9	1536
NEW ENGLAND REGION								
1978	0	0	0	0	1	600	0	0
1981	0	0	2	2300	0	0	0	0
1982	0	0	1	1150	0	0	0	0
1983	0	0	3	3480	0	0	0	0
1984	0	0	1	1150	0	0	0	0
NEW ENGLAND TOTAL	0	0	7	8080	1	600	0	0

MIDDLE ATLANTIC REGION

1977	2 / 1475	0 / 0	2 / 1206	0 / 0
1978	0 / 0	1 / 880	0 / 0	0 / 0
1979	1 / 825	2 / 1935	1 / 850	0 / 0
1980	0 / 0	1 / 1050	0 / 0	0 / 0
1981	0 / 0	1 / 873	0 / 0	0 / 0
1982	1 / 700	3 / 3195	0 / 0	0 / 0
1983	1 / 850	1 / 1120	0 / 0	0 / 0
1984	1 / 800	5 / 5613	0 / 0	0 / 0
1985	1 / 850	3 / 3470	0 / 0	0 / 0
MIDDLE ATLANTIC TOTAL	7 / 5500	17 / 18136	3 / 2056	0 / 0

EAST NORTH CENTRAL REGION

1977	3 / 1680	1 / 906	3 / 1673	0 / 0
1978	11 / 3170	1 / 1050	3 / 1080	0 / 0
1979	6 / 1682	3 / 2966	2 / 1285	0 / 0
1980	6 / 2010	3 / 3402	0 / 0	0 / 0
1981	5 / 1695	3 / 2881	0 / 0	0 / 0
1982	8 / 3281	6 / 5664	0 / 0	0 / 0
1983	3 / 1853	1 / 904	0 / 0	0 / 0
1984	2 / 630	5 / 5388	0 / 0	0 / 0
1985	4 / 1725	4 / 4074	0 / 0	0 / 0
EAST NORTH CENTRAL TOTAL	48 / 17926	27 / 27235	8 / 4038	0 / 0

WEST NORTH CENTRAL REGION

1977	6 / 3739	0 / 0	0 / 0	0 / 0
1978	4 / 2420	0 / 0	0 / 0	0 / 0
1979	4 / 1876	0 / 0	0 / 0	0 / 0
1980	4 / 1854	0 / 0	0 / 0	0 / 0
1981	7 / 3662	1 / 1150	0 / 0	0 / 0
1982	4 / 1620	1 / 1150	0 / 0	0 / 0
1983	2 / 720	2 / 2300	0 / 0	0 / 0
1984	2 / 980	1 / 350	0 / 0	0 / 0
1985	1 / 100	1 / 1260	0 / 0	0 / 0
WEST NORTH CENTRAL TOTAL	36 / 16971	6 / 6210	0 / 0	0 / 0

SUMMARY OF NEW STEAM UNITS PROJECTED FOR 1977-1985
(Continued)

	COAL		NUCLEAR		OIL		GAS	
	NO OF UNITS	CAP (MW)	NO OF UNITS	CAP (MW)	NO OF UNITS	CAP (MW)	NO OF UNITS	CAP (MW)
SOUTH ATLANTIC REGION								
1977	1	280	4	3347	3	1531	0	0
1978	1	870	2	2114	1	525	0	0
1979	2	1026	3	2883	2	398	0	0
1980	3	2646	0	0	2	1210	0	0
1981	2	1161	3	3029	1	775	0	0
1982	3	2143	2	1955	3	1635	0	0
1983	2	1320	1	1150	0	0	0	0
1984	4	2455	4	4470	0	0	0	0
1985	6	3800	4	4798	0	0	0	0
SOUTH ATLANTIC TOTAL	24	15701	23	23746	12	6074	0	0
EAST SOUTH CENTRAL REGION								
1977	4	1758	2	1874	0	0	0	0
1978	4	1232	1	1148	0	0	0	0
1979	2	450	3	3132	0	0	0	0
1980	3	1548	3	3640	0	0	0	0
1981	3	1762	1	1213	0	0	0	0
1982	1	662	0	0	0	0	0	0
1983	2	1162	2	2466	0	0	0	0
1984	7	3991	4	4949	0	0	0	0
1985	3	2151	2	2518	0	0	0	0
EAST SOUTH CENTRAL TOTAL	29	14716	18	20940	0	0	0	0

WEST SOUTH CENTRAL REGION				
1977	5 / 2629	0 / 0	0 / 0	8 / 1436
1978	4 / 2543	1 / 912	0 / 0	0 / 0
1979	8 / 4182	0 / 0	1 / 460	1 / 100
1980	12 / 5830	1 / 1250	0 / 0	0 / 0
1981	7 / 4410	3 / 3255	0 / 0	0 / 0
1982	5 / 2853	2 / 2400	0 / 0	0 / 0
1983	7 / 4190	2 / 2090	0 / 0	0 / 0
1984	6 / 3030	0 / 0	0 / 0	0 / 0
1985	7 / 4380	2 / 2350	0 / 0	0 / 0
WEST SOUTH CENTRAL TOTAL	61 / 34047	11 / 12257	1 / 460	9 / 1536
MOUNTAIN REGION				
1977	1 / 415	0 / 0	0 / 0	0 / 0
1978	5 / 1535	0 / 0	0 / 0	0 / 0
1979	8 / 2821	0 / 0	0 / 0	0 / 0
1980	5 / 2300	0 / 0	0 / 0	0 / 0
1981	5 / 2296	0 / 0	0 / 0	0 / 0
1982	5 / 1780	1 / 1270	0 / 0	0 / 0
1983	6 / 2680	0 / 0	0 / 0	0 / 0
1984	3 / 1650	1 / 1270	0 / 0	0 / 0
1985	6 / 2512	0 / 0	0 / 0	0 / 0
MOUNTAIN TOTAL	44 / 17989	2 / 2540	0 / 0	0 / 0
PACIFIC REGION				
1977	0 / 0	2 / 2120	0 / 0	0 / 0
1978	0 / 0	0 / 0	1 / 292	0 / 0
1980	1 / 500	1 / 1250	0 / 0	0 / 0
1981	0 / 0	1 / 1140	0 / 0	0 / 0
1982	0 / 0	1 / 1250	0 / 0	0 / 0
1983	0 / 0	4 / 4918	0 / 0	0 / 0
1984	0 / 0	1 / 950	0 / 0	0 / 0
1985	0 / 0	4 / 5100	0 / 0	0 / 0
PACIFIC TOTAL	1 / 500	14 / 16728	1 / 292	0 / 0

NEW OIL FIRED UNITS PROJECTED FOR 1977-1985

REC NO	UTILITY NAME	PLANT NAME	UTIL #	UNIT #	R	S	CAP	ORIG COM	CUR COM	FUEL	S CONT
33	BALTIMORE GAS & ELECTRIC	BRANDON SHORES	50154	1	5	MD	610	3/78	3/80	OIL	FUL
34	BALTIMORE GAS & ELECTRIC	BRANDON SHORES	50154	2	5	MD	610	3/79	3/82	OIL	FUL
56	CENTRAL MAINE POWER	W. F. WYMAN	50491	4	1	ME	600	11/77	12/78	OIL	NA
81	COMMONWEALTH EDISON	COLLINS	50643	1	3	IL	515	5/76	4/78	OIL	NA
82	COMMONWEALTH EDISON	COLLINS	50643	2	3	IL	510	10/76	10/77	OIL	NA
83	COMMONWEALTH EDISON	COLLINS	50643	3	3	IL	500	3/77	4/77	OIL	NA
84	COMMONWEALTH EDISON	COLLINS	50643	4	3	IL	505	10/77	10/78	OIL	NA
85	COMMONWEALTH EDISON	COLLINS	50643	5	3	IL	505	3/78	4/79	OIL	NA
93	CONSUMERS POWER	D. E. KARN	50658	4	3	MI	663	10/75	6/77	OIL	PNS
104	DETROIT PUBLIC LIGHTING DEPT	MISTERSKY	50781	7	3	MI	60	1/76	9/78	OIL	NA
108	DETROIT EDISON	GREENWOOD	50782	1	3	MI	780	3/76	5/79	OIL	FUL
122	FLORIDA POWER & LIGHT	MANATEE	51006	2	5	FL	775	12/76	0/77	OIL	FUL
123	FLORIDA POWER & LIGHT	MARTIN COUNTY	51006	1	5	FL	775	9/77	0/81	OIL	CB
124	FLORIDA POWER & LIGHT	MARTIN COUNTY	51006	2	5	FL	775	11/78	0/82	OIL	CB
129	FLORIDA POWER	ANCLOTE	51007	2	5	FL	525	4/75	10/78	OIL	PNS
133	GAINESVILLE-ALACHUA COUNTY	DEERHAVEN	51070	2	5	FL	235	5/78	8/79	OIL	FUL
148	GULF STATES UTILITIES	SABINE	51209	5	7	TX	480	9/76	9/79	OIL	CB
175	JACKSONVILLE ELECTRIC AUTHORIT	NORTHSIDE	51434	3	5	FL	518	10/76	5/77	OIL	FUL
192	LONG ISLAND LIGHTING	NORTHPORT	51685	4	2	NY	386	5/77	11/77	OIL	NA
233	NIAGARA MOHAWK POWER	OSWEGO	52053	6	2	NY	850	11/76	11/79	OIL	NA
261	PENNSYLVANIA POWER & LIGHT	MARTINS CREEK	52288	4	2	PA	820	3/77	3/77	OIL	FUL
272	POTOMAC ELECTRIC POWER	CHALK POINT	52271	4	5	MD	600	6/75	5/80	OIL	SCR
306	SAN DIEGO GAS & ELECTRIC	ENCINA	52570	5	9	CA	292	6/75	10/78	OIL	CB
308	SAVANNAH ELECTRIC & POWER	EFFINGHAM STA	52588	1	5	GA	163	3/76	3/79	OIL	NA
309	SAVANNAH ELECTRIC & POWER	EFFINGHAM STA	52588	2	5	GA	250	5/80	5/82	OIL	NA
334	TALLAHASSEE CITY OF	A. B. HOPKINS	52875	2	5	FL	238	4/77	4/77	OIL	FUL

NEW GAS FIRED UNITS PROJECTED FOR 1977-1985

REC NO	UTILITY NAME	PLANT NAME	UTIL NO	UNIT #	R	S	CAP	ORIG COM	CUR COM	FUEL	S CONT
31	AUSTIN ELECTRIC DEPT	DECKER	50135	2	7	TX	400	3/77	6/77	GAS	FUL
42	BRYAN CITY OF	DANSBY	50354	1	7	TX	100	9/74	11/77	GAS	NA
144	GREENVILLE ELECTRIC DEPT	GREENVILLE	51180	3	7	TX	42	6/77	6/77	GAS	NA
153	HOUMA LIGHT & WATER PLANT	HOUMA	51349	16	7	LA	44	11/76	1/77	GAS	NA
190	LAFAYETTE UTILITY SYSTEM	DOC BONIN	51549	3	7	LA	185	5/76	1/77	GAS	NA
218	MONROE UTILITIES COMMISSION	MONROE	51910	14	7	LA	100	0/ 0	0/79	GAS	NA
269	PONCA CITY MUN WTR & LT DEPT	PONCA STEAM	52365	2	7	OK	40	4/77	7/77	GAS	NA
336	TEXAS ELECTRIC SERVICE	HANDLEY	52501	5	7	TX	425	12/76	10/77	GAS	FUL
396	WEST TEXAS UTILITIES	FORT PHANTOM	53256	2	7	TX	200	6/77	6/77	GAS	NA

Appendix B

FACTS ABOUT THE FEA PROGRAM TO CONVERT EXISTING ELECTRIC GENERATING PLANTS BACK TO COAL

Steps in the Process.—Once FEA identifies promising candidates (after considering plant capacity and condition, coal and transportation availability, economics, etc.), the following steps are needed for each plant:

FEA issues a Notice of Intent (NOI) to issue an order prohibiting the use of fuel other than coal.

FEA holds public hearing on proposed order.

FEA issues the Prohibition order (PO).

FEA begins an environmental assessment or environmental impact statement (EIS) on each order.

EPA, if it so concludes, certifies that the ordered conversion can be accomplished within air quality requirements & standards.

When FEA's environmental analysis is completed (including hearings for EIS's), FEA can issue a Notice of Effectiveness (NOE) which defines the date and schedule for implementing the order.

FEA enforces order—which should lead to burning of coal.

Elapse time.—FEA estimates that a period of 4 to 8 years is required to achieve forced conversion, depending on many factors including whether orders are challenged by the utility or others.

	Approximate number of units	Sites	Approximate capacity (megawatts)
Potential candidates for conversion back to coal:			
Boilers identified as potential candidates	680	.....	62,600
Rejects—considered too old (built before 1950) or too small (25 MGW or less)	425	80	21,700
FEA's first round orders	74	32	11,232
EPA Conclusions on air quality on 1st round:			
Eligible for immediate coal use	11	.....	938
Can convert only if additional pollution control equipment installed	51	.....	7,716
No conclusion yet reached	12	.....	2,578
Potential FEA second round (before June 30, 1977)	65	35	12,350
Potential future orders, if authority extended (identified as of March 1977)	114	50	17,300

Note: No coal is being burned in reconverted plants because of an FEA order. However, utilities especially those in round one are, by their own choice, burning additional coal in the plants covered by some PO's:

Tons of coal burned (millions):	
1973	9.7
1976	14.2
Coal as percent of total fuel burned:	
1973	33
1976	52
Units involved:	
1973	74
1976	74
Estimated 1978 funding required for FEA program (millions)	$6.7

Appendix C

NATIONAL COAL ASSOCIATION
Washington, D.C., March 10, 1977.

Memorandum to NCA Members.

From: Carl E. Bagge.

The Federal Power Commission has just completed the most extensive study ever undertaken by a federal agency on new coal supply for new electric generating units. The attached study, "Status of Coal Supply Contracts for New Electric Generating Units, 1976–1985," was done by combining existing data with a phone survey to all of the power companies planning new coal-fired units. The base year is 1975 and the study covers a ten-year period. The major findings were:

1. The annual amount of coal required by the new units is 173.9 million tons in 1980 and 357.7 million tons in 1985. (The 1985 figure includes the 1980 amount.)
2. The amount of this coal already under contract is 85 percent in 1980 and 68 percent in 1985. See pages 34–37 for a *unit by unit* breakdown on the amount of coal contracted.
3. The average length of contracts signed was (by coal-producing area): Appalachia, 20 years; Texas, 35 years; Western, 26 years.
4. The projected breakdown by mode of transport is as follows:

	1980 (percent)	1985 (percent)
Railroad	65	61
Barge	10	8
Truck and conveyor belt (mine-mouth)	25	28
Pipeline		3

5. The percentage of coal with a transportation contract by mode of transport is as follows:

	1980 (percent)	1985 (percent)
Railroad	57	33
Barge	66	66
Truck and conveyor belt	92	78
Pipeline		

6. The following general points were also indicated by the study:
(a) The further you go into the future, the less coal is under contract.
(b) The average length of transportation contracts is for the duration of the supply contracts.
(c) 94 percent of the coal to be produced West of the Mississippi is projected to be used West of the Mississippi.
(d) Contractual agreements for transportation are not always concluded simultaneously with supply contracts.
(e) Only a relatively small share of the total projected rail shipments, particularly from Appalachia to geographic regions in the eastern United States, is committed to contract. The level of contracts is also low for rail shipments from the Northern Great Plains, although not as low as from Appalachia.
(f) The bulk of the shipments by barge will be from Appalachia, and to a lesser extent from the Interior Basin, to various regions in the East.
(g) Shipments by truck and belt, reflecting the extent of mine-mouth plant developments, will take place almost entirely in the West.
(h) Coal deliveries across the Great Lakes to new units in the East North Central Region will originate in the Northern Great Plains and the first leg of the shipments will be by rail.
(i) The pipeline deliveries are projected for proposed coal-slurry shipments from the Rockies to plants in the Mountain Region (from Utah to Utah and to Nevada).

Also attached are two tables NCA has constructed based on some of the report's most pertinent data.

I hope that this information will be helpful to you.

TABLE 1. ORIGIN AND AMOUNT OF COAL UNDER CONTRACT FOR NEW UNITS

District and State	1980	Coal, percent of contract	1985	Coal, percent of contract
Appalachia:				
1. Pennsylvania	1.3	100	3.2	41
4. Ohio	10.5	72	11.9	68
6. West Virginia	.4	100	.4	0
8. Kentucky, Virginia, Tennessee, West Virginia	9.5	36	30.1	32
13. Alabama, Georgia, Tennessee	1.7	58	6.6	46
Appalachia total	23.4	58	52.2	43
Interior:				
9. Western Kentucky	8.4	96	12.0	82
10. Illinois	11.7	99	15.9	95
11. Indiana	3.2	100	8.5	66
15. Missouri, Oklahoma	.4	100	2.2	21
Interior total	23.7	98	38.6	80
Western:				
15. Texas	21.4	91	51.4	76
16. Colorado	3.8	97	4.3	97
18. New Mexico	9.1	100	18.3	94
19. Wyoming	55.6	90	92.6	78
20. Utah	4.5	80	15.8	85
21. North Dakota	8.7	100	18.1	100
22. Montana	19.3	83	48.4	53
Western total	122.4	91	248.9	76
Unknown	4.4		17.8	
U.S. total	173.9	85	357.7	68

TABLE 2—PROJECTED DELIVERY MODE OF COAL TO NEW UNITS

[Million tons]

Mode/region	Appa-lachian	Percent regional total	Interior	Percent regional total	Western	Percent regional total	U.S. total	Percent of total
1980:								
Railroad	9.8	41.9	18.5	78.1	81.7	66.7	110.0	64.9
Barge	11.6	49.6	3.6	15.2	1.0	0.9	16.2	9.5
Truck and conveyor belt	2.0	8.5	1.6	6.7	39.7	32.4	43.3	25.6
Total	23.4	100.0	23.7	100.0	122.4	100.0	169.5	100.0
1985:								
Railroad	34.1	65.3	28.2	73.1	145.3	58.4	207.6	61.1
Barge	16.0	30.7	6.8	17.6	5.4	2.2	28.2	8.3
Truck and conveyor belt	2.1	4.0	3.6	9.3	88.4	35.5	94.1	27.7
Pipeline					9.8	3.9	9.8	2.9
Total	52.2	100.0	38.6	100.0	248.9	100.0	339.7	100.0

ATTACHMENT C

[From Forbes, May 1, 1977]

CRUNCH IN THE CARIBBEAN—WHAT HOPE FOR THESE CHILDREN?

(BY JAMES COOK)

At the very moment when the U.S. is moving toward restoring relations with Cuba, it is faced with the possible eruption of a half-dozen other Cubas in its own Caribbean backyard. You can blame two factors: the worldwide reduction in infant mortality that has sent populations soaring; the action of the oil barons of the Organization of Petroleum Exporting Countries in quadrupling the price of oil. The former is a slow-growing, simmering kind of problem. The latter hit with all the impact of a Caribbean hurricane.

Jamaica's wily, sophisticated prime minister, Michael Manley, likes to use a folk parable to describe the petro-situation. Jamaica, he says, is like the yam farmer who used to get two pounds of salt fish in exchange for ten pounds of yams. Now he gets only one pound of fish for the yams. How can a man live on one pound of fish? So he borrows to buy the extra pound. Pretty soon no one will lend anything to him. So he goes without fish.

In Manley's parable, the yams stand for almost everything Jamaica produces these days—bauxite, sugar, bananas, tourism. The salt fish stand for just about everything Jamaica imports—from cornflakes and drugs to automobiles and toothpaste. The parallel is exact. Between 1973 and 1976, when the value of Jamaica's imports rose by over $186 million, the value of Jamaica's exports rose by only $152 million. As the island nation struggled to keep going, Jamaica's external debt rose by over $260 million.

This economically intolerable situation is pushing most of the Caribbean to the left-in the direction Cuba has taken. Not because the left offers any easy answers, but because it is the path of least resistance for the ruling politicians. Faced with this situation, the Carter Administration may have a difficult choice: to give strong financial support to these still fairly moderate regimes or leave them to their fates.

Manley's parable applies to most of the countries in and around the Caribbean these days: The yam-to-fish ratio has changed for the worse and probably permanently. This applies to the former Dutch, French and British colonies in the islands and on the mainland of South America, and to long-independent Haiti and the Dominican Republic on the island of Hispaniola. Jamaica lives on bauxite and the tourist business; Barbados and the other small islands on sugar and tourism; Guyana and Surinam on bauxite, sugar and rice; the Dominican Republic on sugar, nickel and coffee; Trinidad on sugar and oil; and poor, beautiful Haiti lives on whatever it can.

The fundamental problem of the Caribbean—and most other poor countries—is this: They are largely outside of the world "recycling" process. The U.S., Japan and Western Europe may lose money to the OPEC nations through higher prices, but they gain it back in the form of investment or from the higher prices they themselves charge for the goods they export. But the poor countries have little to sell to the OPEC nations and little to attract OPEC investment. What they do have to sell—sugar, coffee, bauxite—is subject to wild price fluctuations. Take sugar: The world price went from 21 cents a pound to 45 cents in 1974, and now runs around 10 cents. The result was, when oil sent import bills soaring, export income failed to keep pace.

One consequence has been that the Caribbean has imported inflation without being able to export any of it—as the U.S. has done. Recent wage settlements in Jamaica have run to 60 percent and better. One cabinet minister tells with outrage how a 26-year-old engineer, only five years out of college, got a job this winter at $44,000. This way spells runaway inflation.

Meanwhile, to maintain their standard of living—to continue buying salt fish, in Manley's words—the Caribbean islands had to overspend their income. The result was that capital that might otherwise have gone into development began going into financing their mounting trade deficits. The oil crisis, Michael Manley announced, "is the greatest challenge the Jamaican people have faced in the 20th century." And not just the Jamaican people; that goes for the peoples of the entire developing world.

The bauxite-producing countries—Jamaica, Guyana, Haiti, the Dominican Republic and Surinam—managed to offset a part of the oil price increase with higher taxes on bauxite. At the same time, the price of sugar—the Caribbean's single most important export commidity—soared to unprecendented levels. But the reprieve was

only temporary. Bauxite demand slackened, sugar prices collapsed, drought and storms sent agricultural production reeling, the recession kept even the tourists out of the sun. By 1975, most of the Caribbean countries were in visible financial trouble.

Guyana, with a population of 800,000 and a gross domestic product of roughly $500 million, piled up a massive $100 million balance-of-payments deficit in 1976, and early this year virtually exhausted the foreign exchange it needed to support its imports. Jamaica's foreign exchange reserves plunged over $200 million into the red, and some bankers began to worry that it would default on its external debt, or at least have to reschedule it.

Even Barbados—one of the most fiscally conservative states in the area—was forced early this year to turn to the International Monetary Fund for the first time in history to finance its trade deficit. The smaller islands—Anguilla, Dominica, St. Kitts-Nevis, Grenada and so on—were even more hard-pressed. Only Haiti, which imports practically no oil, and Trinidad, which produces oil of its own, have been thus far immune, and Haiti lives such a marginal existence that economic yardsticks are irrelevant.

The world's bankers have boasted again and again of the skill with which the international banking system recycles the tremendous sums of money that have flooded into the oil-producing countries after 1973. But the recycling has been lopsided. The OPEC states in a single year acquired surpluses of over $60 billion, and the banking system efficiently recycled them—back into the *developed* world. In the poorer countries, where the trade deficit soared from $8.5 billion in 1973 to $41 billion in 1976, there were no compensating capital flows. So these poorer countries had no choice but to borrow—not to develop, but to live.

In response, Jamaica and most of the other countries in the Caribbean have moved noisily to the left. Educated in Britain's liberal economic tradition, politicians like Manley and Guyana's Prime Minister Forbes Burnham had always favored socialist rhetoric anyway, but after 1973 they began moving away from capitalism and the free market system. Jamaica firmly resisted the currency devaluation conventional economics would have dictated to solve its problems. "If you undertook to do that," says Finance Minister David Coore, "you would foment such a degree of social unrest that we didn't see that that prescription would work." Says Guyana's Finance Minister Frank Hope: "A reliance on the free market system would not only destroy the country, it would put us in a position where people can in fact rebel."

The movement to the left, then, is less a matter of capitalism's failing than it is of these countries' devising ways to get people to accept a lower standard of living. In a free society this is difficult; voters would throw the politicians out. The rhetoric of socialism, however, permits a government to *demand* sacrifices in the name of building a socialist society. In this sense, socialism—not religion—is the opiate of the people. It offers, not a better life, but a more acceptable means of coercing people into accepting bitter necessity.

The socialist rhetoric itself is nothing new. What is new is the increasing move toward a socialist reality in the Caribbean. Even in Trinidad and Barbados—where last fall's elections put ostensibly moderate governments in power—the result was to strengthen the leftist leanings of the opposition and could conceivably draw even the incumbents further to the left. In Surinam and the smaller islands—Grenada, Dominica and St. Vincent—leftist presence is vocal. In the circumstances, the seeming paranoia of some recent journalism (for example, Newsweek, Feb. 28, 1977) in alleging an emerging Marxist-Leninist Cuba-Jamaica-Guyana axis does not seem entirely unfounded.

In Jamaica, Manley began by nationalizing Jamaica's utilities (bus, telephone, electric power systems), then turned his attention to other essential industries (bauxite, cement, banking, radio). Even as Jamaica's economic problems worsened, Manley began to funnel more and more of Jamaica's resources into social services (free education, land reform, housing, hospitals, family planning and so on) and then to impose rigid controls on Jamaica's reeling economy (import controls, exchange controls, income taxes that fell heavily on Jamaica's rich and on the middle class).

To curb Jamaica's rising violence, Manley established the so-called Gun Court that permitted anyone caught carrying illegal firearms to be sentenced, without a jury trial, to life imprisonment. More recently, he announced a plan to create a home guard to supplement Jamaica's police force. Critics are inclined to see these moves as the first steps toward the imposition of totalitarian controls.

In the end, would it really make much differnece if Jamaica, or the whole Caribbean for that matter, went communist? In economic terms, the region remains something of a backwater. Including Cuba, the Caribbean has a population of not

much more than 20 million spread across a sea, one-third the size of the continental U.S., that extends from Belize to Surinam, from Curaçao to St. Kitts-Nevis. All told, the 20 states and territories that make up the region have an annual gross domestic product of no more than $20 billion five days' GDP for the U.S.

Would a socialist Caribbean come under Soviet domination? Where the Soviets can win a cheap victory, as in Angola, they will unquestionably do so—but more Cubas? Cuba now costs the hard-pressed Soviet economy $1 billion a year. Moscow does not want any more Cubas—witness its abandonment of the Allende regime in Chile. In any case, as one U.S. diplomat puts it: "The Soviets already have an outpost in the Caribbean and a few more aren't likely to make much difference."

There are, however, other dangers. One such is that the U.S.' emotional and economic stake in the islands may lead to pressure for Washington "to do something" about the dfrift to the left, as it did to its sorrow in Cuba. After all, the U.S. stake is not insignificant: U.S. exports to the Caribbean come to a good $2 billion a year; imports to some $5 billion. U.S. firms have invested maybe $4 billion over the years. Thousands of Americans own property there, and U.S. tourists leave hundreds of millions behind when they visit every year.

What matters far more is that the Caribbean provides the U.S. with 60% of its bauxite and alumina requirements and so forms the base of the $13-billion U.S. aluminum industry. Even more important, the giant export refineries maintained by Texaco in Trinidad, Shell and Exxon in the Netherlands Antilles, and Borco in the Bahamas, provide a good 12 percent of total U.S. oil imports, and, more important, close to 40 percent of our imports of gasoline and fuel oil. So, the temptation for the U.S. to interfere is going to be strong.

THE WEALTH OF NATIONS?

That these Caribbean countries have severe problems is hardly new. But the oil crisis raises questions of whether the economies of the emerging countries are really viable. For 200 years most were colonies of Britain, France and the Netherlands, and when the colonial period ended after World War II, the mother countries kept the islands going. They poured in capital they could not afford, absorbed the immigration they did not want. This is one reason why, as island after island agitated for independence, they got it without much resistance. And why in the French outposts—Guadeloupe and Martinique—even the Communist Party has opposed independence: These countries cannot hope to prosper on their own.

As independent countries, their once-vibrant agricultural economics are stagnant and inefficient, their tourist economies are unstable and psychologically degrading, and their industrial economies are too small to achieve significant economies of scale. Worst of all, they have virtually no control over their economic destiny. They can survive only through trade with the industrial world; yet the prices they get for their bauxite and nickel, sugar and rice—like the prices they pay for their imports—are set, not by the dynamics of their own economies, but by those of the larger economies they serve.

The prospects might be considerably less grim if so much of the population were not unemployed. Right after the war, DDT insecticides finally wiped out malaria and yellow fever, and infant mortality dropped sharply. Until then death and disease had provided a grim but efficient population control. Now the population boomed. By the early Sixties thousands of young people for whom no jobs could be found were moving into the labor force every year.

With the highest population density of any country in the Caribbean, Barbados pointed the way out by subsidizing birth-control programs and encouraging emigration. The programs have been so successful that Barbados' population has held stable for some years now. But with Britain and Canada tightening their immigration policies in recent years, the population pressures are beginning to build again. "We cannot generate enough job opportunities to take care of the demand," says Barbados Deputy Prime Minister Bernard St. John.

The Caribbean tolerates levels of unemployment that would bring down governments in most of the industrial countries. Jamaica's unemployment rate runs around 27 percent, Trinidad's around 15 percent, the Dominican Republic's and Barbados' 20 percent, Guyana's close to 15 percent (though official figures put it at 7 percent). Such figures do not even touch on the probably equivalent proportions of the population that are underemployed. Still, except maybe in Haiti, nobody starves. The climate is benign, and the extended family pattern of the islands goes a long way toward spreading around whatever income there is. But the explosive potential is there and growing. Depending upon the country, 50 percent and more of the population is likely to be under the age of 25, and close to *half* of that is likely to be unemployed.

The trouble with free societies is that they will not long sit still under such stress. But what can be done about it? Very little, and so the temptation is strong for ambitious politicians to hoist the banners of socialism—as an excuse to *force* people to accept their lot in the name of a better future that may never come.

Jamaica turned out 17,000 high school graduates last year, and 12,500 are still unemployed. "These youngsters are literate, articulate and they can't get jobs," says one Jamaican. "It's an explosive situation." And not just potentially. In the early Seventies, Trinidad and Curaçao were rocked by the rioting unemployed. Read the newspapers: Most terrorists are not people from the rural poor, but educated people who have turned against the system.

From the time slavery was abolished in the British Caribbean in 1834, the educated unemployed have tended to disappear into the civil service. But the already swollen government bureaucracies can no longer absorb unemployment of this magnitude. Jamaica, Trinidad and Guyana, as a result, have launched WPA-style make-work projects to put some of its unemployed to work—sweeping streets, cleaning gutters and so on. Such projects defuse the political explosiveness of the situation, but they are costly and do little to solve the problem. The hard truth is that the real wealth of a society lies not in its natural resources but in its ability to employ its people productively. The satellite economies of the underdeveloped world are unable to generate that kind of wealth.

Even natural resources, as Trinidad and Jamaica have discovered, are a mixed advantage. They tend to generate foreign exchange, not jobs, and what jobs they do produce tend to push up wages elsewhere in the economy so that agricultural production, in particular, tends to become uncompetitive. Jamaica's cost of sugar production now run at twice the world price. Jamaica's best hope of becoming competitive, as well as Trinidad's, is to mechanize its sugar production. But modern agriculture is not labor intensive, and mechanization would throw even greater numbers of people on the labor market. Barbados mechanized much of its agriculture and in the process reduced its employment by 10,000 workers—workers it had to absorb elsewhere.

One big employment potential, of course, lies in the growth of the tourist trade, provided people do not balk at becoming waiters, busboys and chambermaids. The tourist business, however, is extremely volatile, subject to fads and recessions. Moreover, in the Caribbean, tourism is less of a source of foreign exchange than it might seem, since so many goods must be imported to support tourists' needs—from whiskey and wheat flour to Kleenex and razor blades.

Even worse, leftist politics and capitalist tourists do not always mix."People follow their leaders very quickly," says one Jamaican. "You start saying things that are antagonistic to capitalism, and you identify tourists with capitalism, and it trickles down quickly. People react." In Jamaica, as in the Bahamas, the Virgin Islands, Bermuda and elsewhere, the reactions have been so antagonistic that tourists have often preferred to go somewhere else, with the result that over the past two years Jamaica's tourist trraffic has dropped nearly 20 percent. The hotel occupancy rate has plunged as low as 18 percent and business has been so bad the Playboy Resort at Ocho Rios shut down last March.

Because of the relatively low cost of Caribbean labor, light manufacturing—textiles, electronics assembly, garment manufacture—obviously offered at least a partial solution to the labor problem and a means of developing much-needed industrial skills as well. But industries were easier to attract than to hold. "They came for the tax holiday," is the way one Trinidadian puts it, "and when the holiday was over, they went somewhere else."

Yet despite the advantage of its location close to the U.S. market, the Caribbean has never been able to attract manufacturers in the volume that Korea or Taiwan have. Except in Haiti, labor costs are too high, and the labor unions have all the disruptive patterns of the British unions that fostered them. Worst of all, the work ethic has never been at home in the Caribbean. Productivity is low and seems to decline every year. A Haitian proverb suggests the problem: "If work were worth anything, the rich would already have grabbed it."

Concedes Jamaica's Finance Minister Coore: "Our trade unions take their patterns of expectations not from a realistic assessment of what the local economy can produce, but from what they see happening in other countries. The day comes when productivity is still low, but the cheap labor is gone, and so is the incentive for investment to come in.

As Coore sees it, and as many people have come to see it in the Caribbean these days, the solution to the region's problems is not industrialization but agricultural self-sufficiency and production for the export market. Why, he asks, should the Caribbean import white potatoes from Idaho when it can grow yams or casabas? Why should Trinidad and Jamaica import a large part of the food they consume

when they have plenty of rich and unproductive land that could be developed to meet their own needs and those of other countries? Jamaica at least has launched an ambitious land-reform program designed to put additional land into production. One-fourth of the farmland is owned by only 3,000 people, most of whom do not utilize it.

Again, however, the basic attitude toward work is a hindrance to agricultural development; people in the Caribbean have the same disdain for backbending work as people do in the U.S., but without the U.S.'s wealth to justify it. "From the time they can understand," one Trinidadian explains, "people tell their children to get off the land. Get out, from the Day One. Now those kids are 14, 15, 16, and you can talk till you're blue in the face about going to work on the land, and they say, 'No way!' " In Trinidad, for instance, agriculture employment is off 25 percent since 1971.

In Jamaica the alternatives to agriculture look a good deal less promising these days. Jamaica has already gravely damaged its tourist industry, and it's far from clear whether that damage can be undone. It may have done even more to damage its industrial potential. Jamaica's OPEC-style bauxite levy brought in $455 million in three years, with another $200 million in prospect every year in the years ahead. "There's noway we'd have attracted that much investment," argues Carlton Davis, head of Jamaica's Bauxite Institute.

The levy, however, served mainly to offset the higher cost of oil, and as essential as it may be, it's hardly a productive investment. Bauxite was the capital base on which Jamaica's boom in the Sixties and Seventies depended, and Jamaica's bauxite levy makes its bauxite just about the highest-cost commercial bauxite in the world, *too* high cost, conceivably, to attract additional investment.

Even worse, because of the Jamaican government's efforts to seize "the commanding heights of the economy," investors have come to feel that private capital is no longer welcome in the country—and that may do Jamaica as much damage as the $200-million tribute it pays to OPEC every year. If the government is right in maintaining that 5 percent of the population has controlled 90 percent of Jamaica's wealth, that 5 percent was about the most productive, skilled and motivated segment of the population—and they are understandably nervous.

According to one observer, "Jamaica has already lost 50 percent of its managerial class, and the other 50 percent has one foot out. The business confidence that's important is local, but an American who comes here finds his Jamaican counterparts in the process of emigrating, or sending their money out illegally, or in a state of panic." And as the capital has gone—Manley claims businessmen have smuggled out over $300 million—so have the entrepreneurs Jamaica needs to run her ailing economy. Even those remaining have sometimes hedged their bets. At least one high official has established a second fortune in Britain.

At this point, Manley seems headed in the same direction Guyana took a few years earlier, which was toward the creation of a centrally planned and controlled economy. But in so doing Guyana had certain advantages. It was, for one thing, much poorer and its expectations were low. Guyana had a virtually inexhaustible supply of land, and more than half of its population was hard-working East Indian, so that its dreams of self-sufficiency in food—which it has virtually realized already—and of becoming a major export producer are realistic. Guyana proceeded to nationalize much of its private business—not only bauxite, but sugar and trade—but it did so in an economy where the private sector had never done much more than trade anyway.

In addition to bauxite, Guyana has other, considerable natural resources: Land, timber, and, most important, rivers, with an undeveloped hydroelectric power potential of 7.2 million kilowatts, reputedly the lowest-cost such reserve remaining in the world. To realize that potential, Guyana has launched an ambitious $1.2-billion hydroelectric scheme. The 3.1-million-kilowatt project would not only free Guyana from its dependence on imported energy, and open up its interior to development, it would provide the power for an aluminum smelter and the industrial base that Guyana sees as its main hope for the future. In Guyana, there is something to start with. Most of the other countries are not so fortunate. The question is: Can even Guyana finance a project whose total cost will run over twice its gross domestic product? And do so in the context of a socialism that inevitably tends to frighten off private capital? Probably not.

Even that stronghold of Caribbean conservatism, the Dominican Republic, is hardly a shining example of private enterprise. Not only does the Dominican government control over 60 percent of the sugar industry, it also controls even more than that of the nonagricultural economy, and it is still expanding its position. The Dominican economy is centrally administered and controlled. The government itself buys and sells most of the agricultural output of the country. It also exerts rigid

control over other prices and over wages for the 60,000 sugar workers and 200,000 government employees. It exerts strict control over imports and foreign exchange: Gulf & Western, the largest private sugar producer, has been unable to repatriate more than a fraction of its Dominican earnings and so has funneled them into a string of posh hotels.

Insofar as socialism is not a rhetorical position but a structural one, the Dominican Republic may be very nearly as socialist as Guyana. But with this difference: Like Trinidad, which also controls the bulk of its economy, it has been able to extend its control over the economy without destroying the spirit of free enterprise or impairing its access to the outside capital it needs for development.

Standing apart from the economic problems of the rest of the region is Cuba, the biggest and most powerful state in the Caribbean. Cuba's apparent economic success stems from its connections with the Soviet Union and the communist bloc, and yet, for both Guyana and Jamaica, Cuba has come to seem a model of what a developing Caribbean country can hope to accomplish.

Michael Manley reportedly came back from Cuba two years ago "a changed man." Both Guyana and Jamaica have studied intensively the ways Cuba has sought to raise the productivity of its people—the workers' brigades, the national service schemes—and attempted to do likewise. "Cuba has developed the sort of educational emphasis and direction we need for this country," says Guyana's Minister of State in the Prime Minister's office, Christopher Nascimento, "the mobilization of people in a direction relevant to development needs and priorities." Nascimento prefers to overlook the imprisonments and executions, the stifled press, the exodus of Cuba's once-productive middle class.

Cuba and Jamaica worked out a technical- and cultural-exchange program two years ago. So far the Cubans have built a $2.7-million secondary school organized on Marxist principles, built a series of minidams in the mountains, a 500-unit housing project, and sent a dozen doctors to Jamaica's western provinces. The Cubans helped Guyana organize its shrimp industry and provided training to its medical students. "It's better," says Nascimento, "to have people training in a developing country, with an environment similar to ours, rather than in a very developed, highly sophisticated society. They will come back here when they're through."

Never mind that most of the Cuban-built dams failed to hold water—the people of the Caribbean have gigantic problems and they are in the mood for experimentation. It is not only on the larger islands that the Cuban myth has taken hold. There are the so-called Associated States—a scattering of 500,000 people on six main islands with 1,000 square miles of land. Dominica, St. Lucia and St. Kitts-Nevis are likely to become independent this year, Antigua and St. Vincent soon after. "You've got a vacuum coming up as the British depart," says one observer, "and that provides an opportunity to any country that feels that its ideology is the wave of the future. Maybe the Cubans aren't expansive, but they're attempting to project their image, their ideology and their way of looking at things beyond their shores, and there aren't very many countries like that left in the world."

The U.S. now seems likely to follow the rest of the Caribbean in establishing diplomatic relations with Cuba, and that itself points a lesson for U.S. policy. It is unlikely that Cuba would ever have achieved the influence and prestige it now has if the U.S. had not provided the shield of isolation behind which Cuba could work out her problems. The Caribbean drift to the left is less a matter of ideology than of political expediency.

To put it bluntly, the small island nations of the Caribbean are in for a rough time, and the U.S., as their immediate neighbor, will feel some of the backlash—in streams of emigrés and refugees, in lost property rights and, not least perhaps, in abuse: "Yankee Go Home," "Down With Coca-Cola Imperialism." If the basic problem is the birthdate and if the immediate problem is the punishing price of oil—storks and shieks—U.S. "fat-cat" capitalism remains the most convenient scapegoat. We may not like much of what may happen in the Caribbean over the next few years, but we are powerless to do very much about it. What we cannot change, we might as well learn to understand and accept.

ATTACHMENT D

A STIMULATIVE ENERGY POLICY—A PROPOSAL FOR ECONOMIC "LINKAGE"*

(By Paul A. London)

Most measures which could be included in the April 20 Carter Energy Package to reduce energy use and increase and diversify energy production must raise consum-

*To the New England Congressional Caucus, March 28, 1977.

er energy costs either directly or indirectly. This is the political dilemma of energy policy.

What many people do not understand is that even mandatory conservation measures raise consumer prices indirectly usually by forcing some energy consumers to give up a cheap fuel and to use an expensive one. One or two mandatory measures like auto mileage standards work without raising consumer costs appreciably, but analogous mandatory conservation standards for homes, businesses and industry which use 80 percent of U.S. energy are much more difficult.

Moreover, development of renewable fuels can not be made mandatory. If consumers are not willing to pay more for renewable energy because fossil fuel prices are held down, taxpayers will have to subsidize renewable energy development.

The consumer cost impact of President Carter's energy policy will be the central political question after April 20, as cost-impact has been the issue for at least 25 years in relation to the Oil Import Quota program and natural gas regulation. Compromise, I believe lies in "economic linkage": That is higher energy costs to promote change in our economy should be linked to a commitment from the Administration not only to rebate tax and cost increases associated with higher taxes and prices, but to propose a larger stimulus package over and above rebates with this "excess" stimulus also keyed to conservation and energy development.

In my view, mechanisms for returning energy taxes and spending power to consumers can do more than limit the economic "damage" of higher taxes and prices. Done right, an energy-linked stimulus program can be strongly reformist in a social and economic sense. If a popular stimulus program can be linked to less popular aspects of the energy package, it should be possible to get support from unions whose principal concern is jobs, and from consumer groups, environmentalists, and all who prefer economic change and growth to static defensive efforts to prevent energy price changes and taxes.

Briefly, taking three broad categories of energy usage, transportation, utilities and industry, and household-commercial, let me suggest what a reformist and stimulative program in the energy area might include:

Transportation

1. Gradually increase the gasoline tax with 100 percent of the income from the tax going immediately to reduce the workers' share of the highly regressive social security-medicare payroll tax. (The Social Security Advisory Committee has recommended one-third general revenue financing for many years.)

2. Social security benefits should be raised to reflect a calculation of the costs of a higher gasoline tax on the elderly. (This is net stimulus since 100 percent of the tax is being rebated to tax-paying workers.)

3. The Federal government should set a goal for U.S. small car production which will be stimulative, e.g. 13 million cars per year vs. 11 million at present. Workers in large car divisions could then expect to get jobs in the expanding small car plants.

Direct policies to encourage early scrapping of older gas guzzlers could be expected to put money in the pockets of poor people who run these cars. (Net stimulus.)

American companies and workers would need protection against increased imports during the changeover period.

4. Tighter mandatory mileage standards and a high registration tax on new gas guzzlers would complement the above policies.

Industry and utilities

1. The stick of higher industrial fuel taxes should be linked to stimulation to make a faster changeover in capital plant and more jobs.

A gradually escalating fossil fuel BTU tax on utilities and industry (probably with a lower tax on coal BTUs and a higher one on natural gas) should be considered. The tax could be rebated dollar for dollar (or perhaps slightly more generously) as a percentage cut in the corporate income tax. For example, if the industrial BTU tax in its second year raised $5 billion the corporate income tax rate could be moved down to "give back" $5 billion.

Thus industries using few BTUs would get a tax cut and industries using a lot of BTUs would face a gradual tax increase. Prices of low energy products could be expected to fall and prices of high energy products could be expected to rise giving the consumer exactly the signal he should be getting.

2. Faster tax write-offs for older energy-using machinery and/or special write-offs for new energy-saving machinery could supplement the BTU tax program. (This would be another net addition to stimulus.)

3. An RFC or similar agency might be developed to make generous loans to industries buying energy saving equipment. (The Japanese government often makes low-cost loans available to industries which it is forcing to modernize.)

4. As in the case of autos, a balanced system of import protection would have to be considered to protect U.S. industries against foreign industries with untaxed energy unless other arrangements could be worked out internationally.

5. A detailed Treasury-CEA-Commerce-Labor analysis of industrial BTU tax alternatives should center on the job-creating aspects of the program, and on the relationship of such a program to longer-term corporate tax reform. The bottom line should be an insistence that no program which does not create more jobs is acceptable.

Household-commercial sector

This is the easiest area politically. While ther are strong objections to cost-raising energy taxes, opposition to tax credits, low-cost loans, and even grants to homeowners is less strong. The willingness to subsidize even well-off household consumers underscores the point made earlier about the consumer-cost issue being the central problem of energy policy.

1. Household-commercial conservation is a marketing problem because the economic incentive for insulation, retrofit and even solar conversion often exists already. Major merchandisers like Sears, Montgomery Ward, etc., and small contractors, fuel dealers, etc., need to be motivated to increase their efforts in this area.

The question is what sort of incentives will spur a door-to-door effort. Leaving home insulation and conservation to utilities risks leaving oil heated homes (about 35–40 percent of U.S. homes) outside of any program.

2. Imaginative credit mechanisms might spur a greater door-to-door effort. A tax credit of $200 or even $400 will leave most homeowners with $1000 to $3000 to finance. Home improvement loans are available but they are not easy to get, and most home heating dealers do not finance homeowner retrofitting because they are too small to carry the loans themselves. One or several acceptance corporations might be created to allow small businesses to finance homeowners' conservation investments and then lay-off their paper with the acceptance corporations.

Summary

In my view, a strong energy conservation and renewable resources development policy can not be sold politically if it is not linked with a strong stimulative program which goes beyond merely maintaining purchasing power.

At the same time, a stimulus program is not possible if energy constraints on faster growth are not dealt with. Those who want stimulus have every interest in linking it to energy reform, just as those who want energy reform will need to link progress here to a growth policy.

Attachment E

Statement of Independent Oil Men's Association of New England, Before Senator Edward Kennedy's Inquiry on President's Energy Message, May 13, 1977

First, like many Americans, we feel that President Carter's energy message was and is important since it focuses on a most serious national problem. As gasoline jobbers remembering the problems created during embargo and other problems associated with federal control of prices and allocation from that time to this, we welcome action to insure adequate gasoline supplies for New England consumers.

Unlike the electric utility which has the option of using oil, coal, gas, or uranium or the heating industry which may eventually deal in solar heat as a supplement, there is no known practical substitute for fueling the family car with gasoline. In this respect the transportation sector of fuel use has special problems.

Turning to the President's energy program, we support conservation measures. Improved mileage for cars, retention of the 55 m.p.h. speed limit, penalties and premiums for car size are all practical moves.

We also endorse increasing strategic reserves to 90 days, but like Senator Kennedy feel that this reserve must be dispersed geographically for security reasons as well as insuring each region can quickly respond to natural disaster, embargos, etc. We endorse expanded offshore leasing with proper safeguards and utility switches to coal.

It appears to us that increasing federal gasoline taxes to discourage use is ill-advisable. And if Uncle Sam uses this tax device, the states will likely feel it is their patriotic duty to follow suit and the public will suffer. Further, much driving is

essential and no one has yet proved that a tax will reduce demand. Doubling the price of gasoline has not reduced demand so far! And, a 50 cent gasoline tax would cost New Englander's $2,690,332,000 a year.*

Petroleum prices will predictably rise with or without controls as a result of OPEC activity. It's a poor time to be adding a tax to the gasoline user whose costs have already doubled in recent years and will predictably increase further. We doubt the tax will accomplish the objective for which it's designed—lowering demand.

We would rather see energy prices rise to world levels through smooth transition making it more profitable to discover more domestic gas and oil. We would agree energy producers could keep such profits so long as they reinvested in production in the United States, its waters and possessions. We feel that the largest flaw in the President's program is that it ignores improving production in the next 25 year period. We feel that conservation alone will not solve the problem of creating adequate supply of gasoline. We need conservation and production incentive.

In time we feel coal will help enormously. Not only can coal fuel many utilities, but it can produce gas for pipelines and liquid fuels including gasoline. There should be greater incentive provided and a crash program to put through the Congress research and tax incentives to solve land reclamation and air abatement problems associated with coal production and use.

Government studies and those of private research groups have consistantly proven that opportunity to save wasted energy is greatest in the electrical power generation sector. Almost two-thirds of the energy going into production of electric power fail to be available for our use. The latest issue of Fortune magazine suggests that new utilities should cease to waste our valuable energy by siting industry next to the utility plant to use steam which is now lost to cooling towers or heating up our streams or the ocean. The opportunity to reduce this, our largest segment of waste, has not been addressed. We feel this need to conserve needs to be mandated in order to make basic energy more readily available in New England.

Finally, we feel federal assistance in recycling programs should be expanded. We have the technology to recycle tires, glass, aluminum, paper and glass. Not only would we save energy by reprocessing since it takes less energy to recycle than produce the original product, but we save other resources as well. That trash which we all produce and that portion of trash which is not recyclable is mostly burnable. These burnables can create energy which will save valuable petroleum products to heat our homes and power our vehicles.

We hope these suggestions are useful and we pledge our support to aid in conservation measures. We have faith that with reasonable American sacrifice, effort to increase and expand versus production of energy sources and newer technology can give us a growing economy and a secure nation. But each element is essential if we are to avoid shortages and serious national economic troubles.

* See Exhibit 1.

EXHIBIT 1

1976 gasoline (gallons)

Massachusetts	2,313,488,000
Connecticut	1,351,553,000
Rhode Island	536,015,000
Vermont	240,270,000
Maine	536,015,000
New Hampshire	403,324,000
Total	5,380,665,000
	× $.50
Total	$2,690,332,500

1975 estimated auto registrations

Massachusetts	2,787,000
Connecticut	1,870,000
Rhode Island	510,000
Vermont	235,000
Maine	520,000
New Hampshire	418,000
Total	6,340,000

2,690,332,500 ÷ 6,340,000 = $424 per car.

Source: NPN factbook.

Goals by '85

- BASIC ENERGY DEMAND GROWTH < 2%
- OIL IMPORTS < 6 MILLION BBLS a DAY
- GASOLINE CONSUMPTION 10% < '77 LEVEL
- INSULATION OF 90% OF ALL HOMES AND NEW BLDGS.
- COAL PRODUCTION UP 400 M TONS to 1065 M.
- SOLAR ENERGY IN MORE THAN 2½ MILLION HOMES

TOOLS PROPOSED TO DRIVE ENERGY CONSUMERS IN THE DESIRED DIRECTIONS

For Oil and Natural Gas

- CONTROL PRICES PAID PRODUCERS
- RAISE CONSUMER PRICES - TO OR ABOVE OPEC LEVEL - SOME EXCEPTIONS
- TAX AWAY DIFFERENCE - REBATE SOME
- SPECIAL TAXES FOR INDUSTRY and UTILITIES
- TAX INEFFICIENT USERS - REWARD EFFICIENT

Tax Credits for

- INSULATION
- ENERGY EFFICIENT CHANGES
- CONVERSION TO COAL
- SOLAR/GEOTHERMAL/CO-GEN.

Program Elements

- **Conservation**

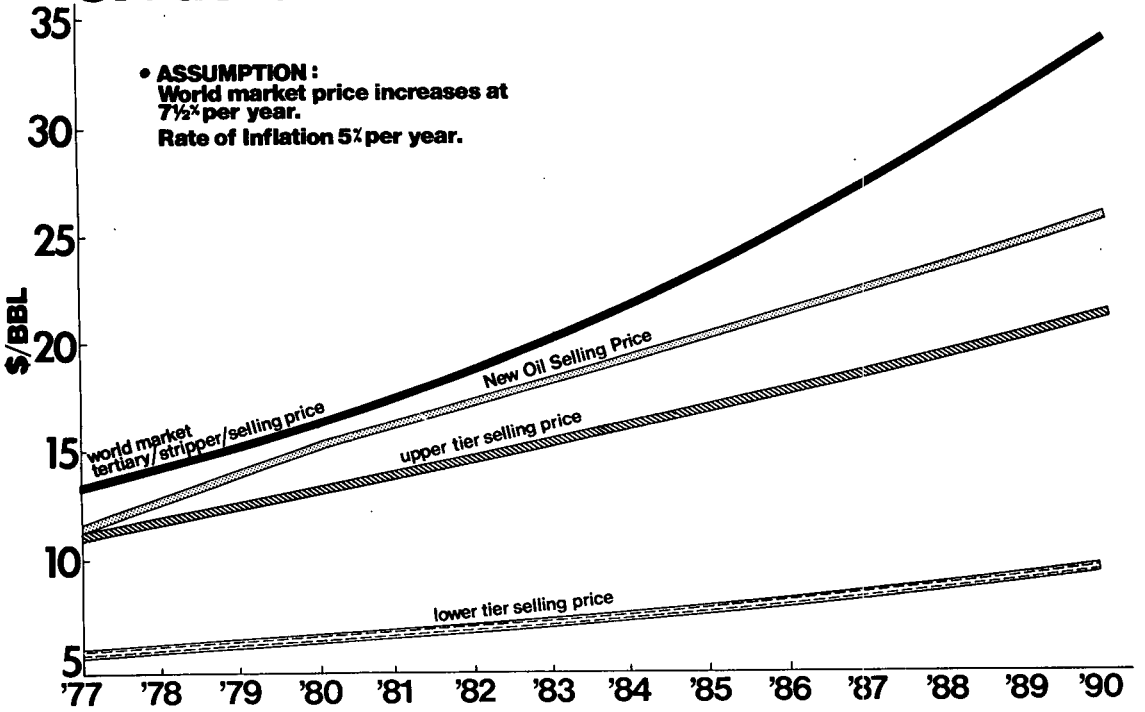
  MAJOR EMPHASIS ON ENERGY PRICES-
  TAXES TAKE MUCH OF INCREASE

- **Expanded role for Coal**
- **Develop renewable resources**

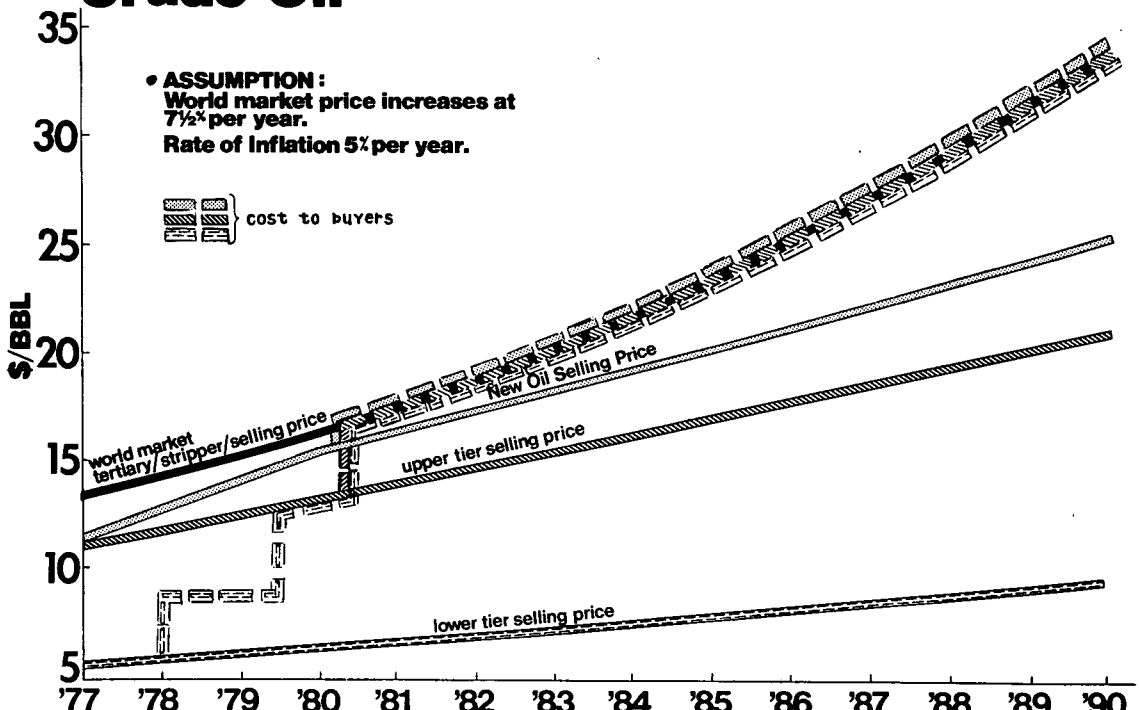
- **Nuclear**

  LT. WTR. REACTORS - YES
  BREEDERS & REPROCESSING - NO

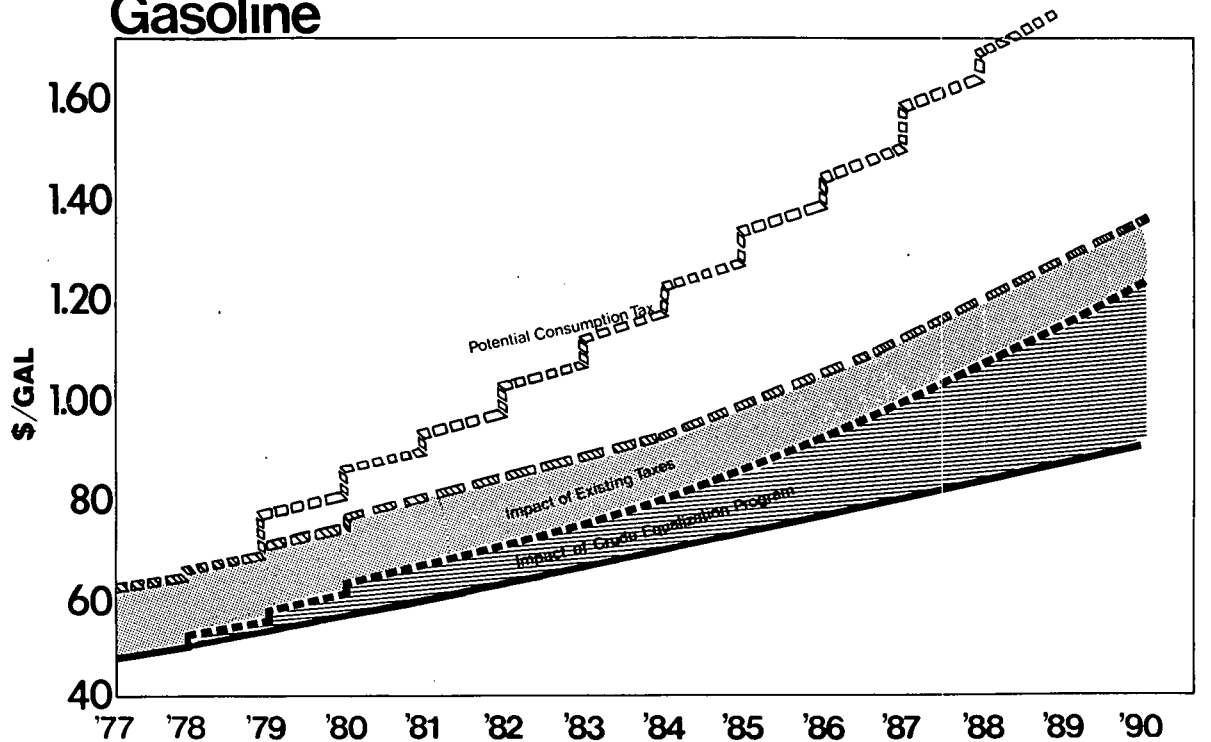
Carter's Proposed Energy Program...
Crude Oil



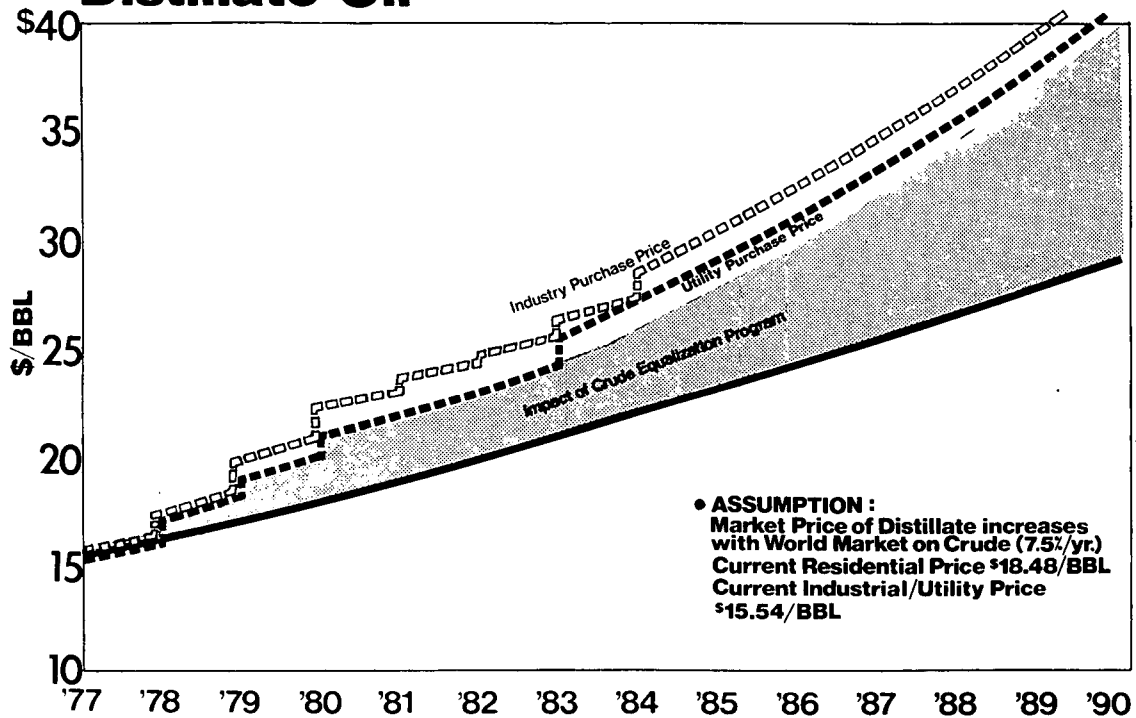
Carter's Proposed Energy Program...
Crude Oil



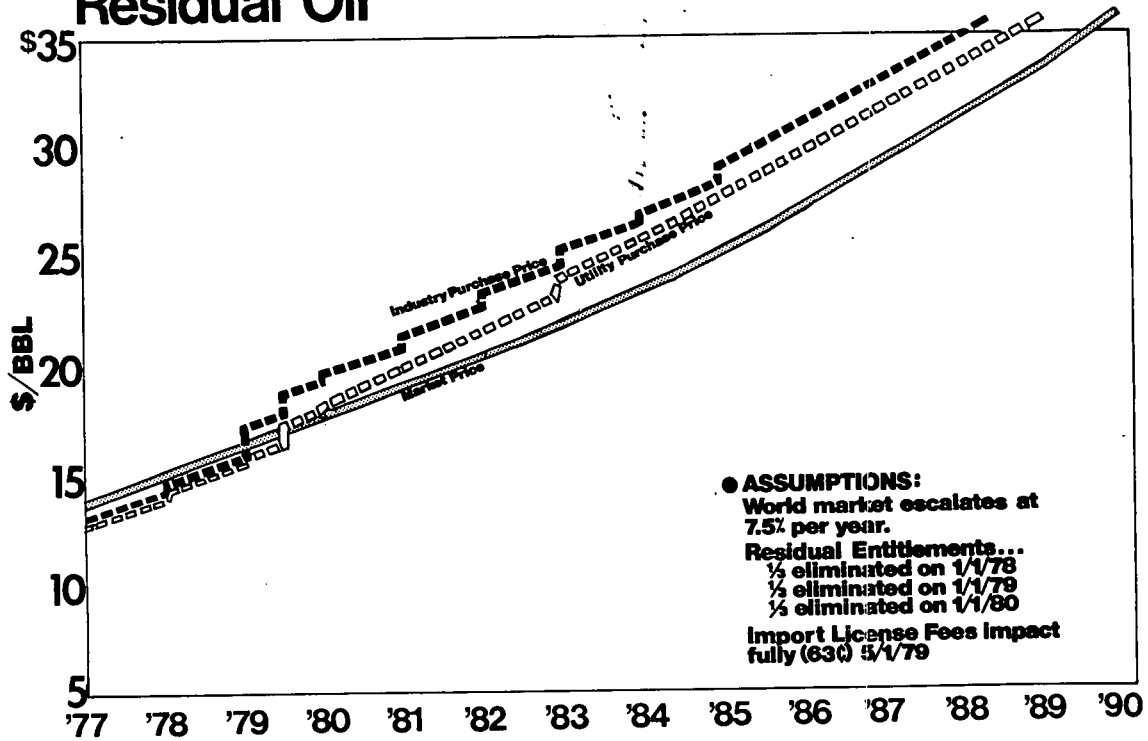
Carter's Proposed Energy Program...
Gasoline



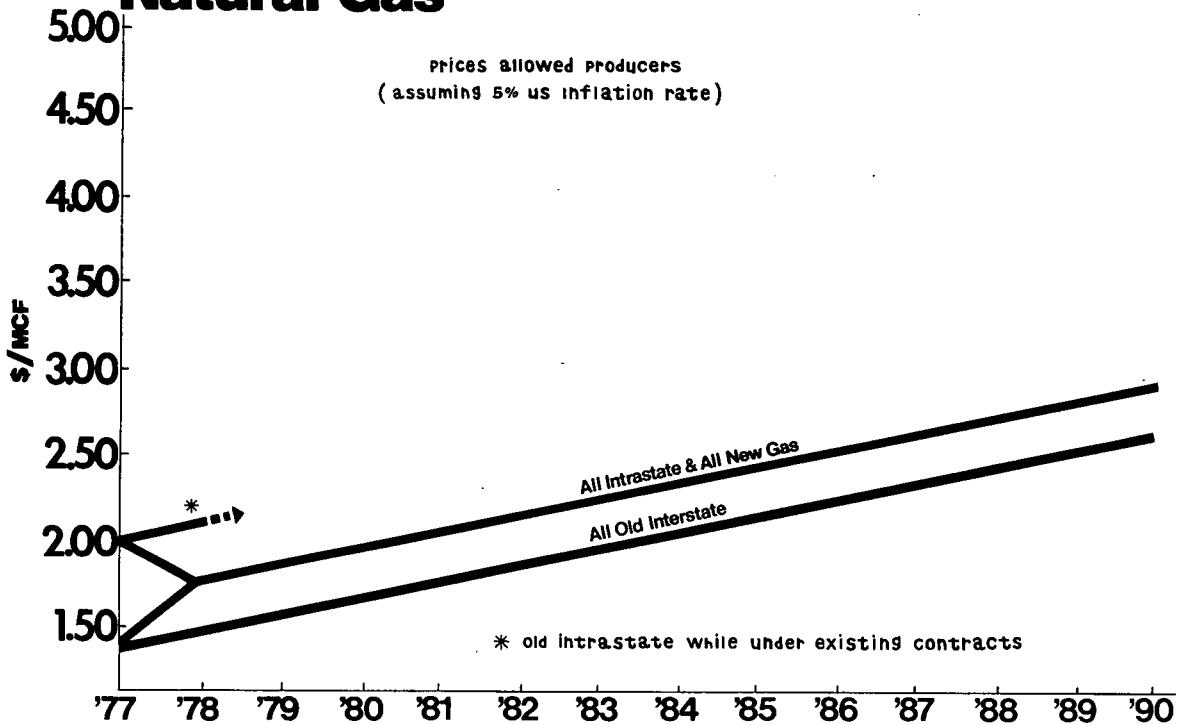
Carter's Proposed Energy Program... Distillate Oil



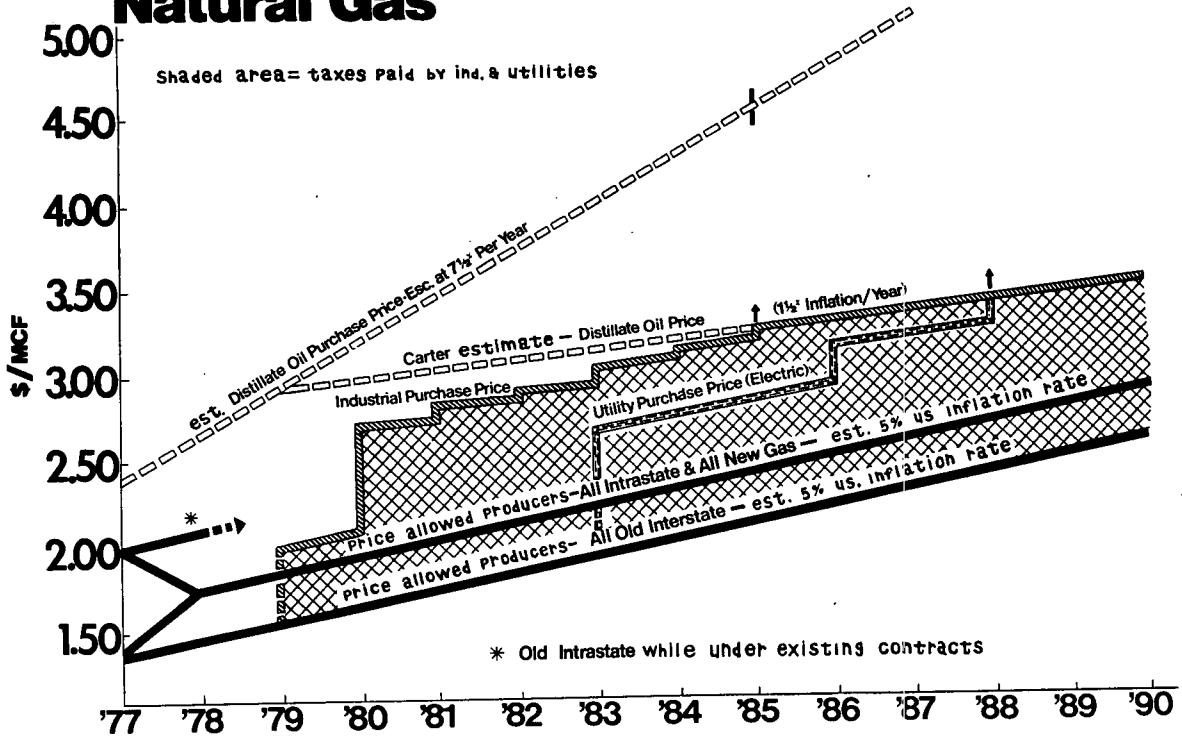
Carter's Proposed Energy Program...
Residual Oil



Carter's Proposed Energy Program...
Natural Gas



Carter's Proposed Energy Program... Natural Gas



Conservation

- TRANSPORTATION
- BUILDINGS V
- APPLIANCES
- INDUSTRIAL CONS. V
- CO GENERATION
- DISTRICT HEATING
- UTILITY RATE REFORM V

RESIDENTIAL *Conservation* MEASURES

- CAULKING & WEATHERSTRIPPING - DOORS/WINDOWS
- MORE EFFICIENT REPLACEMENT BURNERS FOR FURNACES
- MORE EFFICIENT FLUE OPENINGS
- ELECTRICAL OR MECHANICAL REPLACEMENTS FOR GAS PILOT LIGHTS
- CLOCK THERMOSTATS
- CEILING/ATTIC/WALL/FLOOR INSULATION
- INSULATION FOR HOT WATER HEATERS
- STORM WINDOWS

Buildings

- **Residential conservation tax credits**

25% ON FIRST $800 = $200
15% ON NEXT $1400 = $210
$410

- *Utility Insulation Program*
- *Mandated Appliance Standards*
- *School & Hospital Conservation Program*

97-013 O - 77 -- 7

Industrial Conservation

Added Tax... credit

10% for BLDGS. EXISTING

10% for EQUIP.

Co Generation

Added 10% Tax Credit

Potential O.K. to use Oil or Gas

Electric Rates

- **Must reflect costs***
- **No new Master Meter installations**

Utilities must offer...

- TIME OF DAY RATES
- PEAK LOAD MANAGEMENT RATES
- SEASONAL RATES
- INTERRUPTIBLE RATES

**But...* NO DECLINING BLOCK RATES*
RESIDENTIAL CUSTOMERS MAY BE FAVORED

Coal

UTILITIES & INDUSTRY

- NO OIL OR GAS IN NEW BOILERS *
- PERHAPS NO OIL OR GAS FOR NEW NON-BOILER USES
- IF YOU CAN BURN COAL, YOU MUST *
- NO NAT. GAS FOR UTILITY BOILERS AFTER 1990
- NAT. GAS CONTRACTS MAY BE SOLD **
- CO GENERATION GETS FAVORED TREATMENT
- B.A.C.T. IN NEW PLANTS
- NO SIGNIFICANT AIR QUALITY DETERIORATION ALLOWED

* LIMITED EXCEPTIONS

** ELECTRIC UTILITY PROCEEDS MAY BE CUT

Solar

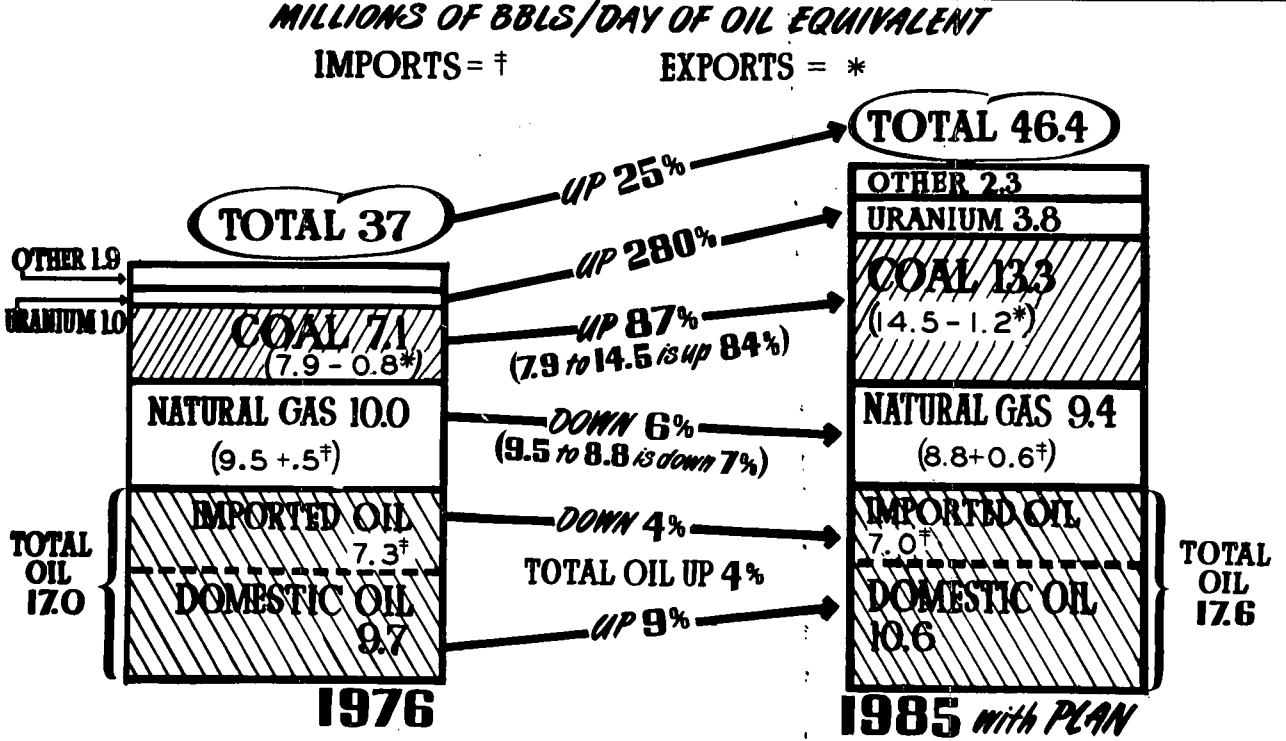
- **Tax Credits**
  - RESIDENTIAL - '77-'79 - LESSOR OF $2000. or
    40% of first $1000.
    25% over $1000.
    - '80-'81 - MAX. OF $1580.
    - '82-'84 - MAX. OF $1210.
  - BUSINESS - ADDED 10% INV. TAX CREDIT
    $100 M. FEDERAL BLDGS. SOLAR PROGRAM
- Geothermal tax incentives too

Nuclear

(legislation not drafted)

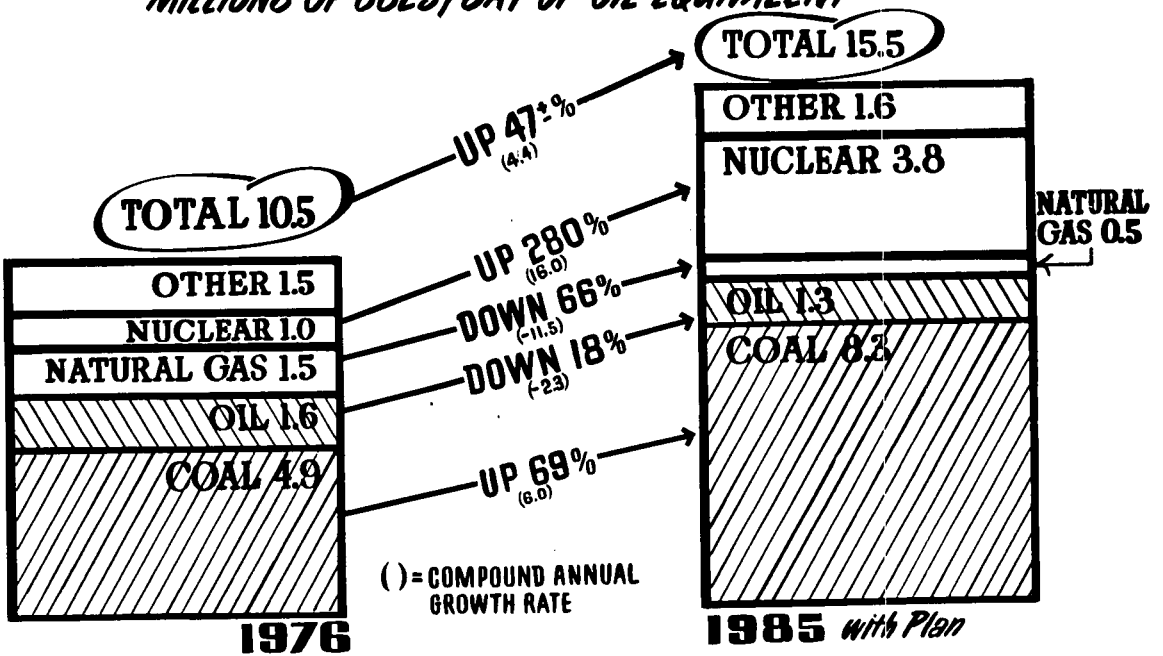
- DEFER BREEDER & REPROCESSING
- EXPAND ENRICHMENT CAPACITY
- ACCEPT FOREIGN ORDERS FOR ENRICHMENT
- DEVELOP SITING CRITERIA / STANDARD DESIGN
- EXPAND SAFETY REQ.

The NATIONAL ENERGY PLAN 4/29/77



SOURCES of BASIC ENERGY for CONVERSION to ELECTRICITY

MILLIONS OF BBLS/DAY OF OIL EQUIVALENT



NEW ENGLAND

with 5.7% of the people in the U.S.
we use...

3.9% OF THE TOTAL ENERGY

6.6% OF THE OIL PRODUCTS

4.9% OF THE GASOLINE

9.6% OF THE DISTILLATE OIL

12.2% OF THE RESIDUAL OIL 1/3 exhibited

1.4% OF THE NATURAL GAS

Senator KENNEDY. Mr. Nichols, would you like to go ahead now.

STATEMENT OF GUY NICHOLS, PRESIDENT, NEW ENGLAND ELECTRIC SYSTEMS

Mr. NICHOLS. Thank you. In the interest of meeting the 7-minute time schedule, I will forego my prepared statement as prepared and just talk my way briefly through a number of charts. The first chart just lists the specific goals of the energy package as prepared and delivered to Congress a week ago this past Wednesday, and I do want to say I think the administration has done a tremendous job in a 100 days time to develop such a complex energy package, and while we may have lots of criticisms about bits and pieces, I think this 100-day accomplishment has really been amazing. I will not go through these goals in detail because the Administrator already touched on them. The principal one is the goal that basic energy demand growth, will be down under 2 percent by 1985.

Senator KENNEDY. Do you find that you are in the ballpark with the administration's projections on growth and the New England situation.

Mr. NICHOLS. I think these are major challenges. I think it is going to be very difficult to get down to under a 2-percent basic energy growth rate, and still achieve a viable economy. I share Mr. Buckley's concern about the soft analysis as far as economic impact and impact on inflation. Those analyses have been changing rapidly over the past 2 or 3 months and we have all read as each new study is made what the new numbers are. So I share concern over the numbers, but I am just listing here the targets and saying that this package does address these targets.

To achieve these targets, the administration has come up with a series of program elements. Three of these elements are addressed in the legislative package. They are: Conservation, expanded use of coal, and the development of renewable resources. I just want to touch on two of them at the moment. As far as conservation is concerned, we strongly support this effort. We think this is absolutely essential. We are pleased as a utility that we were the first in the northeast to be recognized by the FEA and EPA for our efforts in that area.

Certainly we believe in the expanded use of coal, particularly for some of the existing coal plants here in New England. I want to emphasize here that obviously there is a lot of difference in cost estimates as regard the impact of coal conversion. There are just three points I want to make on that.

No. 1, we strongly support the use of coal in a number of our existing units. We know we can do this and we know we can do it cleanly and we know that we can save our customers money if we are allowed to do it as we have proposed. The basic disagreement in this area comes entirely as regards the additional equipment that may have to be installed and the specific types of coal that we may have to burn to meet whatever the then standards may be, and it is in this area that our numbers tend to disagree with FEA's.

Under current legislation when and if a utility is ordered to burn coal and after it has gone through the three-step FEA process, it is very much like writing a blank check, signing your consumers'

name to it and handing it to the Environmental Protection Agency and they get to fill in the amount by dictating the type of coal you have to use and the type of equipment you have to install.

How much of a swing can we get between doing it the way we suggest and doing it the way others may suggest?

Let's go back to the 18 months we burned coal immediately following the OPEC crisis. We burned 90,000 tons of coal a month. We saved our customers, our 1 million customers, $1 million a month during that entire 18-month period. However, if we go to the other extreme, if we install everything anybody might ask us to install——

Senator KENNEDY. Did you keep records on health and air quality during that time?

Mr. NICHOLS. Absolutely, and I am pleased to report that we never exceeded 40 percent of the Federal standards for SO_2. These are the primary standards or the so-called health standards. We had truly an enviable record, but if we have to go to the extreme we could easily—rather than save our customers $1 million a month—cost them $11 million a month. And these numbers have been documented and have been submitted.

I think there are a couple of other areas you would like to have me get to. As regards nuclear, we are very pleased that the energy package, as proposed, does place increasing reliance, as Mr. Buckley suggested, on light water reacters. These are the work horses that have done such a tremendous job here in New England and we are very pleased to see this effort.

Let me run on to a few charts as regards what is going to happen with oil. Before getting to it, though, let me say that this next chart is one person's analysis—mine—of the basic tools that the administration is proposing to use to accomplish its objectives.

As far as oil and natural gas, my analysis suggests they plan to control prices down to producers; they plan to raise consumer prices to the OPEC level with some exceptions; they plan to tax away the difference and rebate some of the tax—and I want to come back to how much they are going to rebate because it is already spelled out in the proposed legislation. There will be special additional taxes for utilities and industry. Inefficient users will be penalized and there will be a reward for efficient users. And then we have other programs that aren't aimed directly at oil and natural gas, in the area of insulation, energy efficient changes, conversion and so forth.

These are the tools that one analysis suggests are being used. Now let's go on to crude oil. Here is something we are very much involved in because we are major oil users and in addition we have an oil and gas exploration company that is involved in this. At the present time we basically have three kinds of oil, as far as the producers are concerned, and these are—old oil, which is controlled at an average of about $5.25; what up until now has been considered new oil, which will be called the upper tier oil, which is priced on an average of around $11; and we have stripper oil which is not controlled and sells at the average free market kind of price and it currently gets over $13.

Under the legislation as filed, what is going to happen to these prices? Well, lower tier or old, old oil will be allowed to escalate at

the U.S. inflation rate, and for purposes of this chart I have assumed a 7.5 percent world inflation rate. They both may be wrong, but for purposes of display I thought this might be helpful.

We are going to have also a new kind of oil, a new, new oil which is the oil discovered after April 20, which is shown by the yellow line. How is that going to be priced? It starts off being priced as upper tier oil. It will be allowed to escalate up until January 1, 1980, at which time it will be equal to today's free market crude price escalated at the U.S. inflation rate, so it is not escalated at 7½ percent. From there on it will escalate at the U.S. inflation rate.

We are going to have a new kind of oil called tertiary oil and it will be priced as strip oil is priced, basically uncontrolled, and therefore this increase in price at the 7.5 percent assumed Free World inflation rate.

These are the prices that you as producers would be paid for the oil you take out of the ground, but how much are the users of oil, the refiners, going to pay?

Now we get to the taxes. These are the taxes that go into what I call the crude oil equalization pot.

If you are buying old oil, this lower tier oil—starting January 1, 1978, if you pass the proposed legislation—the price you would pay would go up $3.50. Starting January 1, 1979, the price would go up an additional amount to the then upper tier price. Those are taxes paid directly to the Federal Government. As of January 1, 1980, all three of these lower bands would be taxed on up to the free world market price for crude oil, which is basically in today's world the OPEC controlled price. The difference between these dotted lines and these lower lines are the dollars that would flow into the tax treasury, and all of these dollars go into what I call the crude oil equalization pot.

Now let's see what the impact would be on gasoline, because I find this is the one people are most interested in. There is a little kicker here that a lot of people haven't recognized as yet, and this is the crude oil equalization kicker on the price of gasoline. Most of us have been reading about the 0.05 to 0.50 cent optional gas tax that we will incur if we don't meet the targets that have been set for gasoline consumption.

Let's start at the bottom with the dotted blue line. This is the average price that your local gas station charges to us, the consumers. Here in Massachusetts, it is about 61 cents; 12½ cents of that at the present time, the green band, represents State and Federal taxes. So actually your retailer is getting about 48½ cents at the present time that he has to pay all of his bills with, including buying the gas and whatever profit he makes.

What is going to happen price-wise under the present plan? This 48½ cents will escalate, we assume, at the U.S. inflation rate out until January 1, 1978, at which time you see the first of the impact of the crude oil equalization program. It comes on and will escalate as shown by this brown area, the impact of the crude oil equalization taxes on gasoline prices.

In addition, starting in 1979, we will be subject to the 0.05 to 0.50 steps if we don't meet the target consumption as outlined.

Let me go on to distillate fuel oil. The utilities use distillate along with everybody else. Distillate fuel oil is now selling locally at the wholesale rack for about 37 cents a gallon—retail prices in New England are averaging somewhere around 44 cents a gallon. What will probably happen to its price? According to our analysis—this is one group's analysis, and another group might come up slightly different. The important thing will not be Mr. O'Leary's analysis or my analysis, but what actually gets passed and what the then bureaucracy enforces and the courts enforce.

Let's see what we think would happen now. Distillate would go from its current rack price of 37 cents up at the U.S. inflation rate and then we would have the impact of the crude equalization program for everybody except the home heating customers. I will come back to that one in a minute.

Utilities, the red line, will be hit with $1.50 per barrel tax above and beyond the impact crude oil equalization, industries by this point in time would be paying a $3 tax which they get to in a series of steps.

I mentioned that the homeowners will not be charged the impact of the crude oil equalization taxes. Why not? Because those taxes will flow directly down the pipeline as one of our previous speakers mentioned, up until you get to the home heating dealers. He will not be allowed under this legislation to charge the home heating user the amount that includes the tax. He will have to pay it to his supplier and have to turn around to the Federal Government and say, "I didn't pass along this amount of tax. Please rebate those dollars to me now."

John Buckley, I can only say you are faced with a cash flow problem and I am sure you recognize it fully.

Let's now talk about what is going to happen to the crude oil equalization pot in total. Three things are going to be deduced from the crude oil equalization pot, according to our interpretation of the current legislation.

One, the crude oil equalization impact on home heating oil customers rebated to home heating oil suppliers will come directly out of the crude oil equalization tax pot.

Two, the Federal Government will not get as much in Federal tax revenues from individuals and businesses because of the increased taxes called for all through this program, and the legislation requires the U.S. Treasury will be reimbursed out of this crude oil equalization pot by an amount equivalent to what they will lose by tax deductions resulting from the program.

Three, the cost of administering the program. That also comes out. How much that is going to be, I don't know. I would like to express my complete agreement with Mr. Buckley's analysis that this is a tremendously complex program, that it is going to take a huge bureaucracy to implement and it is going to be expensive.

Finally, in conclusion, I agree once again with some of the previous speakers that commented on the lack of a balancing trade off between the environment, energy and economy. I really think the legislative package that has gone up to the Hill does a good job as regards addressing the questions of energy demand and really does a good job as regards addressing the questions of environment, if you believe in an absolutely pristine approach to the environment,

which maybe we want to believe in as a country. I won't comment on that. However, Congress has truly been left with the dirty end of the stick. You are faced with making the economic trade-offs, and it is not going to be an easy job.

I will be glad to answer any questions. I didn't quite make my 7 minutes, but I think I made it in 9.

Thank you, Senator.

[The prepared statement of Mr. Nichols follows:]

PREPARED STATEMENT OF GUY NICHOLS

I recognize that we are here this morning to discuss a proposed energy package that involves higher energy costs for New England, but first I would like, on behalf of our one-million consumers, to express my great appreciation for your leadership in attaining for the consumers of New England a share of "old oil entitlements" for imported oil. This new plan that you and Senator Brooke working together were able to get implemented has already saved New England energy users nearly 90 million dollars and is continuing to save at the rate of about 7 million dollars per month.

Now, for the Administration's proposed energy program—I strongly support the basic efforts to conserve energy and use it more efficiently, to use more coal—to rely more heavily on light water nuclear reactors—the wonderful workhorses that are doing such a good job here in New England—and, finally, I support the concept of pricing energy at or closer to its true market cost.

Increased use of coal is a real possibility here in New England. On behalf of my own company I would like to emphasize just three points in this regard:

1. We want to burn coal.

2. We can burn coal in many of our existing generating units, and we can burn it cleanly—our experience in 1974 and 1975 proves this—we burned roughly 90,000 tons per month, saved our customers one-million dollars per month, and never exceeded the Federal primary ambient air standards for sulfur dioxide—in fact, we never got above 40 percent of these standards. We are not now burning coal because despite this excellent record, the administration of the present regulations, by EPA, will not allow us to burn coal without great added costs to our customers.

3. This brings me to my third point. We do not want our customers to bear any needless expense while we are burning coal—yet we have recently been ordered to burn coal, and under the present law this is like writing and signing a blank check and letting the EPA fill in the amount. They can dictate the type of coal we have to use and all the added equipment we have to install—rather than our customers saving one-million dollars a month burning coal—They could easily be incurring extra costs of more than 11 million dollars per month.

Turning to another aspect of the proposed energy package, that which impacts oil. I have with me a few charts that show the maximum dollars that will be allowed to the suppliers of petroleum products as compared with the prices that will be paid by different classes of customers—it is obvious that we will need a huge bureaucracy to implement this approach.

Because New England is predominantly reliant on oil, let's start with domestic crude oil—explain Chart 1 and Chart 1A. Next gasoline—Chart 2 (+2A)—Distillate 3 (+3A)—Resid 4—and Natural Gas 5 (+5A).

Finally, in regard to the overall energy program, you might like to consider it in the light of the three questions raised in the recent issue of the Economist.

1. Is the target the right one?

2. Will the proposed means reach the desired end?

3. Are there undesirable side effects?

First, is the target the right one? I think the answer here is iffy—yes and no. Reducing energy waste and increasing the efficiency of energy use are obviously good. On the other hand, this program which is primarily aimed at depressing demand, does nothing to adequately stimulate production.

Second, will the proposed means reach the desired end? I believe the answer is—probably not. This is a British approach. The still upper lip, we can do without it's approach. This may be okay for the English, but it's not consistent with the American style. Here we tend to be optimistic, to believe that we can do anything—we are conditioned to believe in upward mobility and an increasing flow of material benefits. I doubt that most of our people will be happy in adopting the lifestyle changes incorporated in this program. I believe the great majority wants and looks forward to a higher material standard of living.

Third, are there undesirable side effects? I believe the answer here is yes, despite the statements regarding increased jobs and little or no impact on our economy or the rate of inflation.

The energy industries now spend nearly 40 percent of the total business capital investment in the nation. Drop the energy growth rate in half and there is bound to be a very definite negative impact on the economy.

We also are asking this nation's industry to go on a strict energy diet. Other countries, West Germany, France, Japan, for example, are pushing ahead with emphasis on energy production including the breeder reactor. Their industries may well have a distinct energy cost advantage in tomorrow's world.

Wednesday's New York Times suggests that organized labor is beginning to question this energy program—and well they might. If, after eliminating waste and inefficiency, U.S. industry is to use less energy per unit of output, then the labor input must increase if GNP is to stand still or increase. Our past history of wage increases has been based on increasing productivity brought about by improving technology and increasing energy input per unit of product. With less energy available, three results may occur:

(A) Labor can work harder or longer and possibly improve its lot, or

(B) Labor continues as is and our true standard of living declines.

Or

(C) We have a technological miracle that permits energy inputs to decline, labor inputs to stay level or decline and output to increase. A much desired but most unlikely miracle.

I realize the Administration's proposals leave Congress with the dirty end of the stick. You have the unenviable task of trying to balance the demands of the environment, economy and energy.

The proposed legislation is, unfortunately, rather like a collection of bones that needs to be tied together into a cohesive skeleton and then fleshed out. This job must be done by Congress or, heaven forbid, the job might be left to bureaucracy.

In conclusion, our System Companies are dedicated to meeting the basic elements of this program and do it in such a way that will minimize the economic impact on our customers.

Senator KENNEDY. Your statement is excellent and very informative. What is your reaction looking at it from the utility point of view? I think you have answered a bit of that in the earlier statements, and illustrations.

Mr. NICHOLS. From the utility point of view I really think that probably our job will be a little easier with the lower energy growth rate that the administration envisions, if it does develop. Because during a period of inflation the faster we grow, the faster we have to build new and expensive plants, the higher the average cost of energy that must be charged to our customers, the more we have to go for rate increases, the more difficult it is to get those rate increases because during periods of inflation the regulatory agencies are under great pressure from the consumer groups to hold down cost. We think with the slower growth rate envisioned by the administration, that we will have an easier job of balancing all of the interests we have to look to, and these are both consumers and investors as well.

However, that is a rather selfish comment, solely from the utility viewpoint because I am really not sure that our overall economy can adjust rapidly to a less than 2-percent basic energy growth rate, and I am very much concerned about what is going to happen as regards our position as compared with other industrialized countries. West Germany, France, and Japan are pushing forward, pushing forward hard on energy developments, that may put them in a better competitive position 10, 15 years out than we will be, because this program, if it has a general overall weakness, and I think of perhaps two—one is the overall thought that a high degree of Federal regulation will improve the situation as com-

pared to what I think John Buckley would suggest, as greater reliance on a free marketplace. That's obviously one problem. The other problem is, the program does a great job providing the carrots and sticks to insure that energy consumption will be limited, but I think an inadequate job, and I am sure this can be improved, but an inadequate current job with regards to improving the incentives to drive up production.

Senator KENNEDY. From a utility point of view, how do you view New England versus other parts of the country?

Mr. NICHOLS. As regards this program—I tend to agree with Mr. O'Leary that we will tend to become more competitive in the future, not because of coal, because unfortunately to the extent we have to use coal in New England, we will continue to be at the end of the pipeline and our only hope—to move us more competitively vis-a-vis the rest of the Nation, lies in nuclear light water reactors, and that has already started to move us in that direction and I support Mr. O'Leary's comments in this area.

Senator KENNEDY. I suppose the growth of utility costs in other parts of the country ought to help us to some extent, too. How do you view that?

Mr. NICHOLS. Yes, they will come up closer to our costs.

Senator KENNEDY. And if the figures are consistent in either your analysis or O'Leary's, you see the differential being reduced by as much as a half?

Mr. NICHOLS. I think that is possible only if we push forward very quickly and logically on light water reactors. I think that is the only real route that will accomplish it for New England because of our transportation disadvantages regarding coal.

One comment on coal transportation. The bulk of the utility coal will come into New England, I hope, by sea. To the extent we are relying on railroads we are relying on the Norfolk & Western and the other railroads down in Kentucky, West Virginia areas.

Representative HECKLER. If I may say, Mr. Chairman, I hope Mr. Nichols will consider having some of the docking in Fall River Harbor. I mean it seriously.

Senator KENNEDY. I think it will be useful for Mr. Nichols and the others to plug in on this study of the costs of movement of these alternatives.

Would that be all right, Mr. O'Leary? Could you work out something?

Mr. O'LEARY. I was going to suggest that Mr. Nichols might want to come down and spend a little time with us. That's an excellent analysis and I am sure there is a lot more behind it.

Senator KENNEDY. Thank you.

Mr. Syron.

STATEMENT OF RICHARD F. SYRON, ASSISTANT VICE PRESIDENT AND ECONOMIST, FEDERAL RESERVE BANK OF BOSTON

Mr. SYRON. I will be very brief because I know we have a severe time problem. I must begin by saying that my comments are strictly personal and do not necessarily reflect the official position of the Federal Reserve System. They reflect my own research on the New England economy.

My comments will deal entirely with the potential impact of the proposed energy program on New England's competitive position for industry. Overall I would agree with most of what has been said. The President's program will in general provide a more equitable treatment of manufacturing energy costs in New England compared with the rest of the country. There are a few individual technical points in the program, though, that should be discussed, and I will try to get to those right away.

As you know, the 1975 recession was particularly severe in New England. Our employment level dropped about twice as much as the rest of the country and we are recovering substantially more slowly. An even more disturbing factor is that the recovery is particularly slow in the more populous and heavily industrial southern New England States and the reason for that in no small part is what has happened to our energy prices. To put this in perspective, at the end of the Second World War, energy cost per Btu in manufacturing in New England was twice as much as the rest of the Nation. Some adaptation took place and by 1971 our energy cost was about 50 percent more, which reflected more or less our transportation disadvantage. But now again our energy cost has risen to about twice that of the rest of the country.

Work we have done indicates that even for energy nonintensive high technology industries which we talk about as the salvation of this part of the country in manufacturing—even in these industries this energy cost disadvantage is equal to about 10 percent of profits and that is significant over time.

Of course, as you know, the main reason for our disadvantage is that we rely very heavily on petroleum. It provides more than 60 percent of our manufacturing fuel—and gas only about 14 percent—the reverse of the situation in the rest of the country. The only way that New England's energy cost disadvantage can be minimized is by having a more sensible oil and gas pricing policy. I think the President's proposal to bring that about is the most important single principle that could be implemented to put New England in a more favorable competitive position.

I do think there are two questions that have to be asked about the mechanism to which the principle will be applied. One question has to do with a point that Mr. Buckley and Mr. Nichols both raised on the gas-oil equalization tax for industry. As I understand it—and I don't claim that I know all the particulars in the detail Mr. O'Leary does—under the proposed energy tax program, new natural gas will be set at a wellhead price of $1.75. This is less than the Btu equalization price that would result under complete deregulation of new natural gas. In order to diminish the resulting difference in oil and gas costs to industrial users, a tax is going to be placed on industrial users of natural gas to bring them up to the Btu equivalency price of distillate oul. Now at this point in the analysis, the cost for using distillate oil in New England or using natural gas in another part of the country, would be identical. However, on top of the other oil taxes that we have talked about at the wellhead—major users of distillate oil will also have an additional $3 tax which won't be taken into consideration in setting the gas equalization price. Thus it would appear that this additional

tax will perpetuate a long-term advantage of using natural gas over distillate oil for major industrial users.

There must be a reason why this has been set up as it has, but it is an issue that needs to be raised and answered—why the equalization doesn't occur after the tax rather than before it.

The other point I have to raise goes along with what Mr. Nichols had to say. I think a great deal of attention needs to be paid to the economic feasibility of widespread conversion to coal for industrial use in New England. Once fuels are priced at their true replacement cost—and that is the whole theme of the President's energy program—it seems to me that different regions of the country should use whatever fuel source is cheapest for them. This won't be the same for all regions of the country because of different transportation costs. The reason we use oil is because it is relatively cheap to transport per Btu, and we are at the end of the pipeline. Thus I am concerned about the feasibility of oil conversion to coal from oil in New England.

There is another point that has to do with this issue. Manufacturing installations in New England use less than half as many Btu's per empoyee as in the Nation as a whole. We also have a slightly smaller size average employee unit here as compared to the rest of the Nation. If you use coal and want to meet environmental standards, you have to use expensive capital equipment to make the coal clean after it is burned. Because our units are smaller and use fewer Btu's, capital cost involved in burning coal will have to be spread over a smaller base. This makes me quite skeptical about the economic feasibility of widespread coal conversion for industrial use in New England. It may well be that coal will be the best fuel to use for some applications in New England, but I just think that we don't know quite enough about it yet to commit ourselves to that course.

In summary, I think the President's program will help produce more equitable energy prices in New England as well as solve the national energy crisis, and those are two objectives that everyone interested in New England should favor. I just think there are a few technical points that we have to be very careful of, to make sure that we don't perpetuate New England's long-term disadvantage in energy prices rather than help to diminish it. Thank you.

Senator KENNEDY. Thank you, Mr. Syron.

[The prepared statement of Mr. Syron follows:]

PREPARED STATEMENT OF RICHARD F. SYRON

My name is Richard F. Syron. I am an assistant vice president and economist at the Federal Reserve Bank of Boston. I appreciate the opportunity to testify before this subcommittee concerning the potential impact of the President's energy program on New England. I must stress that the views that I am expressing are strictly my own and do not necessarily reflect the official position of the Federal Reserve Bank of Boston or of the Federal Reserve System.

The Federal Reserve Bank of Boston follows developments in the New England economy quite closely and while we are not energy experts we have done some research in the last few years on energy developments and their effect on the New England economy. Accordingly my comments will deal with the potential impact of the proposed energy program on New England's competitive position for industry. Because the linkage between energy and economic development is so strong New England has a particular interest in assuring whatever energy program is ultimately adopted does not further diminish the region's relative economic position. The information presently available indicates that President Carter's energy program

would help bring about more equitable treatment of New England's energy needs and address many issues which have been ignored for too long. There are a few questions which need to be answered however.

The 1975 recession was particularly severe in New England and there is evidence to suggest that the region is not recovering as fully as most of the nation. During the 1975 recession employment declined by 3.0 percent nationally and by 4.8 percent in New England. Since the bottom of the recession employment has increased by 5.7 percent nationally and there are substantially more Americans working now than before the recession. In New England, however, employment has increased by only 4.1 percent and the region has still not reached its prerecession employment level. In general the northern New England states have performed somewhat better than the more populous and heavily industrialized southern New England states.

One factor contributing to New England's relatively poor economic performance in the last few years is a worsening in the region's energy cost disadvantage. New England has very few indigenous energy resources and is far from most energy sources. As a result, high energy costs have been a traditional regional problem. However, there is some indication that our energy cost disadvantage had diminished somewhat before the imposition of the Arab oil embargo. Immediately following World War II manufacturing energy in New England cost twice as much per Btu as elsewhere. By 1971 this disadvantage had diminished to the point where the region's manufacturers paid only about 50 percent more per Btu than their competitors elsewhere. However this favorable trend has been reversed and according to the latest available data New England manufacturers are paying 85 percent more per Btu for manufacturing energy than their counterparts in the rest of the United States.

New England firms have adapted to their high energy costs by producing less energy intensive products and by adopting more fuel frugal techniques. As a result of this adaptation, manufacturing in New England uses about one-half as many Btu's per employee as nationally. However this does not mean that energy costs are still not an important factor to New England manufacturers. Some research we have done suggests that the differential in energy costs between New England and the rest of the United States can have an important influence on profits even in energy non-intensive industries. For example, we estimated that in 1974 energy costs were equivalent to about 2 percent of sales for nonelectrical machinery producers in New England compared to about 1 percent in the rest of the United States. A cost differential between New England and the rest of the United States equivalent to less than 1 percent of sales wouldn't seem all that important until you consider that profits before taxes average about 8 percent of sales in this industry. Thus the differential in energy costs alone between New England and the rest of the United States even in the energy non-intensive nonelectrical machinery industry is equivalent to about 10 percent of profits. New England's energy cost disadvantage is even more pronounced in more energy intensive industries such as textiles and paper.

The principal reason for the adverse turn in New England's energy terms of trade in the last few years is the difference in the mix of fuels used in New England and the rest of the United States. In the rest of the United States natural gas accounts directly for about 57 percent of all manufacturing energy, in New England that share is about 14 percent. New England manufacturers rely on petroleum products directly for almost 60 percent of their energy use whereas in the rest of the country the figure is about 22 percent. New England manufacturers also get a substantially greater share of their total energy from electricity than do their counterparts elsewhere and our utilities in turn rely heavily on fuel oil, particularly imported residual. In the period following the Arab oil embargo, oil prices set in world markets by the OPEC nations increased much faster than natural gas prices set by the Federal Power Commission.

New England's energy cost disadvantage can never be entirely eliminated; however, it can be greatly mitigated by more sensible fuel pricing policies. In advocating the elimination of the difference in cost per Btu of oil and natural gas President Carter has proposed the single most important step that can be taken to bring New England's energy costs into closer alignment with the rest of the nation. The principle of Btu equalization should be endorsed by all of those interested in this region's welfare. However, I do think there are some questions which have to be asked about the mechanism through which this principle will be applied.

Under the proposed energy program new natural gas will have a wellhead cost of $1.75 per MCF. This is somewhat less that the oil equivalency price which would result if new gas were completely deregulated. To diminish the difference in oil and gas costs to industrial users a tax would be imposed to bring gas costs up to a target level. In 1985 this target level would be the Btu equivalent of distillate oil. Thus the objective of the tax is to eliminate any cost advantage of natural gas over oil for

industrial users. However, by 1985 oil users would also be paying a $3.00 per barrel tax. Since the target cost for gas is oil equivalency before the oil tax the effect of the two programs together would perpetuate a cost advantage of gas over oil. This approach would seem to institutionalize New England's energy cost disadvantage and encourage further use of natural gas. If the objective of the program is to make industries pay the same for gas and oil consideration should be given to equalizing their after tax cost.

I also think that a great deal of attention needs to be paid to the economic feasibility of widespread coal conversion in New England. Once fuels are priced at their true replacement cost different regions should use whatever energy source is most economical for them. Because of differences in transportation costs all areas of the country will not find the same fuel mix optimal. The primary reason New England relies so heavily on oil is that we are distant from most energy sources and oil is relatively cheap to transport. The feasibility of coal conversion in New England as compared to other regions of the United States will depend a great deal on relative transportation costs. Given the expensive equipment required to burn coal and still meet environmental standards I am also concerned about the desirability of requiring new manufacturing facilities in New England to burn coal. Most New England manufacturers use relatively little energy and thus would have a small base over which to spread the heavy capital cost of coal. It may well be that coal will be the best fuel to use for some applications in New England, however, I don't think we know enough to make that decision yet.

The overall effect of President Carter's energy program will be to move us toward solving the national energy issues while at the same time reducing regional inequities in energy prices. Both of these objectives should be favored by those interested in New England's welfare. However, the program is very complex and careful attention must be paid to insure that individual aspects are consistent with its overall objectives.

Senator KENNEDY. How would you suggest we incorporate the $3 tax into the Btu base?

Mr. SYRON. I think there are two points involved. One is, when you are setting gas prices for industry—what is the proper target? Is the target distillate oil or residual oil equivalency? A lot of the research that has been done indicates that if gas were deregulated, its price would tend to rise toward distillate. If that is the case what you should do is add the $3 tax into the Btu base when you are figuring out how much oil costs per Btu, and then figure out what the gas cost should be per Btu. That would translate to about a 50 cent addition per MCF of gas.

Senator KENNEDY. Mr. O'Leary, do you understand what Mr. Syron is saying here?

Mr. O'LEARY. Yes, I sure do. I think it is something we ought to take a look at. I think he has made a point that is important. The other side of the coin, of course, is that the thing we want to do is to get people off of oil, and there is now a very strong tendency to go to oil—to shift from gas and go to oil—and we want to dampen that tendency to the extent that we can through price mechanisms. So there are two points here that have to be borne in mind and I am sure the analysts will recognize the validity of both. They are in conflict and we will have to find some way of reconciling them.

Mr. SYRON. That's right. This region's longer term problem is not that we are converting from gas to oil—we have always had the oil——

Senator KENNEDY. Maybe there is some way or mechanism of using a formula by which, if users have used it in the past, there would be some variation.

Mr. BUCKLEY. Senator, if I might —another way, Dick, to do it would be not to put the $3 tax on oil and leave the gas system the way it is. Because if you put the $3 tax on oil and also put it on

gas, then you end up with every industrial user of oil and gas at $3 above the OPEC price and you severely impede the competitive posture of American industry to be able to export to the world market because they are bearing a higher energy cost than any other industrial country.

Mr. O'LEARY. Senator, one of the things we have to bear in mind is the balancing function the industrial use of gas is going to perform in a market that is dominated by residentials. The residential load factor is very uneven. You run at 100 percent in the winter and you run at zero on a hot summer day, and you have to keep some buffering in there over and above the amount of gas that can go into storage. That is another implicit reason behind this differential that ought to be recognized when you come to a result. It isn't simply a matter of getting equality, because really we are dealing with quite different market balances.

Mr. NICHOLS. Senator, if I may for just a moment—we have been talking about a lot of taxes that are going to raise energy prices in New England and elsewhere, and I would be remiss if on behalf of the over 1 million customers we serve, I didn't publicly express appreciation for the leadership that you gave us, and Senator Brooke, and Congresswoman Heckler, gave us in gaining a share of old oil entitlements for the residual fuel oil coming into New England. This has already saved New England consumers nearly $90 million. It is currently saving at about the rate of $7 million a month, and I just wanted to say thank you for that effort to get our prices down. We appreciate it.

Senator KENNEDY. Let me just say, we got our message from you people and we got the response from Mr. O'Leary and the administration, in a very, very positive way which, at least to me has been enormously reassuring about the sensitivity of our particular problems.

I think particularly this point, which is enormously complex in terms of balancing, our region's interests, traditional use, national interest and concern about increased growth of oil vis-a-vis our international competitive status. I hope you people will work closely with Mr. O'Leary and his shop and give us some alternatives which might help to achieve their objectives the alternatives should meet some of our national objectives, but also should be fair and equitable to us and relate to the broader question of international trade, which is also a national question.

Representative HECKLER. Senator, if I might say, I think that all of those are components, but I am also concerned about the small business impact and it seems to me after listening to Mr. Nichols that the utilities, if you are representative of everyone else in the field, are perhaps the best prepared in this whole society to face the kinds of things that you are dealing with today because you have already started to assess the cost benefit ratio, your alternatives, and you already have a notice of intent on some of your plants, and so forth.

But for the industrial users—Mr. O'Leary, I am comforted by your earlier expression that you intend to try to avoid shock therapy. I can only visualize deep shock and trauma in industries in my district who would be forced almost overnight to either pay an excrutiating tax or convert, without having the potential of a

viable fuel available. Obviously you must be thinking of other alternatives in terms of this, because really this is an absurdity to tax people because they are not converting at a time when they have no other source.

Mr. O'LEARY. That is why the taxes lag. It doesn't come in as a bucket of cold water. It comes in by the drop.

Representative HECKLER. But there are so many businesses that are so marginal and staying in Massachusetts really because of family ties and old associations, we are struggling to keep our industrial base. It is a fragile economy that we are dealing with here. I hope that you will take into account what the impact in terms of costs would be on business decisions—simply close shop, go south, or retire. These things can impact very negatively for us.

Mr. BUCKLEY. If I could just add, Mr. O'Leary, I think the congresswoman is absolutely right. You are lagging until 1979, but you have to know that coal is not going to be able to carry this burden until the year 2000 even on the most optimistic assumptions. It is certainly not going to touch New England, apart from some utilities that already have coal burning facilities, by 1985.

Mr. O'LEARY. I disagree with that. I think you could make very, very substantial conversions by 1985.

Mr. BUCKLEY. Where are you going to get the coal? It is already committed.

Mr. O'LEARY. My friend, you provide the market. I'll provide the coal.

Mr. BUCKLEY. Well, the Federal Power Commission doesn't agree with you.

Mr. O'LEARY. The Federal Power Commission doesn't know anything about the subject.

Mr. BUCKLEY. They made a plant-by-plant survey nationwide of utility contracts for coal, which showed 365 million tons of the 400 million the President wants, already committed under 25-year contracts on average. That doesn't leave you much coal.

Mr. O'LEARY. Those contracts, Senator, are suggestive and really if we could get our game together, there is no reason why we shouldn't have ample coal to meet any of these requirements over this period of time.

Senator KENNEDY. I am glad we flagged this area because this is where some work will have to be done.

Representative HECKLER. Mr. O'Leary, is there an interrelationship between your agency and the Federal Power Commission?

Mr. O'LEARY. I made that comment as being the Chief of one of the Bureaus—one of the two bureaus of the Federal Power Commission for 2 years. They are very good on gas, very good on electric, but they tend to read reports when it comes to coal. They've got one fellow over there that knows anything about coal. He is very good; but institutionally, what we are getting here is a reporting system that asked the utilities, "What are your plans?" The utility writes back, "Our plan is for 365 million tons." Next year we will find a 30-million ton slip in that, so as we have found historically it is a very, very weak statistical base.

Senator KENNEDY. OK. I want to thank you very much. We have a final panel to hear from, but first we will take a short recess.

[A short recess was taken.]

Senator KENNEDY. We will now hear from a panel on nuclear and alternative energy sources. Mindy Lubber, Massachusetts Public Interest Research Group, and Harvey Halpern, of the Clamshell Alliance. Welcome.

STATEMENT OF MINDY LUBBER, STAFF RESEARCHER, MASSACHUSETTS PUBLIC INTEREST RESEARCH GROUP

Ms. LUBBER. I would like to thank Senator Kennedy for inviting us here to make our views known to you. My name is Mindy Lubber. I am a staff researcher for the Massachusetts Public Interest Research Group, a State-wide Ralph Nader inspired, environmental, and consumer protection group. I am testifying here today on behalf of the Massachusetts PIRG as well as Friends of the Earth.

I would like to pay high compliments and praise to President Carter for most of the central concepts outlined in his energy plan, a program I feel was designed to offset our ever apparent energy crisis, by rewarding consumers with tax breaks, credits, and rebates. Further, I would like to very much applaud the President's attempts to develop alternative energies, such as the Sun. He expressed and I qoute, "The use of nonconventional sources of energy must be vigorously expanded."

Massachusetts and New England particularly are in need of the development of these alternative energy sources. Massachusetts consumers spend $1.4 billion per year for fuel to heat their homes and buildings and their water. That is 35 percent, or almost twice the Nation's average of total energy consumption in this State.

I would like to look at the application of Carter's 10th principle, what it would mean to New England and Massachusetts and would like to address five points.

The first point I would like to address is the tax credit, minor modifications I think we might need, and the entire provision. President Carter's plan for a residential tax credit could aid the Northeast by stimulating solar industries and providing an incentive for consumers to install current solar technology. I would like to stress the importance of the tax credit being implemented now, today, or as soon as possible. What we are finding, I think, is a decline in the solar industry. The solar industry has come to a small depression. People are waiting for tax credits. I think it is important that this declining retroactive tax credit be recognized and be implemented to turn around that slow-down in the solar industry.

Two specifics of the residential tax credit I would like to address will need modification, and I suggest that, Senator Kennedy, your subcommittee try to look into these further and I will give you what we feel is important.

First this tax credit might not be adequate for retrofitting of homes since existing homes have disadvantages over new homes for adapting to solar energy. Our State, here in Massachusetts, and other States in New England, have an adequate housing stock so we need to proliferate the solar industry by bringing solar to the older houses. There is little hope for too much housing that will be new to this area. Therefore we must concentrate on the benefits of the retrofitting of our older homes. There is no standard course for

retrofitting. I don't believe there have been any studies into looking into how much greater the cost is to retrofit an older home. Therefore to insure the proliferation of the solar industry in New England we must give some special consideration to those existing homes that lack the capability to acquire less expensive solar heating systems integrated into the construction and design. I ask Senator Kennedy and the subcommittee to be aware of this and possibly pursue it, if they feel the same way we do.

The second modification needed, relative to the residential tax credit, is the definition of residential building. Referring to President Carter's utility programs definition, the term residential building is defined to mean any building developed for residential occupancy which contains no more than two dwelling units. Most other housing legislation defines residential as one to four dwelling units. This point I believe is especially significant in New England and Massachusetts particularly since we have a large number of three family, owner-occupied dwellings, which obviously would not be covered under these residential guidelines. Again I ask the subcommittee to further study that, but I believe that is the case.

Speaking to the second point important to the application of the Carter's 10th principle, the legislation lacks specific provision for three essential programs. One, consumer education; two, training for technicians and plumbers; three, citizen participation.

Consumer education must be a priority with nationwide efforts made by the Federal Government through the media to familiarize the public with solar energy systems. We have recently completed a solar energy study addressing the public opinion of those residents of Massachusetts and what they feel about solar energy. Our findings were that there are incredible misconceptions throughout the State as to what people feel about solar energy. The average group of residents don't feel that it is possible for New England. They are not about to buy a solar system when they don't understand that it is a reality here and it is possible in our State.

I believe that a consumer education program, and it should be a priority for the immediate future, to begin the proliferation of our solar industry must be put forth now through the media to familiarize the public with those solar energy systems. This could aid the Northeast by creating an awareness amongst the population of the nature, benefits, and limitations of this energy source.

To go on further, I feel that President Carter must establish a mechanism to encourage citizen participation in the energy policy process.

To turn to the next application point, establishing standards and certifications. The legislation describing President Carter's package, describes solar energy systems and asks that they be in conformity with such criteria and standards as shall be prescribed by the Secretary in consultation with the administration of the Federal Energy Administration. I would like to ask that the standards be set up now, to restrain those solar charlatans who according to the Wall Street Journal in an article of last week or the week before, are already preying on the unaware consumers. These regulations can help stimulate a reliable solar industry within the region by development of appropriate standards and certification.

The fourth point I would like to make is State laws. I believe President Carter urged the States to enforce State property taxes and solar right laws. Most Northeastern States have begun to deal with these problems. Yet, as usual, the legislative wheels are slow to turn. Early solution could aid the increased use of solar energy throughout the region. Therefore we urge the President to speak out on these two matters with vigor and frequency.

Finally, we ask that this legislation provide adequate funding for development of solar energy. If the consumer is to have access to lower cost solar equipment, the Federal Government must allocate adequate money to solar research and development. Research must be done on solar applications which are specifically tailored to the unique conditions of New England.

This five point platform supplementing and amplifying the President's stated commitments can make a substantial difference in turning the country away from the scarce fossil fuels and nuclear power and for its clean renewable sources. With the President's consistent and determined leadership and the Congress' commitment to an orderly, comprehensive adequately funded solar program, we can harness the Sun's limitless energy potential safely, productively, and economically, not 3 decades hence, but almost immediately, and make the light of day save us from an energy crisis that we can no longer wish away. Thank you.

Senator KENNEDY. Thank you.

[The prepared statement of Ms. Lubber follows:]

PREPARED STATEMENT OF MINDY LUBBER

My name is Mindy Lubber. I'm a staff researcher for the Massachusetts Public Interest Research Group (Mass. PIRG), a statewide, Nader-inspired environmental and consumer protection group. I am testifying today on behalf of Mass. PIRG and Friends of the Earth, a nationwide environmental lobbying group with sister organizations in eleven foreign countries. We appreciate this opportunity to make our views known to you.

High compliments and praise are deserved for most of the central concepts outlined in President Carter's Energy Plan, a program designed to offset our ever apparent energy crises by rewarding with tax breaks, credits and rebates those people who conserve energy and who move toward alternative energy systems. Further, we applaud the President's attempts to develop alternative energies, such as the sun, as expressed in his 10th principle, and I quote: "that the use of nonconventional sources of energy must be vigorously expanded. Relatively clean and inexhaustive sources of energy are a hopeful prospect as supplements to conventional energy resources in this century, and as major sources of energy in the next. Many of these sources permit decentralized production, and thus provide alternatives to large, central systems. Traditional forecasts of energy use assume that nonconventional resources, such as solar and geothermal energy, will play only a minor role in the energy future. Unless positive and creative actions are taken by Government and the private sector, these forecasts will become self-fulfilling prophesies".

Massachusetts and New England are particularly in need of the development of alternative, nonconventional energy resources. Massachusetts consumers spend $1.4 billion per year for fuel to heat their homes, their buildings and their water. Thirty-five percent (or almost twice the nation's average) of the total energy consumption in this state is for space heating. Therefore it is particularly essential that the state actively explore alternatives to fossil fuels and ascertain the economic and technical feasibility of these alternatives.

Let us look at what the application of Carter's tenth principle would mean to New England, and I would like to address five points:

Emphasis on and minor modification of the residential tax credit provision.

A program for training plumbers and technicians and programs for consumer education and participation.

Establishing standards and certification.

A stronger statement urging state laws.

Emphasis on adequate funding for research.

President Carter's plan would provide a residential tax credit which would aid the Northeast by stimulating local solar industry and providing an incentive for consumers to install current solar technology. The use of solar energy as a source of residential water heating and space conditioning is estimated as nearly competitive with other sources because of New England's climate and high energy costs.

The importance of this declining retroactive tax credit must be recognized to turn around the temporary slowdown in the solar industry. Immediate legislation is needed for homeowners awaiting tax credits from the federal government.

Two specifics of the residential tax credit, however, will need modification if the credit is to benefit the metropolitan areas of New England.

First, this tax credit might be inadequate for retrofitting existing homes, since existing homes have disadvantages over new homes for adapting to solar energy use. With adequate housing stock in New England, there is little hope for too much new housing, therefore we must concentrate on the benefits of retrofitting older homes. There is no standard cost for retrofitting, but the costs are often higher than a new system might be expected to cost. Therefore to insure the proliferation of the solar industry in New England, we must give special considerations to those existing homes that lack the capability to acquire less expensive solar heating systems integrated into construction and design.

The second modification needed relative to the residential tax credit is the definition of "residential building". Referring to President Carter's utility program's definitions, the term "residential building" is defined to mean any building developed for residential occupancy . . . which contains no more than two dwelling units. Most other housing legislation defines residential as one to four dwelling units. This point is especially significant for New England since we have a large number of three family owner occupied dwellings which would not be covered under the residential guidelines.

Speaking to the second point important to the application of Carter's tenth principle, the legislation lacks provision for three essential programs: consumer education, citizen participation, and training for technicians and plumbers. Consumer education must be a priority, with nationwide efforts made by the federal government through the media to familiarize the public with solar energy systems. This could aid the Northeast by creating an awareness amongst the population of the nature, benefits and limitations of this energy source.

Further, this legislation has no specific program for the training of technicians and plumbers who will be expected to install solar systems. This gap could be filled by working either with the HVAC (the Heating, Ventilating and Air Conditioning Industry) to set up a training program, or with the Energy Extension Service, a federally funded informational program which funds the states to develop information and training for various energy projects such as those in the solar energy program. If the energy extension service is not given the mandate to do this, we suggest something else be set up that will serve this function.

The third needed program is to establish a mechanism to encourage citizen participation in the energy policy making process.

Now to turn to the next application point—establishing standards and certification—the legislation describes solar energy systems and asks that they be in conformity with such criteria and standards as shall be prescribed by the secretary in consultation with the administration of the Federal Energy Administration. We ask that standards and certification be drawn up with all due speed to restrain those solar charlatans, who according to the Wall Strreet Journal are already preying on the unaware consumer. These regulations could help stimulate a reliable solar industry within the region by development of appropriate standards and certification and training mechanisms.

The fourth point—state laws—is one that needs stronger statement. Carter's energy program urges states to enact laws providing solar property tax exemptions (which Massachusetts already has), and clarifying solar access rights. Most Northeastern states have begun to deal with these problems. Yet, as usual, the legislative wheels are slow to turn. Early solution could aid the increased use of solar energy throughout the region, therefore we urge the President to speak out on these two matters with vigor and frequencey.

And finally, this legislation must provide adequate funding for developing solar energy. If the consumer is to have access to low cost solar equipment, the federal government must allocate adequate money to solar research and development. The solar budget must be larger if we want President Carter's proposition #10 to see the light of day. The small increase in the allocation for solar energy this year ($183.1 million to $249 million) is not enough to nurture this industry's successful develop-

ment. New England must be considered as the prime area for the Solar Research Subsidiary facility presently being considered. Research must be done on solar applications which are specifically tailored to the unique conditions of New England. Greater concentration of effort should be given to reducing costs since cost reduction is a major requirement for expanded solar use.

Our five-point platform supplementing and amplifying the President's stated commitments can make a substantial difference in turning the country away from scarce fossil fuels and nuclear power and toward clean, renewable sources. With the President's consistent and determined leadership, and the Congress's commitment to an orderly, comprehensive, adequately funded solar program, we can harness the sun's limitless energy potential safely, productively, and economically not three decades hence, but almost immediately. May the light of day save us from an energy crisis that we can no longer wish away.

Senator KENNEDY. Now, Mr. Halpern.

STATEMENT OF HARVEY HALPERN, BOSTON CLAMSHELL, CLAMSHELL ALLIANCE

Mr. HALPERN. Thank you, Senator. As you know, I am with the Boston Clamshell, a member of the Clamshell Alliance. On April 30 over 1,800 of us, 1,800 citizens of New England, followed the path of their conscience as they nonviolently occupied the site of the proposed Seabrook Nuclear Plant. Knowing full well that our actions could result in the loss of our freedom and a possible criminal record, we nevertheless put our bodies in the way of a nuclear plant. Why?

Why should 1,800 of us feel this strongly? We look at the facts of nuclear energy and we get a very clear answer why.

Utility companies would like the public to think that the danger of nuclear plants starts and stops at the gates of the plantsite. On the contrary, nuclear powerplants are only one step in the nuclear fuel cycle and many of the greatest dangers occur along the way.

First uranium must be mined. This operation has increased lung cancer rates in certain miners up to 2,400 percent, depending on the cumulative exposure. It must then be transported to a milling site. It must be milled. Then this uranium is transported again. It is transported to enrichment sites. Enrichment is an incredibly energy intensive operation. There is one enrichment plant in Ohio that uses 10 percent of Ohio's energy.

Then we have uranium oxide being transported again. This time to a fuel fabrication plant. It is inserted into fuel rods and transported again. This time to the powerplant. They then remove the used fuel rods, insert the new ones, and then they transport the used ones into cooling ponds because these contain very hot—both radioactively and thermally—wastes.

The next step is transportation to reprocessing plants. At least that is the theory. As you know the theory and the cycle is broken down because there are no commercial reprocessing plants in the country now, and according to President Carter there won't be any.

Now we are presented with high level wastes, wastes which theoretically can be separated from each other. But without a reprocessing plant, a very dangerous reprocessing plant, that won't happen.

You may have noted that between each step of the nuclear fuel cycle there is transportation and there is, of course, a danger of transportation accidents. At every point along the line there is also the chance of floods, hurricane, et cetera, and the likelihood of

human error, all capable of unleashing health hazards of incalculable risk. Consider the Atomic Energy Commission's estimate that the controversial breeder program would require 100,000 shipments of plutonium annually. President Carter has come out against the breeder reactor, but in favor of conventional uranium reactors, which still necessitate transportation at each and every point in the nuclear fuel cycle.

Here in New England we saw and were horrified by a transportation accident involving 6 million barrels of oil, because of human incompetence and shoddy equipment. If that had been but 60 kilograms of plutonium which represents approximately one-third of the plutonium waste generated each and every year by the proposed reactor for Seabrook, we would have seen a disaster which instead of threatening George's Bank would threaten all human life on the Northeast seaboard. This would not be a spectacular ending for us all, such as a nuclear explosion, but it would cause lung cancer mortality rates to skyrocket after a latent period of between 10 and 20 years.

The frequent transportation of deadly radioactive materials and waste is but one of the problems of nuclear power. After the waste has been transported, how and where can it be stored? Every year a thousand MW nuclear reactor produces as much high level radioactive waste as 1,000 Hiroshima size atomic bombs. These wastes include plutonium 239, a substance that is frightening not only because it is the most carcenogenic substance known, but also because it lasts virtually forever. With a half life of 24,600 years, plutonium must be stored and stored perfectly for a half million years. Perfection is required because only one-millionth of a gram of plutonium is needed to induce a fatal lung cancer, that is if it is inhaled.

If plutonium escapes into the biosphere, it threatens life on this planet as we know it. Dr. John Goffman has calculated that if only 0.01 percent of the 440 million pounds of plutonium that could be produced by 2020 in commercial reactors—the results would be 25,750,000 lung cancer fatalities each and every 50 years for the next quarter of a million years. That alone is fairly frightening. What hope is there that the nuclear industry or the U.S. Government can store these to that degree of perfection?

In the military waste storage facility in Hanford, Wash., there have been leaks totaling a phenomenal 537 gallons of high level waste. Of course this is not too surprising as this waste which will have to be stored for thousands of years is presently stored in steel tanks designed to last 30 to 50 years. That is according to the Atomic Energy Commission.

Let me return for one moment to what is to many of us the most frightening aspect of waste storage. It must be forever. With production of waste such as plutonium 239, we threaten all of our future generations' health and existence for an expensive energy source that could be replaced by clean, renewable energy sources. How will we store these poisons? No one knows. That includes the Government.

How can we guarantee that they won't enter the biosphere at all for the next one-half million years? No one will and no one can guarantee this.

The list of dangers from nuclear plants themselves includes more than the real danger of a major plant accident. For instance, nuclear powerplants constantly release low dose radiation and as the U.S. sponsored BIER Report—"Biological Effects of Ionizing Radiation"—there is no safe lavel of radiation, no matter how small. Any dose a person receives increases their chances of getting cancer.

Mr. John Goffman has estimated that if we all received our legal permissible dose, that means 32,000 extra cancer fatalities each year. Now, utilities will argue that people won't ever receive this amount of radioactivity. Yet, they have lobbied extensively against any reduction in permissible dose for the general population. Perhaps they realize the difficulty and expense in meeting lowered standards when there are 1,000 nuclear plants that are spread across the face of our country.

The issue of plant safety itself is still largely a question of probabilities. The Rasmussin Report was computed after only 927 reactor years and without any attempt to include terrorism, acts of God, or perhaps more importantly as we have seen, the ever incurring human error which has accounted for such disasters as the $150 million Browns Ferry Fire. Yet that same report predicts a major disaster every 10 years if we allow 1,000 reactors to be built. However, the people of America and the people of New England won't allow the construction of 1,000 nuclear plants. The large health hazard strike against nuclear plants would alone be enough to mobilize citizens across the country against Nukes, but safety is not the only issue. On the contrary, nuclear power is an economic disaster as well. It produces far fewer jobs than any other form of producing energy. For instance, Boston Edison's oil-fired West Medway Plant produces 6.3 times as many jobs per kilowatt hour as Boston Edison's Pilgrim 1 plant. Conservation is our No. 1 job producer per unit of energy and we feel it is unlikely that the workers of this country, once they have been told the facts, will allow us to spend billions of dollars on capital intensive nuclear plants.

Nuclear power is bad for consumers as well as for workers. Consumers will end up having to pay higher electricity rates if utilities continue building nuclear plants. Construction costs have increased 1,000 percent since 1964, while the consumer price index has risen only 77 percent during that same period. The price of uranium has gone up from $7 a pound in 1973 to over $50 presently, another increase passed on to an already overburdened consumer.

In addition to safety and economic problems, nuclear power presents severe threats to the principles of democracy upon which this country is founded. Plutonium in the hands of terrorists could become a weapon of devastating potential. In event of the threat of nuclear terrorism, authorities would have no choice but to dispense with civil liberties.

Unsafe, unnecessary and uneconomical plants such as the $2 billion Seabrook disaster are clearly unacceptable to the people of New England for a variety of very convincing, very frightening reasons. Many of us feel strongly enough to put our freedom on the

line in order to stop the nuclear insanity. Many more are beginning to feel this way.

Seabrook will not be built. Pilgrim 2 will not be built. The citizens of this country will not allow it. That is how the Boston Clamshell and the Clamshell Alliance and many people across New England feel about nuclear power, that we cannot allow it to continue. Not a single plant. Not another single plant to be built. Thank you.

Senator KENNEDY. Thank you, Mr. Halpern.

[The prepared statement of Mr. Halpern follows:]

PREPARED STATEMENT OF HARVEY HALPERN

Boston Clamshell Statement on Nuclear Power

On April 30th over 1,800 people followed the path of their conscience as they nonviolently occupied the site of the proposed Seabrook Nuclear Plant. Knowing full well that their actions could result in the loss of their freedom and a possible criminal record, these people nevertheless put their bodies in the way of nuclear power. Why? Why should 1,800 of us feel this strongly? A look at the facts on nuclear energy supplies the answers.

Utility companies would like the public to think that the danger of nuclear plants starts and stops at the gates of the plant site. On the contrary, nuclear power plants are only one step in the nuclear fuel cycle, and many of the greatest dangers occur along the way.

First, uranium must be mined—an operation which has increased lung cancer mortality in miners by up to 2400 percent, [1] depending on cumulative exposure. Second, this uranium ore must be milled, a process that isolates about four pounds of uranium oxide in each ton of ore, leaving residues called tailings which contain radioactive radium. Homes and schools have been built from such tailings in Grand Junction, Colorado, showering their inhabitants with increased radiation. Third, the uranium oxide must be transported to an enrichment plant because the "reactive" isotope (uranium 235) comprises only 0.7 percent of naturally occurring uranium, while reactors require 3 to 4 percent uranium 235. The enrichment process is tremendously energy intensive—a single enrichment plant in Ohio consumes 10 percent of that State's total electricity.

After enrichment this uranium oxide is transported again, this time to fuel fabrication plants where it is shaped into ceramic pellets and sealed into metal fuel rods. Once again, radioactive materials must be transported, this time to the reactor site where the reactor is shut down to replace used fuel rods. These used rods are tremendously hot both radioactively and thermally. They too must be transported to concrete cooling ponds for periods of up to a year. The next step is transportation to reprocessing plants. No commercial reprocessing plants exist, however, so the cycle comes to pieces here. Now we are presented with these high level wastes, such as plutonium 239, cesium 137 and strontium 90, which theoretically would be separated from each other and then transported again to either permanent storage or back again to a fuel fabrication plant. You may have noted that between each step of the nuclear fuel cycle there is the danger of transportation accidents. At every point along the line there is also the chance of floods or hurricanes and the likelihood of human error, both capable of unleashing health hazards of incalculable risk. Consider the AEC estimate [2] that the controversial breeder reactor would require 100,000 shipments of plutonium annually. President Carter has come out against the breeder reactor but in favor of conventional uranium reactors, which still necessitate transportation at each and every point in the nuclear fuel cycle. Here in New England we saw and were horrified by a transportation accident involving 6 million barrels of oil because of human incompetence and shoddy equipment. If that had been 60 kilgrams of plutonium, which represents approximately one third of the plutonium waste generated yearly by the proposed reactor for Seabrook, we would have seen a disaster which instead of threatening the Georges Bank would threaten all human life on the northeastern seaboard. This would not be a spectacular ending for us all, such as a nuclear explosion, but would cause lung cancer mortality rates to skyrocket after a latent period of 15 to 20 years.

See footnotes at end of statement.

The frequent transportation of deadly radioactive materials and wastes is but one of the problems of nuclear power. After the waste has been transported, how and where can it be stored? Each year a 1000 megawatt nuclear reactor produces as much high-level radioactive waste as 1000 Hiroshima-sized atomic bombs. These wastes include plutonium 239, a substance that is frightening not only because it is the most carcinogenic substance known, but also because it lasts virtually forever. With a half life of 24,600 years plutonium must be stored—and stored perfectly!—for half a million years. Perfection is required because only one millionth of a gram of plutonium is required to induce a fatal lung cancer. If plutonium escapes into the biosphere, it threatens life on this planet as we know it.

Dr. John Gofman, formerly of the AEC's Lawrence Livermore Laboratories, has calculated [3] that if only 0.01 percent of the 440 million pounds of plutonium that will be produced by 2020 escaped, the results would be 25,750,000 lung cancer fatalities each and every 50 years for the next quarter of a million years. That alone is fairly frightening—but what hope is there that the nuclear industry or the US government can store these to that degree of perfection? Of the industry Robert Gillette of Science magazine has noted: "The record reveals a dismal repetition of leaks in glove boxes; of inoperative radiation monitors; of employees who failed to follow instructions; of managers accused by the AEC of ineptness and failing to provide safety supervision or training to employees; of numerous violations of federal regulation and licensing requirements; of plutonium spills tracked through corridors, and in half a dozen cases, beyond plant boundaries . . . " [4]

The record of the government is perhaps even more frightening. In the military waste storage facility in Hanford, Washington, there have been leaks totaling a phenomenal 537,000 gallons of high level wastes between August 1958 and July 1973.[5] This is not too surprising as this waste—which will have to be stored for thousands of years—is stored in steel tanks designed to last 30 to 50 years, according to the AEC. Strontium 90 produced by the year 2000 from commercial reactors alone would require approximately one fortieth of all the water on the earth to dilute to "theoretically safe" levels.

Let me return to what is for many of us the most frightening aspect of waste storage—it must be forever. With the production of wastes such as plutonium 239 we threaten all of our future generations' health and existence for an expensive energy source that could be replaced by clean renewable energy sources. How will we store these poisons? No one knows. How can we guarantee that they won't enter the biosphere at all for the next one half million years? No one will, no one can.

The list of dangers from nuclear plants themselves includes more than the real danger of a major plant accident. Nuclear power plants are engineered to routinely release into the atmosphere twenty-eight different radionuclides. In addition, unplanned releases happen frequently. For instance, the Vermont Yankee plant dumped 83,000 gallons of radioactive water into the Connecticut river last July.[6] During the first few months of 1976 there were 56 unplanned releases [7] from commercial reactors in the US. Nuclear plants constantly release low dose radiation and, as the US-sponsored BEIR (Biological Effects of Ionizing Radiation) report stated, there is no safe level of radiation, no matter how small. Any dose a person receives increases their chances of getting cancer. Dr. John Gofman has estimated that if the entire population were to receive their legally permissable dosage of radiation from nuclear plants, an additional 32,000 [8] people would die each and every year from cancer. Utilities argue that people won't ever receive this amount of radioactivity, yet they have lobbied extensively against any reduction in permissable dose for the general population. Perhaps they realize the difficulty and expense in meeting lowered standards when there are 1,000 nuclear power plants spread across the face of our country.

The issue of plant safety is still largely a question of probabilities. The Rasmussen report was computed after only 927 reactor years without any attempt to include terrorism, acts of God or, perhaps most importantly, the ever-occurring human error which has accounted for such disasters as the $150,000,000 Browns Ferry Fire. Yet the report predicts a major disaster every 10 years, if we allow 1,000 reactors to be built.

However, the people of New England and America won't allow the construction of 1,000 nuclear plants. The large health hazard strike against nuclear plants would alone be enough to mobilize citizens across the country against nukes, but safety is not the only issue. On the contrary, nuclear power is a economic disaster as well. It produces far fewer jobs than any other form of producing energy. For instance, Boston Edison's oil-fired West Medway plant produces 6.3 times as many jobs per

See footnotes at end of statement.

kilowatt as Boston Edison's Pilgrim I nuclear plant.[9] Conservation is our number one job producer per unit of energy and we feel it is unlikely that the workers of this country, once they have been told the facts, will allow us to spend billions of dollars on capital intensive nuclear plants.

Nuclear power is bad for consumers as well as workers. Consumers will end up having to pay higher electicity rates if utilities continue building nuclear power plants. Construction costs have increased 1,000 percent since 1964 while the Consumer Price Index has risen only 77 percent during the same period. The price of uranium has gone up from $7 per pound in 1977 to over $50 presently—another increase passed on to an already-overburdened consumer.

In addition to safety and economic problems, nuclear power presents severe threats to the priciples of democracy upon which this country is founded. Plutonium, in the hands of terrorists, could become a weapon of devestating potential. In the event of threats of nuclear terrorism, authorities would have no choice but to dispense with civil liberties.

The NRC's Barton report explains: "Increased public concern with nuclear terrorism, coupled with the possibility of greatly increased use of plutoniun in civilian power reactors, are leading the US Nuclear Regulatory Commission to consider various forms of intensified safeguards against theft or loss of nuclear materials and against sabotage (of nuclear plants). The intensified safeguards could include a nationwide guard force, greater surveillance of dissenting poitical groups, area searches in the event of a loss of materials and the creation of new barriers of secrecy around parts of the nuclear programs." [10]

Unsafe, unnecessary and uneconomical plants such as the $2.0 billion Seabrook disaster are clearly unacceptable to the people of New England for a variety of very convincing, very frightening reasons. Many of us feel strongly enough to put our freedom on the line in order to stop the nuclear insanity. Many more are beginning to feel this way. Seabrook will not be built. Pilgrim II will not be built. The citizens of this country will not allow it.

FOOTNOTES

[1] United Nations Scientific Committee on the Effects of Atomic Radiation, "Ionizing Radiation: Levels and Effects. Volume II," United Nations, New York, 1972.
[2] Atomic Energy Commission Proposed Final Environmental Statement for Liquid Metal Fast Breeder Reactor Program. WASH—1535. December 1974, p. 7.4-1.
[3] Dr. John Gofman, "Estimated Production of Human Lung Cancers by Plutonium from Worldwide Fallout." Committee for Nuclear Responsibility, Inc. July, 1975.
[4] Robert Gillette, "Plutonium (1) Questions of Health in a New Industry," Science, September 20, 1974, pp. 1030–1031.
[5] Robert Gillette, "Radiation Spill at Hanford: The Anatomy of an Accident," Science, August 24, 1973. Volume 181, No. 4101.
[6] New York Times, July 22, 1976.
[7] Nuclear Regulatory Commission Accidental Release Data, 1976.
[8] Congressional Record, Volume 120, No. 147.
[9] Boston Edison Annual Report, 1975.
[10] John Barton (for the N.R.C.): "Intensified Nuclear Safeguards and Civil Liberties," 1975.

Senator KENNEDY. Tell me a bit about how you see the solar coming in? What is your time frame in terms of meeting needs here?

Mr. HALPERN. The way we visualize solar is decentralized solar systems. Rather than using solar power to creat electricity with large centralized powerplants which is still economically questionable, although they would be very labor intensive, we see a decentralized solar, heating and cooling of buildings. That's the major use of energy in America—it goes to the heating and cooling of water. Solar power is here today. The technology is here today to do that. We can heat and cool a great percentage of the energy we need—the heating and cooling energy we need in America right now with the technology that exists today. What is needed is the pushing for decentralized solar power. Of course there is not a great lobby behind that. The utilities don't like that. Exxon doesn't like that. No one can own the Sun. Decentralized power is hard to monopolize. Yet that is what seems to be necessary in our minds as

far as solar power goes. We would like to see the Government really pushing that.

Senator KENNEDY. You have seen that FEA study of what would be available in terms of solar energy by 1985?

Mr. HALPERN. Yes.

Senator KENNEDY. Does that conform with what you estimate as to the amount that could be made available?

Mr. HALPERN. Well, we are much more interested in what the American Institute of Architects and Amory Lovins, a physicist with Friends of the Earth have come up with—what decentralized solar power can do. They talk about between conservation and solar power, saving 4 to 6 billion barrels of oil a year by 1990, as well as producing 2 to 3 million jobs annually.

Senator KENNEDY. What is your assessment of Carter's program in terms of decentralization of solar energy? Do you have any reaction to that?

Mr. HALPERN. I've got a few reactions to Carter's program. Many of the things I applauded. However, President Carter seems to be going back on what he said about nuclear reactors. He is pushing for light water reactors. I have heard figures from between 200 and 400 by the year 2000. Totally unacceptable. He does not seem to have pushed decentralized solar as far as it could be. We have talked mainly about private homes, and there are a great number of poor people in this country who don't own private homes. Many of us in cities don't own private homes. We need decentralized solar and insulation which will talk to our problems. President Carter did not say anything about mass transit.

Mass transit is necessary if this country is to save energy. It is all well and good to talk about smaller cars, but unless you talk about people coming together and using mass transit, you are really not talking about significant energy savings.

Representative HECKLER. I want to know whether you are equally opposed to the light water reactor as you are to the breeder reactor? Is your opposition the same to both, even though they do involve different processes?

Mr. HALPERN. They do involve different processes. Both produce waste. Both produce plutonium. In any case, you are going to have material that has to be stored for a quarter to a half million years, which we have no way of guaranteeing that that will happen. We are totally opposed to all nuclear powerplants, light water, and plutonium breeders. And personally I am more opposed to plutonium breeders because they are totally insane. They have a chance of actually having a nuclear explosion. That is not possible in the uranium reactor, as you know. But it is possible in the plutonium breeder. The breeder program is absolute insanity and Carter has seen that—President Carter has seen that.

A lot has been said about nuclear proliferation and it seems to me that people are attempting to persuade the public that if we get rid of the breeder program, if we don't have reprocessing, we have eased off on the problem of proliferation. That just doesn't look at the facts.

The separation of plutonium from the other transuranics and the other waste materials is a simple chemical process. To make factories which do it that are safe is difficult. But we have already

seen India, which was not sold the reprocessing plant, produce its own atomic bomb. It did not have a breeder reactor. It was not sold a reprocessing plant. So to try to convince the public that by getting rid of the breeder program, by not selling reprocessing plants, you've gotten rid of the nuclear proliferation, is just totally wrong and historically that is not the case, and if you look at the science involved, that's not the case.

You might also be interested to know that today the remaining 550 people incarcerated in New Hampshire are getting out.

Senator KENNEDY. I want to thank you. It was very good testimony. Tell me just a little bit about your own background.

Mr. HALPERN. I did cancer research at Tufts Medical Center about a half mile away from here for a couple of years, but I switched over to become a full-time antinuclear activist because I thought if we really wanted to cut down on cancer rates in this country, that that was the most important way of doing it.

Senator KENNEDY. Were you in medical school, or a researcher?

Mr. HALPERN. I was assistant to Dr. Henry Wortis at the Pathology Department, Immunology Research.

Ms. LUBBER. I have recently finished graduate school and am working full time as a staff person with the Massachusetts Public Interest Research Group. Throughout college and graduate school I worked as a student with PIRG's as they are across the country, and felt that could make a very sufficient impact on this country's policy and enjoy the chance of being able to do it full time.

Senator KENNEDY. Thank you all very much for coming.

The subcommittee will stand adjourned.

[Whereupon, at 12:30 p.m., the subcommittee adjourned subject to the call of the chair.]

97-013 O - 77 -- 9

APPENDIX

DAYSTAR CORP.,
Burlington, Mass., May 12, 1977.

Senator EDWARD M. KENNEDY,
U.S. Senate, Washington, D.C.

DEAR SENATOR KENNEDY: Daystar Corporation is a major supplier of solar energy equipment in New England and is now marketing throughout the eastern half of the United States. Our primary market outlet is a network of independent dealer/installers. As the East Coast dealer marketing representative for Daystar, I am sensitive to the residential, small commercial, and small industrial markets. Within these markets, some of the motivations for buying solar energy equipment include energy conservation, ecology, public relations, and social status. However, by far the largest motivating factor is economics: energy dollars saved compared to solar installation and operating costs.

The solar industry and potential solar consumers waited with anticipation for the President's Energy Message. The solar portion of the new policy was well received. However, the question of effective dates for financial incentives has seriously disturbed solar equipment manufacturers, dealer/installers, and potential consumers. Wherever economics is a major factor in the buyers' decision, purchases will be postponed until the eligibility date question has been answered. Therefore, the announcement of financial incentives to solar buyers without the clarification of eligibility dates may actually drive small manufacturers and solar retail establishments out of business.

May I respectfully suggest that the legislation being considered, which will offer financial incentives to purchasers of alternate energy equipment and conservation measures, include retroactivity at least as far back as January 1, 1976. It would seem unfair to exclude those individuals and businesses which have been conserving our precious natural resources even before the incentives were mentioned. Whatever the eligibility date chosen, it should be published as quickly as possible, in order to get the solar marketplace in gear again.

Very truly yours,

BARRY TEPPER,
Dealer, Marketing Representative.

SOLAR SOLUTIONS, INC.,
CONSULTATION IN ENERGY CONSERVATION,
SUDBURY, MASS., *May 12, 1977.*

Senator EDWARD M. KENNEDY,
U.S. Senate, Washington, D.C.

DEAR SENATOR KENNEDY: This letter is to express our deep concern over the implications of the President's energy package for the solar industry in Massachusetts, particularly for those of us involved in the "commercialization" of solar energy.

We are of course pleased with the much needed boost to sales that the proposed legislation could provide. However, the fact that there has been no firm clarification of whether or not the tax credits will be retroactive has already had a disastrous effect. The public, quite understandably, has decided to defer solar purchases until such time as a tax credit or rebate is assured. Well meaning though it may be, therefore, the federal tax incentive could end up being the death blow to many firms such as ours.

Solar should be a growing industry in Massachusetts, a state ideally suited to both its technical development and its commercialization. Potentially it could provide not only sorely needed jobs for our area, but also clean, renewable energy. It

will be tragically ironic if the government's first efforts to support solar energy for the homeowner put us and others like us out of business through lack of clarification of policy.

What is needed is a clear statement from you now that the proposed solar legislation will not only pass in this session of Congress but will definitely be retroactive to April 20, 1977. Such a statement would help us to get solar installations started in the spring and summer when they are practical. Without it, a year will be lost when time is precious, both to us and a country in need of new sources of energy.

I urge you to use your offices to reassure the public at this critical time. Please call on us if we can be of any assistance whatsoever.

Yours sincerely,

LEW F. BOYD,
President, Solar Solutions, Inc.

STATEMENT OF K. HEINZ MUEHLMANN ON THE NATIONAL ENERGY PLAN

Before going into some of the details of the Carter Energy Plan, we would like to briefly comment on what we like about the Plan itself.

The two major underlying concepts, Conservation and Price Equalization, will definitely reduce Massachusetts' competitive disadvantage in the energy area. Massachusetts, along with the entire Northeast, has been forced into major conservation efforts mainly due to the fact that our economy is heavily dependent on imported petroleum products whose prices cannot be controlled.

While the rest of the nation even today is still substantially sheltered from normal market forces by federal price controls, our consumers and industries have benefited little from these controls. In short, with the exception of a small segment in our economy, consumers and businesses alike have adjusted to the fact that "cheap" energy is a distant thing of the past.

A national energy policy which is designed to reduce and ultimately eliminate subsidization of energy nationwide will also reduce the present large cost differential between energy users in Massachusetts and the rest of the nation. Since we are painfully aware that our economic growth has been reduced as a result of our high cost of energy, President Carter's energy program will definitely be an economic plus for this State and our region in general.

It is our hope that despite all of the fine print and the prolonged interference with free market forces, our national energy policy will be flexible enough to allow each region to develop its own least expensive forms of energy that meet regional needs. Only in this manner will scarce resources be allocated for the benefit of the entire economy of this country. We think that if Massachusetts can freely compete for energy in the national and international market our own economy will find its best competitive industrial mix to provide the job growth which is needed for a secure economic future.

And now some observations on specific program ingredients. In the area of conservation proposals: Massachusetts will be affected less adversely in most instances since Massachusetts drivers consume less gasoline per capita than their national counterparts. Our automobile population is already more heavily geared toward smaller cars and our buildings are more energy efficient, etc. As to the effect of new pricing policies for oil, gas and petroleum products—even though the program will result in higher product costs in Massachusetts—which will be hard to swallow—our cost increases will be substantially less than those in other regions and states.

Our greatest concern is the proposal for a tax on the consumption of petroleum products for industrial and utility use. Approximately 95% of fuels used by utilities and industries is in the form of petroleum products. We do not see coal as a viable alternative for conversion since our older power plants are not equipped to comply with environmental regulations. Capital costs of conversion are simply too high to be economically feasible. Hence, this tax would merely add to the cost of electricity and heating in Massachusetts without any other redeeming effects.

As far as other programs are concerned which might result from conservation initiatives contained in this Plan, we see new job opportunities for our high technology industries such as computer and instruments through normal technological demand from the economy to reduce energy waste, as well as jobs in the R & D area where federal investments will be forthcoming.

In closing, we would be willing to work with you and your committee as this proposal undergoes the serious and detailed analysis something of this importance and complexity deserves.

STATEMENT OF JESSE M. CALHOON, PRESIDENT, MARINE ENGINEERS' BENEFICIAL ASSOCIATION

Meeting New England's Energy Needs With a Regional Strategic Petroleum Reserve

Mr. Chairman, the Marine Engineers' Beneficial Association would like to thank this committee for the opportunity to submit a statement which puts forth our proposal for meeting New England's energy needs by establishing a Floating Reserve within the Strategic Petroleum Reserve.

When it established the Strategic Petroleum Reserve, Congress sought to minimize the disruption to the economy brought on by artificial curtailments of imported oil. The legislation which establishes this reserve directs that special attention be given to those regions of the country which are most heavily dependent on oil imports.

High on the list of import-dependent regions is New England. Over 70 percent of that region's residual fuel needs are imported. Eighty percent of its total energy needs are met by petroleum, and 64 percent of its electricty is produced by plants which are fueled by petroleum.

When compared to any other area of the country, New England has a far higher dependence on petroleum imports. While the Federal Energy Administration expects the national dependence on residual fuel oil to decrease by 1980, FEA also predicts that New England will be importing as much residual in that year as was imported in 1975.

During 1975, New England used 138.7 million barrels of residual oil. Almost 93 million of those barrels came from refineries in the Caribbean; and almost 19 million of those 93 million barrels came from crude oil which originated in the Middle East. Thus, it can be assumed that—for the foreseeable future—at least 19 million barrels of New England's residual fuel supply is vulnerable to an embargo by the very countries which imposed an oil embargo on the United States during 1973–74.

Based on storage capacity and current storage patterns, New England has no more than 14 days of spare residual fuel oil. If there is no regional reserve of residual, FEA estimates that it will take 7 weeks before centrally-stored crude will reach refineries, and then even more time before the residual oil would actually reach New England.

If New England had a regional reserve equivalent to a 90-day supply (4.7 million barrels) or a 180-day supply (9.4 million barrels) of residual fuel oil, it would be able to withstand another oil embargo. Without a regional reserve, New England—far more than any other region of the country—will be vulnerable to petropolitics; and if just one major area of the country is vulnerable, the entire country becomes vulnerable.

An oil embargo during the winter months would make home heating oil scarce. It would sharply reduce the oil needed by New England's electric utilities; and it would undoubtedly result in the closing of factories, businesses and schools. These effects can be mitigated with the establishment of a regional reserve of residual fuel oil for New England.

The Federal Energy Administration, however, has decided against establishing such a regional reserve. That decision was based in large part on the projected costs of underground mine storage and the construction of new above-ground tank storage in New England. Both of these alternatives are excessively costly when compared to central storage of crude oil in salt mines located near the Gulf Coast.

In fact, FEA should have considered the storge of a regional reserve of residual oil for New England aboard tankers stationed off the New England coast. This Floating Reserve would be more efficient and less costly than storing crude oil in Gulf Coast salt mines.

The Floating Reserve would consist of U.S.-flag tankers currently laid-up and inactive together with foreign-flag vessels which would be purchased for this program, modified to meet U.S. standards, and then registered in the United States. There are a number of recent-vintage foreign-flag vessels with capacities of from 100,000 to 200,000 deadweight tons which are either in lay-up or headed for the scrap heap due to the severely depressed nature of the world tanker market.

Over a 15-year period, the cost per barrel per year for tanker storage would be about $4.25, compared to $4.34 for salt mine storage of crude oil near the Gulf Coast. The cost of underground storage of crude oil in New England would be about $6.10 per barrel, while the cost of new above-ground tank storage would be over $10 per barrel.

Tanker storage of reserve residual will provide a regional reserve, giving New England quick access to emergency supplies in the event of another embargo. The Floating Reserve would consist of groups of six or more ships, with each group served by a "mother ship" which would privde power for the other ships in the group. Anchorage systems would be installed to minimize the possibility of spillage during rough weather, and each group of 6 ships would have a crew of 24 which would be berthed aboard the "mother ship'.

The accompanying report discusses this proposal in detail, providing cost, environmental and energy analyses which demonstrate that the establishment of a Floating Reserve of residual fuel oil for New England is both necessary and practical.

The soundness of using a Floating Reserve lies in the fact that it provides a region of the country which has almost no refining capacity of its own and which is heavily dependent on imported oil with easy access to residual fuel oil at minimal cost to the taxpayer. In addition, tankers are flexible while other forms of storage are not. They can be moved as the need arises, and they will disappear when the Strategic Petroleum Reserve program is terminated.

Attachment.

A Proposal for Establishing and Storing Strategic Reserves of Petroleum[1]

In the aftermath of the crisis brought on by the 1973–74 Arab oil embargo, Congress sought a means to insulate the United States from the effects of any such future embargoes. If foreign nations could disrupt our economy to the extent experienced during that embargo, it was reasoned, then they could use that weapon to affect our national policy.

One method chosen by Congress to provide insulation was the establishment of a reserve of petroleum which could be used to cushion the impact of any future oil embargo. Therefore, a Strategic Petroleum Reserve was established under the Energy Policy and Conservation Act of 1975.

The Act provides for the storage of at least 150 million barrels of crude oil and petroleum products by December 22, 1978, with further authority to store up to 1 billion barrels. These 150 million barrels are part of the Early Storage Reserve authorized by the Act to protect against near-term embargoes. To the maximum extent practicable, they are to be stored in existing capacity.

The following are the specific targets established in the Act for the Strategic Petroleum Reserve Plan: June 22, 1977: 50 million barrels; December 22, 1977: 112½ million barrels; December 22, 1980: 325 million barrels; December 22, 1982: 500 million barrels.

The Act also authorized the establishment of a Regional Petroleum Reserve in or readily accessible to any region of the country which imports more than 20 percent of its residual fuel oil or refined pretoleum product demand during the preceding 24 months. The quantity of petroleum products in this special reserve is to be credited towards the statutory requirements for the Strategic Petroleum Reserve.

On December 15, 1976, The Federal Energy Administration presented to the Congress its Strategic Petroleum Reserves Plan. This plan, which took effect on April 6, 1977, has the following major features:

1. It provides for a Reserve of 500 million barrels by 1982.
2. The Reserve will contain only crude oil.
3. The crude oil will be acquired "through the normal Federal procurement procedures" under regulations which will permit the oil to be acquired at near the national composite price for crude oil.
4. The crude oil will be stored underground in salt dome caverns or mines or in rock caverns.
5. No Regional Petroleum Reserve will be established.
6. The June 22, 1977 deadline for storing 50 million barrels will not be met "because of technical requirements, environmental hazards and high costs."

Some of the deficiencies of this plan will be discussed in this report.

[1] Prepared for the Marine Engineers' Beneficial Association, by Ruttenberg, Friedman, Kilgallon, Gutchess & Associates, Inc., Washington, D.C., May 1977.

Oil import dependence in the United States

As of 1976, the United States imported nearly 40 percent of all crude oil refined in this country and 11 percent of all petroleum products consumed. For major petroleum products, the level of import dependence is—[2]

U.S. dependence on imports for petroleum products

	Percent
Motor Gasoline	1.9
Jet Fuel	7.7
Distillate Fuel	4.6
Residual Fuel	50.2
Liquefied Gases	12.5

When these statistics are broken down on a regional basis, they reveal that some regions of the country are more dependent on imports than others:

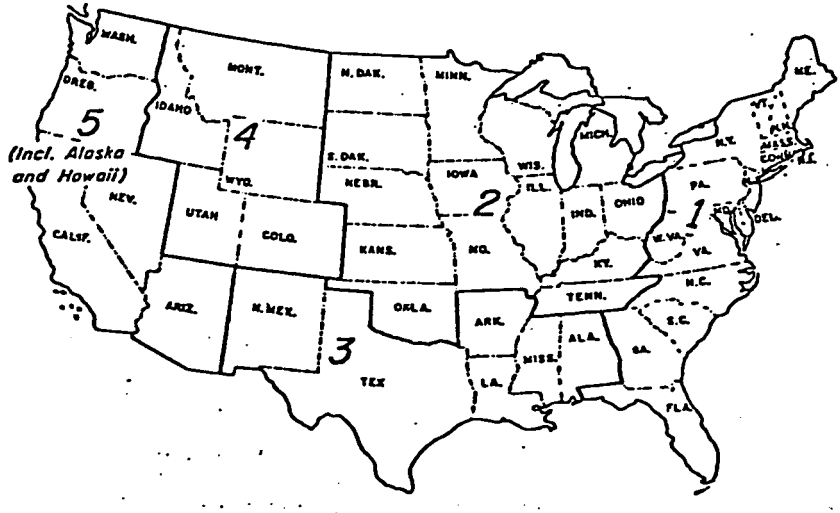
REGIONAL PETROLEUM PRODUCT IMPORTS AS A PERCENT OF LOCAL DEMAND

Pad district [1]	I	II	III	IV	V	Total
Motor gasoline	5.0	0.04	0.6		0.4	1.9
Jet fuel	19.2				8.2	7.7
Distillate fuel	9.6		.6		2.5	4.6
Residual fuel	80.8	11.0	1.5		3.8	50.2
Liquefied gases	8.3	16.3	4.9	34.8	33.3	12.5

[1] For outline of PAD districts, see fig. 1, p. 4.

FIGURE 1

PETROLEUM ADMINISTRATION FOR DEFENSE (P.A.D.) DISTRICTS



In addition, the United States imports an ever-increasing amount of crude oil. The following table traces those direct crude oil imports which come from the countries which embargoed U.S. oil ships in 1973–74:

[2] All petroleum statistics based on U.S. Bureau of Mines, Mineral Industry Surveys, unless otherwise attributed.

U.S. CRUDE OIL IMPORTS FROM EMBARGO NATIONS 1976

PAD district	I	II	III	IV	V	Total
Percent of crude imports from embargo nations	68.2	50.1	47.4		27.9	44.8
Crude imports from embargo nations (thousands of barrels)	353,221	183,222	308,593		105,828	867,532

In terms of direct products imports, the U.S. has only a slight dependence on the embargo nations. For all petroleum products, .3 percent of domestic demand (or about 45,392 barrels per day) come from the embargo nations. Half of these imports (or 23,764 barrels per day) are accounted for by residual fuel imports to PAD I.

Finally, none of these statistics adequately reflects the impact of indirect imports which come from the Middle East. For example, almost 90 percent of U.S. residual fuel imports come directly to the United States from the Caribbean. Some of this Caribbean residual originates in Venezuela, but a large percentage originates in the Middle East which ships crude to the U.S. Virgin Islands where it is refined and then shipped to the United States. Thus, the U.S. dependence on the embargo nations for crude oil and petroleum products is actually far higher than the statistics cited above would indicate.

Existing emergency stockpiles of petroleum

There are currently two sources of emergency supplies of petroleum. The first is that oil which comprises current petroleum inventories. During 1976, the United States had just under 1 billion barrels of crude oil and petroleum products stocks. While the total number of barrels which this level of inventories suggests would appear to be adequate to offset the effects of a 6-month oil embargo, it is highly unlikely that the actual use of current inventories would come anywhere close to meeting that objective.

The following table demonstrates that current stocks are not well distributed among petroleum products:

CURRENT EMERGENCY STORAGE CAPACITY

[Millions of barrels]

Product	1976 average stocks	1976 average daily consumption	Days usable[1] storage
Crude oil	278.4	[2]13.42	20.8
Motor gasoline	233.2	6.98	33.4
Jet fuel	15.6	.99	15.8
Distillate fuel	197.4	3.13	63.1
Residual fuel	73.2	2.79	26.3
Liquefied gases	110.4	1.04	106.0

[1] Average stocks divided by average daily consumption.
[2] Crude input to refineries used as consumption measure.

In addition to this uneven distribution of product inventories, FEA (in its 1974 Project Independence Blueprint) estimated that only one-half of existing inventories could be used to meet shortages caused by an embargo. The other half represents products which are merely being stored for a short period of time. They would be needed locally, and their use in other parts of the country would cause local shortages beyond those caused by the embargo itself.

In terms of the crucial product of residual fuel, which not only heats homes but is used in industry, the United States has less than a 30-day supply. Using FEA's guideline, less than 15 days of this supply could be used to offset the impact of an embargo.

The other, more promising, existing source of petroleum reserves is oil found in the Naval Petroleum Reserves. These reserves were established between 1912 and 1924 to provide an assured defense fuel supply. The four naval reserves contain at least 1.16 trillion barrels of oil and 1.34 trillion cubic feet of natural gas. Elk Hills, California—the most important of these reserves—contains 87 percent of the proved reserves of petroleum and natural gas in the total Naval Reserve system.

These reserves statistics do not, by any means, represent the full potential of the Naval Reserves. Under current methods of estimating proved reserves, the extent of reserves estimated is a direct function of the degree of exploratory drilling which has taken place. Despite the drilling of more than 1,000 wells at Elk Hills, there are major segments of that reserve which have yet to be adequately explored. In addition, the reserve in Alaska has yet to experience any significant exploration. Thus, the extent of its reserves are likely to be far higher than presently estimated. The Buena Vista Hills reserve is now fully developed, and the Teapot Dome reserve in Wyoming has the capability of producing 2,000 barrels per day without additional drilling. Neither of these latter two reserves is capable of producing a significant amount of petroleum.

The Elk Hills reserve is presently capable of producing about 160,000 barrels of oil per day (or 58.4 million barrels per year). By April of 1979, it will be producing at its maximum efficient rate of 300,000 barrels per day (or 109.5 million barrels per year). It is estimated that this maximum rate of production can be maintained for about five years, with a gradual decline in production capability thereafter.[3]

The use of Elk Hills oil for the strategic reserve

The use of Elk Hills oil for both the Early Storage Reserve and the Strategic Petroleum Reserve is attractive because it avoids buying high-priced oil on the open market, as has been proposed by the Federal Energy Administration. Under the Naval Petroleum Reserves and Production Act (Public Law 94-258), 80 percent of Elk Hills oil can be transferred to the petroleum reserve at cost.[4]

The cost to the federal government of lifting a barrel of oil from Elk Hills is about 25 cents.[5] When investment expenses are amortized, the total cost per barrel is no more than $2.00.[6]

FEA has stated that it will not use Elk Hills oil to fill all, or any portion, of the Strategic Petroleum Reserve because Elk Hills oil would have higher costs than the national average composite price, and that it "may" cost more than obtaining oil at world prices.[7] These statements are inaccurate.

With the amortized cost of Elk Hills oil of $2.00 per barrel and transportation costs of no more than $3.00 per barrel (taking into account the necessity of using small tankers to transport the oil through the Panama Canal to Gulf and/or East Coast ports), the total cost of a barrel of Elk Hills oil would be around $5.00. FEA cites a recent sale of Elk Hills oil for $12.31 a barrel to justify its statements on cost, but this sale was under another provision of the law which permits Elk Hills oil to be sold without regard to any price controls.

The December, 1976 national average price for domestic oil (the latest period for which figures are currently available) was $8.62. Elk Hills oil would be more than $3.50 cheaper. The landed cost of Saudi Arabian crude during the same period was $13.02 a barrel. Elk Hills oil would be more than $8.00 cheaper. The composite refiner acquisition cost of both domestic and imported crude oil for the same period was $11.34. Elk Hills oil would be more than $6.00 cheaper.

While it may appear that the government could profit more by selling Elk Hills oil without price controls on the open market than by using Elk Hills oil for the Strategic Petroleum Reserve, it is an elusive profit. The statute provides that, if Elk Hills oil is sold on the open market, revenues from the sale would have to go toward the continued exploration and development of both the Elk Hills and the Alaska reserves. These exploration and development expenditures, however, will be made regardless of whether or not Elk Hills oil is sold on the open market. No matter what is done with Elk Hills oil, the American people will pay the costs of further reserve development. The difference which results from selling Elk Hills oil on the open market and buying Strategic Petroleum Reserve oil on the open market is that the oil industry is permitted to increase its profits. If Elk Hills oil were used to fill a portion of the Strategic Reserve, the oil industry would lose out on a source of additional profits.

When the Navy testified before a joint meeting of two Senate committees in 1975, it was clear that the first priority for Elk Hills oil would be the then-embryonic strategic petroleum reserve: "We have identified as first priority sending the oil to

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[3] Statement of Assistant Secretary of the Navy Jack Bowers before joint hearings of the Senate Armed Services and Interior Committees, March 11, 1975. (Hereinafter cited as "1975 Hearings").

[4] 10 U.S.C. 641, para. 7430(k).

[5] Statement of Assistant Secretary Bowers, 1975 Hearings, op. cit.

[6] Ibid.

[7] Statements of Assistant FEA Administrator Thomas E. Noel in a letter to Jesse M. Calhoon, President, National Marine Engineers' Beneficial Association, March 9, 1977.

the strategic reserve. The next priority is to top off the mobilization reserve stocks for the military. . . . The third priority is to sell the oil." [8]

The reference to selling Elk Hills oil did not mean sale on the open market: "Our natural recourse would probably be to sell the oil to ourselves, and in so doing we would free other oil currently being purchased (by the U.S. government) to the public economy. . . ." [9]

In its report to Congress on plans to establish the Early Storage Reserve, the Federal Energy Administration identified three alternative means of providing the government's portion of that reserve: [10]

(1) use or exchange of government royalty oil

(2) purchase or exchange of domestic or foreign petroleum products

(3) use or exchange of Naval Petroleum Reserve oil

At that time, FEA recognized that "the NPRs [Naval Petroleum Reserves] could produce enough petroleum to meet ESR [Early Storage Reserve] and SPR [Strategic Petroleum Reserve] requirements." [11] FEA also recognized that the problem of transporting Elk Hills oil to the Midwest and East could be resolved by exchanging Elk Hills oil on West Coast markets for similar quantities and types of crude oil or petroleum products located elsewhere.

President Carter has asked Congress to provide funds for storing 250 million barrels in the first stage of the Strategic Petroleum Reserve by the end of 1978. If Elk Hills oil were used for this purpose, American taxpayers would save $1.58 billion. Savings in later stages would be even greater as the cost of open market oil escalates.

TANKER STORAGE OF A PORTION OF THE STRATEGIC RESERVE

A. *New England's dependence on oil imports*

In establishing an emergency supply of petroleum, Congress sought to minimize the disruption to the economy brought on by artificial curtailments of imported oil. The legislation directs that, in the establishment of this reserve, special attention be given to those regions of the country which are most heavily dependent on oil imports.

High on the list of these regions is New England. Over 70 percent of that region's residual fuel needs are imported. [12] Eighty percent of its total energy needs are met by petroleum, and 64 percent of its electricity is produced by plants which are fueled by petroleum. [13] When compared to any other area of the country, New England has a far higher dependence on petroleum imports. While the Federal Energy Administration expects the national dependence on residual fuel oil to decrease by 1980, FEA also predicts that New England and the remainder of PAD I to be importing as much residual in that year as was imported in 1975. [14]

Based on storage capacity and current storage patterns, New England has no more than 14 days of spare residual fuel oil. [15] If there is no regional reserve of residual, the FEA estimates that it will take 7 weeks before centrally-stored crude will reach refineries, and then even more time before the residual oil would actually reach New England.

FEA estimates that some of this time lag will be accounted for by shipments en route to the United States at the time of the imposition of an embargo. This estimate is based on two erroneous premises. First, oil destined for the U.S. will not necessarily reach this country because the oil companies—even U.S. companies—will act as they did during the 1973-74 embargo and act as oil managers. In that capacity, they will begin to redistribute oil supplies throughout the world in an attempt to "equalize suffering". [16] Thus, the supply of oil en route to the United States will actually be reduced. During the previous embargo, statistics show that the oil companies chose to supply Japan more generously than they did the United States or Western Europe. [17] In effect, therefore, the amount of oil redistributed

[8] Statement of Assistant Secretary Bowers, 1975 Hearings, op. cit.

[9] Ibid.

[10] Federal Energy Administration, Early Storage Reserve Plan, April 22, 1976.

[11] Ibid.

[12] Testimony of Zeb D. Alford, Chairman, Energy Committee, New England Council, before House Energy and Power Subcommittee, February 16, 1977.

[13] Statement of Massachusetts Lt. Governor Thomas P. O'Neill, Jr. before the House Energy and Power Subcommittee, February 16, 1977.

[14] Testimony of John H. Lichtblau, Executive Director, Petroleum Industry Research Foundation, Inc., before the Senate Committee on Interior and Insular Affairs, February 4, 1977.

[15] Alford testimony, op. cit.

[16] Robert B. Stobaugh, "The Oil Companies in the Crises", published in Daedalus, Fall, 1975.

[17] Ibid.

cannot be predicted. In fact, the record shows that only one large tanker carrying Saudi Arabian crude loaded before the embargo actually reached the United States after the embargo was imposed.[18]

Second, the oil companies do not have total control over much of the fleet which carries their oil. Nearly all ships carrying oil to the U.S. from foreign countries are registered under foreign flags. Only about 3.5 percent of imported oil is carried by U.S.-flag ships. Any of these foreign countries could act to prohibit ships of its registry from carrying oil to an embargoed country. Furthermore, the Arab countries have been amassing a sizeable fleet of their own tankers since the embargo.[19] That fleet is expected to amount to 20 million deadweight tons by 1980. By 1978, Saudi Arabia will export 50 percent of its own oil in Saudi Arabian ships. By the end of the current year, the Arabs will control more than 5 percent of the world's tanker capacity.[20] What this means is that the oil companies may lose what ability they now possess to redistribute oil supplies on an even-handed basis during any future embargo.

With this as a base, it is possible to determine New England's residual fuel oil dependence on the embargo nations. New England's annual residual fuel oil demand during 1975 was 138.7 million barrels.[21] An examination of FEA records shows that about 67 percent of residual fuel oil imports to the East Coast of the U.S. comes from the Caribbean. Assuming the same percentage also applies to imports of residual to New England alone, it can be estimated that New England receives 92.9 million barrels of residual fuel oil from the Caribbean (138.7MmBbl. x .67).

Based on FEA data provided by Texaco—one of the biggest importers of residual fuel oil to the eastern United States—it can be estimated that the Middle East supplies about 20 percent of the crude oil from which residual fuel oil is extracted at Caribbean refineries and then sent to the U.S. Thus, it is calculated that New England depends on the Middle East for 18.6 million barrels of residual fuel oil per year (92.9 MmBbl. x .20). A supply equivalent to 90 days of Middle East-originated residual would therefore be 4.7 million barrels (18.6 MmBbl./yr. divided by 4).

If New England had a regional reserve of 4.7 million barrels of residual fuel oil, it would be able to withstand at least a 90-day embargo. However, the Federal Energy Administration has decided against establishing such a regional reserve. This decision was based in large part on the projected costs of underground mine storage of petroleum in New England. Two mine sites were examined by FEA, one in Massachusetts and one in Connecticut. The respective per barrel costs of storage determined by FEA were $6.10 and $8.95.[22]

In fact, FEA should have considered alternatives to underground storage. Residual fuel oil must be stored in a heated environment. FEA did consider above-ground tank storage, but found its costs to be in excess of $10 per barrel.[23]

B. *Use of tankers to store residual for New England*

The use of tankers to store residual reserves for New England is both logical and practical. Tanker storage is more efficient, less costly, and more environmentally sound than storing crude oil in salt domes or mines located near the Gulf Coast.

The Floating Reserve which is proposed would be comprised of tankers leased by the federal government from private owners. Some of these vessels would be those U.S.-flag tankers currently laid-up and inactive. Others would be U.S.-flag vessels which are presently in uneconomic use. Still others would be foreign-flag vessels which are either laid-up or under construction and destined for lay-up due to the severely-depressed state of the world tanker market.

There are presently a number of foreign-flag Very Large Crude Carriers (VLCCs) with capacities of from 100,000 to 250,000 deadweight tons which are either in lay-up or headed for the scrap heap. Most of these vessels are 10 years old or less. With world tanker prospects likely to be depressed for the next 10 years, and since these

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[18] Ibid.

[19] V. H. Oppenheim, "Arab Tankers Move Downstream," in Foreign Affairs, Fall, 1976.

[20] Hanns Maull, Oil and Inflation: the Weapon Examined, International Institute for Strategic Studies, Adelphi Papers No. 117, 1975.

[21] Federal Energy Administration, Strategic Petroleum Reserve Plan, Table V-1, p. 99; December 15, 1976.

[22] Federal Energy Administration, Strategic Petroleum Reserve Plan, op. cit., Table V-3, p. 105.

[23] Ibid., Table V-4, p. 106.

vessels are generally too small for use by the Arab nations which are expanding their fleets, there is no market for these VLCCs. They can be purchased for $2 to $4 million—one-fifth to one-tenth of their normal market value.

To make use of these foreign-flag vessels, Congress should enact legislation authorizing the Secretary of Commerce to establish a program which would:

(1) make subsidies or loans to private U.S. shipping companies for the purchase of foreign-flag ships for use in the Floating Reserve; or, in the alternative, permit the federal government to purchase foreign-flag ships for use in the Floating Reserve; and

(2) authorize the government to enter into long-term charter arrangements with the private owners of such ships for use in the Floating Reserve, providing the ships have been registered under the U.S. flag.

This approach to establishing a Floating Reserve would result in the acquisition of significant tonnage capacity at very low cost.

The floating Reserve would give New England easy access to emergency supplies of petroleum. Tankers could be anchored in calm waters off the New England coast or near the Port of New York to provide direct access of their residual fuel cargoes to New England pipelines or New York-area refineries. The time lag in getting the reserve residual from the tankers to New England would be a matter of a few days, rather than a matter of weeks as under the FEA proposal.

C. *Environmental and cost factors in tanker storage*

The Federal Energy Administration states that it has considered the possibility of using tankers to store a portion of the Strategic Petroleum Reserve. While stating that tankers "would provide a flexible means of storage near major ports and coastal refineries," FEA concludes that this alternative is not acceptable when environmental and cost factors are taken into account.[24]

The Federal Energy Administration has made the following cost estimate for tanker storage of oil:[25]

Item	*Cost in $/bbl.*
Tanker Purchase	$4.22
Refurbishing after lay-up	.14
Movement to U.S.	.28
Vapor recovery system	.56
Anchorage system	.11
Crew, maintenance, etc.	1.82
Evaporation loss	.30
Tanker sale (cost recovery)	(1.01)
Total discounted present value	6.42

This cost analysis was based on a study conducted for FEA in January, 1977 by the Institute for Defense Analyses. That study made the following assumptions:

(1) foreign flag tankers could be purchased at no less than $30 per deadweight ton;

(2) non-recurrent costs (such as costs of acquiring the ship and moving it to the U.S.) were not separated from recurring costs;

(3) a vapor evaporation system would have to be installed to reduce evaporation loss;

These assumptions lead to the cost estimates listed above. In several respects, they are invalid.

(A) foreign-flag tankers in good condition can be purchased for $20 per deadweight ton (or about $2.82 per barrel);[26]

(B) refurbishing costs as estimated by the FEA study are 10 times the Maritime Administration estimate of $.014 per barrel.[27] A careful reading of the FEA study indicates that the contractor merely guessed at its cost estimate.

(C) a vapor recovery system is not needed for the storage of residual fuel oil. Residual is heavy oil with very little evaporation. The FEA study relied on the evaporation experience of crude oil, which contains light fractions which do evaporate during storage. Residual contains very few light fractions.

[24] Federal Energy Administration, Early Storage Reserve Plan, April 22, 1976.

[25] Statement of FEA Administrator John F. O'Leary, reprinted in the Congressional Record, daily edition, March 7, 1977, p. S 3624.

[26] U.S. Maritime Administration, "The Cost of Using Tankers for the Strategic Petroleum Reserve Program", October, 1976.

[27] Ibid.

(D) the study added a cost for transporting the foreign-flag vessel to the U.S. and then used this cost to compare tanker storage unfavorably with salt dome and mine storage. In fact, much of the oil being placed in the Strategic Petroleum Reserve will come from foreign sources, thus necessitating ship transportation across the Atlantic. This will be two-way ship trasportation, at least 50 percent of which is required by law to be composed of U.S.-flag ships. By contrast, acquiring foreign-flag tankers for the Floating Reserve will require only one-way transportation. Either U.S. crews will be flown overseas to pick up the ship, or foreign crews will be flown overseas after the ship has been delivered to the U.S. Taking these factors into account, it is doubtful that the cost of moving a foreign-flag ship to the U.S. will be any different than moving foreign oil to the U.S.

A more accurate estimate of the costs of storing a barrel of residual fuel oil aboard a tanker would be:[27a]

Item	*Cost in $/bbl*
Tanker Purchase	[1] $2.820
Refurbishing at End of Program	[2] .014
Movement to U.S.	[3] .490
Modification to meet U.S. standards	[4] .282
Anchorage system	[5] .111
Crew	[6] .239
Fuel, Food, Insurance, Miscellaneous	[7] .170
Loss due to evaporation and in distribution	[8] .300
Salvage value	[9] (2.820)
Total cost of tanker storage	2.116

[1] Based on $2 million cost for 100,000 dwt vessel.
[2] Based on Maritime Administration estimate, see footnote 26.
[3] Based on full rate charged on recent Saudi Arabia to U.S. voyage.
[4] Based on Maritime Administration estimate, see footnote 26.
[5] Includes additional anchor cable for stern anchorage, anchorage surveys, "Yokohama Fenders" between anchored ships, and galvalum anode system for hull corrosion inhibition. Based on Maritime Administration estimate, see footnote 26.
[6] Assumes that ships will be anchored together in groups of at least six. One ship will act as a "mother ship" for the others, providing all power and heat needed and housing the crew. The crew includes: 3 deck officers, 3 engine officers, 1 radio officer, 1 steward/cook, and 16 unlicensed deck and engine officers for each group of six ships.
[7] Based on shipping company sources.
[8] Based on Maritime Administration estimate.
[9] Non-discounted salvage value assuming ship can be sold for same amount as purchase price.

These costs can be better understood if they are spread over a period of time to separate recurring from non-recurring costs and to take into account the decrease in the value of the dollar.[28] Using a 15-year period, the costs of tanker storage as calculated by the FEA study and as calculated using the data listed above are as follows:

FIFTEEN YEAR COSTS OF TANKER STORAGE OF RESIDUAL OIL

[Dollars per barrel]

Item	FEA study	MEBA study
Initial costs:		
Tanker purchase	4.22	2.82
Movement to United States	.28	1.00
Anchorage system	.11	.11
Modification to meet U.S. standards		.28
Vapor recovery system	.56	
Recurring costs: Crew, fuel, food, etc	1.82	.41
Program termination costs:		
Refurbishing after layup	.14	
Loss due to evaporation and in distribution	.30	.30
Salvage value	(1.01)	(.67)
Total discounted present value cost	6.42	4.24
Total per year	.43	.28

[27a] The Japanese have estimated the cost of tanker storage at $1.60 per barrel per year. Petroleum Intelligence Weekly; September 6, 1976.
[28] A 10 percent discount factor has been chosen in accordance with Office of Management and Budget Circular A-94.

These costs can be compared with the cost estimates for storing crude oil in salt domes: [29]

FIFTEEN YEAR COSTS OF TANKER STORAGE VS. SALT DOME STORAGE

[Dollars per barrel]

Item	Regional tanker storage	Central salt mine storage
Initial costs:		
Site land		0.50
Dome leaching		.50
Facilities		.30
Fill costs		.64
Movement to United States	1.00	1.00
Tanker purchase	2.82	
Anchorage system	.11	
Modification of Tankers	.28	
Recurring costs:		
Static operations		.18
Crew, fuel, food, etc	.41	
Program termination costs:		
Additional shipping costs [1]		.84
Loss due to evaporation and in distribution	.30	.38
Salvage value	(.67)	
Total discounted present value cost	4.25	4.34
Total per year	.28	.29

[1] Estimated U.S.-flag shipping cost from Texas ports to Boston.

The costs of tanker storage and central salt mine storage are, thus, comparable. However, the tanker storage is a regional reserve which provides New England with quick access to emergency supplies of residual fuel oil, while the salt mine storage option elected by the Federal Energy Administration makes use of central storage sites near the Gulf Coast. These central sites will hold crude oil only, thus necessitating a delay of several weeks before residual oil could reach New England.

D. *Anchorage sites for the floating reserve*

Based upon criteria such as adequate water depth, ocean-bottom composition, low volume of vessel traffic, isolation from high density population, sheltered anchorage, and environmental pollution considerations, the Maritime Administration has found five sites which would be suitable for anchoring vessels in the Floating Reserve. Three of those sites are in Long Island Sound: Mattituck, Rocky Point, and Mulford Point. The other two are in Narragansett Bay and near Portland, Maine.[30] Both the Coast Guard and oil company personnel have agreed that these are suitable anchorage sites.[31]

[29] Salt mine storage costs derived from Institute for Defense Analyses, Use of Tankers for Stockpiling Petroleum (January, 1977) and U.S. Maritime Administration (see footnote 26).

[30] See footnote 26.

[31] Institute for Defense Analyses, Use of Tankers for Stockpiling Petroleum, January, 1977.

Due to the anchorage systems to be employed and the stationary nature of the Floating Reserve, spillage resulting from weather or accidents is highly unlikely.[32] It is conceivable that, during an embargo period, tankers in the Floating Reserve might be subject to deliberate attack. In the event of an embargo, the risk of deliberate attack could be minimized by increasing Coast Guard surveillance of stationary Floating Reserve vessels. Of course, during an embargo, the vessels in the reserve would move immediately to port to discharge their cargoes. Thus, the risk of deliberate attack would be minimal.

E. *Size of floating reserve*

To store the 4.7 million barrels of residual fuel oil necessary to insulate New England from a 90-day embargo, the equivalent of 6.6 100,000 dwt vessels would be required. Should the amount of residual stored be greater, or should the size of the ships used be smaller, a larger number of vessels would be required.

CONCLUSION

The establishment of a Strategic Petroleum Reserve is essential for the security of our country. We must not be in a position where we are vulnerable to the use of petroleum blackmail by foreign governments.

In establishing the reserve, policies which emphasize the minimization of cost and the maximization of flexibility and utility should be adopted.

The soundness of using Elk Hills oil lies in the fact that 80 percent of the oil in that reserve is already owned by the government and can be produced at a very low cost. No additional legislative authority is needed. However, in light of the Federal Energy Administration's unwillingness to consider this alternative, Congress should amend existing law and require FEA to give first priority for the use of Elk Hills oil to filling the Strategic Petroleum Reserve.

Similarly, the soundness of using a Floating Reserve to store residual fuel oil for New England lies in the fact that it provides a region of the country which is heavily dependent on imported oil with easy access to residual fuel oil at minimal cost to the taxpayer. The cost of establishing other forms of regional storage for New England would be far higher than using tankers, and tankers are flexible while other forms of storage are not. They can be moved as the need arises, and they will disappear when the Strategic Petroleum Reserve program is terminated.

Congress should act to include the use of tankers as a storage alternative to be used in those instances where a regional reserve is called for and where alternative forms of storage are either more costly or less efficient in providing access to stored petroleum in time of emergency.

Only with this additional legislation can the United States establish an effective Strategic Petroleum Reserve Plan.

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[32] Ibid.

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